

DESIGN GUIDELINES

2021 Design Guidelines

[WITH CHANGES TRACKED]

Real Estate Development + Facilities



ACKNOWLEDGEMENTS

We would like to thank the following individuals and departments for their role in creating and maintaining these Design Guidelines.

Executive Leadership

Vicki Match Suna, AIA | Vice Dean and Executive Vice President for RED+F
David Resnick, AIA | Vice President for Project Planning, Design and Construction

Editor-in-Chief

Fred Alvarez, AIA | Senior Director of Design

Editors

Leeza Springer, PMP | Senior Design Manager
Paul Mulyk, PE, BCxP | Associate Director of Commissioning

Contributing Divisions of Real Estate Development and Facilities (RED+F)

Design Studio
Project Planning, Design and Construction
Facilities Management and Operations
Space Planning and Management
Energy and Sustainability
Environmental Health and Safety (EH&S)
Environmental Services / Building Services
Campus Security
Project Support Office

Contributing Departments

Medical Center Information Technology (MCIT)
Infection Prevention and Control (IPC)
Occupational and Industrial Orthopedic Center (OIOC)

TABLE OF CONTENTS

LETTER FROM THE VICE DEAN AND EXECUTIVE VICE PRESIDENT 1

INTRODUCTION *(UPDATED)* 3

UPDATES AND REVISIONS *(UPDATED)* 4

Section 1: Architectural Guidelines

General Information

MASTER PLAN GUIDING PRINCIPLES 7

DESIGN PRINCIPLES 8

GENERAL PROJECT REQUIREMENTS 9

A/E DESIGN FEE GUIDELINES *(UPDATED)* 12

PROJECT DELIVERY PROCESS *(UPDATED)* 20

BASIS OF DESIGN 30

DESIGN REVIEW PROCESS *(UPDATED)* 31

PRESENTATION MATERIALS 35

FINISH & FURNITURE BOOKLETS 41

Architecture / Interiors

CAD DOCUMENTATION STANDARDS 48

BUILDING INFORMATION MODELING 52

SPACE PLANNING *(UPDATED)* 55

ERGONOMICS 92

ROOM FINISHES FOR CLINICAL SPACES *(UPDATED)* 96

ROOM FINISHES FOR NON-CLINICAL SPACES *(UPDATED)* 112

MATERIAL LEGEND *(UPDATED)* 136

PAINT COLORS *(UPDATED)* 160

ART PROGRAM 164

ROOM NUMBERING, SIGNAGE & WAYFINDING 166

FURNITURE *(UPDATED)* 168

PANTRY APPLIANCES *(UPDATED)* 230

PLUMBING FIXTURES *(UPDATED)* 236

EMERGENCY PLUMBING FIXTURES 255

TOILET ACCESSORIES *(UPDATED)* 257

BUILDING ACCESSORIES *(UPDATED)* 274

RECYCLING PROGRAM *(UPDATED)* 281

DOOR HARDWARE *(UPDATED)* 298

ENVIRONMENTAL HEALTH & SAFETY 321

ENVIRONMENTAL SUSTAINABILITY *(UPDATED)* 323

INFORMATION TECHNOLOGY 328

SECURITY 332

MISCELLANEOUS *(UPDATED)* 335

DOS AND DON'TS *(UPDATED)* 339

Section 2: Engineering Guidelines

TABLE OF CONTENTS 349

GENERAL 354

MECHANICAL *(UPDATED)* 356

ELECTRICAL *(UPDATED)* 396

PLUMBING *(UPDATED)* 415

FIRE PROTECTION *(UPDATED)* 427

FIRE ALARM 434

BUILDING MANAGEMENT SYSTEM *(UPDATED)* 436

Section 3: Project Close-Out

CLOSE-OUT PACKAGE 553

PHOTOGRAPHY 555

POST-OCCUPANCY EVALUATIONS 557

LETTER FROM THE VICE DEAN AND EXECUTIVE VICE PRESIDENT

This is an especially exciting time for NYU Langone Health, as our trifold mission to serve, teach, and discover is achieved daily through an integrated academic culture devoted to excellence in patient care, education, and research.

The transformation of our campus is key to achieving this vision. Building upon a legacy of excellence, we are creating a uniquely seamless environment in which patient care, research, and education blend synergistically across all areas of our institution. Our researchers will have state-of-the-art laboratories built to encourage collaboration, which in turn will speed the translation of scientific discoveries to the patient bedside; and, our students and faculty will work together in modern educational facilities equipped with the latest technological tools. This integration culminates in our paramount focus—to set new standards of excellence in providing for the health and comfort of patients and their families.

In line with these goals is adherence to a set of comprehensive design standards, shaped by a set of guiding principles for the built environment:

- *Design Quality*
- *Construction Quality*
- *Cost Effectiveness*
- *Schedule Compliance*
- *Design Flexibility*
- *Efficiency, Functionality and Practicality*
- *Intuitive Wayfinding*
- *Durable Materials*
- *Attention to Detail*
- *Collaborative Process*

The mission of the Real Estate Development and Facilities (RED+F) department at NYU Langone is to plan, develop, operate and maintain our growing network of facilities and, in doing so, to provide the foundation for our growth and success in the 21st century. The design guidelines put forth here will enable RED+F to work efficiently and successfully with its partners in the design community to play a vital role in translating our vision into the physical reality.



Vicki Match Suna, AIA
Vice Dean and Executive Vice President
Real Estate Development and Facilities

INTRODUCTION

Purpose

With over 13 million square feet at locations throughout the New York metropolitan region, NYU Langone Health leases, owns and operates an enormous variety of buildings. The *NYU Langone Health – Design Guidelines* ~~and the *Supplemental Design Guidelines (Design Guidelines)*~~ have been created as a guide for architects, interior designers, engineers and Real Estate Development + Facilities Project Managers (PM), etc. to design existing and new facilities. We understand all projects are unique. As such, it is expected the Architectural/Engineering Team (A/E Team) shall take into account existing site conditions, user requirements, building codes, these Design Guidelines, and all other requirements as necessary to design our facilities. In addition, these guidelines are not intended to repeat or replace any code mandated requirements. Compliance with relevant codes is the sole responsibility of the A/E Team.

Goals

- *Efficiency*

A principal goal of the Design Guidelines is to improve the efficiency of the design process. We can improve operations and maintenance by creating a commonality of systems and products across our expanding portfolio. Where appropriate, approved materials and products are indicated in the guidelines. The aim is not to limit design expression but to guide the architects and engineers toward solutions that are in conformance with our construction and maintenance practices. Improving efficiency in design, construction and operations is of substantial financial benefit to our institution.

- *Design Excellence and Quality Construction*

NYU Langone Health is committed to design excellence, and stands by the premise that intelligent planning, inspired design, meticulous documentation, and quality construction are all indispensable to this effort, and will bring added value to our organization. The guidelines have been created in support of this goal.

Applicability

~~At the start of a project, the PM shall inform the A/E Team whether the *Supplemental Design Guidelines* shall be used. The documents~~These guidelines will be updated periodically. The PM on a particular project will advise when new updates are available.

Access and Exceptions

The Design Guidelines can be accessed on the RED+F website:

<http://nyulangone.org/vendor-supplier-information/design-guidelines>

Designers may seek approval of deviations from or alternatives/additions to the Design Guidelines by written request to the PM, who will forward such requests to the RED+F Design Studio for review. The PM will advise the designer in writing whether or not the proposed deviation, alternative or addition is approved. Under no circumstances shall deviation from the Design Guidelines be construed as a basis for additional services.

UPDATES AND REVISIONS

These guidelines will be updated periodically. Below is a Legend and Summary of how and what changes have been incorporated into the 2021 release of the NYU Langone Health Design Guidelines:

Legend

- ***(CAPITALIZED BOLD ITALIC)*** text following subsection titles listed in the Table of Contents shall be used to identify New and Updated subsections.

Summary

The following subsections in the 2021 NYU Langone Health Design Guidelines have been ***UPDATED:***

Section 1: Architectural Guidelines

- Introduction
- Updates and Revisions
- A/E Design Fee Guidelines
- Project Delivery Process
- Design Review Process
- Space Planning
- Room Finishes for Clinical Spaces
- Room Finishes for Non-Clinical Spaces
- Material Legend
- Paint Colors
- Furniture
- Pantry Appliances
- Plumbing Fixtures
- Toilet Accessories
- Building Accessories
- Recycling Program
- Door Hardware
- Environmental Sustainability
- Miscellaneous
- Dos and Don'ts

Section 2: Engineering Guidelines

- Mechanical
- Electrical
- Plumbing
- Fire Protection
- Building Management System

1. ARCHITECTURE

MASTER PLAN GUIDING PRINCIPLES

NYU Langone Health has developed master plan guiding principles to help direct our collective efforts in the transformation of our campus. All projects undertaken at NYU Langone shall be planned in accordance with these master plan guiding principles.

1. All future facility improvement and development should redefine and reposition NYU Langone Health in the New York metropolitan region.
2. NYU Langone Health will be a leader in patient-centered care.
3. The physical environment should support efficient, LEAN-based operations in all enterprises of the campus.
4. All programs and facilities should foster clinical and translational research that:
 - is integrated into programs and facilities
 - promotes collaboration in care delivery and research
 - can support NYU Langone to broaden sources of funding for research
5. The physical environment should encourage flexibility and an adaptive environment.
6. NYU Langone Health will be a premier “service” organization that is:
 - safe
 - supportive of faculty, clinicians, students, patients and visitors
 - disease-focused
 - innovative
 - responsive to market forces and dynamics
7. The faculty response to clinical needs must be fiscally responsible and provide clear direction for expansion over time, as funds become available.
8. Consistent with the NYU Langone mission and as they support strategic areas, innovative methods and technologies will be anticipated and incorporated into clinical programs and practices.
9. All facilities should provide space in support of the educational and training mission of the Medical School and the University.
10. The care that we provide at NYU Langone Health results from a team effort working on behalf of the patient and family.
11. All facilities should embrace sustainable and evidence-based parameters in design, materials, equipment and technology.

DESIGN PRINCIPLES

NYU Langone Health is committed to design excellence and demands the highest quality built environment. We stand by the premise that intelligent planning, inspired design, meticulous documentation and quality construction are all indispensable to this effort. As part of our mission devoted to excellence in patient care, education, and research, we have developed the following design principles:

1. Design Quality

- Design solutions must be timeless with a clearly organized concept, developed and reinforced with appropriate materials and details.
- Provide innovative solutions that create safe, secure and supportive environments and improve workflow.
- Develop design solutions that strengthen the NYU Langone brand.

2. Construction Quality

- The built environment must have the highest possible quality of construction appropriate to the project scope, budget and schedule.

3. Cost Effectiveness

- Design solutions must be cost effective and fiscally responsible.

4. Schedule Compliance

- Design and construction schedules must be maintained.

5. Design Flexibility

- The physical environment should encourage flexibility and adaptability and provide clear direction for expansion over time.

6. Efficient, Functional and Practical

- Designs should look to improve workflow, support efficient, LEAN-based operations, and create environments that are easily maintained.

7. Intuitive Wayfinding

- The circulation pattern from point of entry to final destination must be clearly visible and easily understood.

8. Durable Materials

- Materials and finishes must last over time and be easily maintainable.

9. Attention to Detail

- It is critical that details are thoughtfully designed, thoroughly documented and carefully constructed.

10. Collaborative Process

- NYU Langone Health promotes an integrated team approach in the development and construction of projects. It is essential that all stakeholders have input in the process.

GENERAL PROJECT REQUIREMENTS

1. *Architects Agreement*

Architects are required to execute NYU Langone Health’s Standard Master Owner - Architect Agreement (the “Agreement”); no exception may be taken to the terms and conditions of the Agreement. In the event of any inconsistency between these Design Guidelines and the provisions of the Agreement, the provisions of the Agreement shall govern.

2. *Communication and Approach*

NYU Langone Health promotes a team approach in the development and construction of projects. We believe it is essential that all stakeholders have input into the process. This includes the User, Real Estate Development + Facilities (RED+F), Medical Center Information Technology (MCIT), Environmental Health & Safety (EH&S), Security, Environmental Service/ Building Services, etc. The RED+F Project Manager (PM) will act as the main contact on the project to ensure all elements are coordinated.

The Architectural/Engineering team (A/E Team) is encouraged to initiate and sustain open communications throughout the project. All communication with the A/E Team will be handled through their primary contact, the PM. Other contacts listed in this document should only be contacted at the direction of the PM.

3. *Roles and Responsibilities*

The following is a list of NYU Langone departments with whom the A/E Team will likely have regular contact during the planning, design and construction process:

- ***Real Estate Development and Facilities (RED+F)*** - RED+F is the client. They provide architectural design review and planning information for projects. This includes information on related or concurrent projects, NYU Langone practices, policies and space standards. RED+F has a staff of in-house architects, engineers and designers that oversee the design of all NYU Langone capital projects. In order to provide a consistent vision for the built environment, RED+F is responsible for approving the final finish selections.
- ***Sponsor*** - The Sponsor for a capital project is the department or group that is funding the project.
- ***User*** - The User is the department or group that will occupy the project after it is constructed. They have an important responsibility to provide feedback on their functional and programmatic needs, workflow requirements and to sign off on the plan. The plan sign-off is a critical schedule milestone that determines when Construction Documents begin and when the Users will be able to move in. The Users will be shown the proposed materials and finishes for the project and be allowed to provide input on functional issues. The aesthetic approval of the finishes will be the sole responsibility of RED+F.

The following is a list of key project participants with whom the A/E Team will likely have regular contact during the planning, design and construction process:

- **RED+F Project Manager (PM)** - The PM is the primary contact for all aspects of the project. They act as the central point of contact for collecting and disseminating information, project schedule, project budget and all communication. PMs utilize resources within the NYU Langone Health community as needed to support the project objectives.
- **Representatives from the following RED+F Divisions -**
 - **Design Studio** - The Design Studio will provide architectural and interior design review on capital construction projects (including Art and Signage).
 - **Space Planning and Management** - The Space Planning and Management group will provide backgrounds of existing conditions, assign room numbers, assist with BuildFlow and maintain “as-built” information.
 - **Facilities Management and Operations** - Facilities Management and Operations will provide engineering design review on construction projects.
 - **Commissioning** - RED+F Commissioning (a subset of Facilities Management) will provide engineering design review as well as engineering and commissioning oversight on construction projects.
 - **Real Estate and Housing** - The Real Estate and Housing division administers the leasing and acquisition of real estate property, provides portfolio management services, and manages the operations of commercial and residential property for NYU Langone Health.
 - **Energy and Sustainability** - The Energy and Sustainability Manager will assist the PM with setting and meeting NYU Langone’s sustainability goals on capital construction projects.
 - **Environmental Services or Building Services** - Environmental Services or Building Services maintain NYU Langone’s buildings and grounds providing cleaning and waste management services. They will review the proposed maintenance support spaces and FFE items from a cleaning operations perspective.
 - **Environmental Health and Safety (EH&S)** - The EH&S PM will assist the PM with various aspects of health and safety including asbestos abatement, hazardous waste removal and OSHA safety requirements.
 - **Clinical Engineering** - Clinical Engineering coordinates the ordering and installation of medical equipment.
 - **Campus Security** - Campus Security will review and approve the proposed security solutions on capital construction projects.

- *Medical Center Information Technology (MCIT)* - The MCIT PM will assist the PM with coordinating the IT, telecommunication, audio-visual and associated cabling requirements for capital construction projects.
- *Infection Prevention and Control (IPC)* - Infection Prevention and Control will review capital projects for compliance with NYULH policies and procedures surrounding environmental cleaning, disinfecting, sterilization, and infection control.

4. *Adherence to Budget and Schedule*

Cost and schedule control are of paramount concern to NYU Langone Health. As per the Standard Master Owner - Architect Agreement, the Architect is responsible to meet the project's budget and schedule goals. Evaluations of the Architect's work and consideration for future projects will be made based on meeting these budget and schedule goals, adherence to the Design Principles, and overall RED+F and User satisfaction.

A/E DESIGN FEE GUIDELINES

NYU Langone Health is committed to providing design excellence based on a fair and reasonable A/E fee. The purpose of these guidelines is to outline the process for utilizing the NYU Langone Health A/E Fee Percentage schedule for capital projects. The information provided includes:

1. General Information
2. A/E Fees
3. Program Types
4. A/E Fee Reference Tables
5. A/E Fee Calculator
6. Sample Calculations

This is a guideline and Project Managers are expected to use critical thinking skills along with the tools provided here to ensure a responsible fee is paid and that NYU Langone Health does not under or overpay for any services.

1. General Information

- **Basic Services** - The following disciplines are included as part of Basic Services per the Standard Master Owner – Architect Agreement:
 - Architecture
 - Mechanical, Electrical, Plumbing and Fire Protection Engineering
 - Structural Engineering
 - Furniture, Fixtures & Equipment (FFE)
 - Signage

- **Full Scope of Services** - The full scope of services for a particular project shall be as described in the Standard Master Owner – Architect Agreement and amended per Services Order. For example, although coordination work associated with Security, IT/AV is not included as part of Basic Services it may be added via Services Order. In such cases, the construction budget shall include the costs for these items and the A/E fee shall include these services.

- **Compensation per Phase** - Compensation shall be by phase as follows per the Standard Master Owner – Architect Agreement or as amended per Services Order:

- Site Investigation, Analysis and Feasibility Phase:	5%
- Schematic Design Phase:	10%
- Design Development Phase:	20%
- Construction Documents Phase:	35%
- Bidding and Negotiation Phase:	5%
- Construction Phase:	15%
- Substantial Completion:	5%
- <u>Close-Out Phase:</u>	<u>5%</u>
Total	100%

2. *A/E Fees* - A/E Fees shall be calculated by the Project Manager using the:
- Program Type (based on Table 1 below),
 - Construction Budget, and
 - Complexity Multiplier (1.0 or based on Table 4 below).

3. *Program Types* - The A/E fee varies based on the following programmatic categories:

TABLE 1 – PROGRAM TYPES
<p><i>Program Type I</i></p> <ul style="list-style-type: none"> - Plant Maintenance Workshops - Standard Parking Structures - Utility Structures / Service Buildings - Warehouse / Storage Facilities
<p><i>Program Type II</i></p> <ul style="list-style-type: none"> - Administrative Offices - Academic and Medical Classrooms - Physical Plant upgrades
<p><i>Program Type III</i></p> <ul style="list-style-type: none"> - Dormitories and Student Housing - Dry / Computational Research programs - Physician Practice renovation projects (non-Article 28)
<p><i>Program Type IV</i></p> <ul style="list-style-type: none"> - Cafeterias and Food Service - Engineering Labs and Wet Research Labs – Up to BSL2 - Medical Labs - Outpatient Surgical Centers and Specialty Clinics - Physician Practice renovation projects (Article 28) - Telecom / Data Processing Facilities - Theaters, Performance Halls and Auditorium Assembly
<p><i>Program Type V</i></p> <ul style="list-style-type: none"> - Animal Research Facilities - Hospital - Specialty Research Labs / Support Facilities – BSL3 & Above

4. A/E Fee Reference Tables

TABLE 2 – A/E FEE PERCENTAGE					
CONSTRUCTION BUDGET	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V
\$50,000,000 and Above	To be negotiated.				
\$50,000,000	4.15%	4.55%	4.95%	5.35%	5.75%
\$25,000,000	4.35%	4.85%	5.35%	5.85%	6.35%
\$10,000,000	4.75%	5.35%	5.95%	6.55%	7.15%
\$5,000,000	5.60%	6.30%	7.00%	7.70%	8.40%
\$1,000,000	6.90%	7.75%	8.60%	9.45%	10.30%
\$500,000	8.40%	9.40%	10.40%	11.40%	12.40%
\$250,000	9.40%	10.90%	12.40%	13.90%	15.40%
\$100,000 - \$250,000	Not to exceed \$30,000				
<\$100,000	Not to exceed \$20,000				
Notes:					
1. The above percentages are for both renovations and new construction projects.					
2. When the cost falls between tabular limits, the Fee Percentage is determined by linear interpolation.					

TABLE 3 – COMPLEXITY MULTIPLIER EXAMPLES	
Multiplier Range	Examples
0.50 – 0.99	Project Scope <u>less than</u> Basic Services such as: Replacement of a Single System; Limited Documentation; Interiors Project to Match Existing Conditions; Project not Requiring One or More Basic Service Task(s)
1.00	Project Scope <u>equal to</u> standard Basic Services per Master Agreement
1.01 – 1.50	Project Scope <u>in excess of</u> Basic Services such as: Project Requiring Additional Services in Excess of Standard Basic Services; Project with More than One Construction Phase and/or Bid Package
Notes:	
1. The Project Manager shall use Table 4 - Complexity Multiplier Worksheet on projects that differ from standard Basic Services to determine the Complexity Multiplier.	

5. A/E Fee Calculator

PROJECT INFORMATION			
PIM #:	Text Here	RED+F PM:	Text Here
PROJECT NAME:	Text Here	RED+F PD:	Text Here
This is a guideline and Project Managers are expected to use critical thinking skills along with the tools provided here to ensure a responsible fee is paid and that NYU Langone Health does not under or overpay for any services.			

A/E FEE CALCULATOR						
Program Type	(based on Table 1)	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V
Program Description		Text Here	Text Here	Text Here	Text Here	Text Here
Construction Budget		\$0	\$0	\$0	\$0	\$0
Fee Percentage	(automatically based on Table 2)	0.00%	0.00%	0.00%	0.00%	0.00%
Complexity Multiplier	(1.0 or based on Table 4)	1.00	1.00	1.00	1.00	1.00
SUB-TOTAL A/E Fee		\$0	\$0	\$0	\$0	\$0
Misc. A/E Fee Costs	(Items not represented in the Complexity Multiplier)			\$0		
TOTAL Maximum Allowable A/E Fee	(not including Reimbursables)			\$0		
Proposed Fee from A/E Team	(not including Reimbursables)			\$0		
Delta				\$0		

- Instructions:**
- The A/E Fee Calculator shall be used for typical NYULH capital projects with construction budgets >\$250k.
 - RED+F Project Manager to input items shown in red.
 - For projects consisting of more than one program type multiple columns may be used.
 - The Construction Budget includes hard costs (plus insurance) but does not include soft costs (i.e. design fees, contingencies, furniture, etc.).
 - When the Construction Budget falls between tabular limits the Fee Percentage will be automatically calculated by linear interpolation from Table 2.
 - The Project Manager shall use page 2 to determine the Complexity Multiplier and to list any additional comments.
 - Misc. A/E Fee Items are any additions or deletions to Basic Services not represented by the Complexity Multiplier.
 - The PM shall provide a breakdown of the Misc. A/E Fee Costs in the Comments section on page 2.
 - The PM shall submit both sheets of this document.

TABLE 1 - PROGRAM TYPES			
Program Type I	- Plant Maintenance Workshops - Standard Parking Structures	- Utility Structures/Service Buildings - Warehouse/Storage Facilities	Program Type IV
Program Type II	- Administrative Offices - Academic and Medical Classrooms	- Physical Plant upgrades	- Cafeterias and Food Service - Engineering Labs and Wet Research Labs - Up to BSL2 - Physician Practice renovation projects (Article 28) - Telecom/Data Processing Facilities
Program Type III	- Dormitories and Student Housing - Dry/Computational Research programs - Physician Practice renovation projects (non-Article 28)		Program Type V
			- Animal Research Facilities - Hospital - Medical Labs - Outpatient Surgical Centers and Specialty Clinics - Theaters, Performance Halls and Auditorium Assembly - Specialty Research Labs /Support Facilities - BSL3 & Above

TABLE 2 - A/E FEE PERCENTAGE					
CONSTRUCTION BUDGET	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V
\$50,000,000 and above			To be negotiated.		
\$50,000,000	4.15%	4.55%	4.95%	5.35%	5.75%
\$25,000,000	4.35%	4.85%	5.35%	5.85%	6.35%
\$10,000,000	4.75%	5.35%	5.95%	6.55%	7.15%
\$5,000,000	5.60%	6.30%	7.00%	7.70%	8.40%
\$1,000,000	6.90%	7.75%	8.60%	9.45%	10.30%
\$500,000	8.40%	9.40%	10.40%	11.40%	12.40%
\$250,000	9.40%	10.90%	12.40%	13.90%	15.40%
\$100,000 - \$250,000			Not to exceed \$30,000		
<\$100,000			Not to exceed \$20,000		

- Notes:**
- The above percentages are for both renovations and new construction projects.
 - When the cost falls between tabular limits, the Fee Percentage is automatically calculated by linear interpolation.

SIGNATURES	
RED+F PM / Date _____	RED+F PD / Date _____
RED+F DoD / Date _____	RED+F VP of DC / Date _____

PROJECT INFORMATION			
PIM #:	Text Here	RED+F PM:	Text Here
PROJECT NAME:	Text Here	RED+F PD:	Text Here
This is a guideline and Project Managers are expected to use critical thinking skills along with the tools provided here to ensure a responsible fee is paid and that NYU Langone Health does not under or overpay for any services.			

TABLE 3 - COMPLEXITY MULTIPLIER EXAMPLES	
Multiplier Range	Examples
0.50 - 0.99	Project Scope <u>less than</u> Basic Services such as: Replacement of a Single System; Limited Documentation; Interiors Project to Match Existing Conditions; Project not Requiring One or More Basic Service Task(s)
1.00	Project Scope <u>equal to</u> standard Basic Services per Master Agreement
1.01 - 1.50	Project Scope <u>in excess of</u> Basic Services such as: Project Requiring Additional Services in Excess of Standard Basic Services; Project with More than One Construction Phase and/or Bid Package
Notes: 1. The Project Manager shall use Table 4 - Complexity Multiplier Worksheet on projects that differ from standard Basic Services to determine the Complexity Multiplier.	

TABLE 4 - COMPLEXITY MULTIPLIER WORKSHEET							
BASIC SERVICES	Average Complexity Multiplier	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V	Remarks
Architecture	0.50						
MEP / FP Engineering	0.30						
Structural Engineering	0.10						
Furniture, Fixtures & Equipment (FFE)	0.06						
Signage	0.04						
SUB-TOTAL of Basic Services	1.00	0.00	0.00	0.00	0.00	0.00	
ADDITIONAL SERVICES							
Landscape Design	0.05						
Geotechnical Engineering	0.05						
Civil Engineering	0.05						
Vertical Transportation	0.03						
Flood Mitigation Design	0.03						
AV/IT Design	0.02						
Security Design	0.02						
Lighting Design	0.02						
Acoustic Design	0.02						
Shielding Design	0.02						
CON Services	0.02						
Each Additional Construction Phase	0.01						
Each Additional Bid Package	0.01						
Other	TBD						
Other	TBD						
Other	TBD						
SUB-TOTAL of Additional Services	TBD	0.00	0.00	0.00	0.00	0.00	
TOTAL Complexity Multiplier		0.00	0.00	0.00	0.00	0.00	

COMMENTS
<p>Instructions: The Project Manager shall use the space below to:</p> <p>1) explain how the Complexity Multiplier was determined if not using the average complexity multiplier shown,</p> <p>2) provide a breakdown of any miscellaneous costs not represented by the Complexity Multiplier and</p> <p>3) provide any other pertinent information.</p> <p>Text Here</p>

6. Sample Calculations

- **EXAMPLE 1 (Project Scope equal to standard Basic Services)** - Provide standard basic services for administrative offices inside an existing office building with a construction budget of \$10 million. In addition, the A/E Team shall perform a building analysis of existing MEP systems for \$20,000.

EXAMPLE 1 (Project Scope <u>equal to</u> standard Basic Services) – A/E FEE CALCULATOR					
Program Type <i>(based on Table 1)</i>	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V
Program Description	-	Office	-	-	-
Construction Budget	-	\$10,000,000	-	-	-
Fee Percentage <i>(automatically based on Table 2)</i>	0.00%	5.35%	0.00%	0.00%	0.00%
Complexity Multiplier <i>(1.0 or based on Table 4)</i>	-	1.00	-	-	-
SUB-TOTAL A/E Fee	\$0	\$535,000	\$0	\$0	\$0
Misc. A/E Fee Items <i>(items not included in the Complexity Multiplier)</i>	\$20,000				
TOTAL Maximum Allowable A/E Fee <i>(not including Reimbursables)</i>	\$555,000				

- Fee Breakdown of Example 1

Below is the fee breakdown of Example 1, itemized by phase in accordance with the Standard Master Owner – Architect Agreement:

<u>Site Investigation, Analysis and Feasibility Phase</u>	<u>5%</u>	<u>\$ 27,750</u>
<u>Schematic Design Phase</u>	<u>10%</u>	<u>\$ 55,500</u>
<u>Design Development Phase</u>	<u>20%</u>	<u>\$111,000</u>
<u>Construction Documents Phase</u>	<u>35%</u>	<u>\$194,250</u>
<u>Bidding and Negotiation Phase</u>	<u>5%</u>	<u>\$ 27,750</u>
<u>Construction Phase</u>	<u>15%</u>	<u>\$ 83,250</u>
<u>Substantial Completion</u>	<u>5%</u>	<u>\$ 27,750</u>
<u>Close-Out Phase</u>	<u>5%</u>	<u>\$ 27,750</u>
Total	100%	\$555,000

- EXAMPLE 2 (Project Scope *less than* Basic Services)** - Provide A/E services to upgrade existing MEP systems in a Physicians' Practice (Article 28) in an existing facility with a construction budget of \$500,000. A/E services shall include limited Architectural services, full MEP / FP Engineering services and no structural, furniture or signage scope. The RED+F PM shall select Program Type IV and use a Complexity Multiplier of 0.60. (Limited Architectural services: 0.30; Full MEP / FP services: 0.30)

EXAMPLE 2 (Project Scope <i>less than</i> Basic Services) – A/E FEE CALCULATOR					
Program Type <i>(based on Table 1)</i>	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V
Program Description	-	-	-	Physician Practice (Article 28)	-
Construction Budget	-	-	-	\$500,000	-
Fee Percentage <i>(automatically based on Table 2)</i>	0.00%	0.00%	0.00%	11.40%	0.00%
Complexity Multiplier <i>(1.0 or based on Table 4)</i>	-	-	-	0.60	-
SUB-TOTAL A/E Fee	\$0	\$0	\$0	\$34,200	\$0
Misc. A/E Fee Items <i>(items not included in the Complexity Multiplier)</i>	-				
TOTAL A/E Fee Calculated <i>(not including Reimbursables)</i>	\$34,200				

- Fee Breakdown of Example 2

Below is the fee breakdown of Example 2, itemized by phase in accordance with the Standard Master Owner – Architect Agreement:

<u>Site Investigation, Analysis and Feasibility Phase</u>	<u>5%</u>	<u>\$ 1,710</u>
<u>Schematic Design Phase</u>	<u>10%</u>	<u>\$ 3,420</u>
<u>Design Development Phase</u>	<u>20%</u>	<u>\$ 6,840</u>
<u>Construction Documents Phase</u>	<u>35%</u>	<u>\$11,970</u>
<u>Bidding and Negotiation Phase</u>	<u>5%</u>	<u>\$ 1,710</u>
<u>Construction Phase</u>	<u>15%</u>	<u>\$ 5,130</u>
<u>Substantial Completion</u>	<u>5%</u>	<u>\$ 1,710</u>
<u>Close-Out Phase</u>	<u>5%</u>	<u>\$ 1,710</u>
<u>Total</u>	<u>100%</u>	<u>\$34,200</u>

- EXAMPLE 3 (Project Scope *in excess* of Basic Services)** – Provide A/E services for a \$125 million mixed-use project consisting of a \$100 million freestanding hospital and a \$25 million administrative wing that will be brought on line in 2 phases. The A/E Team shall provide a variety of additional services for each program as described below. The RED+F PM shall sub-divide the project using the following Program Types and Complexity Multipliers:

- Hospital: \$100 million, Program Type V, Complexity Multiplier 1.10
 (Full Basic Services: 1.0; AV/IT Design: 0.02; Security Design: 0.02; Lighting Design: 0.02; Acoustic Design: 0.02; and Shielding Design: 0.02)
- Admin. Wing: \$25 million, Program Type II, Complexity Multiplier 1.05
 (Full Basic Services: 1.0; AV/IT Design: 0.02; Security Design: 0.02; 1 Additional Construction Phase: 0.01)

EXAMPLE 3 (Project Scope <i>in excess</i> of Basic Services) – A/E FEE CALCULATOR					
Program Type <i>(based on Table 1)</i>	Program Type I	Program Type II	Program Type III	Program Type IV	Program Type V
Program Description	-	Admin.	-	-	Hospital
Construction Budget	-	\$25,000,000	-	-	\$100,000,000
Fee Percentage <i>(automatically based on Table 2)</i>	0.00%	4.85%	0.00%	0.00%	5.35%
Complexity Multiplier <i>(1.0 or based on Table 4)</i>	-	1.05	-	-	1.10
SUB-TOTAL A/E Fee	\$0	\$1,273,125	\$0	\$0	\$5,885,000
Misc. A/E Fee Items <i>(items not included in the Complexity Multiplier)</i>	-				
TOTAL A/E Fee Calculated <i>(not including Reimbursables)</i>	\$7,158,125				

- Fee Breakdown of Example 3

Below is the fee breakdown of Example 3, itemized by phase in accordance with the Standard Master Owner – Architect Agreement:

<u>Site Investigation, Analysis and Feasibility Phase</u>	<u>5%</u>	<u>\$ 357,906</u>
<u>Schematic Design Phase</u>	<u>10%</u>	<u>\$ 715,813</u>
<u>Design Development Phase</u>	<u>20%</u>	<u>\$1,431,625</u>
<u>Construction Documents Phase</u>	<u>35%</u>	<u>\$2,505,344</u>
<u>Bidding and Negotiation Phase</u>	<u>5%</u>	<u>\$ 357,906</u>
<u>Construction Phase</u>	<u>15%</u>	<u>\$1,073,719</u>
<u>Substantial Completion</u>	<u>5%</u>	<u>\$ 357,906</u>
<u>Close-Out Phase</u>	<u>5%</u>	<u>\$ 357,906</u>
<u>Total</u>	<u>100%</u>	<u>\$7,158,125</u>

PROJECT DELIVERY PROCESS

RED+F's project delivery process falls into three major categories: formulation and planning; design; and construction.

Typically, projects are formulated for approval and are then guided through Design and Construction by an assigned NYU Langone project manager (RED+F PM) who follows a defined process to formulate and implement construction projects based on a specified scope, schedule and budget to meet the goals and needs of all stakeholders.

1. *Formulation & Planning*

- **Formulation** - To ensure that NYU Langone Health's resources are utilized in the most effective manner, most projects are initiated through Senior Administration. Individual departments can also initiate small department-funded projects by contacting RED+F directly. These requests are then reviewed by Senior Administration and, if approved, authorized to proceed. Requests are evaluated based on their importance in supporting NYU Langone Health's vision and strategic goals, space requirements, staffing requirements, potential impact on other programs, and funding sources.
- **Planning** - If Senior Administration determines a requested project merits further investigation, RED+F will do a planning study to identify the project objectives, scope, budget and schedule requirements. This is an iterative process, which attempts to balance project requirements with available resources. Throughout this process, RED+F provides professional assistance to define the primary objective of the project, the specific needs of the user department and the potential solutions.

Working with Senior Administration, RED+F then analyzes the options in a campus-wide context and establishes target budgets. By identifying key relationships, such as adjacencies to public spaces, utility connections, and potential future uses of the site, broad facility issues can be addressed one project at a time. The best options are re-examined and re-analyzed until a viable solution is found.

For major projects, RED+F will often contract outside consulting firms to work with the user-group through a process of defining the project goals, developing the space program, identifying and analyzing options, and budgeting. Throughout this process, RED+F will review the progress with Senior Administration. At the conclusion of the planning study, a formal report is prepared to document the project scope, budget, and schedule for approval by Senior Administration.

For small projects, the planning process is similar, but usually less complex and without the involvement of outside consultants.

- **Approvals** - During the Formulation Process, RED+F develops a clear statement of project objectives. This statement is incorporated into a final report along with the space program, schedule, and project budget for approval by Senior Administration and to serve as a guide throughout the design process.

All projects move through an approval process to ensure that NYU Langone Health's resources are managed effectively. The parties involved in the approval process and the number of approvals required varies depending on the project category, the size of the budget, and other considerations.

As projects are planned, they are incorporated into a comprehensive capital plan, either as a specific line item or as a broad allowance (pools). The capital plan is developed within the framework of a long-term financial plan. Both the capital plan and the financial plan are updated regularly to ensure that the future costs of any planned capital investments are accounted for in the long-term financial plan.

As projects become more defined, capital and operating budget implications are considered and the capital and financial plans are updated, reviewed and prioritized by NYU Langone Senior Leadership and approved by NYU Langone Health's Finance Committee. The planning studies prepared in the previous phase not only identify each project's objective, scope, budget, and schedule, but they also include a Project Authorization Form with signature lines for each of the parties responsible for approval. When all signatures on the form are received the project account is established and the design process begins.

2. *Design Phase*

Once approved, a NYU Langone project manager (RED+F PM) is assigned to the project, and a project user-group is established. Starting with a design kick-off meeting, and the PM coordinates a series of meetings with the Users and the Project Team to gather information. This group – comprising representatives from users, the Design Studio, Facilities Management, MCIT, Senior Administration, architectural and engineering consultants, and the construction manager, if applicable – will guide the project through planning and design. Its meetings provide a forum for coordination of the various aspects of the project during the design process.

- ***Schematic Design (SD)*** - This first phase of the design process defines the design parameters and the overall layout. The A/E Team generates schemes based on information gathered from a field investigation as well as from Users. The PM brings in other NYULH departments (Design Studio, Facilities, MCIT, Infection Prevention and Control, EH&S, Security, etc.) to help inform the design from their perspectives. Schemes are reviewed by all stakeholders and refined accordingly.

An estimate will be prepared at the end of this preliminary design phase to verify that the project remains within budget. The budget must be reconciled with scope prior to proceeding with the next phase of design.

A/E Deliverables:

- Meeting Minutes
- Schedule
- Cost Estimate
- Outline BIM Execution Plan (*if applicable*)
- Feasibility Studies

- Outline Program Analysis
 - Outline Scope Narrative (incl. user requirements such as storage needs, etc.)
 - Outline “Basis of Design” document
 - SD Drawings:
 - Floor Plans (w/ FFE, material notes, etc.)
 - Elevations
 - CAD Renderings of major spaces
 - MEP/FP schematic drawings (single line acceptable)
 - Structural schematic drawings (i.e. primary structural system)
 - Sample materials
 - Outline Equipment List
 - Outline architectural and engineering specifications
- **Design Development (DD)** - In this phase, the layout agreed upon in preliminary design is developed in greater detail with all major components of the project defined and developed. There is often heavy User involvement to be sure that the design adheres to their needs. The PM brings in other NYU Langone Health departments (Design Studio, Facilities, MCIT, Infection [Prevention and Control](#), EH&S, Security, etc.) to help inform the design from their perspectives. All key design decisions are made and agreed upon by the end of this phase.

The PM works with the A/E Team to keep scope in line with what was initially approved, with the addition of any changes incorporated during preliminary design. The PM must approve any changes to the agreed upon and authorized scope of the project as such changes would have impacts on the project budget.

An estimate is prepared at the end of the Design Development phase and the budget must be reconciled with the project scope prior to proceeding with the next phase. In addition, the User must sign-off on the floor plan(s) in a timely manner in order for the A/E Team to proceed into the Construction Document phase and maintain the overall project schedule.

A/E Deliverables:

- Meeting Minutes
- Schedule
- Cost Estimate
- Updated BIM Execution Plan (*if applicable*)
- Final Program Analysis
- Final Scope Narrative (incl. user requirements such as storage needs, etc.)
- Updated “Basis of Design” document
- DD Drawings:
 - Floor Plans (w/ FFE, dimensions, partition tags, RED+F room numbers, etc.)
 - Enlarged Floor Plans (of typical and major spaces)
 - Reflected Ceiling Plans
 - Elevations
 - Sections

- Schedules (i.e. Room Finish, Furniture, Door, Door Hardware, Lighting, Plumbing Fixture, Toilet Accessory, etc.)
 - Typical and Major Details
 - CAD Renderings of major spaces
 - MEP/FP DD drawings (including double line HVAC drawings and riser diagrams)
 - Structural DD drawings (including typical details)
 - Signage package including a list of assumptions and observations, location plans (including locations of brand/donor related signage), message schedule and simple elevation renderings for “high-profile” sign types. “High-profile” sign types shall include brand/donor related signage such as:
 - Building ID Branding/Recognition
 - Canopy Signage/Recognition
 - Building Entry Signage/Recognition
 - Main Lobby Recognition
 - Floor Recognition
 - Departmental Recognition
 - Waiting Area Recognition
 - Staging/phasing plans (if applicable)
 - Updated sample materials
 - Finish and Furniture Booklets
 - Updated Equipment List
 - Updated architectural and engineering specifications
 - Outline List of Special Inspections or Testing required by the Building Code
- **Construction Documents (CD)** - This phase takes the design as developed and finalized during Design Development and documents it for construction. Details are further refined as construction issues are addressed. The main emphasis of this phase is to verify that all needed information is on the drawings and in the specifications so that the project can be bid for construction. Typically, there are fewer meetings in this phase that require the involvement of the Users, as the emphasis is documentation of earlier design decisions.

Again, previously agreed upon and authorized scope, schedule and budget must be adhered to, and the Project Manager works with the A/E Team to keep scope in line, taking into account any changes incorporated during previous phases. At the end of this phase the Project Manager puts the project out to bid.

A/E Deliverables:

- Meeting Minutes
- Schedule
- Cost Estimate
- Final BIM Execution Plan (if applicable)
- Final “Basis of Design” document
- CD Drawings:
 - Floor Plans (fully developed and coordinated)
 - Enlarged Floor Plans (of typical and major spaces)
 - Reflected Ceiling Plans
 - Elevations

- Sections
- Schedules (i.e. Room Finish, Furniture, Door, Door Hardware, Lighting, Plumbing Fixture, Toilet Accessory, etc.)
- All details (fully developed)
- CAD Renderings of major spaces
- MEP/FP construction drawings (fully developed and coordinated)
- Structural construction drawings (fully developed and coordinated)
- Final Signage package including location plans, message schedule, signage quantity list, details/elevations and specifications.
- Construction and Demolition Waste Management Plan (*if applicable*)
- Final staging/phasing plans (*if applicable*)
- Addendums issued prior to bidding
- Final sample materials
- Final Finish and Furniture Booklets
- Final Equipment List
- Final architectural and engineering specifications
- Final List of Special Inspections or Testing required by the Building Code

3. Construction Phase

After the Design phase the Project Manager coordinates construction of the project according to the construction drawings and specifications set by the Contract Documents. Project Managers have expertise in architecture, engineering, design and construction to bring capital construction and renovation projects forward from design to completion and occupancy.

- **Bidding and Negotiation (B/N)** - As a given project moves from development to the construction phase, the Project Manager initiates and oversees the bidding and negotiation procedure, forwarding contract documents to a list of pre-qualified contractors to solicit bids. During the ensuing bid period, the Project Manager and a consulting team (typically an architect and engineer) answer questions raised by bidders, making sure all bidders are aware of all questions asked and answered.

At the end of bidding, contractors submit their proposed prices in sealed bids. Once the bids are opened, a leveling process ensues – a critical part of the process; leveling vets out discrepancies among bids to ensure an “apples to apples” comparison.

A/E Deliverables:

- Meeting Minutes
- Participation in Pre-Bid Conferences and Site Walkthroughs
- Bid Documents (Instructions to Bidders, Bid Form, Drawings and Specifications)
- Written RFI Responses
- Review and Approval of product substitution(s), “or equal” product(s)
- Bid Leveling and Evaluation
- Assist with bid negotiations and bidder selection
- Final Construction Documents (including supplemental Addendums issued prior to award of construction contract)

- **Construction Administration (CA)** - Once leveling is completed, the project is awarded to the qualified bidder with the lowest bid, and a contract sets an agreed upon price for the work and commits the winning contractor to the authorized scope, schedule and budget. Starting with a construction kick-off meeting and continuing through the life of the project, the Project Manager sets goals and continually reviews the progress of construction with a focus on maintaining schedule and budget.

During construction, the Project Manager also orchestrates the coordination required with all other team members and organizations with ancillary project responsibilities, such as the Design Studio, Facilities, IT, Environmental Health & Safety, Radiation Safety, Infection Prevention and Control, Life Safety, Clinical Engineering and Security; as well as interior designers and other specialty consultants.

During this phase the A/E Team is responsible for helping the Contractor build the project as specified in the NYU Langone-approved Construction Documents. This is done through coordination with NYU Langone and the builder, inspection of physical “as-built” conditions and review of project documents prepared by the Contractor.

A/E Deliverables:

- Meeting Minutes, when deemed necessary
- Attendance at Regular Job Progress Meetings
- Visual inspection of construction work
- Written report to document deficiencies, quality and quantity of work inspected
- Recommendation to reject work not in compliance with Construction Documents
- Direct minor changes in construction work
- Written RFI Responses or Change Directives
- Shop Drawing Review and Approval (Note: Furniture and signage shop drawings require review and approval by RED+F’s Design Studio)
- Review and Approval of material sample(s)
- Review and Approval of product substitution(s), “or equal” product(s) (Note: Substitutions require prior approval from RED+F’s Design Studio)
- CA Drawings:
 - Bulletins issued after award of construction contract (including supplemental or revised drawings, specifications, sketches and other documents issued during construction)
 - Final “as-built” drawings received from contractor
 - Updated BIM model and Construction Documents reflecting construction related design changes w/ respect to floor plans, RCPs, Structural and MEP/FP field changes
- Recommendation of testing and inspection laboratories or consultants
- Maintenance and operating instructions and manuals, equipment manuals, warranties, guarantees, certificates of inspection, test results, approvals and related documents, and all other Construction Contract close-out documents
- Review and Recommendation regarding Change Order Proposals
- Review of Contractor’s Applications for Payment
- Issuance of Certificates of Payment, as appropriate
- Sign-Off as required by Regulatory Agencies

- Preparation or, if prepared by others, review and approval of punch lists
 - Inspection of the project to determine substantial completion
 - Substantial Completion Checklist
 - Certificate of Substantial Completion with punch lists and list of acceptable non-conforming work attached, if appropriate
- **Close-Out (CO)** - Once the project is completed, the Project Manager initiates the closeout procedure, makes certain that all installed components are operating as specified, and the newly opened facility project performs as designed.

During this phase the A/E Team is responsible for bringing the project to closure ensuring that all deliverables are in compliance with the Contract Documents, all necessary documents (such as equipment manuals, warranties, guarantees, etc.) have been delivered to NYU Langone Health, all required regulatory sign-offs have been obtained, all punch list items are completed to the satisfaction of NYU Langone Health, and final payment request has been reviewed and approved.

A/E Deliverables:

- Participation in Project Close-Out Meeting
- Close-Out Drawings:
 - Filing of amended Construction Documents with DOB and other authorities having jurisdiction
 - “Final record drawings” incorporating all design changes subsequent to issuance of the Construction Documents.
- As-Built “Basis of Design” document
- As-Built Finish and Furniture Booklets
- Finish Photography
- Complete sets of regulatory approvals
- Maintenance and operating instructions and manuals, equipment manuals, warranties, guarantees, certificates of inspection, test results, approvals and related documents, and all other Construction Contract close-out documents.
- Completion of Close-Out Checklist
- Inspection of the project to determine final completion
- Issuance of the Certificate of Final Completion
- Review and Approval of final payment to contractor

4. To assist the A/E Team, below is a summary of A/E Deliverables for the Design Phases [Schematic Design (SD), Design Development (DD) and Construction Documents (CD)]:

A/E DELIVERABLES for the DESIGN PHASES	PHASE		
	SD	DD	CD
Project Documentation			
Meeting Minutes	✓	✓	✓
Schedule	✓	✓	✓
Cost Estimate	✓	✓	✓
BIM Execution Plan (<i>if applicable</i>)	Outline	Updated	Final
Feasibility Studies	✓		
Program Analysis	Outline	Final	
Scope Narrative (incl. user requirements such as storage needs, etc.)	Outline	Final	
“Basis of Design” document	Outline	Updated	Final
List of Special Inspections or Testing required by the Building Code		Outline	Final
Drawings			
Architectural drawings			
Floor plans (w/ FFE, material notes, etc.)	✓		
Floor Plans (w/ FFE, dimensions, partition tags, RED+F room #s, etc.)		✓	
Floor Plans (fully developed and coordinated)			✓
Enlarged Floor Plans (of typical and major spaces)		✓	✓
Reflected Ceiling Plans		✓	✓
Elevations	✓	✓	✓
Sections		✓	✓
Schedules (i.e. Room Finish, Furniture, Door, Door Hardware, Lighting, Plumbing Fixture, Toilet Accessory, etc.)		✓	✓
Typical and Major Details		✓	
All details (fully developed)			✓
CAD Renderings of major spaces	✓	✓	✓
MEP/FP drawings			
Schematic drawings (single line acceptable)	✓		
DD drawings (incl. double line HVAC drawings and riser diagrams)		✓	
Construction drawings (fully developed and coordinated)			✓
Structural drawings			
Schematic drawings (i.e. primary structural system)	✓		
DD drawings (incl. typical details)		✓	
Construction drawings (fully developed and coordinated)			✓
Signage package			
incl. list of assumptions and observations, location plans (<u>including locations of brand/donor related signage</u>), message schedule, simple elevation renderings for “high profile” sign types		✓	
incl. location plans, message schedule, signage quantity list, details/elevations and specifications			✓
Construction and Demolition Waste Management Plan (<i>if applicable</i>)			✓
Staging/Phasing plans (<i>if applicable</i>)		Outline	Final
Addendums (<i>issued prior to bidding</i>)			✓
Specifications			
Sample materials	Outline	Updated	Final
Finish and Furniture Booklets		Outline	Final
Equipment List	Outline	Updated	Final
Architectural and Engineering specifications	Outline	Updated	Final

5. To assist the A/E Team, below is a summary of A/E Deliverables for the Construction Phases [Bidding and Negotiation (B/N), Construction Administration (CA) and Close-Out (CO)]:

A/E DELIVERABLES for the CONSTRUCTION PHASES	PHASE		
	B/N	CA	CO
Project Documentation			
Meeting Minutes, when deemed necessary	✓	✓	
Participation in Pre-Bid Conferences and Site Walkthroughs	✓		
Written RFI Responses	✓		
Bid Leveling and Evaluation	✓		
Assist with bid negotiations and bidder selection	✓		
Attendance at Regular Job Progress Meetings		✓	
Visual inspection of construction work		✓	
Written report to document deficiencies, quality and quantity of work inspected		✓	
Recommendation to reject work not in compliance with Construction Documents		✓	
Direct minor changes in construction work		✓	
Written RFI responses or Change Directives		✓	
Recommendation of testing and inspection laboratories or consultants		✓	
Maintenance and operating instructions and manuals, equipment manuals, warranties, guarantees, certificates of inspection, test results, approvals and related documents, and all other Construction Contract close-out documents		✓	✓
Review and Recommendation regarding Change Order Proposals		✓	
Review of Contractor’s Applications for Payment		✓	
Issuance of Certificates of Payment, as appropriate		✓	
Sign-Off as required by Regulatory Agencies		✓	
Preparation or, if prepared by others, review and approval of punch lists		✓	
Inspection of the project to determine substantial completion		✓	
Substantial Completion Checklist		✓	
Certificate of Substantial Completion with punch lists and list of acceptable non-conforming work attached, if appropriate		✓	
Participation in Project Close-Out Meeting			✓
As-Built “Basis of Design” document			✓
As-Built Finish and Furniture Booklets			✓
Finish Photography			✓
Complete sets of regulatory approvals			✓
Completion of Close-Out Checklist			✓
Inspection of project to determine final completion			✓
Issuance of the Certificate of Final Completion			✓
Review and Approval of final payment to contractor			✓

A/E DELIVERABLES for the CONSTRUCTION PHASES (CONT'D)	PHASE		
	B/N	CA	CO
Drawings			
Bid Documents (Instructions to Bidders, Bid Form, Drawings and Specifications)	✓		
Final Construction Documents (incl. supplemental Addendums issued prior to award of construction contract)	✓		
Bulletins issued after award of construction contract (incl. supplemental or revised drawings, specifications, sketches and other documents issued during construction)		✓	
Final “as-built” drawings received from contractor		✓	
Updated BIM model and Construction Documents reflecting construction related design changes w/ respect to floor plans, RCPs, Structural and MEP/FP field changes		✓	
Filing of amended Construction Documents with DOB and other authorities having jurisdiction			✓
“Final record drawings” incorporating all design changes subsequent to issuance of the Construction Documents			✓
Specifications			
Shop Drawing Review and Approval (Note: Furniture and signage shop drawings require review and approval by RED+F’s Design Studio)		✓	
Review and Approval of product substitution(s), “or equal” product(s) [Note: Substitutions require prior approval from RED+F’s Design Studio]	✓	✓	
Review and Approval of material sample(s)		✓	

BASIS OF DESIGN

The Basis of Design report shall be a word document providing general project information including a project narrative, specific applicable codes, as well as architectural, structural and MEP/FP narratives. This document shall be submitted by the A/E Team as part of Schematic Design, Design Development and the Construction Document phases. It shall also be included in the “As-Built” package at the end of the Construction Administration phase. The purpose of the Basis of Design report is to ensure that the owner and consultants have agreed to the scope and code interpretations in a clear and succinct manner.

The following shall be included in the Basis of Design report:

1. ***Cover Page***
 - Title: Basis of Design Report
 - Project Name:
 - PIM #:
 - Prepared by:
 - Date and Rev #:
2. ***Table of Contents***
3. ***Project Narrative***
 - Project name
 - Location and size
 - Type of project (renovation or new construction)
 - Consultant Team Information (i.e. Architect of Record, Engineer(s) of Record, Specialty Consultants, etc.)
4. ***Applicable codes***
 - List of all applicable codes and specific code requirements
5. ***Architectural Narrative***
 - Brief description of architectural design and finishes used.
 - Program which includes the list of spaces and square footages
6. ***Structural Narrative***
 - Brief description of structural systems for the foundation, floor, columns and roofs.
7. ***MEP/FP Narrative***
 - Brief description of the systems for HVAC, Electrical, Plumbing and Fire Protection.
8. ***Sustainability Narrative***
 - Brief description of the project’s environmental and sustainability goals and the methods that will be used to meet them.

Each revision shall be dated. All changes shall be tracked to compare the current revised version to the previous version.

DESIGN REVIEW PROCESS

The Design Studio at RED+F provides architectural and interior design review on capital projects throughout NYU Langone Health. The studio’s goal is to ensure projects are designed, detailed and built in conformance with NYU Langone’s mission devoted to excellence in patient care, education, and research and comply with our Design Principles as outlined in these Design Guidelines:

- Design Quality
- Construction Quality
- Cost Effectiveness
- Schedule Compliance
- Design Flexibility
- Efficient, Functional and Practical
- Intuitive Wayfinding
- Durable Materials
- Attention to Details
- Collaborative Process

The information provided in this subsection includes:

1. Design Studio Involvement per Phase
2. Design Studio, PM and A/E Team Meeting(s)
3. Design Review Meeting(s) with the EVP of RED+F

1. Design Studio Involvement per Phase

The RED+F Design Studio is comprised of four groups: Architecture, Interior/Furniture, Signage/Wayfinding and Art. Each group will provide feedback at certain phases. Below is a list of the groups’ involvement per phase:

Phase	Architecture Group	Interior/Furniture Group	Signage/Wayfinding Group	Art Group
SD	✓	✓		
DD	✓	✓	✓	✓
CD	✓	✓	✓	✓
B/N		✓	✓	✓
CA	✓	✓	✓	✓

Legend:

- SD = Schematic Design
- DD = Design Development
- CD = Construction Documents
- B/N = Bidding and Negotiation
- CA = Construction Administration

2. *Design Studio, PM and A/E Team Meeting(s)*

The number of design meetings between the A/E Team, PM and the RED+F Design Studio will depend on the size and complexity of the project and how properly the A/E Team develops a project in accordance with the design direction provided. The Design Studio shall receive a half-size set of the drawings after each phase. The following describes design issues the Design Studio will opine on per phase.

▪ *Kick-Off*

The RED+F PM will schedule a separate meeting with the Design Studio at the start of the project and provide the following information. Please note, the Design Studio cannot assist until this information is provided:

- Project Name and Address
- PIM number
- Scope of the project (program/department, phasing, existing conditions, etc.)
- Budgets for Furniture, Signage and Art
- Schedule

▪ *Schematic Design*

- Review the basic plan organization (parti).
- Review the plans and RCP.
- Discuss basic material and furniture types that should be considered.

▪ *Design Development*

Architecture Group:

- Finalize the plan's organization and confirm it is developing properly.
- Review the plan, RCP and details in relation to the parti.
- Review the proposed materials to confirm they are reinforcing the parti.

Interior/Furniture Group:

- Discuss budget and phasing with PM.
- Review the furniture layouts. After the A/E Team has finalized their furniture layout, the CAD files will be sent to an approved furniture vendor. The furniture vendor will draw up the actual furniture pieces in the floor plan and send back to the A/E Team.
- Identify recycling and waste bins for front-of-house and back-of-house areas.
- Review the proposed materials to confirm they are reinforcing the parti.

Signage/Wayfinding Group:

- Discuss the approach and process for signage design and procurement.
- Review signage and wayfinding system including:
 - location plan,
 - branding,
 - room numbering system,
 - message schedule
 - digital signage, and
 - atypical signage

Art Group:

- Discuss budget with PM.
- Discuss locations for the owner selected art.
- Coordinate lighting.
- Confirm electrical devices (i.e. light switches, fire strobes, thermostats, electrical outlets, telephone/data outlets, etc.), room and directional signage, and furniture are not blocking art locations.

- **Construction Documents**

Architecture Group:

- Finalize the plan, RCP and details in relation to the parti.
- Finalize material selection in relation to the parti.
- Review any modifications to the architecture due to the final furniture layout.

Interior/Furniture Group:

- Finalize budget and phasing with PM.
- Review final furniture layout.
- Finalize material selection in relation to the parti.
- Review any modifications to the architecture due to the final furniture layout.

Signage/Wayfinding Group:

- Review final signage package including location plans, message schedule, details and specifications.

Art Group:

- Finalize budget with PM.
- Finalize locations for the owner selected art.
- Finalize lighting.
- Finalize locations of electrical devices (i.e. light switches, fire strobes, thermostats, electrical outlets, telephone/data outlets, etc.), room and directional signage, and furniture are not blocking art locations.

- **Construction Administration**

Architecture Group:

- Review any design related issues during the CA phase.
- Walk the construction site at appropriate intervals (50% sheetrock installed, 90% painting, 100% complete, Post-Occupancy review).
- Review punchlist submitted by Architect.

Interior/Furniture Group:

- Review furniture shop drawings for fabrication.
- Review and approval of product substitutions.
- Review furniture installation.
- Walk the construction site at appropriate intervals (50% sheetrock installed, 90% painting, 100% complete, Post-Occupancy review).
- Review punchlist submitted by Architect.

Signage/Wayfinding Group:

- Review signage shop drawings for fabrication.
- Review signage installation.
- Walk the construction site at appropriate intervals (50% sheetrock installed, 100% complete, Post-Occupancy review).
- Review punchlist submitted by Architect.

Art Group:

- Coordinate art installation.
- Walk the construction site at appropriate intervals (50% sheetrock installed, 100% complete, Post-Occupancy review).

3. *Design Review Meeting(s) with the EVP of RED+F*

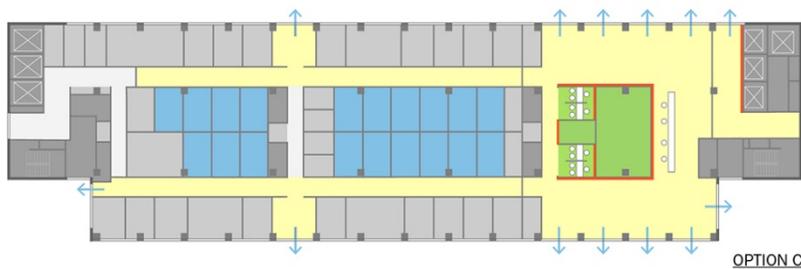
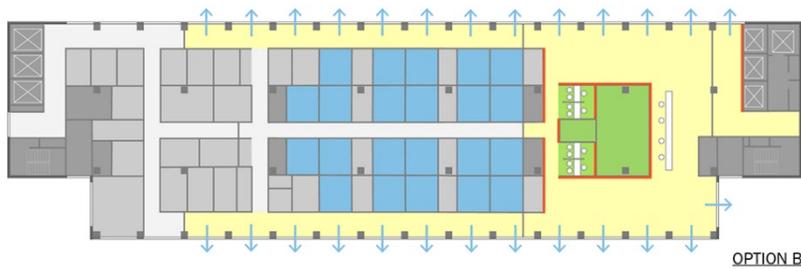
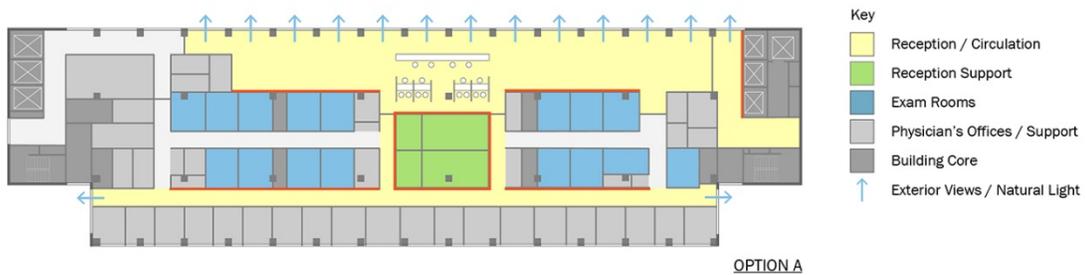
After a project has been vetted by the Design Studio the project will be reviewed by the Executive Vice President of RED+F. The number of design presentations will depend on the size and complexity of the project and how properly the A/E Team develops a project in accordance with the design direction provided. A project may be reviewed once or several times. The project may be presented to the EVP of RED+F either by the A/E Team or by the Design Studio. The Program Director and Design Director will determine how this will be presented on a case-by-case basis.

PRESENTATION MATERIALS

In communicating the design to NYU Langone Health, the A/E Team shall provide presentation materials that are clear and easy to understand. Plan Diagrams, Reflected Ceiling Plans (RCP), Material/Finish Diagrams, Material/Finish samples, Perspective Renderings, and Furniture cut sheets are to be presented during the design phases, with any additional or supplemental information as may be necessary to clearly communicate the quality of the space. Below are some examples of acceptable presentation materials:

1. Schematic Design Phase

- **Plan Diagrams** - Plan diagrams shall be presented to NYU Langone during the schematic design phase. Diagrams shall be labeled and color coded with a key. They shall convey the overall plan organization (parti), programmatic spaces, key features, circulation, and highlight natural light and views (inside and out). Below are acceptable examples:



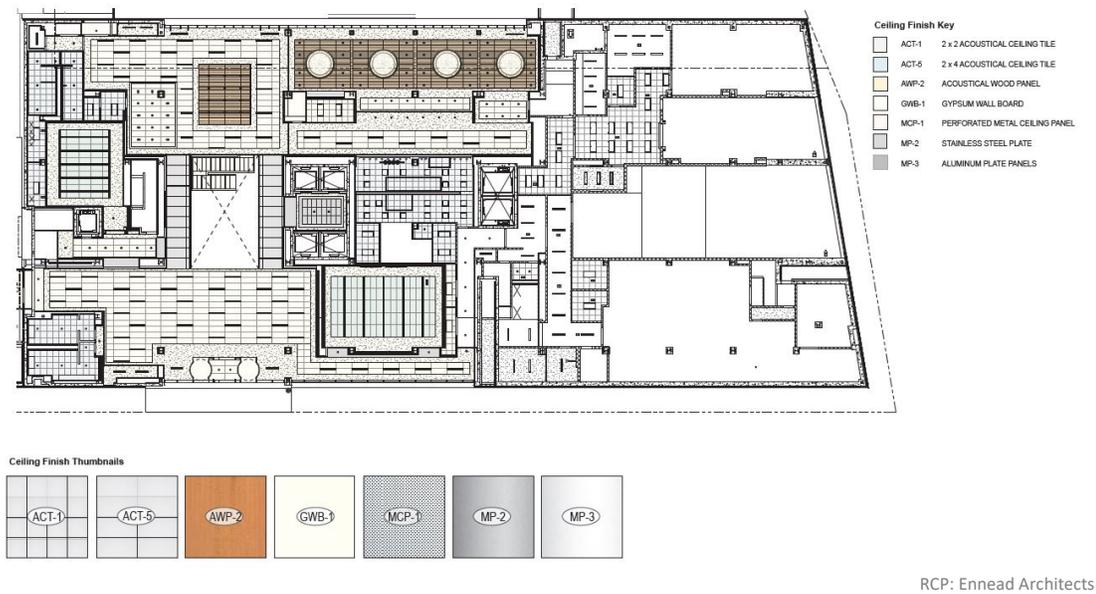
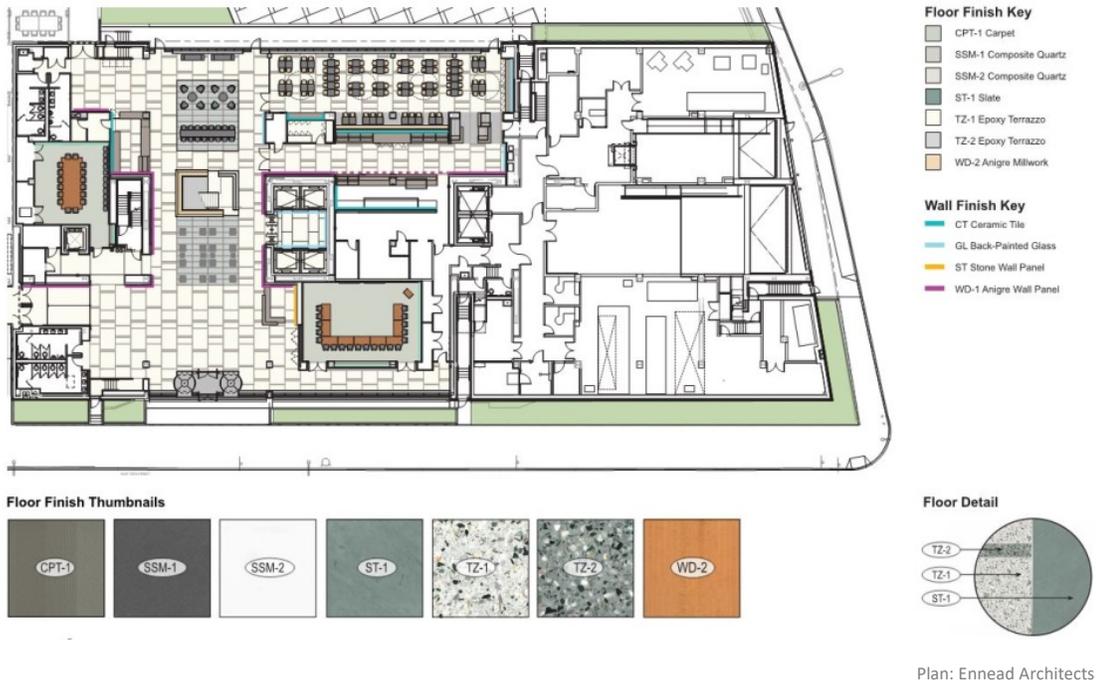
Key

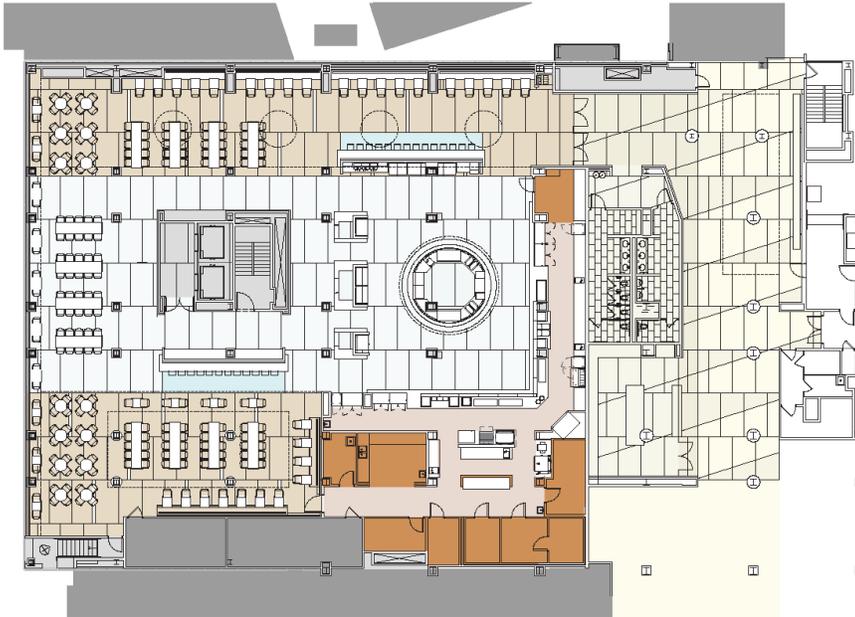
- Reception / Circulation
- Reception Support
- Exam Rooms
- Physician's Offices / Support
- Building Core
- Exterior Views / Natural Light

Plans: Ballinger

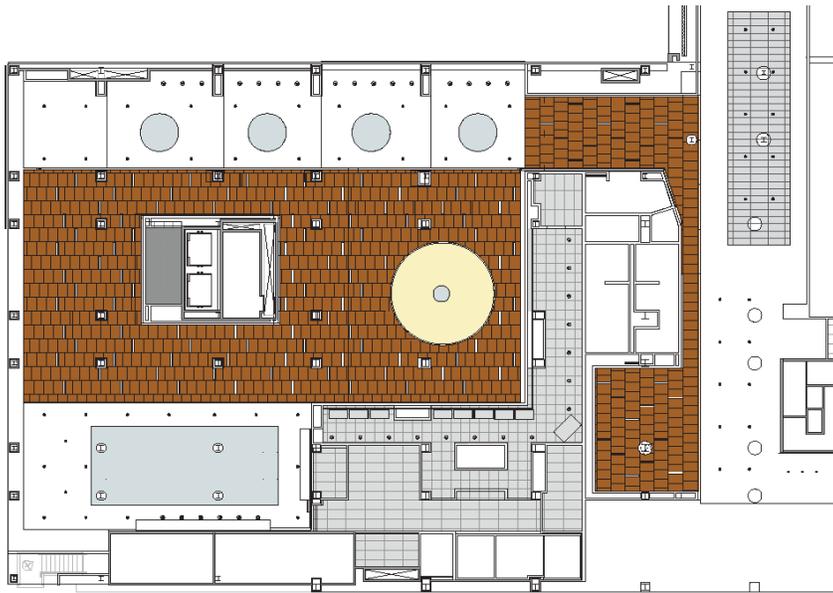
2. Design Development Phase

- Plan Diagrams - Plan diagrams shall be presented to NYU Langone during the design development phase. Rooms shall be labeled, furniture drawn, and the drawings shall be to a scale with a key designating the various materials. They shall be presented when materials and finishes are being reviewed. Below are acceptable examples:



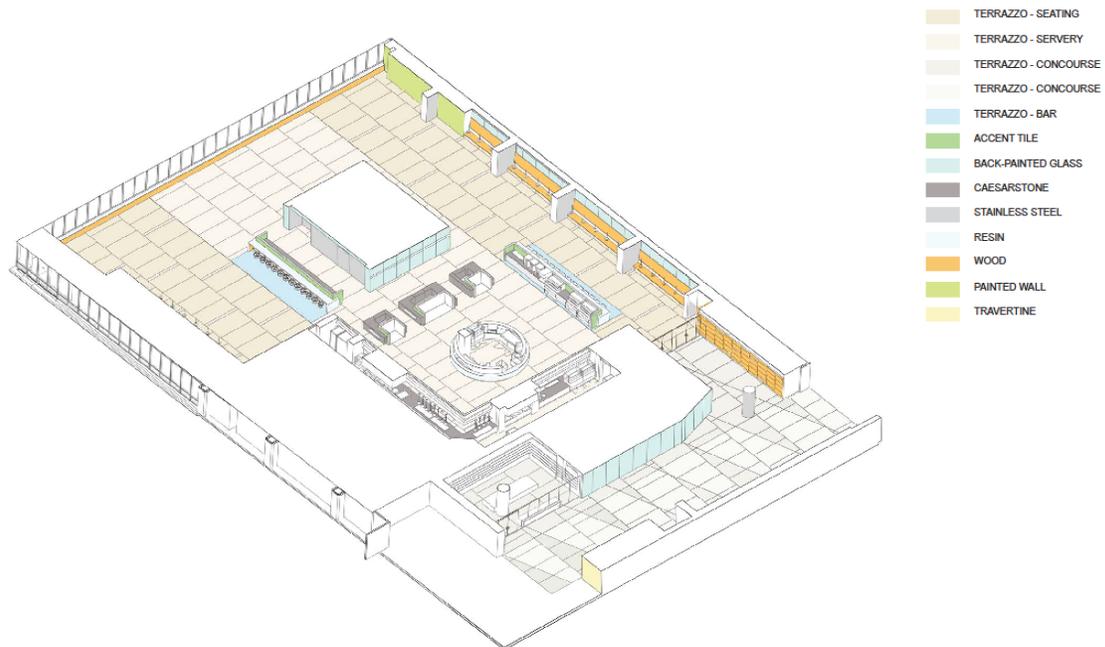
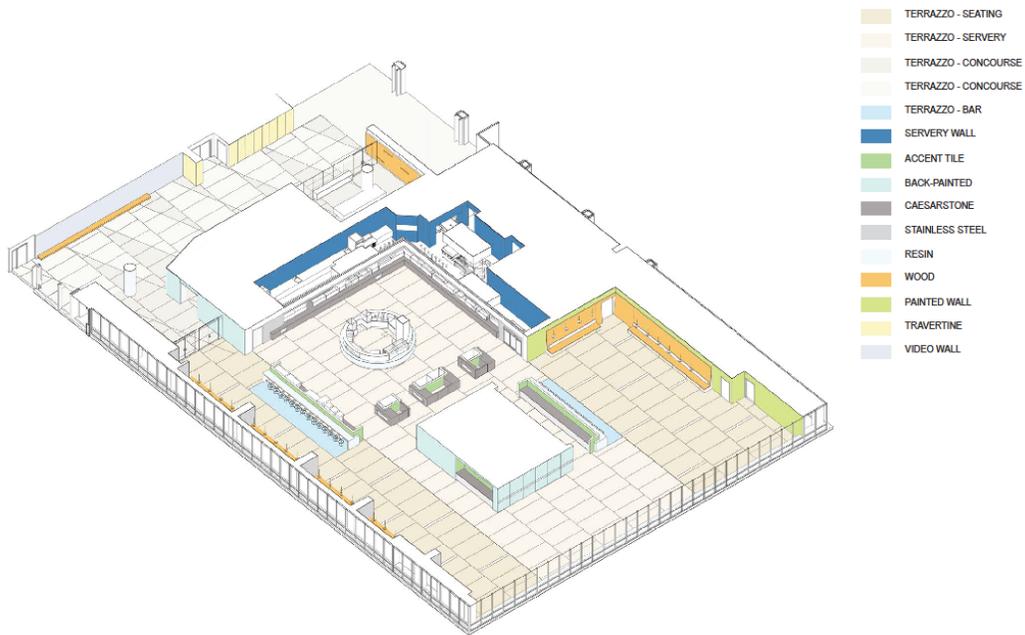


Plan: Ennead Architects



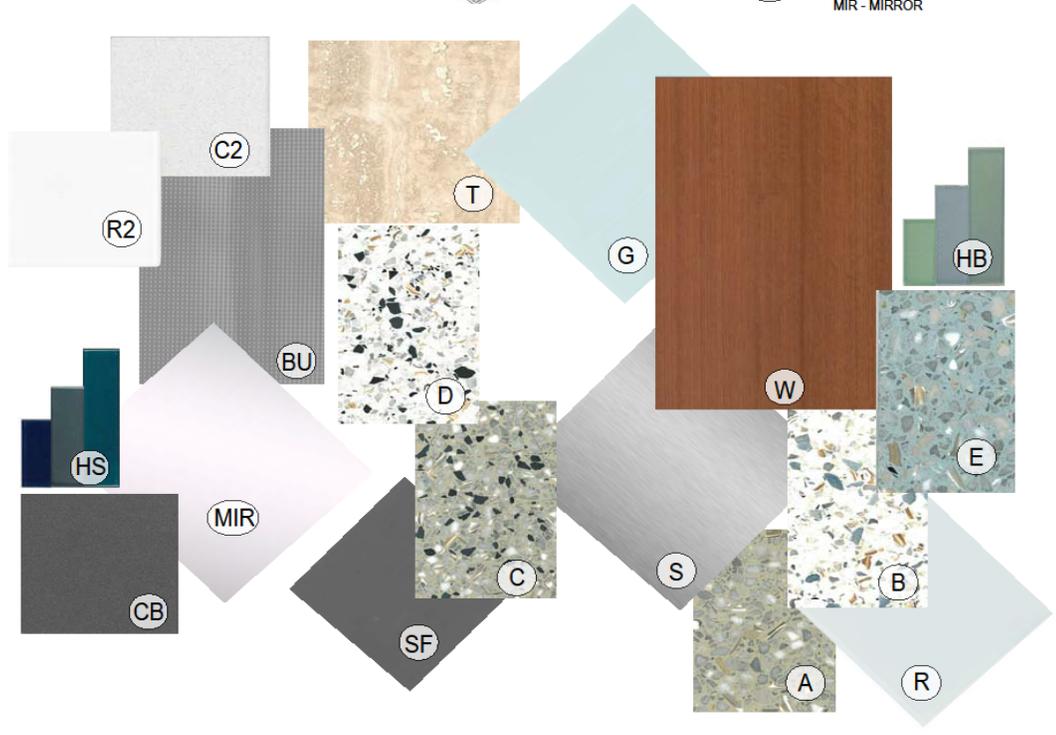
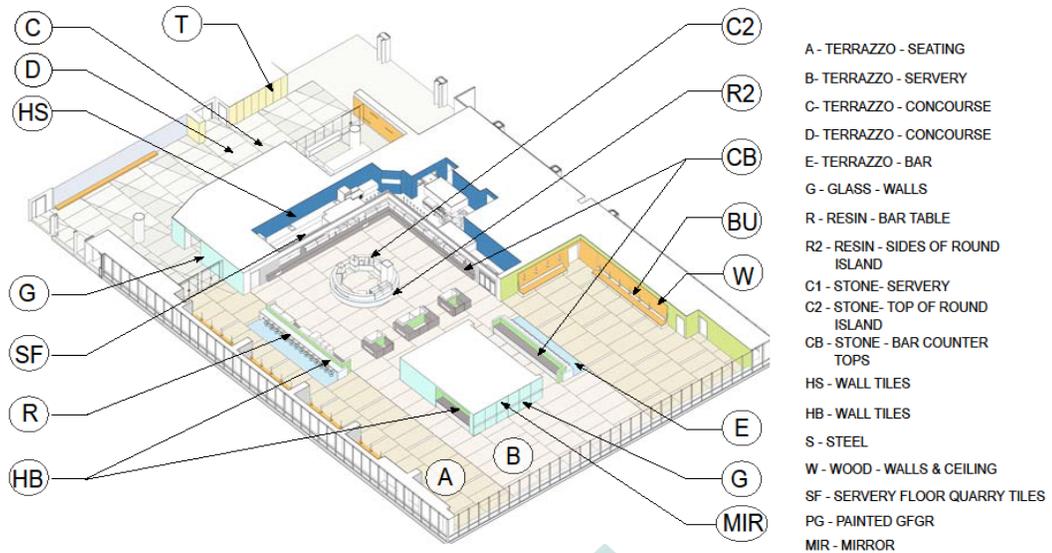
RCP: Ennead Architects

- Material/Finish Diagrams** - Finish Diagrams shall be presented to NYU Langone during the design development phase. The purpose is to clearly identify the locations of the various materials and finishes in the project. The drawing can be a plan or axonometric. The diagram should be color coded and have a key identifying the different materials and finishes. The actual material samples shall be presented simultaneously. Below are acceptable examples:



Ennead Architects

- Material/Finish Samples** - Actual samples of Materials/Finishes shall be presented to NYU Langone during the design development phase. The Architect shall provide sizes that are appropriate to both the scale and scope of the material in the project. For example, a large sample of the base color must be presented if it is being used in the majority of spaces. Samples such as wood and terrazzo shall be large enough to show the pattern, grain, color variation, etc. The materials should be keyed into the Finish Diagrams and/or Renderings. Below is an acceptable example:



Ennead Architects

- Perspective Renderings** - CAD Perspective renderings shall be presented to NYU Langone during the design phases. The quality level shall be sufficient for NYU Langone to understand the scale, material, color and lighting of the space. Single line or freehand perspectives are to be used sparingly and only as additional or supplemental information. Below are acceptable examples of such renderings:



Ennead Architects



Ennead Architects

FINISH & FURNITURE BOOKLETS

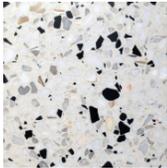
The Architect shall submit to the RED+F Design Studio, a (1) Finish Booklet and a (2) Furniture Booklet using NYULH templates provided by RED+F's Design Studio. Each booklet shall be submitted in pdf format via BuildFlow at the end of Design Development, Construction Documents and as part of the project closeout.

1. **Finish Booklet Items** - The Finish booklet shall have floor plan(s) and RCP(s), as well as all finish information used on the project. The Finish Booklet shall include information on the final installed materials, including product name and number, color, finish, size, manufacturer, contact information, room/location, and any other pertinent information. The booklet shall follow the Room Finish Material Legend subsection of these Design Guidelines as described below:

- **Floors:**
 - Resilient Flooring (Tile, Wood Plank, Sheet Flooring, Wood Sheet, etc.)
 - Rubber Flooring (Rubber Tile, Rubber Sheet)
 - Carpet (Broadloom, Tile)
 - Tile (Ceramic, Porcelain, Quarry, Stone)
 - Terrazzo
 - Walk-off Mat
 - Concrete Coatings
- **Base:**
 - Rubber Base (Cove, Straight)
 - Metal Base (Stainless Steel, Aluminum)
 - Porcelain Base
 - Integral Cove Base
- **Walls:**
 - Paint
 - Wall Covering
 - Tile (Ceramic, Porcelain, Glass)
 - Specialty Material (Wood, Metal, Stone, Acrylic Resin, Glass, etc.)
 - Wall Protection (Crash Rails, Handrails, Sheet, Corner Guards, etc.)
 - Demountable Partitions
- **Doors:**
 - Hollow Metal
 - Wood
 - Acrovyn
- **Ceilings:**
 - Paint
 - Lay-in Ceiling (Acoustic Ceiling Tile, Grid System)
 - Specialty (Wood, Metal, Fiberglass-Reinforced Panel, etc.)
- **Others:**
 - Millwork (Wood, Plastic Laminate, Stl. Stl., Solid Surface, Engineered Stone, etc.)
 - Countertops (Plastic Laminate, Solid Surface, Engineered Stone, etc.)
 - Window Sills (Solid Surface, Ptd. Metal)
 - Window Treatments (Shade Cloth, Sheers)

2. *Format for the Finish Booklet* - Below is the format to be used for the Finish Booklet. The first pages of the Finish Booklet shall contain floor plan(s) and RCP(s) of the project. This should be followed by the Material and Finish data on 8½” x 11” as formatted below. A template will be provided by the RED+F Design Studio.

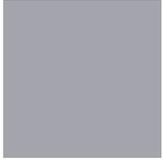
Floors

TERRAZZO			
TER-1	Manufacturer:	KrisStone	
	Description:	Thin-set epoxy custom mix with zinc dividers, KLLC1211E	
	Thickness:	3/8”	
	Contact:		
RESILIENT FLOORING: RESILIENT TILE			
RT-2	Manufacturer:	Nora	
	Product Style:	Nora Environcare	
	Product Color:	Lace Vine 2945	
	Size:	24” x 24”	
	Thickness:	2 mm thick	
FLOOR TILE			
TILE-1	Manufacturer:	Fritz Tile	
	Product Style:	Classic Terrazzo Collection	
	Product Color:	C521515, Dusk	
	Size:	12” x 12”, 3/16” thick	

Walls

WALL TILE		
TILE-2	<p>Manufacturer: Nemo Tile</p> <p>Product Style: Embarcadero Porcelain</p> <p>Product Color: Mission Beige</p> <p>Grout: Laticrete Spectralock Pro, 23 Antique White</p> <p>Size: 12" x 24"</p> <p>Contact: Nic Jennings njennings@nemotile.com/212-505-0009</p>	
WALL COVERING		
WC-01	<p>Manufacturer: Carnegie Xorel</p> <p>Product Style: Strie W, 6423W</p> <p>Product Color: Color 136</p> <p>Size: Width: 52"</p> <p>Contact:</p>	
WALL AND CORNER PROTECTION		
CG-4	<p>Manufacturer: Construction Specialties, or approved</p> <p>Product No.: CO-8</p> <p>Finish: Stainless Steel</p> <p>Legs: 2 ½"</p> <p>Height: Full height</p> <p>Corner: 90 degree corners Surface mounted</p>	
HR-1	<p>Manufacturer: Construction Specialties, or approved</p> <p>Product No.: P-RWS</p> <p>Finish: Stainless Steel, Wood Handrail, stain to match WD-1</p>	

Base

WALL BASE			
RB-1	Manufacturer:	Johnsonite	
	Product Style:	Tightlock Cove Base, Resilient Floors	
	Product Color:	Pewter, 38	

Doors

WOOD			
WD-1	Manufacturer:	Dooge Veneers Inc.	
	Product Color:	Anigre, Qtd Figured	
	Log No.:	#77/30 FSC, stained to match architect’s sample	

Ceilings

ACOUSTICAL LAY-IN CEILINGS			
ACT-1	Manufacturer:	Armstrong	
	Product Style:	Healthzone Ultima	
	Product Color:	White	
	Size:	As Noted	

3. **Furniture Booklet Items** - The Furniture Booklet shall have furniture and electrical plan(s), as well as furniture information used on the project. The Furniture Booklet shall include information on the final installed furniture, including product name and number, color, finish, size, manufacturer, contact information, room/location, and any other pertinent information. The booklet shall follow the Furniture subsection of these Design Guidelines as described below:

- **Casegoods:**
 - Private Office
 - Lecterns
- **Work Stations**
- **Tables:**
 - Conference Tables
 - Collaboration Tables
 - Height Adjustable Tables
 - Training Tables
 - Café and Occasional Tables
 - Inpatient Tables
- **Seating:**
 - Conference / Seminar Seating (including Stacking or Nesting)
 - Task Chairs / Stools
 - Private Office Guest Seating
 - Café / Staff Lounge Seating
 - Waiting Area Lounge and Tandem Seating
 - Bench and Banquet Seating
 - Clinical Guest Seating, Specialty Seating, Inpatient Sleepers
- **Storage:**
 - Prefab Millwork/ Lockers
 - Closed / Open Storage, Shelving, Mobile Carts
- **Accessories:**
 - Chart and Literature Holders
 - Task, Decorative and Undercabinet lighting
 - Marker / Tack Boards
 - IT and Specialty Ergonomic Furniture & Accessories
- **Recycling**
- **Outdoor Furniture**

4. *Format for the Furniture Booklet* - Below is the format to be used for the Furniture Booklet. The first pages of the Furniture Booklet shall contain furniture plan(s) of the project. This should be followed by the Furniture and Finish data on 8½” x 11” as formatted below. A template will be provided by the RED+F Design Studio.

Workstations

WORKSTATION	
Description:	WS-1
Manufacturer:	STEELCASE
Product name:	Universal
Finish:	Steelcase Established Textured Paint Fog 7236 (Metal) Steelcase Plain Jane Petosky 5F72 (Trackable)
Options:	Reduced Pulls, Configuration Varies, See Plan
Location:	Typical Administrative Offices





Tables

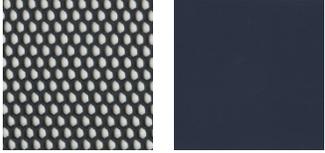
CONFERENCE TABLE	
Description:	T-4
Manufacturer:	BERNHARDT
Product name:	Trace Table
Finish:	Oak 867
Options:	n/a
Location:	2 nd Floor Conference Room




CREDENZA	
Description:	ST-2
Manufacturer:	BERNHARDT
Product name:	Shift Credenza
Finish:	Oak 867
Options:	Per NYU Standards
Location:	2 nd Floor Conference Room




Seating

TASK CHAIR	
Description:	CH-5
Manufacturer:	STEELCASE
Product name:	Think 3D Knit
Frame Color:	Black
Arm Cap:	Black
Options:	n/a
Upholstery (seat):	Mayer Durango Sapphire
Upholstery (back):	Steelcase 3D Knit Sailor
Location:	Reception Desks, Admin Offices, MA Stations
	
	
CONFERENCE CHAIR	
Description:	CH-17
Manufacturer:	KEILHAUER
Product name:	Vanilla
Frame Color:	Chrome Frame
Arm Cap:	None
Options:	n/a
Upholstery (seat):	Maharam Article Storm
Upholstery (back):	Luum Line Language, Pigment
Location:	2 nd Floor Conference Room
	
	

Recycling

TRASH / RECYCLING CENTER	
Description:	TB-6
Manufacturer:	Nucraft
Product name:	Recycling Center
Finish:	Oak 867
Options:	Per NYU Standards
Location:	2 nd Floor Conference Room
	
	

CAD DOCUMENTATION STANDARDS

The Space Planning and Management group of RED+F is responsible for space reporting, assessment and planning for NYU Langone Health. In order to fulfill its responsibilities, the group maintains a space inventory of all owned and leased properties, comprising floor plans and usage information. Keeping all floor plans and space information current is important to our operations. Staff and consultants involved in capital projects that impact the space inventory must provide appropriate documentation to the Space Planning and Management group in a timely manner.

Drawings/Models are to be delivered to NYU Langone Health on the completion of each of the following phases: Schematic Design, Design Development, Construction Documents, and Construction Administration.

1. *Mode of Delivery*

All project files shall be delivered via BuildFlow, the NYU Langone Health construction document management site.

2. *File Submission Requirements*

▪ *Drawing Files (.dwg)*

Drawings shall be delivered in DWG format. Each drawing file should contain the drawing sheet(s) in AutoCAD Space Mode. All X-ref drawings must be bound and inserted into the drawings. All 3D and BIM drawings must be converted to 2D-compatible DWG files.

▪ *Plotsheet Files (.dxf / .pdf)*

Plotsheet files should be generated out of the BIM and/or drawing files in DXF and/or PDF format.

3. *File Standards*

This subsection establishes the basic file standards and naming conventions that must be used when developing a project using Computer Aided Design (CAD) technology for NYU Langone Health.

▪ *Project Identification Number*

Each project within NYU Langone Health is assigned a unique Project Identification Number, also referred to as the PIM #. At the inception of all projects, the A/E Team must obtain the NYU Langone project ID number from the RED+F Project Manager to support the proper naming of drawing/model files, content and other support files. The PIM # must appear clearly on the drawing sheet(s).

- **Regulatory Agency Application Numbers**

The NYC Department of Buildings job number for projects in New York City or the equivalent for projects in municipalities outside of New York City must appear clearly on the drawing sheet(s).

- **Discipline Codes**

All drawing/model files, content and support files shall be prefixed with the appropriate Discipline Code (D). Discipline codes in use by NYU Langone Health are in line with the national CAD standards. The most common are listed in the table below:

Code	Discipline Name	Code	Discipline Name
A	Architectural	L	Landscape
C	Civil	M	Mechanical
E	Electrical	P	Plumbing
FP	Fire Protection	S	Structural

- **Drawing List Standards**

Drawing sets shall be organized as described below:

- A-000 General Information
- A-100 Floor Plans
- A-200 Elevations
- A-300 Exterior Details
- A-400 Interior Details
- A-500 Vertical Transportation
- A-600 Reflected Ceiling Plans
- A-700 Finish Plans
- A-800 Schedules

Note: Consultant drawings should follow the same format (i.e. M-000 General Information, M-100 Floor Plans, etc.).

- **File Naming Standards**

All electronic project information should be named following the nomenclature outlined in these guidelines. This will ensure that projects can be accurately maintained during production, archived at each milestone and retrieved for future use.

- Drawing Files (.dwg)

Drawing Files should be named beginning with the Project Identification Number followed by a dash, the Sheet Number, underscore and the Sheet Name.

The filename should take the form of:

PIM#-Sheet Number_Sheet Name.format

As an example, an Architecture Drawing File would be named as follows:

10662-A-100_First Floor Plan.dwg

- Model Files (.rvt)

Model Files should be named beginning with the Project Identification Number followed by a dash, and a Discipline Code. If multiple models are being submitted for a single discipline you may use a level 2 designator as outlined in the national CAD standards.

The filename should take the form of:

PIM#-D.format

As an example, an Architecture Revit Model File would be named as follows:

10662-A.rvt

- Plotsheet Files (.dxf / .pdf)

Plotsheet Files should be named beginning with the Project Identification Number, followed by a dash, the Sheet Number, underscore and the Sheet Name.

The filename should take the form of:

PIM#-Sheet Number_Sheet Name.format

As an example, an Architecture Plotsheet File would be named as follows:

10662-A-100_First Floor Plan.dxf

10662-A-100_First Floor Plan.pdf

CAD LAYER STANDARDS					
Category	RED+F Layer Name	Description	RED+F CAD Color	RED+F CAD Lineweight	RED+F CAD Linetype
Architectural	A-CURB	Curbs for Equipment	2-yellow	Default	Continuous
Architectural	A-DOOR	Doors	1-red	Default	Continuous
Architectural	A-DOOR-IDEN	Door number, hardware group, etc.	4-cyan	Default	Continuous
Architectural	A-FLOR-EVTR	Elevator cars and equipment	2-yellow	Default	Continuous
Architectural	A-FLOR-GRATE	Grating	2-yellow	Default	Continuous
Architectural	A-FLOR-IDEN-ROOM	Room numbers	7-white	Default	Continuous
Architectural	A-FLOR-IDEN-PRE-EPIC	Pre-EPIC Room numbers	7-white	Default	Continuous
Architectural	A-FLOR-IDEN-TEXT	Room names, targets, occupants, etc.	7-white	Default	Continuous
Architectural	A-FLOR-SHFT	Shafts	2-yellow	Default	Continuous
Architectural	A-FLOR-SIGN	Signage	1-red	Default	Continuous
Architectural	A-FLOR-STRS	Stair treads, escalators, ladders, level changes, ramps, pits, depressions	2-yellow	Default	Continuous
Architectural	A-ROOF	Roof	1-red	Default	Continuous
Architectural	A-WALL-EXTR	Exterior Building Wall	5-blue	Default	Continuous
Architectural	A-WALL-INTR	Interior Building Wall	3-green	Default	Continuous
Architectural	A-WNDW	Windows, curtain walls, glazed partitions	4-cyan	Default	Continuous
General	DEFPOINTS	Defpoints	7-white	Default	Continuous
Electrical	E-LITE	Lighting	3-green	Default	Continuous
Electrical	E-LITE-EXIT	Exit lighting	3-green	Default	Continuous
Electrical	E-POWR-WALL	Power wall outlets and receptacles	3-green	Default	Continuous
Electrical	E-SAFETY-CRDRDR	Card reader	3-green	Default	Continuous
Electrical	E-SAFETY-ICDB	Intercom/door buzzer system	3-green	Default	Continuous
General	G-ANNO-SYMB	Symbols	7-white	Default	Continuous
General	G-ANNO-TEXT	General Text	7-white	Default	Continuous
General	G-ANNO-TTLB	Border and Title Block	7-white	Default	Continuous
General	G-ANNO-TTLB-TEXT	Border and Title Block Text	7-white	Default	Continuous
General	G-LOGO	Title Block Logo	94,56,150	Default	Continuous
General	G-SCALE	Scale	7-white	Default	Continuous
General	G-VP	Viewport	7-white	Default	Continuous
Interior	I-EQPM-FIX	Fixed Equipment, except HVAC	6-magenta	Default	Continuous
Interior	I-EQPM-MOVE	Moveable equipment	6-magenta	Default	Continuous
Interior	I-FURN	Furniture	6-magenta	Default	Continuous
Interior	I-MILLWORK	Cabinetry / Casement	6-magenta	Default	Continuous
Landscaping	L-SITE	Site improvements	4-cyan	Default	Continuous
Mechanical	M-HVAC-EQPM	Mechanical equip. (chiller, boiler etc.)	6-magenta	Default	Continuous
Plumbing	P-FIXT	Plumbing fixtures, toilets, sinks	6-magenta	Default	Continuous
Plumbing	P-SAFETY-SHWSH	Emergency shower and eye wash	6-magenta	Default	Continuous
Structural	S-COLS	Columns	2-yellow	Default	Continuous
Structural	S-GRID	Column grid	2-yellow	Default	Center
Telecomm	T-JACK	Data/telephone jacks	3-green	Default	Continuous

BUILDING INFORMATION MODELING

Where so stipulated by Services Order, RFQ, or RFP, Building Information Modeling (BIM) shall be implemented throughout the project lifecycle. In these documents the A/E Team will find a list of intended BIM Uses requested by NYU Langone Health. The A/E Team is expected to capture these requirements, at minimum, in the project's BIM Execution Plan.

1. BIM Execution Plan

The A/E Team shall develop a BIM Execution Plan in the Schematic Design Phase and maintain and implement the BIM Execution Plan throughout the various phases of the project. The BIM Execution Plan shall include but not be limited to:

- *Plan Overview*
- *Project Goals/BIM Uses* - The A/E Team shall identify BIM Uses that aid in the development and delivery of a project's scope of work including but not limited to:
 - Existing Condition Modeling
 - Design Authoring
 - Design Review
 - Drawing Generation
 - Phase Planning
 - 3D Coordination
- *Organizational BIM Roles*
- *BIM Process Mapping*
- *Information Exchange*
- *Collaboration Procedure*
- *Quality Control*
- *Technical Needs*
- *Model Structure*
- *Project Deliverables* - The A/E Team shall provide a list of project-specific BIM deliverables organized by project phase. Appropriate Model Levels of Development shall be identified for each deliverable listed.

2. *BIM Uses*

The following list of BIM uses shall be used on NYU Langone Health RED+F projects. They are broken up into those provided as Basic Services for all projects designated to be delivered using BIM, and those uses that may be additionally requested in the Services Order, RFQ or RFP. BIM uses shall be assessed and recorded in the BIM Execution Plan to be provided by the A/E Team to NYU Langone RED+F for each project.

BASIC SERVICES	
BIM Use	Goal
Programming	<ul style="list-style-type: none"> Include NYU Langone space programming data and validate program meets requirements.
Existing Conditions Modeling	<ul style="list-style-type: none"> Create existing conditions models within project scope for areas to be surveyed or field verified prior to commencing design.
Design Authoring	<ul style="list-style-type: none"> All projects to use Autodesk Revit BIM authoring application.
Drawing Generation (Drawing Production)	<ul style="list-style-type: none"> Derive all drawings from Autodesk Revit BIM authoring application during all phases of a project.
Design Reviews	<ul style="list-style-type: none"> Visually review design solutions in 3d or virtually; validate end user design requirements; evaluate alternatives.
3D Coordination	<ul style="list-style-type: none"> Eliminate conflicts prior to construction, reduce RFI's, and eliminate field condition change orders.
Field and Management Tracking	<ul style="list-style-type: none"> NYU Langone Health to make available the use of BIM 360 during construction administration.

ADDITIONAL SERVICES	
BIM Use	Goal
Cost Estimation (Quantity Take-off)	<ul style="list-style-type: none"> Early master planning and design cost estimation based on gross sq. ft. rentable, lease, etc. using historical cost data. Quantify model objects, and track cost and cost changes during design and construction.
Phase Planning (4D Modeling)	<ul style="list-style-type: none"> Preliminary phasing studies, project phasing, master planning, linked to schedules for sequencing, visual studies. Project phasing during design and construction, for visualization, presentation, design consultant/construction schedules, and construction logistics.
Site Analysis	<ul style="list-style-type: none"> Site studies, building orientation, real estate acquisitions, master planning.
Engineering Analysis	<ul style="list-style-type: none"> Engineering analysis tools and processes to use BIM + BIM data for analysis. (Structural, Mechanical, etc.)

Energy Analysis	<ul style="list-style-type: none"> Specific engineering analysis on energy use. Validating BIM and design performance.
Lighting Analysis	<ul style="list-style-type: none"> Optimize lighting analysis design solutions. Indoor (artificial) vs outdoor (natural) light.
Sustainability / LEED Evaluation	<ul style="list-style-type: none"> Appropriately categorize and identify all sustainability criteria; NYU Langone Health to be able to distinguish building objects etc. impacting sustainability goals.
Code Validation	<ul style="list-style-type: none"> Code validation; design consultant to validate fire and life safety code compliance, egress, travel distances, etc.
Site Utilization Planning	<ul style="list-style-type: none"> Project phasing during construction, for visualization, presentation, construction logistics, site planning, and schedules.
Construction System Design (Virtual Mockup)	<ul style="list-style-type: none"> Construction system design, required planning for logistics / workflow (i.e. placing large equipment, MRI machines, etc.)
Digital Fabrication	<ul style="list-style-type: none"> Design to fabrication
3D Control and Planning (Digital Layout)	
Record Modeling	<ul style="list-style-type: none"> NYU Langone Health to require record model of as-built conditions to include data and documentation necessary in support of FM/OM. NYU Langone Health to use and maintain record model for FM/OM.
Building (Preventative) Maintenance Scheduling	<ul style="list-style-type: none"> Update and maintain BIM in alignment with Building Maintenance Scheduling.
Building Systems Analysis	<ul style="list-style-type: none"> NYU Langone Health to analyze and compare performance of building systems to design intent.
Asset Management	<ul style="list-style-type: none"> NYU Langone Health to link FM/OM asset data to BIM.
Space Management and Tracking	<ul style="list-style-type: none"> NYU Langone Health to integrate BIM space data and floor plans with IWMS Planon.
Disaster Planning	<ul style="list-style-type: none"> NYU Langone Health to leverage BIM in disaster planning and recovery.

SPACE PLANNING

RED+F has developed this subsection based on space planning layouts that we have found to be successful at NYU Langone Health. Our goal in providing this information is to streamline the design process by providing the Architect and Interior Designer pertinent information they can use during the programming and planning phases of a project. The information provided includes:

1. Floor Area Definitions
2. Planning Definitions
3. Formulas and Ratios
4. Space Types by Staff Title
5. Typical Room Sizes and Furniture Layouts

This information does not relieve the Architect or Interior Designer of designing a project that is code compliant and appropriate to the needs of the user. The Architect and Interior Designer may suggest other room and furniture layouts if they believe the proposed layouts support our mission, design principles, and the design intent of the project.

1. Floor Area Definitions

The Architect and Interior Designer shall provide floor area information to NYU Langone based on the following definitions:

- **Gross Square Feet (GSF)** - Floor area measured to the outside face of a building's exterior walls. GSF shall include the exterior wall thickness and all vertical penetrations (i.e. mechanical, electrical, plumbing, and elevator shafts, stairwells, etc.), as well as basements and garages.
- **Gross Departmental Square Feet (GDSF)** - The floor area for each department shall be measured from the outside face of a building's exterior walls, the centerline of shared walls and to the corridor side of corridor walls. Building and Floor Common Elements shall be apportioned based on the percentage of the floor occupied by each department. In cases where the department occupies an entire floor of a building the GSF shall be used.
- **Usable Square Feet (USF)** - Gross floor area less Building Common Elements. For multi-tenant/department floors, Floor Common Elements shall be apportioned based on the percentage of the floor occupied by each tenant/department. (per REBNY)
- **Net Square Feet (NSF)** - The area occupied by each identified program space measured to the centerline of interior partitions. Examples of such spaces include individual workspaces (i.e. workstations and offices), dedicated support spaces (i.e. conference rooms), shared support spaces (i.e. shared copier rooms, break rooms, etc.) and special mission-critical spaces (i.e. exam rooms, laboratories, etc.). Note: Building Common Elements, Floor Common Elements, and primary and secondary circulation are not included.

- **Building Common Elements** - The building core and common elements include portions of a building that *serve all tenants*. Such items, inclusive of their nominal 4” enclosing walls, include equipment/utility rooms (i.e. mechanical, electrical and telecom rooms serving the entire building), HVAC shafts, telecom / electrical distribution shafts, elevator shafts, public stairwells, etc. (per REBNY)
- **Floor Common Elements** - The floor common elements include portions of a floor that *serve all tenants of that floor*. Such items, not inclusive of their enclosing walls, include corridors, common toilets, shared supply rooms, etc. (per REBNY)

2. Planning Definitions

The Architect and Interior Designer shall provide planning information/calculations to NYU Langone based on the following definitions:

- **Max. Allowable Occupancy** - Maximum occupancy of a space as calculated per the Building Code(s).
 - Note: The A/E Team needs to calculate the maximum allowable occupancy within a space per the Building Code(s) based on several factors including but not limited to egress stair widths, exit door widths, plumbing fixture counts, etc.
- **Workplace Seating (WPS)** - Seating designated for use by a single employee. This can be located within an open area or in an enclosed room as described below:
 - **Open Workplace Seating** - Seating designated for use by a single employee in an open area. This is a permanent seat such as a:
 - Workstation
 - Bench
 - Reception
 - **Enclosed Workplace Seating** - Seating designated for use by a single employee in an enclosed room such as a:
 - Private Office
- **Collaboration Seating** - Seating available for use by a group of employees and/or visitors. This can be located within an open area or in an enclosed room as described below:
 - **Open Collaboration Seating** - Seating available for use by a group of employees and/or visitors in an open area. Examples of such seating include:
 - Waiting Areas
 - Pantries
 - Open Collaboration areas
 - **Enclosed Collaboration Seating** - Seating available for use by a group of employees and/or visitors in an enclosed room. Examples of such seating include:
 - Quiet Rooms
 - Discussion Rooms
 - Conference Rooms
 - Training Rooms
 - Multi-Purpose Rooms

3. *Formulas and Ratios*

The following information is intended to assist the Architect and Interior Designer during the planning and programming phases. The Architect and Interior Designer must also factor in circulation and support spaces (i.e. copy rooms, filing rooms, storage closets, lactation rooms, etc.) into their design.

- **USF** = GSF – (Building Common Elements)
- **USF / WPS** = USF ÷ Total # Anticipated WPS
Note: On average Administrative spaces should result in a USF / WPS of 100-150 sf.
- **Ratio of Open WPS** = # of Open WPS ÷ Total # of WPS
Note: On average Administrative spaces should result in a Ratio of Open WPS of 75-85%.
- **Ratio of Workplace Seats to Collaboration Seats:**
Note: Administrative spaces have the following approximate ratios:
 - Workplace Seating : Collaboration Seating = 1 : 1 to 1.4 : 1
 - Encl. Workplace Seating : Open Workplace Seating = 1 : 2.8 to 1 : 5.4
 - Encl. Collaboration Seating : Open Collaboration Seating = 1 : 0.8 to 1 : 1
 - Workplace Seating : Enclosed Collaboration Seating = 1.75 : 1 to 2.8 : 1
 - Workplace Seating : Open Collaboration Seating = 1.85 : 1 to 2.8 : 1
 - Workplace Seating : Pantry Seating = 6 : 1 to 8.4 : 1

Legend:

- USF = Usable Square Feet
- GSF = Gross Square Feet
- WPS = Workplace Seats

4. *Space Types by Staff Title*

The following chart represents the square footage requirements for typical work spaces as they relate to staff titles:

STAFF TITLE		SPACE REQUIREMENTS		
Academic / Clinical / Research	Admin / Hospital OPs	Type	Floor Area	Interior Dimensions
Department Chair	SVP	Extra-Large Private Office	164 SF	10'-0" x 16'-5"
Vice Chair	-	Large Private Office	125 SF	10'-0" x 12'-6"
Director	-	Medium Private Office	100 SF	10'-0" x 10'-0"
Faculty / MD / PI	VP / Director	Small Private Office	80 SF	8'-0" x 10'-0"
Fellows / Staff	Manager / Staff	Workstation	36 SF	6'-0" x 6'-0"
Residents / Post Docs	Admin Staff / Consultant	Bench Seating	Varies	4-6 LF <u>5 - 6 LF</u>

5. *Typical Room Sizes and Furniture Layouts*

The pages that follow show typical room sizes and furniture layouts for various space types that we have found to be successful. The overall square footage of spaces must be maintained but actual dimensions can be modified to fit within the project site conditions including the structural grid and building core. The space types included are:

- | | |
|---|---------------------------------------|
| A. Reception Desk A (Non-Clinical) | P. Medium Conference Room (12 person) |
| B. Reception Desk B (Clinical) | Q. Large Conference Room (24 person) |
| C. Reception Desk C (Clinical) | R. Training Room |
| D. Exam Room A (Side-by-Side Config.) | S. Open Collaboration A |
| E. Exam Room B (Interlocking Config.) | T. Open Collaboration B |
| F. Self Check-in Kiosks <u>Equipment</u> | U. Open Collaboration C |
| G. Bench Seating | V. Multipurpose Room |
| H. Workstation | W. Lecture Hall (150 person) |
| I. Workstation Configurations | X. Small Pantry (25 person) |
| J. Small Private Office | Y. Medium Pantry (50 person) |
| K. Medium Private Office | Z. Large Pantry (75 person) |
| L. Large Private Office | AA. Lactation Room |
| M. Extra-Large Private Office | <u>BB.</u> <u>Wellness Room</u> |
| N. Discussion Room | BBCC. Digital Regulatory & |
| O. Small Conference Room (8 person) | Departmental Signage |

A. RECEPTION DESK A (NON-CLINICAL)	
	Size
	Area: Varies
	Interior Dimensions: Varies
	Furniture & Accessories
	<p>F1 Feature Wall (Wood, Backlit Glass, etc.)</p> <p>F2 Worksurface (<u>ADA Height 29\"</u> <u>H</u>)</p> <p>F3 Transaction Counter (42\" H)</p> <p>F4 Task Chair</p> <p>F5 Box/Box/File Pedestal</p> <p>F6 Storage Millwork</p> <p>F7 Recycling (Paper only)</p> <p>F8 Stainless Steel Plate</p>
	Equipment
	<p>EQ1 Monitor</p> <p>EQ2 CPU</p> <p>EQ3 Keyboard</p> <p>EQ4 Mouse</p> <p>EQ5 Telephone</p> <p>EQ6 Printer/Copier</p>
	Signage
	<p>S1 Logo</p> <p>S2 Donor Recognition</p> <p>S3 Department Name</p> <p>S4 Room Identification</p>
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

A. RECEPTION DESK A (NON-CLINICAL)	
<p>A1 - ELEVATION</p>	<p>Size</p> <p>Area: Varies Interior Dimensions: Varies</p> <p>Furniture & Accessories</p> <p>F1 Feature Wall (Wood, Backlit Glass, etc.) F2 Worksurface (<u>ADA Height 29" H</u>) F3 Transaction Counter (42" H) F4 Task Chair F5 Box/Box/File Pedestal F6 Storage Millwork F7 Recycling (Paper only) F8 Stainless Steel Plate</p>
<p>A2 - ELEVATION</p> <p style="text-align: right;">0 1 2 4</p>	<p>Equipment</p> <p>EQ1 Monitor EQ2 CPU EQ3 Keyboard EQ4 Mouse EQ5 Telephone EQ6 Printer/Copier</p>
<p>A3 - SECTION</p> <p style="text-align: right;">0 1 2 4</p>	<p>Signage</p> <p>S1 Logo S2 Donor Recognition S3 Department Name S4 Room Identification</p>
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

B. RECEPTION DESK B (CLINICAL)

Size	
Area:	Varies
Interior Dimensions:	Varies

Furniture & Accessories	
F1	Feature Wall (Wood, Backlit Glass, etc.)
F2	Worksurface (<u>ADA Height 29" H</u>)
F3	Transaction Counter (42" H)
F4	Task Chair
F5	Guest Chair
F6	Privacy Screen
F7	Lateral File
F8	Box/Box/File Pedestal
F9	Base Cabinets
F10	Storage, Cabinets or Shelving (<u>as required where possible</u>)
F11	Recycling (Paper only)
F12	Stainless Steel Plate

Equipment	
EQ1	Monitor
EQ2	CPU
EQ3	Keyboard
EQ4	Mouse
EQ5	Telephone
EQ6	Printer/Copier
EQ7	EPIC Printer
EQ8	Self Check-in Equipment
EQ9	Check-out Equipment

Signage	
S1	Logo
S2	Donor Recognition
S3	Department Name
S4	Room Identification

Notes

1. Refer to other subsections of these Design Guidelines for further information.
2. Refer to the NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards and coordinate electrical/IT requirements with MCIT.
3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer.
4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

B. RECEPTION DESK B (CLINICAL)																																																															
<p>B1 - ELEVATION</p>	<table border="1"> <thead> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Size</th> </tr> </thead> <tbody> <tr> <td>Area:</td> <td>Varies</td> </tr> <tr> <td>Interior Dimensions:</td> <td>Varies</td> </tr> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Furniture & Accessories</th> </tr> <tr> <td>F1</td> <td>Feature Wall (Wood, Backlit Glass, etc.)</td> </tr> <tr> <td>F2</td> <td>Worksurface (<u>ADA Height 29" H</u>)</td> </tr> <tr> <td>F3</td> <td>Transaction Counter (42" H)</td> </tr> <tr> <td>F4</td> <td>Task Chair</td> </tr> <tr> <td>F5</td> <td>Guest Chair</td> </tr> <tr> <td>F6</td> <td>Privacy Screen</td> </tr> <tr> <td>F7</td> <td>Lateral File</td> </tr> <tr> <td>F8</td> <td>Box/Box/File Pedestal</td> </tr> <tr> <td>F9</td> <td>Base Cabinets</td> </tr> <tr> <td>F10</td> <td>Storage, Cabinets or Shelving (<u>as required where possible</u>)</td> </tr> <tr> <td>F11</td> <td>Recycling (Paper only)</td> </tr> <tr> <td>F12</td> <td>Stainless Steel Plate</td> </tr> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Equipment</th> </tr> <tr> <td>EQ1</td> <td>Monitor</td> </tr> <tr> <td>EQ2</td> <td>CPU</td> </tr> <tr> <td>EQ3</td> <td>Keyboard</td> </tr> <tr> <td>EQ4</td> <td>Mouse</td> </tr> <tr> <td>EQ5</td> <td>Telephone</td> </tr> <tr> <td>EQ6</td> <td>Printer/Copier</td> </tr> <tr> <td>EQ7</td> <td>EPIC Printer</td> </tr> <tr> <td>EQ8</td> <td>Self Check-in Equipment</td> </tr> <tr> <td>EQ9</td> <td>Check-out Equipment</td> </tr> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Signage</th> </tr> <tr> <td>S1</td> <td>Logo</td> </tr> <tr> <td>S2</td> <td>Donor Recognition</td> </tr> <tr> <td>S3</td> <td>Department Name</td> </tr> <tr> <td>S4</td> <td>Room Identification</td> </tr> </tbody> </table>	Size		Area:	Varies	Interior Dimensions:	Varies	Furniture & Accessories		F1	Feature Wall (Wood, Backlit Glass, etc.)	F2	Worksurface (<u>ADA Height 29" H</u>)	F3	Transaction Counter (42" H)	F4	Task Chair	F5	Guest Chair	F6	Privacy Screen	F7	Lateral File	F8	Box/Box/File Pedestal	F9	Base Cabinets	F10	Storage, Cabinets or Shelving (<u>as required where possible</u>)	F11	Recycling (Paper only)	F12	Stainless Steel Plate	Equipment		EQ1	Monitor	EQ2	CPU	EQ3	Keyboard	EQ4	Mouse	EQ5	Telephone	EQ6	Printer/Copier	EQ7	EPIC Printer	EQ8	Self Check-in Equipment	EQ9	Check-out Equipment	Signage		S1	Logo	S2	Donor Recognition	S3	Department Name	S4	Room Identification
Size																																																															
Area:		Varies																																																													
Interior Dimensions:	Varies																																																														
Furniture & Accessories																																																															
F1	Feature Wall (Wood, Backlit Glass, etc.)																																																														
F2	Worksurface (<u>ADA Height 29" H</u>)																																																														
F3	Transaction Counter (42" H)																																																														
F4	Task Chair																																																														
F5	Guest Chair																																																														
F6	Privacy Screen																																																														
F7	Lateral File																																																														
F8	Box/Box/File Pedestal																																																														
F9	Base Cabinets																																																														
F10	Storage, Cabinets or Shelving (<u>as required where possible</u>)																																																														
F11	Recycling (Paper only)																																																														
F12	Stainless Steel Plate																																																														
Equipment																																																															
EQ1	Monitor																																																														
EQ2	CPU																																																														
EQ3	Keyboard																																																														
EQ4	Mouse																																																														
EQ5	Telephone																																																														
EQ6	Printer/Copier																																																														
EQ7	EPIC Printer																																																														
EQ8	Self Check-in Equipment																																																														
EQ9	Check-out Equipment																																																														
Signage																																																															
S1	Logo																																																														
S2	Donor Recognition																																																														
S3	Department Name																																																														
S4	Room Identification																																																														
<p>B2 - ELEVATION</p>																																																															
<p>B3 - SECTION</p>																																																															
Notes																																																															
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Refer to the <u>NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards</u> and coordinate electrical/IT requirements with MCIT. 3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 																																																															

C. RECEPTION DESK C (CLINICAL)

Size	
Area:	Varies
Interior Dimensions:	Varies
Furniture & Accessories	
F1	Feature Wall (Wood, Backlit Glass, etc.)
F2	Worksurface (<u>ADA Height 29" H</u>)
F3	Transaction Counter (42" H)
F4	Task Chair
F5	Guest Chair
F6	Privacy Screen
F7	Lateral File
F8	Box/Box/File Pedestal
F9	Base Cabinets
F10	Storage, Cabinets or Shelving (<u>as required where possible</u>)
F11	Recycling (Paper only)
F12	Stainless Steel Plate
Equipment	
EQ1	Monitor
EQ2	CPU
EQ3	Keyboard
EQ4	Mouse
EQ5	Telephone
EQ6	Printer/Copier
EQ7	EPIC Printer
EQ8	Self Check-in Equipment
EQ9	Check-out Equipment
Signage	
S1	Logo
S2	Donor Recognition
S3	Department Name
S4	Room Identification

Notes

1. Refer to other subsections of these Design Guidelines for further information.
2. Refer to the NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards and coordinate electrical/IT requirements with MCIT.
3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer.
4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

C. RECEPTION DESK C (CLINICAL)

Size

Area: Varies
Interior Dimensions: Varies

Furniture & Accessories

F1 Feature Wall
(Wood, Backlit Glass, etc.)

F2 Worksurface (ADA Height 29" H)

F3 Transaction Counter (42" H)

F4 Task Chair

F5 Guest Chair

F6 Privacy Screen

F7 Lateral File

F8 Box/Box/File Pedestal

F9 Base Cabinets

F10 Storage, Cabinets or Shelving
(as required where possible)

F11 Recycling (Paper only)

F12 Stainless Steel Plate

Equipment

EQ1 Monitor

EQ2 CPU

EQ3 Keyboard

EQ4 Mouse

EQ5 Telephone

EQ6 Printer/Copier

EQ7 EPIC Printer

EQ8 Self Check-in Equipment

EQ9 Check-out Equipment

Signage

S1 Logo

S2 Donor Recognition

S3 Department Name

S4 Room Identification

Notes

1. Refer to other subsections of these Design Guidelines for further information.
2. Refer to the NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards and coordinate electrical/IT requirements with MCIT.
3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer.
4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

D. EXAM ROOM A (SIDE-BY-SIDE CONFIGURATION)	
	Size
	Area: Varies
	Interior Dimensions: As Shown
	Furniture & Accessories
	F1 Exam Table / Chair
	F2 Clinician's Stool
	F3 Guest Chair
F4 Millwork	
F5 Tan Step Can (trash only)	
F6 Paper Towel Dispenser	
F7 Soap Dispenser	
F8 Purell Dispenser	
F9 Sharps Container	
F10 2 x Coat Hooks	
F11 Privacy Curtain (if required)	
Plumbing Fixtures	
P1 Faucet	
P2 Sink	
Equipment	
EQ1 Computer Station (Wall Mounted / WOW)	
EQ2 Diagnostic Equipment	
EQ3 Scale	
EQ4 Stadiometer	
Signage	
S1 Room Identification	
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Refer to the NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards and coordinate IT requirements with MCIT. 3. Coordinate medical equipment with Clinical Engineering and clinical tan step cans with Building Services. 4. If required, coordinate privacy curtain with RCP. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

E. EXAM ROOM B (INTERLOCKING CONFIGURATION)

The diagram shows a rectangular exam room with a sink and mirror on the left wall. An exam table (F1) is positioned diagonally. A computer station (EQ1) is wall-mounted on the right wall. A diagnostic equipment unit (EQ2) is on the top wall. A scale (EQ3) and stadiometer (EQ4) are on the bottom wall. Various dispensers (F6-F8) and containers (F4, F5, F9) are placed around the room. A privacy curtain (F11) is indicated on the right wall. Dimensions include a minimum width of 9'-0" and a maximum width of 11'-0". A scale bar at the bottom indicates 0, 1, 2, and 4 feet.

Size	
Area:	Varies
Interior Dimensions:	As Shown

Furniture & Accessories	
F1	Exam Table / Chair
F2	Clinician's Stool
F3	Guest Chair
F4	Millwork
F5	Tan Step Can (trash only)
F6	Paper Towel Dispenser
F7	Soap Dispenser
F8	Purell Dispenser
F9	Sharps Container
F10	2 x Coat Hooks
F11	Privacy Curtain (if required)

Plumbing Fixtures	
P1	Faucet
P2	Sink

Equipment	
EQ1	Computer Station (Wall Mounted / WOW)
EQ2	Diagnostic Equipment
EQ3	Scale
EQ4	Stadiometer

Signage	
S1	Room Identification

Notes
1. Refer to other subsections of these Design Guidelines for further information.
2. Refer to the NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards and coordinate IT requirements with MCIT.
3. Coordinate medical equipment with Clinical Engineering and clinical tan step cans with Building Services.
4. If required, coordinate privacy curtain with RCP.
5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

F. SELF CHECK-IN KIOSK EQUIPMENT	
	Size
	<p>Area: Varies Interior Dimensions: As Shown</p>
	Furniture & Accessories
	<p>F1 Counter (34" H) F2 Grommets (coor'd location w/ RED+F) F3 Wire Management Accessory (at underside of counter) F4 Millwork Apron</p>
	Equipment
	<p>EQ1 Self Check-in KioskEquipment EQ2 Power/Data (directly below counter as req'd)</p>
	Signage
Notes	
<ol style="list-style-type: none"> 1. Check-in kiosksequipment shall be located between the department entry and the reception desk. Proximity to the reception desk is preferred. 2. Refer to other subsections of these Design Guidelines for further information. 3. Refer to the NYU Langone Health – Hardware Standards Epic Desktop Guidelines and Hardware Standards and coordinate IT requirements with MCIT. 	

G. BENCH SEATING	
	Size
	Area: Varies
	Interior Dimensions: 4-6-5-6 LF
	Furniture & Accessories
	<p>F1 Worksurface</p> <p>F2 Personal Storage (optional)</p> <p>F3 Desktop Privacy Screen</p> <p>F4 Task Chair</p> <p>F5 Task Light (optional)</p>
Equipment	
	<p>EQ1 Monitor</p> <p>EQ2 CPU</p> <p>EQ3 Keyboard</p> <p>EQ4 Mouse</p> <p>EQ5 Telephone</p>
Signage	
	<p>S1 Desk Identification</p>
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

H. WORKSTATION	
	Size
	Area: 36 sf
	Interior Dimensions: 6'-0" X 6'-0"
	Furniture & Accessories
	<p>F1 Worksurface <u>(sit-to-stand optional)</u></p> <p>F2 Wardrobe <u>or</u> <u>Box/Box/File Pedestal</u></p> <p>F3 Lateral File</p> <p>F4 Open Shelf</p> <p>F5 Tackable Surface</p> <p>F6 Task Chair</p> <p>F7 Task Light (optional)</p> <p>F8 Monitor Arm (optional)</p>
Equipment	
	<p>EQ1 Monitor</p> <p>EQ2 CPU</p> <p>EQ3 Keyboard</p> <p>EQ4 Mouse</p> <p>EQ5 Telephone</p>
	Signage
	S1 Desk Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

I. WORKSTATION CONFIGURATIONS									
<p style="text-align: center;">OPTION A</p> <p style="text-align: center;">OPTION B</p> <p style="text-align: center;">OPTION C</p> <p style="text-align: center;">OPTION D</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="background-color: #4b4b8b; color: white;">Size</th> </tr> <tr> <td style="height: 100px;"> </td> </tr> <tr> <th style="background-color: #4b4b8b; color: white;">Furniture & Accessories</th> </tr> <tr> <td style="height: 100px;"> </td> </tr> <tr> <th style="background-color: #4b4b8b; color: white;">Equipment</th> </tr> <tr> <td style="height: 100px;"> </td> </tr> <tr> <th style="background-color: #4b4b8b; color: white;">Signage</th> </tr> <tr> <td style="height: 100px;"> </td> </tr> </table>	Size		Furniture & Accessories		Equipment		Signage	
Size									
Furniture & Accessories									
Equipment									
Signage									
Notes									

J. SMALL PRIVATE OFFICE	
	Size
	Area: 80 sf
	Interior Dimensions: 8'-0" X 10'-0"
	Furniture & Accessories
	F1 Worksurface
	F2 Overhead Storage
	F3 Wardrobe
	F4 Lateral File
	F5 Box/Box/File Pedestal
	F6 Tackable Surface
	F7 Task Chair
	F8 Guest Chair
	F9 Task Light (optional)
	F10 Undercabinet/Shelf Light (optional)
	F11 Monitor Arm (optional)
	F12 Coat Hook
	Equipment
	EQ1 Monitor
	EQ2 CPU
	EQ3 Keyboard
	EQ4 Mouse
	EQ5 Telephone
	Signage
	S1 Room Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. For ADA compliant offices, the work surface can either be placed on casters or turned 90 degrees. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

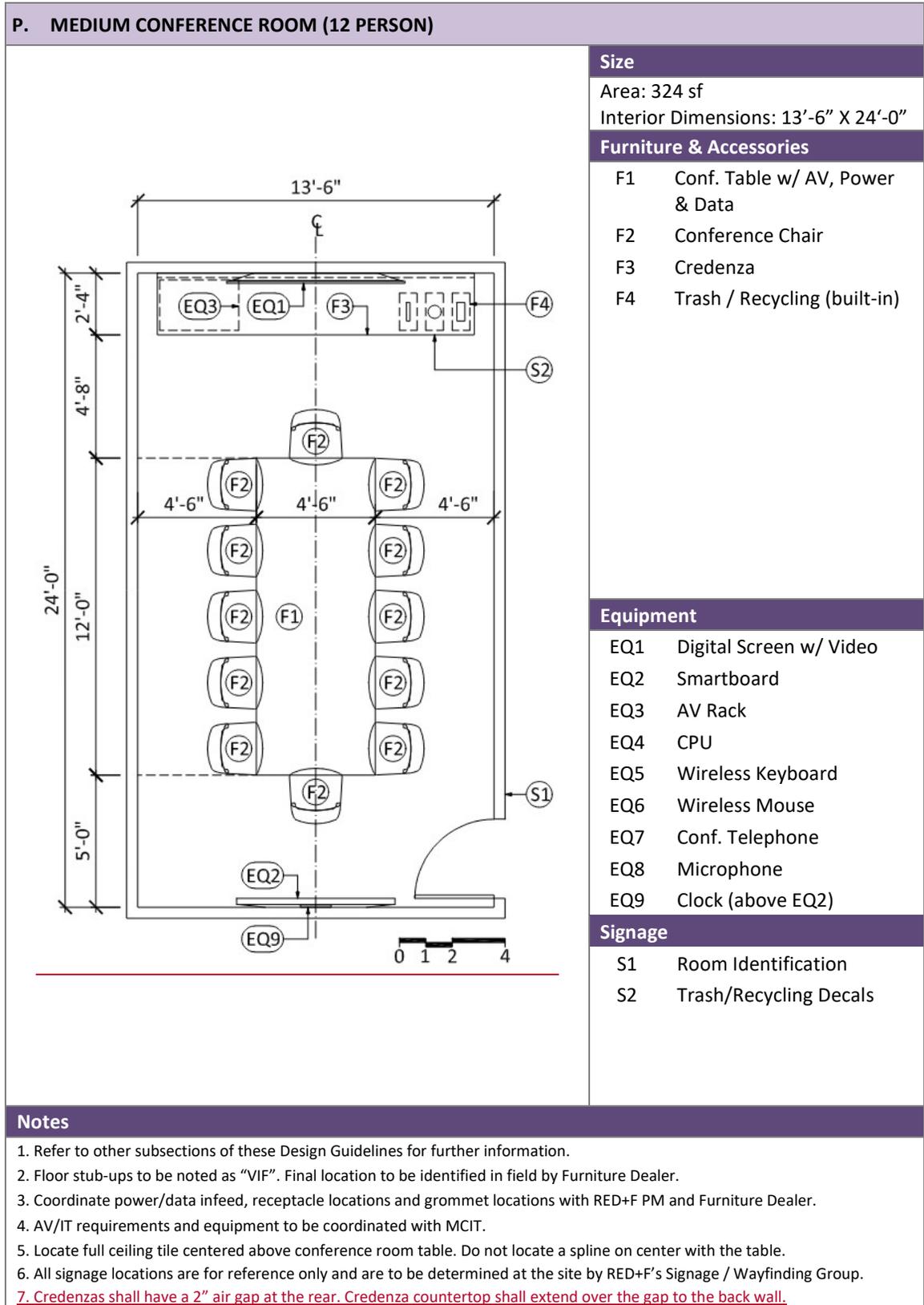
K. MEDIUM PRIVATE OFFICE	
	Size
	Area: 100 sf
	Interior Dimensions: 10'-0" X 10'-0"
	Furniture & Accessories
	<ul style="list-style-type: none"> F1 Worksurface F2 Overhead Storage F3 Wardrobe F4 Lateral File F5 Box/Box/File Pedestal F6 Tackable Surface F7 Task Chair F8 Guest Chair F9 Task Light (optional) F10 Undercabinet/Shelf Light (optional) F11 Monitor Arm (optional) F12 Coat Hook
Equipment	
	<ul style="list-style-type: none"> EQ1 Monitor EQ2 CPU EQ3 Keyboard EQ4 Mouse EQ5 Telephone
Signage	
	<ul style="list-style-type: none"> S1 Room Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. For ADA compliant offices, the work surface can either be placed on casters or turned 90 degrees. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

L. LARGE PRIVATE OFFICE	
	Size
	Area: 125 sf
	Interior Dimensions: 12'-6" X 10'-0"
	Furniture & Accessories
	F1 Worksurface
	F2 Overhead Storage
	F3 Wardrobe
	F4 Lateral File
	F5 Box/Box/File Pedestal
	F6 Tackable Surface
	F7 Task Chair
	F8 Guest Chair
	F9 Task Light (optional)
	F10 Undercabinet/Shelf Light (optional)
	F11 Monitor Arm (optional)
	F12 Coat Hook
	Equipment
	EQ1 Monitor
	EQ2 CPU
	EQ3 Keyboard
	EQ4 Mouse
	EQ5 Telephone
	Signage
	S1 Room Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. IT requirements and equipment to be coordinated with MCIT. 4. For ADA compliant offices, the work surface can either be placed on casters or turned 90 degrees. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

M. EXTRA-LARGE PRIVATE OFFICE	
	Size
	Area: 164 sf
	Interior Dimensions: 10'-0" X 16'-5"
	Furniture & Accessories
	<ul style="list-style-type: none"> F1 Worksurface F2 Overhead Storage F3 Wardrobe F4 Lateral File F5 Box/Box/File Pedestal F6 Tackable Surface F7 Task Chair F8 Guest Chair F9 Meeting Table F10 Task Light (optional) F11 Undercabinet/Shelf Light (optional) F12 Monitor Arm (optional) F13 Coat Hook
Equipment	
<ul style="list-style-type: none"> EQ1 Monitor EQ2 CPU EQ3 Keyboard EQ4 Mouse EQ5 Telephone EQ6 Digital Screen w/ built-in Microphone & Video 	
Signage	
S1 Room Identification	
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. AV/IT requirements and equipment to be coordinated with MCIT. 4. For ADA compliant offices, the work surface can either be placed on casters or turned 90 degrees. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

N. DISCUSSION ROOM	
	Size
	Area: 1152 sf Interior Dimensions: 10'-0" X 11'-6" 2"
	Furniture & Accessories
	F1 Meeting Table w/ AV, Power & Data F2 Conference Chair
	Equipment
	EQ1 Digital Screen w/ built-in Microphone & AV EQ2 Smart Board EQ3 Conf. Telephone
	Signage
	S1 Room Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. AV/IT requirements and equipment to be coordinated with MCIT. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

O. SMALL CONFERENCE ROOM (8 PERSON)	
	Size
	Area: 270 sf
	Interior Dimensions: 13'-6" X 20'-0"
	Furniture & Accessories
	<p>F1 Conf. Table w/ AV, Power & Data</p> <p>F2 Conference Chair</p> <p>F3 Credenza</p>
	Equipment
	<p>EQ1 Digital Screen w/ Video</p> <p>EQ2 Smartboard</p> <p>EQ3 AV Rack</p> <p>EQ4 CPU</p> <p>EQ5 Wireless Keyboard</p> <p>EQ6 Wireless Mouse</p> <p>EQ7 Conf. Telephone</p> <p>EQ8 Microphone</p> <p>EQ9 Clock (above EQ2)</p>
	Signage
	<p>S1 Room Identification</p>
Notes	
<p>1. Refer to other subsections of these Design Guidelines for further information.</p> <p>2. Floor stub-ups to be noted as "VIF". Final location to be identified in field by Furniture Dealer.</p> <p>3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer.</p> <p>4. AV/IT requirements and equipment to be coordinated with MCIT.</p> <p>5. Locate full ceiling tile centered above conference room table. Do not locate a spline on center with the table.</p> <p>6. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.</p> <p>7. <u>Credenzas shall have a 2" air gap at the rear. Credenza countertop shall extend over the gap to the back wall.</u></p>	



Q. LARGE CONFERENCE ROOM (24 PERSON)										
	Size									
	Area: 462 sf									
	Interior Dimensions: 16'-6" X 28'-0"									
	Furniture & Accessories									
	<table border="0"> <tr> <td style="padding-right: 10px;">F1</td> <td>Conf. Table w/ AV, Power & Data</td> </tr> <tr> <td>F2</td> <td>Conference Chair</td> </tr> <tr> <td>F3</td> <td>Stacking Chair</td> </tr> <tr> <td>F4</td> <td>Credenza</td> </tr> <tr> <td>F5</td> <td>Trash / Recycling (built-in)</td> </tr> </table>	F1	Conf. Table w/ AV, Power & Data	F2	Conference Chair	F3	Stacking Chair	F4	Credenza	F5
F1	Conf. Table w/ AV, Power & Data									
F2	Conference Chair									
F3	Stacking Chair									
F4	Credenza									
F5	Trash / Recycling (built-in)									
Equipment										
EQ1	Digital Screen w/ Video									
EQ2	Smartboard									
EQ3	AV Rack									
EQ4	CPU									
EQ5	Wireless Keyboard									
EQ6	Wireless Mouse									
EQ7	Conf. Telephone									
EQ8	Microphone									
EQ9	Clock (above EQ2)									
Signage										
S1	Room Identification									
S2	Trash/Recycling Decals									
Notes										
<ol style="list-style-type: none"> Refer to other subsections of these Design Guidelines for further information. Floor stub-ups to be noted as "VIF". Final location to be identified in field by Furniture Dealer. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. AV/IT requirements and equipment to be coordinated with MCIT. Locate full ceiling tile centered above conference room table. Do not locate a spline on center with the table. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. <u>Credenzas shall have a 2" air gap at the rear. Credenza countertop shall extend over the gap to the back wall.</u> 										

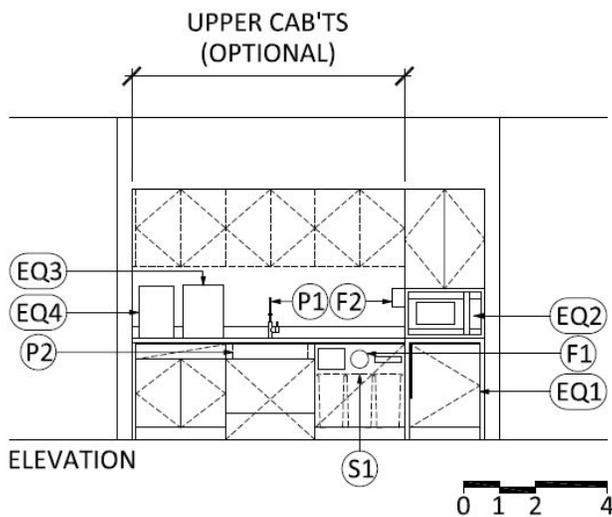
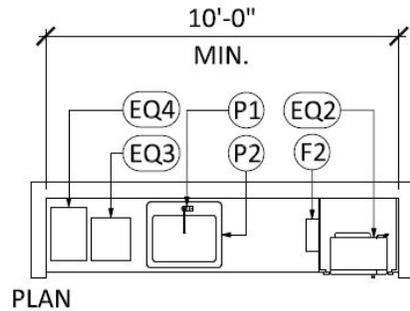
R. TRAINING ROOM	
	Size
	Area: 693 sf
	Interior Dimensions: 21'-0" X 33'-0"
	Furniture & Accessories
	F1 Training Table (Presenter)
	F2 Training Table (Attendee)
	F3 Stacking / Nesting Chair
	F4 Trash / Recycling (outside)
	Equipment
	EQ1 Digital Screen
	EQ2 Monitor
	EQ3 CPU
	EQ4 Keyboard
	EQ5 Mouse
	EQ6 Conf. Telephone
	EQ7 Microphone / Video
	EQ8 Clock
	Signage
	S1 Room Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 3. AV/IT requirements and equipment to be coordinated with MCIT. 4. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

T. OPEN COLLABORATION B	
	Size
	<p>Area: Varies Interior Dimensions: Varies</p>
	Furniture & Accessories
	F1 Lounge Height Table w/ AV, Power & Data
	F2 Lounge Seating
	F3 Stool
	F4 Worksurface (Counter Height)
	F5 Coffee Table
	Equipment
	EQ1 Digital Screen w/ AV
	Signage
	S1 Area Identification (optional)
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Floor stub-ups to be noted as "VIF". Final location to be identified in field by Furniture Dealer. 3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 4. AV/IT requirements and equipment to be coordinated with MCIT. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

V. MULTIPURPOSE ROOM								
	Size							
	Area: 1600 sf							
	Interior Dimensions: 40'-0" x 40'-0"							
	Furniture & Accessories							
	<table border="0"> <tr><td>F1</td><td>Training Table</td></tr> <tr><td>F2</td><td>Stacking Chair</td></tr> <tr><td>F3</td><td>Lectern</td></tr> <tr><td>F4</td><td>Trash / Recycling</td></tr> </table>	F1	Training Table	F2	Stacking Chair	F3	Lectern	F4
F1	Training Table							
F2	Stacking Chair							
F3	Lectern							
F4	Trash / Recycling							
Equipment								
EQ1	Digital Screen							
EQ2	Monitor							
EQ3	CPU							
EQ4	Keyboard							
EQ5	Mouse							
EQ6	Telephone							
EQ7	Microphone							
EQ8	Clock							
Signage								
S1	Room Identification							
S2	Trash/Recycling Decals							
Notes								
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Floor stub-ups to be noted as "VIF". Final location to be identified in field by Furniture Dealer. 3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 4. AV/IT requirements and equipment to be coordinated with MCIT. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 								

W. LECTURE HALL (150 PERSON)	
	Size
	Area: 1800 sf
	Interior Dimensions: 40'-0" X 45'-0"
	Furniture & Accessories
	F1 Lectern
	F2 Auditorium Seating
	F3 Removable Auditorium Seating (ADA-compliance)
	F4 Trash / Recycling (outside)
	Equipment
	EQ1 Digital Screen
	EQ2 Monitor
	EQ3 CPU
	EQ4 Keyboard
	EQ5 Mouse
	EQ6 Telephone
	EQ7 Microphone
	EQ8 Clock
	Signage
	S1 Room Identification
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Floor stub-ups to be noted as "VIF". Final location to be identified in field by Furniture Dealer. 3. Coordinate power/data infeed, receptacle locations and grommet locations with RED+F PM and Furniture Dealer. 4. AV/IT requirements and equipment to be coordinated with MCIT. 5. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 	

X. SMALL PANTRY (25 PERSON)



Size

Area: Varies
Interior Dimensions: 10 LF (min.)

Furniture & Accessories

- F1 Trash / Recycling (built-in)
- F2 Paper Towel Dispenser
(see Building Accessories)

Plumbing Fixtures

- P1 Faucet
- P2 Sink

Equipment

- EQ1 Undercounter Refrigerator
- EQ2 Microwave
- EQ3 Countertop Water Disp.
- EQ4 Coffee Maker

Signage

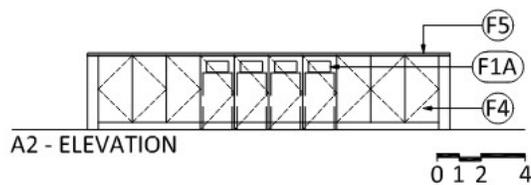
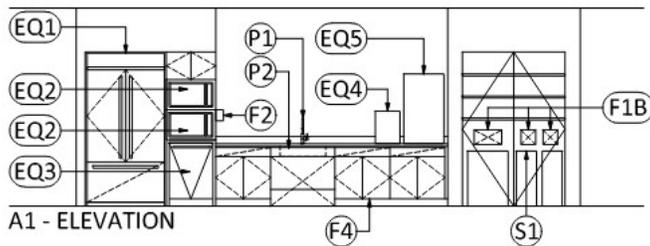
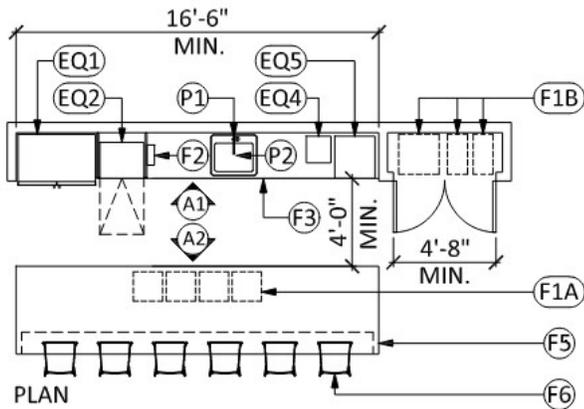
- S1 Trash/Recycling Decals

Notes

1. Refer to other subsections of these Design Guidelines for further information.
2. Coordinate millwork details with equipment to ensure proper structural support is factored in.
3. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

Y. MEDIUM PANTRY (50 PERSON)	
<p>13'-0" MIN.</p> <p>EQ2 P2 P1 EQ1 F2 EQ3 EQ4</p> <p>PLAN</p>	Size
	<p>Area: Varies Interior Dimensions: 13 LF (min.)</p>
<p>UPPER CAB'TS (OPTIONAL)</p> <p>EQ2 F1 S1 F2 P1 EQ3 EQ4 EQ1</p> <p>ELEVATION</p> <p>0 1 2 4</p>	Furniture & Accessories
	<p>F1 Trash / Recycling (built-in) F2 Paper Towel Dispenser (see Building Accessories)</p>
<p>P1 Faucet P2 Sink</p>	Plumbing Fixtures
	<p>Equipment</p> <p>EQ1 Refrigerator EQ2 Microwave EQ3 Countertop Water Disp. EQ4 Coffee Maker</p>
<p>S1 Trash/Recycling Decals</p>	Signage
	<p>Notes</p> <ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate millwork details with equipment to ensure proper structural support is factored in. 3. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

Z. LARGE PANTRY (75 PERSON)



Size

Area: Varies
Interior Dimensions: 16'-6" (min.)

Furniture & Accessories

- F1A [Trash / Recycling](#) ~~(built-in)~~ [\(preferred built into island\)](#)
- F1B [Trash / Recycling Alternate](#) [\(w/in pantry closet\)](#)
- F2 Paper Towel Dispenser (see Building Accessories)
- F3 [Counter \(34" H\)](#)
- F4 [Base Cabinets](#)
- F5 [Island \(42" H\)](#)
- F6 [Stool](#)

Plumbing Fixtures

- P1 Faucet
- P2 Sink

Equipment

- EQ1 Refrigerator
- EQ2 Microwave
- EQ3 Dishwasher (optional)
- EQ4 Water Cooler
- EQ5 Coffee Maker

Signage

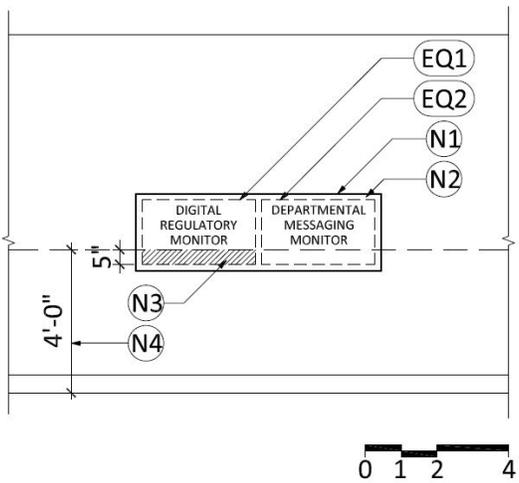
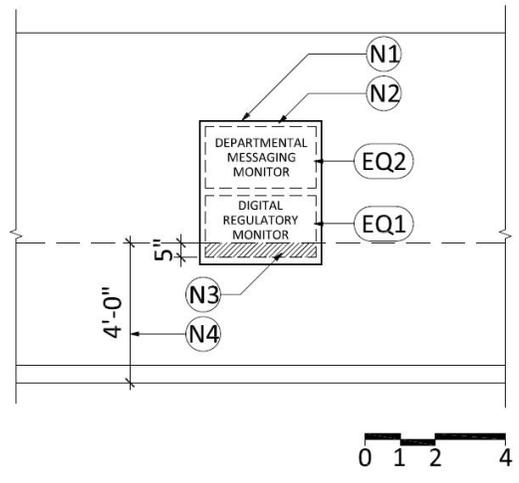
- S1 [Trash/Recycling Decals](#)

Notes

1. Refer to other subsections of these Design Guidelines for further information.
2. Coordinate millwork details with equipment to ensure proper structural support is factored in.
3. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.

AA. LACTATION ROOM	
<p style="text-align: center;">PLAN</p>	Size
	<p>Area: 80 sf Interior Dimensions: 10'-0" X 8'-0"</p>
<p style="text-align: center;">ELEVATION</p>	Furniture & Accessories
	<p>F1 Lounge Chair F2 Occasional Table w/ Power & Data (if not part of chair) F3 Coat Hook F4 Trash / Recycling (built-in) F5 Art F6 Paper Towel Dispenser (see Building Accessories) F7 Soap Dispenser F8 Frameless Mirror</p>
	Plumbing Fixtures
	<p>P1 Faucet P2 Sink</p>
	Equipment
	<p>EQ1 Undercounter Refrigerator</p>
	Signage
	<p>S1 Room Identification S2 Trash/Recycling Decals</p>
Notes	
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. Coordinate millwork details with equipment to ensure proper structural support is factored in. 3. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group. 4. ADA mirrors shall be specified with the bottom of the reflective surface at 40" AFF, not the mirror frame. 5. <u>Provide dimmable light switch.</u> 	

BB. WELLNESS ROOM	
	<p>Size</p> <p>Area: 80 sf</p> <p>Interior Dimensions: 10'-0" X 8'-0"</p>
	<p>Furniture & Accessories</p> <p>F1 Lounge Chair</p> <p>F2 Occasional Table w/ Power & Data (if not part of chair)</p> <p>F3 Coat Hook</p> <p>F4 Art</p>
	<p>Plumbing Fixtures</p>
	<p>Equipment</p>
	<p>Signage</p> <p>S1 Room Identification</p>
<p>Notes</p> <p>1. Refer to other subsections of these Design Guidelines for further information.</p> <p>2. All signage locations are for reference only and are to be determined at the site by RED+F's Signage / Wayfinding Group.</p> <p>3. Provide dimmable light switch.</p>	

CC. DIGITAL REGULATORY & DEPARTMENTAL SIGNAGE																											
 <p style="text-align: center;">** Preferred Configuration **</p>	<table border="1"> <thead> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Size</th> </tr> </thead> <tbody> <tr> <td>Area:</td> <td>Varies</td> </tr> <tr> <td>Interior Dimensions:</td> <td>Varies</td> </tr> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Drawing Notes</th> </tr> <tr> <td>N1</td> <td>¼" thick stainless steel trim full depth of recess. Trim to protrude ½" from face of wall. Black metal backpan within 4" - 6" deep recess.</td> </tr> <tr> <td>N2</td> <td>Air gap as required for ventilation of equipment</td> </tr> <tr> <td>N3</td> <td>Hatched area denotes ADA accessible touchscreen area</td> </tr> <tr> <td>N4</td> <td>Height limit of ADA compliant unobstructed forward reach</td> </tr> <tr> <th colspan="2" style="background-color: #4b4b8b; color: white;">Equipment</th> </tr> <tr> <td>EQ1</td> <td>43" Digital Touchscreen (Digital Regulatory Monitor)</td> </tr> <tr> <td>EQ2</td> <td>43" Digital Touchscreen (Departmental Messaging Monitor)</td> </tr> <tr> <td>EQ3</td> <td>Touchscreen Wall Mounts</td> </tr> <tr> <td>EQ4</td> <td>Flat panel wall box(es)</td> </tr> </tbody> </table>	Size		Area:	Varies	Interior Dimensions:	Varies	Drawing Notes		N1	¼" thick stainless steel trim full depth of recess. Trim to protrude ½" from face of wall. Black metal backpan within 4" - 6" deep recess.	N2	Air gap as required for ventilation of equipment	N3	Hatched area denotes ADA accessible touchscreen area	N4	Height limit of ADA compliant unobstructed forward reach	Equipment		EQ1	43" Digital Touchscreen (Digital Regulatory Monitor)	EQ2	43" Digital Touchscreen (Departmental Messaging Monitor)	EQ3	Touchscreen Wall Mounts	EQ4	Flat panel wall box(es)
Size																											
Area:	Varies																										
Interior Dimensions:	Varies																										
Drawing Notes																											
N1	¼" thick stainless steel trim full depth of recess. Trim to protrude ½" from face of wall. Black metal backpan within 4" - 6" deep recess.																										
N2	Air gap as required for ventilation of equipment																										
N3	Hatched area denotes ADA accessible touchscreen area																										
N4	Height limit of ADA compliant unobstructed forward reach																										
Equipment																											
EQ1	43" Digital Touchscreen (Digital Regulatory Monitor)																										
EQ2	43" Digital Touchscreen (Departmental Messaging Monitor)																										
EQ3	Touchscreen Wall Mounts																										
EQ4	Flat panel wall box(es)																										
 <p style="text-align: center;">** Alt Configuration for Locations w/ Limited Space **</p>																											
Notes																											
<ol style="list-style-type: none"> 1. Refer to other subsections of these Design Guidelines for further information. 2. IT requirements and equipment specifications to be coordinated with MCIT. 																											

ERGONOMICS

NYU Langone Health is committed to providing a healthy work environment where our patients, visitors, students and staff are healthy, safe, comfortable and productive. In line with that effort RED+F has developed this subsection in collaboration with NYU Langone’s Occupational & Industrial Orthopedic Center (OIOC) to encourage Architects and Interior Designers to consider user body size, strength and range of motion as well as surrounding environmental factors in the design of our projects. The information provided includes:

1. Ergonomic Design Considerations
2. Helpful Resources

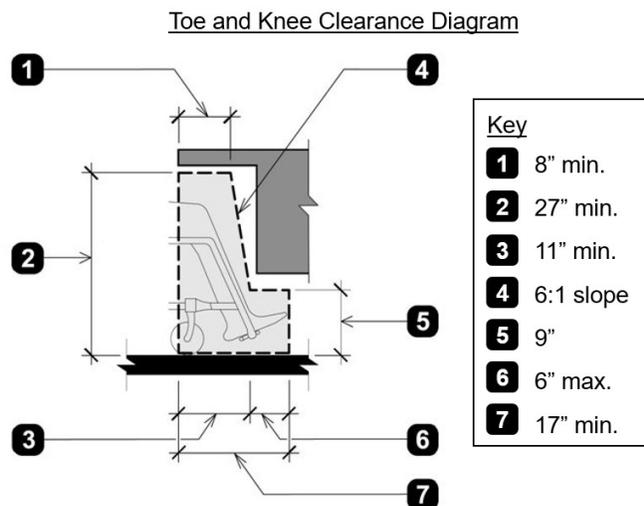
This information does not relieve the Architect or Interior Designer of designing a project that is code compliant and appropriate to the needs of the user. The Architect and Interior Designer may suggest layouts and products not shown in these guidelines if they believe the proposed layouts and products support our mission, design principles, and the design intent of the project.

1. Ergonomic Design Considerations

When applying ergonomics, the Architect and Interior Designer shall consider the nature of the user (physical body dimensions and any individual limitation), the type of task(s) they perform, the layout of the workspace, the work organization, and the equipment/tools used. The primary focus is to create the most efficient and injury-free interface between people and the tools and technology they use.

The Architect and Interior Designer shall consider the following:

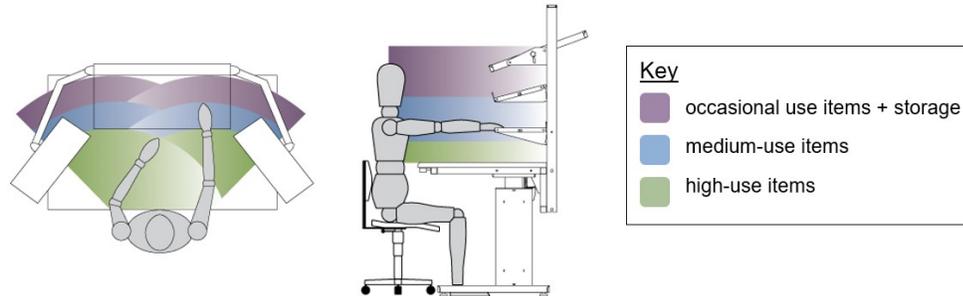
- **Human Body** - The Architect and Interior Designer should familiarize themselves with anthropometric data, which provides a good understanding of body measurement variation and movement limitation for the main user population. Having a good grasp of this information will allow the A/E Team to provide for appropriate:
 - **Clearances** (i.e. headroom, elbow room, legroom, etc.) between the body and surrounding objects,



<https://slideplayer.com/slide/3410524/>

- **Reach** towards objects and equipment allowing for placement and adjustment of these items in appropriate reach zones, and

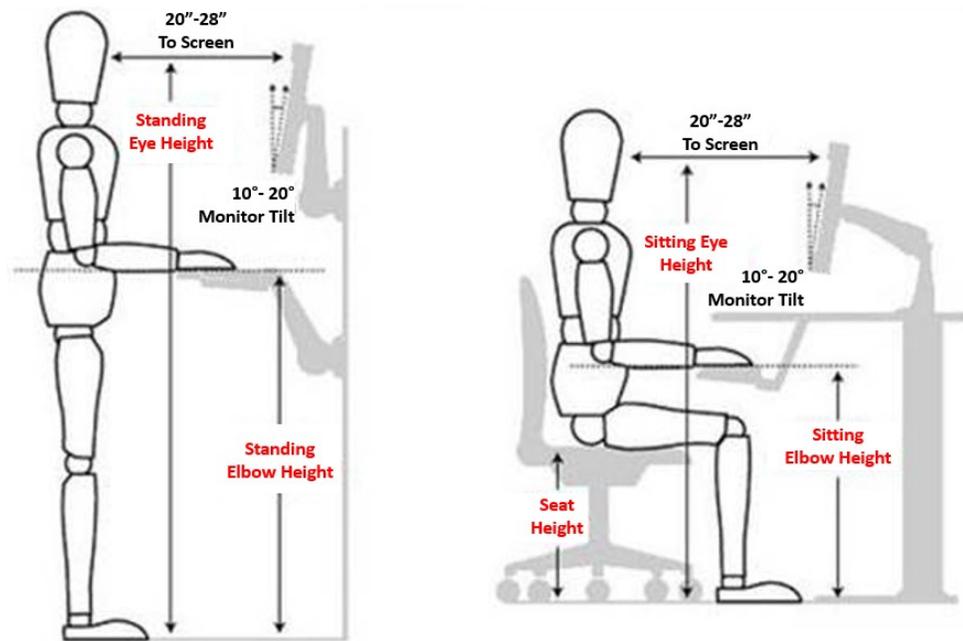
Work Area Reach Zones



<https://www.bostontec.com/ergonomics/>

- **Posture**, promoting healthy and safe body positioning through responsible furniture layouts and selection.

Standing and Seated Posture



https://www.joionline.net/library/show/ergonomics_in_the_workplace/

Seated Anthropometric Measurements

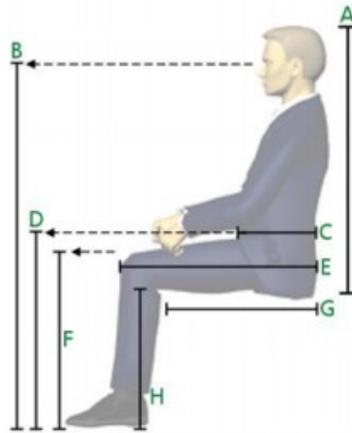
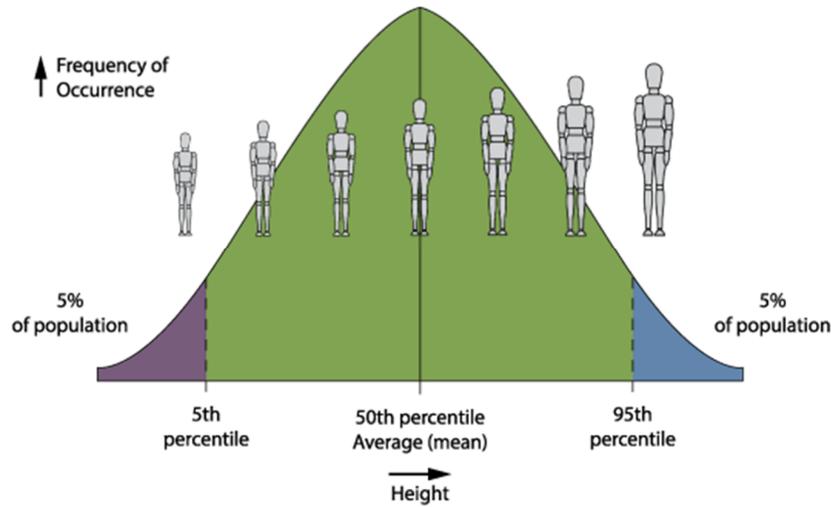


Figure 4. Common anthropometric measurements for the seated position. Use Table 2 for values.

Measurement	Letter	Female 5th – 95th%	Male 5th – 95th%	Overall Range 5th – 95th%
Sitting Height	A	31.3" – 35.8"	33.6" – 38.3"	31.3" – 38.3"
Sitting Eye Height	B	42.6" – 48.8"	46.3" – 52.6"	42.6" – 52.6"
Waist Depth	C	7.3" – 10.7"	7.8" – 11.4"	7.3" – 11.4"
Thigh Clearance	D	21.0" – 24.5"	23.0" – 26.8"	21.0" – 26.8"
Buttock-to-Knee	E	21.3" – 25.2"	22.4" – 26.3"	21.3 – 26.3"
Knee Height	F	19.8" – 23.2"	21.4" – 25.0"	19.8" – 28.0"
Seat Length/Depth	G	16.9" – 20.4"	17.7" – 21.1"	16.9" – 21.1"
Popliteal Height	H	15.0" – 18.1"	16.7" – 19.9"	15.0" – 19.9"
Seat Width	Not Shown	14.5" – 18.0"	13.9" – 17.2"	13.9" – 18.0"

Table 2. Values for 5th to 95th percentile males and females in the seated position used in designing seating. Use Figure 4 for visualization. Data from BIFMA Ergonomics Guidelines, 2002. All measurements are in inches.

Further, Architects and Interior Designers should understand that most designed furniture targets the 5th – 95th percentile of users, or 90% of the user population. This means that the expectation is that their designs meet the needs of 90% of our users. For the 10% of users outside of this range, NYU Langone will assess the workspace, as requested, and provide recommendations to the end user. Architects and Interiors Designers should integrate adjustability and flexibility into their furniture layouts and selections.



<https://www.bostontec.com/ergonomics/>

- **Environment** - The Architect and Interior Designer should keep the following items in mind during design, including relevant code requirements and industry standards:
 - **Light** - To minimize end-user eye strain Architects and Interior Designers should ensure that artificial lighting is not too bright, natural light does not impede the use of equipment such as computer or digital screens, glare is minimized from both artificial and natural sources, and task lighting is provided accordingly. The use of proper lighting equipment and controls as well as window drapes and shades should be integrated into the design.
 - **Ventilation** - Architects and Interior Designers should ensure that users have adequate fresh-air ventilation and heating or cooling so that they feel comfortable when working.
 - **Noise** - Noise can cause stress leading to tensed muscles increasing the risk of injury. Architects and Interior Designers should locate and arrange workstations to allow for quiet surroundings around work areas, wherever possible.

2. **Helpful Resources**

- Occupational Safety and Health Administration – www.osha.gov
- ICC A117.1-2017
- ANSI/HFES 100-2007
- Refer to the Environmental Health & Safety subsection of these Design Guidelines for further information.

ROOM FINISHES FOR CLINICAL SPACES

In accordance with both our Mission devoted to excellence in patient care, education, and research and our Design Principles of providing timeless designs that are cost effective, efficient, functional and practical, RED+F has developed a palette of typical materials and finishes that we have found to be successful for various spaces at NYU Langone Health.

Our goals in listing these materials and finishes are to:

- Streamline the design process
- Assist the Architect and Interior Designer with specifying materials
- Comply with the Healthier Hospitals Initiative (HHI) Safer Chemicals Challenge, eliminating the use of formaldehyde, perfluorinated compounds, polyvinyl chloride (PVC), antimicrobials, and all flame retardants from all materials and finishes
- Create spaces that are timeless, durable, easily maintainable and cost-effective
- Create a consistent NYU Langone brand

The Architect and Interior Designer should use this as a guide for specifying the finishes on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying materials that are appropriate and code compliant for specific spaces. Also, the Architect and Interior Designer may suggest other materials and finishes if they believe those proposed materials and finishes will support our mission, design principles, and the design intent of the project.

Recommended finishes have been provided for the following *Clinical Spaces*:

- A. Patient Rooms
- B. Patient Toilets / Showers
- C. Patient Corridors
- D. Corridors (Outpatient Facilities)
- E. Family Lounges
- F. Waiting Rooms (Outpatient Facilities)
- G. Gown Waiting (Outpatient Facilities)
- H. Nurse Stations Inpatient Facilities
- I. Medical Assistant Station (Outpatient Facilities)
- J. Exam Rooms (Inpatient Facilities)
- K. Exam Rooms (Outpatient Facilities)
- L. Phlebotomy Lab (Outpatient Facilities)
- M. Procedure Rooms
- N. Psychiatric Clinical Rooms
- O. Patient Transport Elevator Cabs
- P. Service Corridors
- Q. Clean Utility
- R. Soiled Utility
- S. Storage Rooms

The following finishes are recommended for *Clinical Spaces*. For product specifications reference the Room Finish Material Legend within the Design Guidelines.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

A. PATIENT ROOMS	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - Resilient, wood plank - <u>Resilient, tile</u>
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Wall Protection	Rubstrip, C-S Impact Resistant Wall Covering <u>Cost-saving Alternatives:</u> - <u>Rubstrip, C-S, where deemed necessary</u> - <u>Heavy Duty Wall Covering (Xorel)</u>
Door type/finish	Hollow Metal (HM), paint, semi-gloss finish, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT Hzone
Millwork	Wood <u>Cost-saving Alternatives:</u> - Plastic Laminate
Countertops	Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Treatments	Shade Cloth, 3% opening and Shade Cloth, blackout Use double roller

B. PATIENT TOILETS / SHOWERS	
Item	Finish
Flooring ¹	Porcelain, tile (2x2 mosaic at shower floors)
Base	Porcelain, straight <u>Cost-saving Alternatives:</u> - <u>Porcelain, integral to match floor</u>
Wall Finish	Porcelain, tile Ceramic, tile Wall Covering (non-wet walls) <u>Cost-saving Alternatives:</u> - <u>Ceramic, tile, Dal-tile (Modern Dimensions)</u> - <u>GWB, paint, scrub-resistant (non-wet walls)</u>
Door type/finish	Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - HM, paint, semi-gloss finish, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Door Protection	Kickplate, Stainless Steel
Ceiling Material	GWB, paint, flat finish Lay-in, ACT Hzone
Countertops	Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Treatments	Shade Cloth, 1% opening
Shower Curtains	100% trevira, no mesh
1. Provide waterproofing under floor tile and turned up 8" along the perimeter when restrooms are located above critical patient areas (i.e. OR's, MRI's, Patient Rooms, Exam Rooms, etc.), IT spaces, Auditoriums and any other spaces designated by RED+F.	

C. PATIENT CORRIDORS	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - <u>Resilient, wood plank</u> - <u>Resilient, tile</u>
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Wall Protection	Corner Guards Crash Rail Handrail, C-S
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT Hzone

D. CORRIDORS (OUTPATIENT FACILITIES)	
Item	Finish
Flooring	Resilient, tile Resilient, wood plank
Base	Rubber, cove, 4"
Wall Finish	<u>GWB, paint, scrub-resistant</u> <u>Heavy Duty Wall Covering (Xorel)</u> <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u>
Wall Protection	Corner Guards
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT Hzone <u>Cost-saving Alternatives:</u> - <u>Lay-in, ACT Ultima</u>

E. FAMILY LOUNGES	
Item	Finish
Flooring	<p><u>Resilient</u> Rubber, tile <u>Cost-saving Alternatives:</u> - <u>Resilient, wood plank</u> - <u>Resilient, tile</u></p>
Base	Rubber, cove, 6"
Wall Finish	<p>Wall Covering Glass <u>Cost-saving Alternatives:</u> - GWB, paint, eggshell finish (allow 1 accent wall)</p>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Ceiling Material	Lay-in, ACT Hzone
Millwork	Plastic Laminate
Countertops	<p>Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u></p>
Window Sills/Convactor	<p>Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u></p>
Window Treatments	<p>Shade Cloth, 3% openness Trevira Sheers</p>
<p>1. TV monitors are not allowed. Monitors for both Digital Regulatory Signage and Departmental Messaging are allowed.</p>	

F. WAITING ROOMS (OUTPATIENT FACILITIES)	
Item	Finish
Flooring	<p><u>Resilient</u> Rubber, tile <u>Cost-saving Alternatives:</u> - <u>Resilient, wood plank</u> - <u>Resilient, tile</u> - <u>Carpet, tile</u></p>
Base	<p>Rubber, straight, <u>4"</u>, Johnsonite (Tightlock) <u>Cost-saving Alternatives:</u> - Rubber, cove, <u>4"</u></p>
Wall Finish	<p>Wall Covering Glass <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u></p>
Door type/finish	<p>HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> Glass <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u></p>
Door Frame type/finish	<p>HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u></p>
Ceiling Material	<p>Lay-in, ACT Hzone <u>Cost-saving Alternatives:</u> - <u>Lay-in, ACT Ultima</u></p>
Millwork	<p>Plastic Laminate</p>
Countertops	<p>Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u></p>
Window Sills/Convactor	<p>Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u></p>
Window Treatments	<p>Shade Cloth, 3% openness Trevira Sheers</p>
<p>1. TV monitors are not allowed. Monitors for both Digital Regulatory Signage and Departmental Messaging are allowed.</p>	

G. GOWN WAITING (OUTPATIENT FACILITIES)	
Item	Finish
Flooring	Resilient, tile Resilient, wood plank
Base	Rubber, cove, 4"
Wall Finish	GWB, paint, eggshell finish (allow 1 accent wall)
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT Hzone <u>Cost-saving Alternatives:</u> - <u>Lay-in, ACT Ultima</u>
Millwork	Prefab Millwork (see Furniture subsection) Lockers (see Furniture subsection)
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Curtains	Cubicle Curtain

H. NURSE STATIONS (INPATIENT FACILITIES)	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - <u>Resilient, wood plank</u> - <u>Resilient, tile</u>
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Ceiling Material	Lay-in, ACT Hzone
Millwork	Plastic Laminate Specialty Material <u>Cost-saving Alternatives:</u> - <u>Workstation Systems Furniture</u>
Countertops	Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>

I. MEDICAL ASSISTANT STATION (OUTPATIENT FACILITIES)	
Item	Finish
<u>Flooring</u>	<u>Resilient, wood plank, match adjacent corridor</u> <u>Resilient, tile, match adjacent corridor</u>
<u>Base</u>	<u>Rubber, cove, match adjacent corridor</u>
<u>Wall Finish</u>	<u>GWB, paint, scrub-resistant</u> <u>Heavy Duty Wall Covering (Xorel)</u> <u>Cost-saving Alternatives:</u> <u>- <u>GWB, paint, eggshell finish</u></u>
<u>Ceiling Material</u>	<u>Specialty Material, incl. metal</u> <u>Lay-in, ACT Hzone</u> <u>Cost-saving Alternatives:</u> <u>- <u>Lay-in, ACT Ultima</u></u>
<u>Millwork</u>	<u>Plastic Laminate</u>
<u>Countertops</u>	<u>Solid Surface</u> <u>Cost-saving Alternatives:</u> <u>- <u>Solid Surface, Corian Grade A</u></u>

II. EXAM ROOMS (INPATIENT FACILITIES)	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> <u>- <u>Resilient, wood plank</u></u> <u>- <u>Resilient, tile</u></u>
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Wall Protection	Rubstrip <u>Cost-saving Alternatives:</u> <u>- <u>Rubstrip, where deemed necessary</u></u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT Hzone
Millwork	Plastic Laminate
Countertops	Solid Surface <u>w/ full height backsplash</u> Engineered Stone <u>w/ full height backsplash</u> <u>Cost-saving Alternatives:</u> <u>- <u>Solid Surface, Corian Grade A w/ full height backsplash</u></u>
Window Treatments	Shade Cloth, 3% opening and Shade Cloth, blackout Use double roller

J.K. EXAM ROOMS (OUTPATIENT FACILITIES)	
Item	Finish
Flooring	Resilient, tile Resilient, wood plank
Base	Rubber, cove, 4"
Wall Finish	GWB, paint, eggshell finish
Wall Protection	Rubstrip, where deemed necessary
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT Hzone <u>Cost-saving Alternatives:</u> - <u>Lay-in, ACT Ultima</u>
Millwork	Prefab Millwork (see Furniture subsection)
Countertops	Solid Surface <u>w/ full height backsplash</u> <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A w/ 4" backsplash</u>
Window Treatments	Shade Cloth, 3% opening and Shade Cloth, blackout Use double roller

L. PHLEBOTOMY LAB (OUTPATIENT FACILITIES)	
Item	Finish
<u>Flooring</u>	<u>Resilient, tile</u> <u>Resilient, wood plank</u>
<u>Base</u>	<u>Rubber, cove</u>
<u>Wall Finish</u>	<u>GWB, paint, eggshell finish</u>
<u>Wall Protection</u>	<u>Rubstrip</u> <u>Cost-saving Alternatives:</u> <u>- Rubstrip, where deemed necessary</u>
<u>Door type/finish</u>	<u>HM, paint, semi-gloss finish, 8'-0" high</u> <u>Wood, 8'-0" high</u> <u>Cost-saving Alternatives:</u> <u>- HM, paint, semi-gloss finish, 7'-0" high</u> <u>- Wood, 7'-0" high</u>
<u>Door Frame type/finish</u>	<u>HM, paint, semi-gloss finish</u> <u>Cost-saving Alternatives:</u> <u>- HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
<u>Ceiling Material</u>	<u>Lay-in, ACT Hzone</u> <u>Cost-saving Alternatives:</u> <u>- Lay-in, ACT Ultima</u>
<u>Millwork</u>	<u>Plastic Laminate</u>
<u>Countertops</u>	<u>Solid Surface w/ full height backsplash</u> <u>Cost-saving Alternatives:</u> <u>- Solid Surface, Corian Grade A w/ full height backsplash</u>
<u>Window Treatments</u>	<u>Shade Cloth, 3% opening and Shade Cloth, blackout</u> <u>Use double roller</u>

K.M. PROCEDURE ROOMS	
Item	Finish
Flooring	Rubber, sheet, chemically welded Rubber, tile, chemically welded Resilient, sheet; <u>Cost-saving Alternatives:</u> - <u>Resilient, sheet, Gerflor (Mipolam Symbioz)</u>
Base	Rubber, 6" <u>Cost-saving Alternatives:</u> - Integral, sanitary cove base, 6"
Wall Finish	GWB, paint, scrub-resistant <u>Scuffmaster</u>
Wall Protection	Corian Solid Surface Sheet, Inpro (Endurant Bioprism) <u>Cost-saving Alternatives:</u> - <u>None (Outpatient Facilities)</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high (Outpatient Facilities)</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints (Outpatient Facilities)</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material ¹	GWB, paint, scrub-resistant <u>Scuffmaster</u> Lay-in, ACT Clean Room VL
Millwork	Stainless Steel <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate (Outpatient Facilities)</u>
Countertops	Stainless Steel <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A (Outpatient Facilities)</u> - <u>Plastic Laminate (Outpatient Facilities)</u>
1. Refer to item #4 in the Miscellaneous subsection of these Design Guidelines for further information.	

<u>L.N.</u> PSYCHIATRIC CLINICAL ROOMS	
Item	Finish
Flooring	Rubber, sheet, chemically welded Rubber, tile, chemically welded Resilient, sheet <u>Cost-saving Alternatives:</u> - <u>Resilient, sheet, Gerflor (Mipolam Symbioz)</u>
Base	Integral, sanitary cove base, <u>6"</u>
Wall Finish	GWB, paint, <u>scrub-resistant Scuffmaster</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Door Protection	Kickplate, Stainless Steel
Ceiling Material	GWB, paint, <u>scrub-resistant Scuffmaster</u>

<u>M.O.</u> PATIENT TRANSPORT ELEVATOR CABS	
Item	Finish
Flooring	Match floor material in adjacent elevator lobby / corridor
Base	Integral, <u>4"</u> , to match floor material <u>Cost-saving Alternatives:</u> - <u>Stainless Steel</u>
Wall Finish	Specialty Material, incl. metal <u>Cost-saving Alternatives:</u> - <u>Stainless Steel</u>
Wall Protection	Crash Rail Bumper Rail
Door type/finish	Stainless Steel
Door Frame type/finish	Stainless Steel
Ceiling Material	Specialty Material, incl. metal <u>Cost-saving Alternatives:</u> - <u>Stainless Steel</u>

<u>N.P.</u> SERVICE CORRIDORS	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - Resilient, tile
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish on upper portion
Wall Protection	Crash Rail, Double Stainless Steel Rub strip at IV pole height Impact Resistant Wall Covering, Inpro (Ricochet), on lower portion <u>Cost-saving Alternatives:</u> - <u>Diamond plate, on lower portion</u> - <u>Stainless Steel sheet, on lower portion</u>
Door type/finish	HM, paint, semi-gloss finish
Door Frame type/finish	HM, paint, semi-gloss finish
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT Ultima

<u>O-Q.</u> CLEAN UTILITY	
Item	Finish
Flooring	Rubber, sheet, chemically welded Rubber, tile, chemically welded Resilient, sheet; <u>Cost-saving Alternatives:</u> - <u>Resilient, sheet, Gerflor (Mipolam Symbioz)</u>
Base	Integral, Sanitary cove base, 6" <u>Rubber, cove (Outpatient Facilities)</u>
Wall Finish	GWB, paint, scrub-resistant <u>Scuffmaster</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss, 7'-0" high (Outpatient Facilities)</u> - <u>Wood, 7'-0" high (Outpatient Facilities)</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints (Outpatient Facilities)</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material ¹	Lay-in, ACT Clean Room VL
Millwork	Plastic Laminate Stainless Steel (<u>Inpatient Facilities</u>) <u>Wire Shelving (Outpatient Facilities)</u>
Countertops	Solid Surface, Corian Stainless Steel (<u>Inpatient Facilities</u>) <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A (Outpatient Facilities)</u>
1. Refer to item #4 in the Miscellaneous subsection of these Design Guidelines for further information.	

P.R. SOILED UTILITY	
Item	Finish
Flooring	Rubber, sheet, chemically welded Rubber, tile, chemically welded Resilient, sheet; <u>Cost-saving Alternatives:</u> - <u>Resilient, sheet, Gerflor (Mipolam Symbioz)</u>
Base	Integral, Sanitary cove base, 6" <u>Rubber, cove (Outpatient Facilities)</u>
Wall Finish	Impact Resistant GWB, paint, scrub-resistant <u>Scuffmaster</u> , on upper portion
Wall Protection	Impact Resistant Wall Covering, Inpro (Ricochet), on lower portion Diamond Plate, on lower portion <u>Cost-saving Alternatives:</u> - <u>None (Outpatient Facilities)</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high (Outpatient Facilities)</u> - <u>Wood, 7'-0" high (Outpatient Facilities)</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints (Outpatient Facilities)</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material ¹	Lay-in, ACT Clean Room VL <u>Cost-saving Alternatives:</u> - <u>GWB, paint, flat finish (Outpatient Facilities)</u>
Millwork	Stainless Steel <u>Plastic Laminate (Outpatient Facilities)</u>
Countertops	Stainless Steel <u>Solid Surface, Corian w/ full height backsplash (Outpatient Facilities)</u> <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A w/ full backsplash (Outpatient Facilities)</u>
1. Refer to item #4 in the Miscellaneous subsection of these Design Guidelines for further information.	

Q.S. STORAGE ROOMS	
Item	Finish
Flooring	Rubber, tile Resilient, tile
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high (Outpatient Facilities)</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints (Outpatient Facilities)</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT Hzone <u>Cost-saving Alternatives:</u> - <u>Lay-in, ACT Ultima (Outpatient Facilities)</u>
Millwork	Plastic Laminate <u>Cost-saving Alternatives:</u> - <u>Wire Shelving (Outpatient Facilities)</u>
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Wire Shelving (Outpatient Facilities)</u>

ROOM FINISHES FOR NON-CLINICAL SPACES

In accordance with both our Mission devoted to excellence in patient care, education, and research and our Design Principles of providing timeless designs that are cost effective, efficient, functional and practical, RED+F has developed a palette of typical materials and finishes that we have found to be successful for various spaces at NYU Langone Health.

Our goals in listing these materials and finishes are to:

- Streamline the design process
- Assist the Architect and Interior Designer with specifying materials
- Comply with the Healthier Hospitals Initiative (HHI) Safer Chemicals Challenge, eliminating the use of formaldehyde, perfluorinated compounds, polyvinyl chloride (PVC), antimicrobials, and all flame retardants from all materials and finishes
- Create spaces that are timeless, durable, easily maintainable and cost-effective
- Create a consistent NYU Langone brand

The Architect and Interior Designer should use this as a guide for specifying the finishes on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying materials that are appropriate and code compliant for specific spaces. Also, the Architect and Interior Designer may suggest other materials and finishes if they believe those proposed materials and finishes will support our mission, design principles, as well as the design intent of the project.

Recommended finishes have been provided for the following *Non-Clinical Spaces*:

- | | |
|--|--|
| A. <u>Entry</u> Vestibule | P. <u>Pantry (with Seating)</u> |
| B. Public Lobby <u>ies</u> | Q . Cafeterias (Public Areas) |
| C. Public Elevator Lobby <u>ies</u> | R . Food Preparation |
| D. Public Elevator Cabs | Q <u>S</u> . Laboratory <u>ies</u> |
| E. Public Toilets | R <u>T</u> . Vivarium |
| F. Reception Desk | S <u>U</u> . Locker Room <u>s</u> |
| G. Waiting Area <u>s</u> | T <u>V</u> . Lactation Room <u>s</u> |
| H. Auditorium <u>s</u> / Lecture Hall <u>s</u> / Seminar Room <u>s</u> | W . <u>Wellness Room</u> |
| I. Conference Room <u>s</u> | U <u>X</u> . Service Elevator Lobby / Service Corridor <u>s</u> |
| J. Training Room <u>s</u> | V <u>Y</u> . Service / Freight Elevator Cab <u>s</u> |
| K. Public Corridor <u>s</u> | W <u>Z</u> . Building Services |
| L. Administrative-Private Offices | X <u>AA</u> . Shop <u>s</u> |
| M. Staff Offices <u>Open Work Area</u> | Y <u>BB</u> . BDF/IDF Room <u>s</u> & Data Center <u>s</u> |
| N. Staff Lounge <u>s</u> | Z <u>CC</u> . Mechanical Equipment Room <u>s</u> |
| <u>O</u> . <u>Pantry (without Seating)</u> | A <u>ADD</u> . Electrical Equipment Room <u>s</u> |

The following finishes are recommended for *Non-Clinical Spaces*. For product specifications reference the Room Finish Material Legend within the Design Guidelines.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

A. <u>ENTRY VESTIBULE</u>	
Item	Finish
Flooring	Walk-off Carpet
Base	Stainless Steel, 4"
Wall Finish	<u>Glass Storefront</u> Specialty Material, incl. metal, glass, stone, wood Wall Covering <u>Cost-saving Alternatives:</u> - GWB, paint, eggshell finish
<u>Door type/finish</u>	<u>Glass Storefront</u>
Ceiling Material	GWB, paint, flat finish

B. PUBLIC LOBBYIES	
Item	Finish
Flooring	Terrazzo, poured Stone <u>Cost-saving Alternatives:</u> - Porcelain, tile
Base	Stainless Steel, <u>4"</u> Integral, to match flooring material
Wall Finish	Glass Storefront Specialty Material, incl. glass, acrylic resin, wood <u>Cost-saving Alternatives:</u> - Wall Covering - GWB, paint, eggshell finish
Door type/finish	Glass Storefront HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish
Ceiling Material	Specialty Material, incl. wood (<u>acoustic</u>) <u>Cost-saving Alternatives:</u> - GWB, paint, flat finish - Lay-in, ACT, Ultima
Millwork	See item F. Reception Desk <u>Cost-saving Alternatives:</u> - <u>Prefab Reception Desk</u>
Countertops / Transaction Tops	See item F. Reception Desk
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Treatments	Shade Cloth, 3% opening Trevira Sheers <u>Cost-saving Alternatives:</u> - <u>No Sheers</u>

C. PUBLIC ELEVATOR LOBBYIES	
Item	Finish
Flooring	Terrazzo, poured <u>Cost-saving Alternatives:</u> - Porcelain, tile, <u>to match adjacent flooring material</u> - Resilient, tile, <u>to match adjacent flooring material</u>
Base	Wood <u>Cost-saving Alternatives:</u> - Integral, to match flooring material - Rubber, straight or cove, <u>4"</u>
Wall Finish	Specialty Material, incl. glass, acrylic resin, wood <u>Cost-saving Alternatives:</u> - Wall Covering - GWB, paint, eggshell finish
Door type/finish	Glass storefront HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> Stainless Steel (<u>elevator doors</u>) <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u> - HM, Scuffmaster paint, metallic finish (elevator doors)
Door Frame type/finish	HM, paint, semi-gloss finish Stainless Steel (<u>elevator doors</u>) <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u> - HM, Scuffmaster paint, metallic finish (elevator doors)
Ceiling Material	Specialty Material, incl. wood (<u>acoustic</u>) <u>Cost-saving Alternatives:</u> - GWB, paint, flat finish - Lay-in, ACT Ultima
Millwork	See Item F. Reception Desk <u>Cost-saving Alternatives</u> - <u>Prefab Reception Desk</u>
Countertops	See Item F. Reception Desk
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Treatments	Shade Cloth, 3% opening Trevira Sheers <u>Cost-saving Alternatives:</u> - <u>No Sheers</u>

D. PUBLIC ELEVATOR CAB\$	
Item	Finish
Flooring	Match floor material in adjacent elevator lobby / corridor
Base	Stainless Steel <u>Cost-saving Alternatives:</u> - Integral, 4" , to match floor material
Wall Finish	Specialty Material, incl. metal (stainless steel or decorative mesh), glass, acrylic resin (3Form), stone, wood veneer (w/ protective gorilla glass) <u>Cost-saving Alternatives:</u> - <u>Stainless Steel</u>
Wall Protection	Crash Rail Bumper Rail
Door type/finish	Stainless Steel <u>Cost-saving Alternatives:</u> - HM, Scuffmaster paint, metallic finish
Door Frame type/finish	Stainless Steel <u>Cost-saving Alternatives:</u> - HM, Scuffmaster paint, metallic finish
Ceiling Material	Specialty Material, incl. metal (stainless steel), wood <u>Cost-saving Alternatives:</u> - <u>Stainless Steel</u>

E. PUBLIC TOILETS	
Item	Finish
Flooring ¹	Porcelain, tile
Base	Porcelain, straight
Wall Finish	Glass, tile (accent wall) Ceramic, tile Wall Covering (non-wet walls) <u>Cost-saving Alternatives:</u> - Porcelain, tile - <u>GWB, paint, scrub-resistant (non-wet walls)</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	GWB, paint, flat finish Lay-in, ACT, Ultima
Countertops	Solid Surface Engineered Stone Bradley Verge All-in-One Sink Assembly ² <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
<p>1. Provide waterproofing under floor tile and turned up 8" along the perimeter when restrooms are located above critical patient areas (i.e. OR's, MRI's, Patient Rooms, Exam Rooms, etc.), IT spaces, Auditoriums and any other spaces designated by RED+F.</p> <p>2. Refer to Plumbing Fixtures subsection of these Design Guidelines for further information.</p>	

F. RECEPTION DESK	
Item	Finish
Millwork (Front Face)	Stone Solid Surface, Corian Engineered Stone Wood Veneer (w/ protective gorilla glass) Specialty Material, incl. Acrylic (3Form), Decorative Glass <u>Cost-saving Alternatives:</u> - Solid Surface, Corian Grade A - Plastic Laminate
Counter (Transaction)	Stone Solid Surface, Corian Engineered Stone Wood (w/ protective glass, if required) Specialty Material, incl. Acrylic (3Form) <u>Cost-saving Alternatives:</u> - Solid Surface, Corian Grade A - Plastic Laminate
Counter (Work)	Stone Solid Surface, Corian Engineered Stone Wood (w/ protective glass, if required) Specialty Material, incl. Acrylic (3Form) <u>Cost-saving Alternatives:</u> - Plastic Laminate
Millwork (Base w/ recessed toe kick)	Stainless Steel Solid Surface, Corian Stone <u>Cost-saving Alternatives:</u> - Rubber, straight, match adj. base height, Johnsonite (Color: 69 Sterling Silver CG)

G. WAITING AREAS	
Item	Finish
Flooring	Porcelain, tile <u>Cost-saving Alternatives:</u> - Resilient, <u>wood plank</u> - <u>Resilient, tile</u> - Carpet, <u>tile</u>
Base	Integral, <u>4"</u> to match floor material Rubber, straight, Tightlock <u>Cost-saving Alternatives:</u> - Rubber, straight, <u>4"</u>
Wall Finish	Glass Storefront Specialty Material Acoustic Solutions <u>Cost-saving Alternatives:</u> - Wall Covering - <u>GWB, paint, eggshell finish</u>
Door type/finish	Glass Storefront HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Wood, 8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Specialty Material, incl. metal, wood <u>Cost-saving Alternatives:</u> - Lay-in, ACT, Ultima
Millwork (incl. Privacy Screens at Registration Desks)	See Item F. Reception Desk <u>Cost-saving Alternatives:</u> - <u>Prefab Reception Desk</u> - <u>Prefab Millwork (see Furniture subsection)</u>
Countertops / Transaction Tops	See Item F. Reception Desk
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Treatments	Shade Cloth, 3% opening Trevira Sheers <u>Cost-saving Alternatives:</u> - <u>No Sheers</u>
1. TV monitors are not allowed . Monitors for both Digital Regulatory Signage and Departmental Messaging are allowed .	

H. AUDITORIUMS / LECTURE HALLS / SEMINAR ROOMS	
Item	Finish
Flooring	Wood (stage) Rubber, <u>sheet</u> (under chairs) Carpet (in circulation areas only) <u>Cost-saving Alternatives:</u> - Resilient, sheet (under chairs)
Base	Wood Stainless Steel <u>Cost-saving Alternatives:</u> - Rubber, straight, <u>4"</u>
Wall Finish	Specialty Material, incl. wood Acoustic Solutions <u>Cost-saving Alternatives:</u> - <u>Acoustic Solutions, felt</u> - Wall Covering - GWB, paint, eggshell finish
Door type/finish	Wood, <u>8'-0" high</u> HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>Wood, 7'-0" high</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Specialty Material, incl. wood (acoustic) <u>Cost-saving Alternatives:</u> - GWB, paint, flat finish - Lay-in, ACT
Millwork	Wood <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u> - <u>Prefab Millwork (see Furniture subsection)</u> - <u>Prefab Lectern (see Furniture subsection)</u>
Countertops	Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u> - Painted Metal

I. CONFERENCE ROOMS	
Item	Finish
Flooring	Carpet, <u>tile</u>
Base	Rubber, straight, <u>4"</u>
Wall Finish	Specialty Material, incl. wood Acoustic Solutions Demountable Partitions <u>Cost-saving Alternatives:</u> - Wall Covering - GWB, paint, eggshell finish
Door type/finish	Wood, <u>8'-0" high</u> HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>Wood, 7'-0" high</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Specialty Material, incl. wood GWB, paint, flat finish <u>Cost-saving Alternatives:</u> - Lay-in, ACT
Millwork	Wood Plastic Laminate <u>Cost-saving Alternatives:</u> - <u>Prefab Millwork (see Furniture subsection)</u> - <u>Prefab Credenza (see Furniture subsection)</u>
Countertops	Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Treatments	Shade Cloth, 3% openness Trevira Sheers <u>Cost-saving Alternatives:</u> - <u>No Sheers</u>

J. TRAINING ROOMS	
Item	Finish
Flooring	Carpet, <u>tile</u>
Base	Rubber, straight, <u>4"</u>
Wall Finish	Wall Covering <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT

K. PUBLIC CORRIDORS	
Item	Finish
Flooring	Rubber, tile Resilient, <u>sheet</u> <u>Cost-saving Alternatives:</u> - <u>Resilient, tile</u> - <u>Resilient, wood plank</u>
Base	<u>Rubber, or straight, 4"</u> <u>Cost-saving Alternatives:</u> - Rubber, cove
Wall Finish	Specialty Material <u>Cost-saving Alternatives:</u> - Wall Covering - <u>GWB, paint, eggshell finish</u>
Door type/finish	Glass Stainless Steel, <u>8'-0" high</u> HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	Stainless Steel HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	GWB, paint, flat finish <u>Cost-saving Alternatives:</u> - Lay-in, ACT

L. ADMINISTRATIVE PRIVATE OFFICES	
Item	Finish
Flooring	Carpet, <u>tile</u>
Base	Rubber, straight, 4"
Wall Finish	Demountable Partitions <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u>
Door type/finish	Wood, <u>8'-0" high</u> (8'-0" door ht. typ.) <u>Cost-saving Alternatives:</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT Ultima
Millwork	<u>Case Goods, Wood</u> (see Furniture subsection)
<u>Countertops</u>	<u>Solid Surface</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Treatments	Shade Cloth, 3% opening

M. STAFF OFFICES OPEN WORK AREA	
Item	Finish
Flooring	Carpet, <u>tile</u> Resilient, <u>tile</u>
Base	Rubber, straight <u>Cost-saving Alternatives:</u> - <u>Rubber, or cove, 4"</u>
Wall Finish	GWB, paint, eggshell finish
Door type/finish	Wood, <u>8'-0" high (8'-0" door ht. typ.)</u> <u>Cost-saving Alternatives:</u> - <u>Wood, 7'-0" high</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT, Ultima
Millwork	Plastic Laminate <u>Workstations (see Furniture subsection)</u>
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Treatments	Shade Cloth, 3% opening

N. STAFF LOUNGE	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - <u>Resilient, tile</u> - <u>Resilient, wood plank</u>
Base	Rubber, cove, 4"
Wall Finish	Demountable Partitions <u>Wall Covering</u> <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u>
Door type/finish	Stainless Steel HM, paint, semi-gloss finish, <u>8'-0" high</u> Wood, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	Stainless Steel HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Door Protection	Kickplate, Stainless Steel <u>Cost-saving Alternatives:</u> - <u>No Kickplate</u>
Ceiling Material	Lay-in, ACT, Ultima
Millwork	Plastic Laminate <u>Cost-saving Alternatives:</u> - <u>Prefab Millwork (see Furniture subsection)</u>
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Treatments	Shade Cloth, 3% opening

O. PANTRY (WITHOUT SEATING)	
Item	Finish
<u>Flooring</u>	<u>Rubber, tile</u> <u>Cost-saving Alternatives:</u> - <u>Resilient, tile</u> - <u>Resilient, wood plank</u>
<u>Base</u>	<u>Rubber, cove</u>
<u>Wall Finish</u>	<u>GWB, paint, eggshell finish</u> <u>Specialty Material, Glass (backsplash)</u> <u>Glass, tile (backsplash)</u> <u>Cost-saving Alternatives:</u> - <u>No backsplash</u> - <u>Ceramic, tile (backsplash)</u>
<u>Door type/finish</u>	<u>HM, paint, semi-gloss finish , 8'-0" high</u> <u>Wood , 8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
<u>Door Frame type/finish</u>	<u>HM, paint, semi-gloss finish</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
<u>Door Protection</u>	<u>Kickplate, Stainless Steel</u> <u>Cost-saving Alternatives:</u> - <u>No Kickplate</u>
<u>Ceiling Material</u>	<u>Lay-in, ACT, Ultima</u>
<u>Millwork</u>	<u>Plastic Laminate</u> <u>Cost-saving Alternatives:</u> - <u>Prefab Millwork (see Furniture subsection)</u>
<u>Countertops</u>	<u>Solid Surface</u> <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
<u>Window Sills/Convactor</u>	<u>Solid Surface</u> <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
<u>Window Treatments</u>	<u>Shade Cloth, 3% opening</u>

P. PANTRY (WITH SEATING)	
Item	Finish
<u>Flooring</u>	<u>Rubber, tile</u> <u>Porcelain, tile</u> <u>Cost-saving Alternatives:</u> - <u>Resilient, tile</u> - <u>Resilient, wood plank</u>
<u>Base</u>	<u>Rubber, cove</u> <u>Integral, to match flooring material</u>
<u>Wall Finish</u>	<u>Wall Covering</u> <u>Specialty Material, Glass (backsplash)</u> <u>Glass, tile (backsplash)</u> <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u> - <u>Ceramic, tile (backsplash)</u>
<u>Door type/finish</u>	<u>HM, paint, semi-gloss finish, 8'-0" high</u> <u>Wood, 8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
<u>Door Frame type/finish</u>	<u>HM, paint, semi-gloss finish</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
<u>Door Protection</u>	<u>Kickplate, Stainless Steel</u> <u>Cost-saving Alternatives:</u> - <u>No Kickplate</u>
<u>Ceiling Material</u>	<u>Lay-in, ACT, Ultima</u>
<u>Millwork</u>	<u>Plastic Laminate</u> <u>Cost-saving Alternatives:</u> - <u>Prefab Millwork (see Furniture subsection)</u>
<u>Countertops</u>	<u>Solid Surface</u> <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
<u>Window Sills/Convactor</u>	<u>Solid Surface</u> <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
<u>Window Treatments</u>	<u>Shade Cloth, 3% opening</u>

0-Q. CAFETERIAS (PUBLIC AREAS)	
Item	Finish
Flooring	Terrazzo, poured Porcelain, tile <u>Cost-saving Alternatives:</u> - Resilient, <u>tile</u>
Base	Integral, to match floor material, 6" Integral, sanitary cove base, 6" <u>Cost-saving Alternatives:</u> - <u>Rubber, cove</u>
Wall Finish	Glass Storefront (at Entry) Specialty Material, incl. wood, glass Glass, tile <u>Cost-saving Alternatives:</u> - Ceramic, tile - Wall Covering - GWB, paint, eggshell finish
Door type/finish	Glass Storefront Stainless Steel, <u>8'-0" high</u> HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0"</u>
Door Frame type/finish	Stainless Steel HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish knockdown w/ bondo joints</u>
Door Protection	Kickplate, Stainless Steel <u>Cost-saving Alternatives:</u> - <u>No Kickplate</u>
Ceiling Material	Specialty Material, incl. wood <u>Cost-saving Alternatives:</u> - GWB, paint, flat finish - Lay-in, ACT
Millwork	Stainless Steel <u>Cost-saving Alternatives:</u> - Plastic Laminate
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A at areas w/ sink</u> - <u>Stainless Steel, at areas w/o sink</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Treatments	Shade Cloth, 3% opening

<u>P-R.</u> FOOD PREPARATION	
Item	Finish
Flooring	Quarry, tile <u>Epoxy, Tnemec</u> <u>Cost-saving Alternatives:</u> - Resilient, sheet
Base	Quarry, cove, 6" Integral, sanitary cove base <u>Cost-saving Alternatives:</u> - Integral, to match floor material, 6"
Wall Finish	GWB, paint, scrub-resistant <u>Scuffmaster</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT, Hzone
Millwork	Stainless Steel
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - Stainless Steel

<u>Q-S.</u> LABORATORIES	
Item	Finish
Flooring	Resilient, tile
Base	Rubber, cove, 4"
Wall Finish	GWB, paint, eggshell finish
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT, Hzone GWB, paint, flat finish
Lab Casework	Countertops: Specialty Material, Phenolic Resin Millwork: Wood or Stainless Steel Tack panel: Wall Covering, Carnegie, Xorel

R.T. VIVARIUM	
Item	Finish
Flooring	Concrete Coating, Poured Epoxy (typical rooms), Stonhard
Base	Integral, sanitary cove base
Wall Finish	Specialty Material, incl. fiberglass-reinforced composite panel GWB, paint, scrub-resistant Scuffmaster
Door type/finish	Stainless Steel
Door Frame type/finish	Stainless Steel
Door Protection	Aluminum plate
Ceiling Material	Specialty Material, incl. fiberglass-reinforced panel GWB, paint, scrub-resistant Scuffmaster

S.U. LOCKER ROOMS	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - Resilient, tile - Resilient, wood plank
Base	Rubber, cove, 4"
Wall Finish	GWB, paint, eggshell finish
Door type/finish	HM, paint, semi-gloss finish, 8'-0" high <u>Cost-saving Alternatives:</u> - HM, paint, semi-gloss finish, 7'-0" high
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - HM, paint, semi-gloss finish, knockdown w/ bondo joints
Door Protection	Kickplate, Stainless Steel <u>Cost-saving Alternatives:</u> - No Kickplate
Ceiling Material	Lay-in, ACT Hzone
Millwork	Lockers (see Furniture subsection)
Countertops	Solid Surface <u>Cost-saving Alternatives:</u> - Solid Surface, Corian Grade A
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - Plastic Laminate
Window Treatments	Shade Cloth, 3% opening

<u>7.V. LACTATION ROOM</u>	
Item	Finish
Flooring	Resilient, <u>tile</u> <u>Resilient, wood plank</u>
Base	Rubber, cove, 4"
Wall Finish	Acoustic Solutions, felt (accent wall) GWB, paint, eggshell finish
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Wood, 8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT, Hzone
Millwork	Wood <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u> - <u>Prefab Millwork (see Furniture subsection)</u>
Countertops	Solid Surface Engineered Stone <u>Cost-saving Alternatives:</u> - <u>Solid Surface, Corian Grade A</u>
Window Sills/Convactor	Solid Surface <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
Window Treatments	Shade Cloth, 3% opening and Shade Cloth, blackout Use double roller <u>Cost-saving Alternatives:</u> - <u>Shade Cloth, 1% opening</u>

W. WELLNESS ROOM	
Item	Finish
<u>Flooring</u>	<u>Resilient, tile</u> <u>Resilient, wood plank</u> <u>Carpet, tile</u>
<u>Base</u>	<u>Rubber, cove</u>
<u>Wall Finish</u>	<u>GWB, paint, eggshell finish</u>
<u>Door type/finish</u>	<u>HM, paint, semi-gloss finish, 8'-0" high</u> <u>Wood, 8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u> - <u>Wood, 7'-0" high</u>
<u>Door Frame type/finish</u>	<u>HM, paint, semi-gloss finish</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
<u>Ceiling Material</u>	<u>Lay-in, ACT, Hzone</u>
<u>Window Sills/Convactor</u>	<u>Solid Surface</u> <u>Cost-saving Alternatives:</u> - <u>Plastic Laminate</u>
<u>Window Treatments</u>	<u>Shade Cloth, 3% opening and Shade Cloth, blackout</u> <u>Use double roller</u> <u>Cost-saving Alternatives:</u> - <u>Shade Cloth, 1% opening</u>

U-X. SERVICE ELEVATOR LOBBY / SERVICE CORRIDORS	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - Resilient, tile
Base	Rubber, cove, 6"
Wall Finish	<u>GWB, paint, scrub-resistant</u> <u>Cost-saving Alternatives:</u> - <u>GWB, paint, eggshell finish</u>
Wall Protection	Crash Rail, Double Stainless Steel <u>(confirm location of top and bottom rails AFF on site)</u> Aluminum-Diamond plate <u>Cost-saving Alternatives:</u> - <u>No diamond plate</u>
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT, Hzone

V-Y. SERVICE / FREIGHT ELEVATOR CABS	
Item	Finish
Flooring	Match floor material in adjacent elevator lobby / corridor
Base	Integral, 6" , to match floor material <u>Cost-saving Alternatives:</u> - <u>Stainless Steel, 6"</u>
Wall Finish	Specialty Material, incl. metal (stainless steel) , <u>Cost-saving Alternatives:</u> - <u>Diamond Plate</u> - <u>Stainless Steel</u>
Wall Protection	Crash Rail Bumper Rail
Door type/finish	Stainless Steel <u>Cost-saving Alternatives:</u> - <u>HM, Scuffmaster paint, metallic finish</u>
Door Frame type/finish	Stainless Steel <u>Cost-saving Alternatives:</u> - <u>HM, Scuffmaster paint, metallic finish</u>
Ceiling Material	Specialty Material, incl. metal (stainless steel) <u>Cost-saving Alternatives:</u> - <u>Open</u>

W.Z. BUILDING SERVICES	
Item	Finish
Flooring	Rubber, tile <u>Cost-saving Alternatives:</u> - Resilient, <u>tile</u>
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Wall Protection	Aluminum Plate
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Lay-in, ACT, Hzone (Washable)
<u>1. Provide waterproofing under flooring and turned up 8" along the perimeter when Building Services spaces are located above critical areas (i.e. IT spaces, Auditoriums, etc.) and any other spaces designated by RED+F.</u>	

X.AA. SHOPS	
Item	Finish
Flooring	Resilient, tile
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0"</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Door Protection	Kickplate, Stainless Steel
Ceiling Material	Lay-in, ACT, Ultima

Y.BB. BDF/IDF ROOMS & DATA CENTERS	
Item	Finish
Flooring	Static Dissipative Tile, match adj. flooring when possible
Base	Rubber, cove, 4"
Wall Finish	GWB, Scuffmaster paint, eggshell finish
Door type/finish	HM, paint, semi-gloss finish, <u>8'-0" high</u> <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, 7'-0" high</u>
Door Frame type/finish	HM, paint, semi-gloss finish <u>Cost-saving Alternatives:</u> - <u>HM, paint, semi-gloss finish, knockdown w/ bondo joints</u>
Ceiling Material	Exposed, underside of slab painted flat finish (white color)

Z-CC. MECHANICAL EQUIPMENT ROOMS	
Item	Finish
Flooring	Concrete Coating, waterproofing (grey color)
Concrete Pads	Concrete Coating, waterproofing (yellow color)
Floor Drains	Painted, (yellow color)
Base	Waterproofing turned up 8"
Wall Finish	CMU, paint, eggshell finish
Door type/finish	HM (solid core) paint, semi-gloss finish
Door Frame type/finish	HM (welded frame), paint, semi-gloss finish
Ceiling Material	Exposed to underside of slab, paint, flat finish

AA-DD. ELECTRICAL EQUIPMENT ROOMS	
Item	Finish
Flooring	Concrete coating, Epoxy, Tnemec (red color)
Concrete Pads	Concrete coating, Epoxy, Tnemec (yellow color)
Base	Rubber, cove, 6"
Wall Finish	GWB, paint, eggshell finish
Door type/finish	HM (solid core) paint, semi-gloss finish
Door Frame type/finish	HM (welded frame), paint, semi-gloss finish
Ceiling Material	Exposed to underside of slab, painted, flat finish GWB, paint, flat finish

MATERIAL LEGEND

In accordance with both our Mission devoted to excellence in patient care, education, and research and our Design Principles of providing timeless designs that are cost effective, efficient, functional and practical, RED+F has developed a palette of typical materials and finishes that we have found to be successful for various spaces at NYU Langone Health.

Our goals in listing these materials and finishes are to:

- Streamline the design process
- Assist the Architect and Interior Designer with specifying materials
- Comply with the Healthier Hospitals Initiative (HHI) Safer Chemicals Challenge, eliminating the use of formaldehyde, perfluorinated compounds, polyvinyl chloride (PVC), antimicrobials, and all flame retardants from all materials and finishes
- Create spaces that are timeless, durable, easily maintainable and cost-effective
- Create a consistent NYU Langone brand

The Architect and Interior Designer should use this as a guide for specifying the finishes on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying materials that are appropriate and code compliant for specific spaces. Also, the Architect and Interior Designer may suggest other materials and finishes if they believe those proposed materials and finishes will support our mission, design principles, and the design intent of the project.

Recommended manufacturers and products for specific applications have been provided in the following categories:

- A. Flooring
- B. Base
- C. Wall Finish
- D. Doors and Door Frames
- E. Ceilings
- F. Millwork and Countertops
- G. Window Sills
- H. Window Treatments
- I. Shower Curtains
- J. Cubicle Curtains
- K. Cubicle Track

Use of materials in *Clinical* versus *Non-Clinical* spaces is denoted with an * located in both or one of the two columns to the right of the page.

A. FLOORING

Resilient Flooring						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Tile	American Biltrite	Texas Granite (SVT)	Varies (See manuf. info)	3.17mm, sizes vary; Phthalate-free; limited color options coordinate with American Biltrite Electrotile static dissipative tile	*	*
	Bentley Mills	Batiste (LVT)	Varies (See manuf. info)	5mm x 18" x 36"	-	-
	Gerflor	Saga² (LVT)	Varies (See manuf. info)	4.6mm x 19.685" x 19.685"; Phthalate-free	-	-
	Gerflor	Creation (LVT)	Varies (See manuf. info)	sizes vary; Phthalate-free	-	-
	Patcraft	Admix \ Admix Matte	Varies (See manuf. info)	3.2mm, sizes vary; PVC-free; terrazzo look	*	*
	Patcraft	Admix Encore \ Admix Encore Matte	Varies (See manuf. info)	3.2mm x 12" x 12"; PVC-free	*	*
	Patcraft	Meaning Tile	Varies (See manuf. info)	2.5mm x 13.19" x 26.38"; PVC-free	*	*
	Patcraft	Aggregate (LVT)	Varies (See manuf. info)	2.5mm x 24" x 24";	-	-
	Shaw Contract	Amalgam (LVT)	Varies (See manuf. info)	5mm x 20" x 20"	-	-
	Shaw Contract	Cast 2.5 (LVT)	Varies (See manuf. info)	2.5mm x 24" x 24"	-	-
	Shaw Contract	Compound 2.5 (LVT)	Varies (See manuf. info)	2.5mm x 24" x 24"	-	-
	Shaw Contract	Eon (LVT)	Varies (See manuf. info)	5mm x 20" x 20"	-	-
	Shaw Contract	Innate	Varies (See manuf. info)	2.5mm x 13" x 26"	-	-
	Shaw Contract	Intricate (LVT)	Varies (See manuf. info)	2.5mm x 12" x 24"	-	-
	Shaw Contract	Kind (LVT)	Varies (See manuf. info)	5mm x 24" x 24"	-	-
	Shaw Contract	Terrace 2.5 (LVT)	Varies (See manuf. info)	2.5mm x 12" x 24"	-	-
	Shaw Contract	Thoughtful (LVT)	Varies (See manuf. info)	5mm x 24" x 24"	-	-
	Tarkett (f.k.a. Johnsonite)	Cortina Grande (SVT)	Varies (See manuf. info)	1/8" x 16" x 16"; Phthalate-free	-	-
	Tarkett	Carrera (SVT)	Varies (See manuf. info)	3.05mm x 18" x 18"; 3.05mm x 12" x 36"	-	-
	Tarkett	Drop Cloth (SVT)	Varies (See manuf. info)	3.05mm x 18" x 18"; 3.05mm x 9" x 36"	-	-
Tarkett (f.k.a. Johnsonite)	ID Inspiration 55 (LVT)	Varies (See manuf. info)	2.5mm x 19.7" x 19.7"; Phthalate-free	*	*	

	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Tile (cont'd)	Tarkett (f.k.a. Johnsonite)	IQ Granit (SVT)	Varies (See manuf. info)	2mm., varies; Phthalate-free; coordinates with Johnsonite IQ Granite SD static dissipative sheet and tile	*	
	Tarkett (f.k.a. Johnsonite)	IQ Optima (SVT)	Varies (See manuf. info)	2mm., varies; Phthalate-free	*	
	Tarkett	Meshwork (SVT)	Varies (See manuf. info)	3.05mm x 18" x 18"; 3.05mm x 12" x 36"	*	*
	Upofloor	Zero	Varies (See manuf. info)	2 mm x 20" x 20"; PVC-free	*	*
	Wineo 1500	Fusion XL	Varies (See manuf. info)	2.5mm x 19.68" x 39.37"; PURLINE Organic Flooring; PVC-free	*	*
	Wineo 1500	Stone XL	Varies (See manuf. info)	2.5mm x 19.68" x 39.37"; PURLINE Organic Flooring; PVC-free	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Wood Plank	Amtico	Cirro	Varies (See manuf. info)	PVC-free	*	*
	<u>Gerflor</u>	<u>Creation</u>	<u>Varies (See manuf. info)</u>	<u>sizes vary; Phthalate-free</u>	<u>*</u>	<u>*</u>
	<u>Shaw Contract</u>	<u>Cover (SPC)</u>	<u>Varies (See manuf. info)</u>	<u>4mm x 7" x 48"</u>	<u>*</u>	<u>*</u>
	<u>Shaw Contract</u>	<u>Envelop (SPC)</u>	<u>Varies (See manuf. info)</u>	<u>4mm x 7" x 48"</u>	<u>*</u>	<u>*</u>
	Upofloor	Xpression Small Planks	Varies (See manuf. info)	2 mm. x 4" x 36"; PVC-free	*	*
	Wineo 1500	Wood XS/ Wood L	Varies (See manuf. info)	2.5mm x 3.93" x 23.62"; PURLINE Organic Flooring; PVC-free	*	*
Notes: 1. All wood planks are to be non-beveled.						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Floating Floor	Tarkett (f.k.a. Tandus Centiva)	Adaptt (SVT)	Varies (See manuf. info)	4.5mm. x 7.25" x 48"; avail. w/ SureStart underlayment for use over asbestos; Phthalate-free	*	*
	<u>Gerflor</u>	<u>Creation (LVT)</u>	<u>Varies (See manuf. info)</u>	<u>sizes vary; Phthalate-free</u>	<u>*</u>	<u>*</u>
Notes: 1. Confirm project specific rolling load requirement for appropriate material selection. 2. Confirm project specific acoustic and moisture mitigation requirements for appropriate material selection.						

	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Sheet	Gerflor	Mipolam Symbioz	Varies (See manuf. info)	2mm. x 6'-6"; Phthalate-free	*	
	Patcraft	Ivy Walk	Varies (See manuf. info)	2.2mm x 72"	*	
	Tarkett (f.k.a. Johnsonite)	IQ Granit	Varies (See manuf. info)	2mm. x 6'-6"; Phthalate-free; coordinates with Johnsonite IQ Granite SD static dissipative sheet and tile	*	
	Tarkett (f.k.a. Johnsonite)	IQ Optima Acoustifloor	Varies (See manuf. info)	2mm. x 6'-6"; Phthalate-free	*	
	Tarkett (f.k.a. Johnsonite)	Melodia 3.0	Varies (See manuf. info)	2mm. x 6'-6"; Phthalate-free	*	
	Upofloor	Zero	Varies (See manuf. info)	2mm. x 4'-9"; PVC-free	*	
	Wineo 1500	Chip ∞	Varies (See manuf. info)	2.5mm x 6.56' PURLINE Organic Flooring; PVC-free	*	*
	Wineo 1500	Fusion ∞	Varies (See manuf. info)	2.5mm x 6.56' PURLINE Organic Flooring; PVC-free	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Wood Sheet	Polyflor	Forest FX PUR	Varies (See manuf. info)	2mm. x 2m.; Phthalate-free	*	
	Tarkett (f.k.a. Johnsonite)	Acczent Wood	Varies (See manuf. info)	.080"T, 6'-6"; Phthalate-free	*	
	Patcraft	Enrich Sheet	Varies (See manuf. info)	2.5mm. x 6.59'; PVC-free	*	*
	Wineo 1500	Wood ∞	Varies (See manuf. info)	2.5mm x 6.56' PURLINE Organic Flooring; PVC-free	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Specialty Sheet	Altro	Walkway 20	Varies (See manuf. info)	2mm. x 6'-7"; slip-resistant; Phthalate-free; avail. in static dissipative version	*	*
	Polyflor	Polysafe Verona PUR	Varies (See manuf. info)	2mm. x 2m.; slip-resistant; Phthalate-free	*	*
	Tarkett (f.k.a. Johnsonite)	Granit Safe.T	Varies (See manuf. info)	2mm. x 6'-6"; slip-resistant; coordinates with Johnsonite IQ Granit; Phthalate-free	*	*

Rubber Flooring						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Tile	Nora	Norament Grano	Varies (See manuf. info)	3.5mm. x 40" x 40"	*	*
	Nora	Norament Satura	Varies (See manuf. info)	3.5mm. x 40" x 40"	*	*
	Nora	Norament XP	Varies (See manuf. info)	3.5mm. x 40" x 40" (for Sterile Zone in OR and procedure rooms w/ ESD requirements)	*	
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Sheet	Nora	Valua	Varies (See manuf. info)	2mm. or 3mm. x 48"w	*	

Linoleum						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Tile	Forbo	Marmoleum	Varies (See manuf. info)		*	*
	Forbo	MCT Modular Tile	Varies (See manuf. info)	2.0mm x 13.11" x 13.11"	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Sheet	Forbo	Marmoleum / <u>Marbled</u>	Varies (See manuf. info)	<u>2.5mm x 79"w</u>	*	*
	Gerflor	Landscape	Varies (See manuf. info)		*	*

Static Dissipative						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Resilient	American Biltrite	Electrotile	Varies (See manuf. info)	3.17mm, sizes vary; PVC-free; limited color options coordinate with American Biltrite Texas Granite SVT	*	*
	Farkett (f.k.a. Johnsonite)	IQ Granit SD	Varies (See manuf. info)	2mm., varies; coordinate with Johnsonite IQ Granite sheet and tile; Phthalate-free	*	*

Notes:

- For BDF / IDF Rooms and Data Centers use Static Dissipative Tile (SDT) installed as a system per manufacturer's complete specification. Refer to the Information Technology subsection of these Design Guidelines for additional information.

Carpet						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Atlas	Varies (See manuf. info)	Varies (See manuf. info)			*
	Bentley Mills	Varies (See manuf. info)	Varies (See manuf. info)			*
	Interface	Varies (See manuf. info)	Varies (See manuf. info)			*
	Patcraft	Varies (See manuf. info)	Varies (See manuf. info)			*
	Shaw	Varies (See manuf. info)	Varies (See manuf. info)			*
	Tandus Centiva	Varies (See manuf. info)	Varies (See manuf. info)			*

Wood						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)		*	*

Walk-Off Carpet						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Mats Inc.	Decorib	Charcoal	High-density rubber back runner		*
	Patcraft	Walk Forward (modular)	Varies (See manuf. info)	24" x 24" tile; PVC-free		*
	Tarkett (f.k.a. Tandus Centiva)	Abrasive Action II (modular)	Varies (See manuf. info)	24" x 24" tile; PVC-free; provide w/ Powerbond Cushion backing		*
	Tarkett (f.k.a. Tandus Centiva)	Assertive Action (modular)	Varies (See manuf. info)	24" x 24" tile; PVC-free; provide w/ Powerbond Cushion backing		*
	Tarkett (f.k.a. Tandus Centiva)	Assertive Stria (modular)	Varies (See manuf. info)	24" x 24" tile; PVC-free; provide w/ Powerbond Cushion backing		*
	Tarkett (f.k.a. Tandus Centiva)	Assertive Rib (modular)	Varies (See manuf. info)	24" x 24" tile; PVC-free; provide w/ Powerbond Cushion backing		*

Porcelain Tile						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Crossville	Varies	Varies (See manuf. info)	available in 2" x 2" mosaic (Java Joint series)	*	*
	Dal-Tile	Keystones Colorbody Porcelain	Varies (See manuf. info)	2" x 2" mosaic; for use in Janitor's Closets	*	*
	Dal-Tile	Varies	Varies (See manuf. info)		*	*
	Mosa	Varies	Varies (See manuf. info)		*	*
	Stone Source	Varies	Varies (See manuf. info)		*	*
Notes: 1. Confirm use of products on walls with RED+F and floor tile manufacturer.						

Quarry Tile						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Dal-Tile	Quarry Tile	Varies (See manuf. info)	½" x 6" x 6"	*	*

Stone Tile						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)		*	*

Terrazzo						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Poured	Custom Mix		Varies	Thin set epoxy with zinc dividers, ¼", 3/8", ½" thick	*	*
	Port Morris Tile and Marble (or approved equal)		Varies	Thin set epoxy with zinc dividers, 3/8" T	*	*

Concrete Coatings						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Epoxy	Stonhard	Stonclad UT AB PBB Free		6mm. T; Procedure Rooms only	*	*
	Tnemec	Epoxy Coating		Series 54 masonry filler; Series 151 Elasto-Grip FC epoxy primer; Series 156 Enviro-crete acrylate top coat (various colors avail.) Food Preparation <u>and</u> <u>Electrical Equipment Rooms</u> only		*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Water-proofing	Kemper Systems	Kemperol 2K-PUR		At Mech Rooms – Provide 20-year warranty		*

B. BASE

Rubber Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Cove	Johnsonite	Baseworks cove base	Varies (See manuf. info)	¼" x 4-3/8" or 6-3/8"; use inside and outside corners	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Straight	Johnsonite	Tightlock	Varies (See manuf. info)	¼" x 4-1/4" or 6-1/4"; for carpet use with spacer; use inside and outside corners	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Cove (w/ recess)	Johnsonite	Perceptions Recess RWDC Toe	Varies (See manuf. info)	1/8" x 4.25"H; use inside and outside corners	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Straight (w/ recess)	Johnsonite	Perceptions Recess Toeless	Varies (See manuf. info)	1/8" x 4.25"H; use inside and outside corners	*	*
Notes:						
1. Comparable Roppe products are acceptable.						
2. Coordinate height of adjacent millwork with finished base height.						

Stainless Steel Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Custom	Custom	Non-directional Stainless Steel	18 Ga, height varies	*	*

Aluminum Wall Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	AlumaFloor	Alloy 5052	Clear anodized with matte finish	0.040" thick, 6" high	*	*

Porcelain Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)	Cove, to match floor or wall tile	*	*

Quarry Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)	Cove, to match floor tile		*

Stone Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)	To match adjacent floor material		*

Wood Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)			*

Integral Base						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)	Cove, seamless, 6" to match floor material; Schluter metal backer to prevent puncture	*	*
	Varies	Sanitary Cove Base	Varies (See manuf. info)	6" H, coordinate thickness with adjacent sheet floor finish; match sanitary cove base mfr. to flooring mfr.	*	*

Transitions						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Johnsonite	Varies	Varies (See manuf. info)		*	*
	Schluter	Varies	Varies (See manuf. info)		*	*
	Tandus Centiva	Metal Edge	Varies (See manuf. info)		*	*

C. WALL FINISH

GWB / Paint						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
<u>Standard</u>	Benjamin Moore	EcoSpec WB Silver	Finish as scheduled	Eggshell #474; Flat #473; Semi-gloss #476	*	*
	Benjamin Moore	Ultra Spec SCUFF-X	Eggshell Finish		*	*
<u>Scrub-resistant</u>	Scuffmaster	Scrubtough	Eggshell Finish		*	*

Wall Covering						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Carnegie	Type II / PVC-Free TPO	Varies (See manuf. info)	With breathable back	*	*
	Carnegie	Xorel	Varies (See manuf. info)	With breathable back	*	*
	Design Tex	PVC-free	Varies (See manuf. info)	With breathable back	*	*
	Innovations	PVC-free	Varies (See manuf. info)	With breathable back	*	*
	Knoll	PVC-free	Varies (See manuf. info)	With breathable back	*	*
	Maharam	PVC-free	Varies (See manuf. info)	With breathable back	*	*

Acoustic Solutions						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Buzzispace	Felt	Varies (See manuf. info)	3mm., direct glue and panels		*
	<u>Carnegie</u>	<u>Varies</u>	<u>Varies (See manuf. info)</u>			*
	Design Tex	Felt AM002	Varies (See manuf. info)	3mm., direct glue		*
	DFB	Panel Tex	Varies (See manuf. info)	¾" T Fabric / Carnegie, Xorel or Owner-approved fabric		*
	Fitzfelt	Felt	Varies (See manuf. info)	3mm., direct glue		*
	Snowsound	Fiber Acoustic Textiles	Varies (See manuf. info)			*
	Notes: 1. Wall covering panels in conference rooms shall have a full panel centered on the conference room table.					

Ceramic Tile						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Crossville	Varies	Varies (See manuf. info)		*	*
	Dal-Tile	Varies	Varies (See manuf. info)		*	*
	Mosa	Varies	Varies (See manuf. info)		*	*

Glass Tile						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Crossville	Varies	Varies (See manuf. info)		*	*
	Dal-Tile	Color Wave	Varies (See manuf. info)	Accent Tile, sizes vary	*	*
	Nemo	Glass Hues	Varies (See manuf. info)	Accent Tile, sizes vary	*	*
	Stone Source	Glacier	Varies (See manuf. info)	Accent Tile, sizes vary, confirm lead times	*	*

Porcelain Tile						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Crossville	Varies	Varies (See manuf. info)		*	*
	Dal-Tile	Varies	Varies (See manuf. info)		*	*
	Mosa	Varies	Varies (See manuf. info)		*	*
	Stone Source	Varies	Varies (See manuf. info)	confirm lead times	*	*
Notes: 1. If applicable, porcelain floor tile can run up wall. A/E Team to confirm use of floor tile products on walls with RED+F and floor tile manufacturer.						

Tile Trim						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Schluter	Varies	Varies (See manuf. info)		*	*

Specialty Materials						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Concrete Veneer	DFB	Vitruv		Seamless concrete applied finish	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Wood	Architectural Systems	MDF Panels	Varies (See manuf. info)		*	*
	Robin Reigi	Plyboo Strand Plyboard			*	*
	Varies		Species varies; Clear Finish (See manuf. info)		*	*
Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical	
Metal	C-S Group	Varies	Varies (See manuf. info)		*	*
	Forms + Surfaces	Varies	Varies (See manuf. info)		*	*
	Varies	Varies	Decorative metal mesh		*	*
	Varies	Varies	Stainless Steel		*	*
	Varies	Diamond Plate	Alum.		*	*
Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical	
Stone	Varies	Varies	Varies (See manuf. info)		*	*
Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical	
Porcelain Tile Panels	Crossville	Laminam	Varies (See manuf. info)	<u>1mx 3m panel size;</u> <u>3mm T (wall only applications);</u> <u>5.6mm T (wall and floor applications)</u>	*	*
Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical	
Acrylic Resin	3-Form	Acrylic Resin, Varia Ecoresin			*	*
	3-Form	Acrylic Resin, Chroma			*	*
	Lightblocks	Acrylic Panels	Varies (See manuf. info)	Gauge varies, 1/16" – 2" panel thickness available; std. panel size 48" x 96"	*	*

	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Glass	Bendheim	Varies	Varies (See manuf. info)		*	*
	Custom	Varies	Varies (See manuf. info)	Back-painted glass	*	*
	Forms + Surfaces	Varies	Varies (See manuf. info)		*	*
	Skyline Design	Varies	Varies (See manuf. info)		*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Fiberglass-Reinforced Panels	Arcoplast	Varies	Varies (See manuf. info)			*

Wall Protection						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Impact Resistant Wall Covering	Inpro	Ricochet	Varies (See manuf. info)	Impact Resistant	*	
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Sheet	Corian	Varies	Varies (See manuf. info)	Solid Surface	*	
	Inpro	Endurant Bioprism	Varies (See manuf. info)	Solid Surface	*	
	<u>Lumicor</u>	<u>Wall Protection Sheet</u>	<u>Varies</u> <u>(See manuf. info)</u>		*	
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Alum. Plate	Varies	Diamond Plate	Alum.		*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Corner Guards	C-S Group	Model CO-8	Stainless Steel	Full Height; 1” Leg Length at FGP sites <u>and administrative sites</u> ; 2-1/2” Leg Length at all other clinical sites unless noted otherwise	*	*

	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
End Guards	C-S Group	Model SCO-8	Stainless Steel	Leg Length: 2-1/2" unless noted otherwise	*	
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Crash Rails	C-S Group	Rub Strip, Acrovyn 4000 Series RS-60N	metal, brushed nickel	.060" thick x 9" H; use C-S Group water-based mastic adhesive; confirm spec w/ RED+F	*	
	C-S Group	Crash Rail, ECR 32A/32S/60A		Concealed fasteners preferred. Coor'd bracket type, min. lengths and splice locations w/ Design Studio.	*	
	C-S Group	Crash Rail, SCR 16SSV			*	
Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical	
Bumper Rails	C-S Group	Model HB-100D	Black EPDM rubber	<u>With mechanical fasteners</u>	*	
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Hand-rails	C-S Group	Model P-RWS	Stainless Steel / Wood	Stainless Steel crash rail w/ wooden handrail	*	
Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical	
Chair Rail	Johnsonite	Millwork Rampart	Varies (See manuf. info)	4"H x 3/8"	*	

Demountable Partitions						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	AllSteel	Aspect / Beyond (framed)	Varies (See manuf. info)			*
	Dirtt	Rectilinear Profile Stickbuilt	Varies (See manuf. info)			*
	Steelcase	V.I.A.	Varies (See manuf. info)			*
	Teknion	Altos Portrait Optus	Varies (See manuf. info)			*
Notes: 1. Glazing gradient shall be 100% opacity from 0' to 3' AFF. Opacity shall then transition from 100% at 3' to 0% opacity at 7' AFF.						

Glass Storefront						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)			*

D. DOORS AND DOOR FRAMES

HM Doors and Frames / Paint						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Scrub-resistant	Benjamin Moore	Ultra Spec SCUFF-X	Semi-gloss finish	Use w/ Ultra Spec HP Acrylic Metal Primer HP04	*	*
	Scuffmaster	Scrubtough Max	Semi-gloss finish		*	*
Metallic	Scuffmaster	<u>Solid Metal</u>	Metallic finish	Elevator doors and frames	*	*

Wood Door						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies		Species varies; (See manuf. info)	Clear Finish	*	*

Acrovyn Door						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	C-S Group		Faux wood / metal finish	Color TBD	*	*

Glass Storefront Doors						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)	Match finish of storefront assembly		*

Stainless Steel Doors and Frames						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	#4 finish			*
	Varies	Varies	Non-directional			*

Door Protection						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	C-S Group	Model KP-SS	#304 16ga. stainless steel	Kick plate; Coor'd height with door schedule	*	*
	C-S Group	Acrovyn 4000		Kick plate; Coor'd height with door schedule	*	*
	Varies	Diamond Plate	Alum. Plate	Armor plate; Coor'd height with door schedule	*	*

E. CEILINGS

Lay-In Ceiling						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
ACT	Armstrong	Ultima Health Zone #1936		9/16" beveled tegular, ¾" x 24" x 24"	*	*
	Armstrong	Ultima #1912		9/16" beveled tegular, ¾" x 24" x 24"	*	*
	Armstrong	Clean Room VL #868		Unperforated, square lay-in, 5/8" x 24" x 24" w/ 15/16" Co-Extruded Clean Rm Grid	*	
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
ACT Grid	Armstrong	Interlude XL HRC	White	9/16"	*	*

Specialty Material						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Wood	Armstrong	Woodworks	Varies (See manuf. info)	Linear, Grille or Vector	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Metal	Lindner USA	LMD-E Hook on System	Finish: custom makore; direct printed metal faux wood veneer; or white	Custom upturned panel lengths thru-out; 24 ga steel panel micro-perforated w/ RG 0, 7-4 w/ mineral wool lined 0.5" alum. honeycomb core; typ. panel size 2' x 3'; 1/8" black neoprene gasket joint on all sides	*	*
	Varies	Varies	Stl. Stl. / Match adj. wall panels		*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Fiberglass-Reinforced Panel	Arcoplast	Varies	Varies (See manuf. info)			*

Notes:

1. Type of specialty acoustic material at ceilings to be confirmed by Architect and/or Acoustic Consultant.
2. Ceilings shall be installed per manufacturer specifications unless noted otherwise.
3. Removal of ceiling panels shall not require removal of adjacent panels.

GWB / Paint						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Standard	Benjamin Moore	EcoSpec WB Silver	Flat finish		*	*
Scrub-resistant	<u>Benjamin Moore</u>	<u>Ultra Spec SCUFF-X</u>	<u>Eggshell Finish</u>		*	*
	<u>Scuffmaster</u>	<u>Scrubtough</u>	<u>Eggshell Finish</u>		*	*

F. MILLWORK AND COUNTERTOPS

Notes:

1. All millwork substrate shall be formaldehyde free.
2. Provide 4” or full height backsplash, typ.
3. Provide 4” sidesplash, where required.
4. High Pressure Laminate (HPL) shall be used for horizontal surfaces.

Plastic Laminate						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Wood Grain and Solid	Formica	Varies	Varies (See manuf. info)		*	*
	Nevamar	Varies	Varies (See manuf. info)		*	*
	Pionite	Varies	Varies (See manuf. info)		*	*
	Wilsonart	Varies	Varies (See manuf. info)		*	*

Solid Surface						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Corian	Varies	Varies (See manuf. info)	Corian used as worksurface (i.e. at reception desks, workstations, nurse stations, etc.) shall be tested for mouse functionality.	*	*
	Formica	Varies	Varies (See manuf. info)		*	*
	Wilsonart	Varies	Varies (See manuf. info)		*	*

Engineered Stone						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Caesarstone	Varies	Varies (See manuf. info)		*	*
	Dupont	Corian Quartz	Varies (See manuf. info)		*	*
	Quartz Masters	Varies	Varies (See manuf. info)		*	*

Stone						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)			*

Wood						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Species Varies; Clear Finish (See manuf. info)	Provide protective glass, if required		*

Stainless Steel						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	#4 finish		*	*

Specialty Material						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Acrylic	3-Form	Acrylic Resin, Varia Ecoresin			*	*
	3-Form	Acrylic Resin, Chroma			*	*
	Lightblocks	Acrylic Panels	Varies (See manuf. info)	Gauge varies, 1/16" – 2" panel thickness available; standard panel size 48"x 96"	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Phenolic Resin	Varies	Varies	Varies (See manuf. info)	Countertops in Laboratories Only	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Misc.	Architectural Systems	Varies	Varies (See manuf. info)	Not for use at countertops	*	*
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
Decorative Glass	Bendheim	Varies	Varies (See manuf. info)	Not for use at countertops	*	
	Forms + Surfaces	Varies	Varies (See manuf. info)	Not for use at countertops	*	
	Skyline Design	Varies	Varies (See manuf. info)	Not for use at countertops	*	

Trim						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Schluter	Varies	Varies (See manuf. info)		*	*

G. WINDOW SILLS

Solid Surface						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Corian	Varies	Varies (See manuf. info)		*	*
	Formica	Varies	Varies (See manuf. info)		*	*
	Wilsonart	Varies	Varies (See manuf. info)		*	*

Painted Metal						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	Varies	Varies (See manuf. info)	Electrostatic Painted Alum. Gauge to-withstand a person standing on it.	*	*

H. WINDOW TREATMENTS

Shadecloth						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	DFB	Sol-R-Shade; G50 Series		3% openness; available as motorized; PVC and phthalate-free shade fabrics	*	*
	Phifer	Sheerweave, Infinity 2		Sun Control, 1, 3 or 5% openness; PVC and phthalate-free shade fabrics	*	*
	Phifer	Sheerweave, Style 7000		Black out; PVC and phthalate-free shade fabrics	*	*
	Phifer	Sheerweave, Style 8000		Sun Control, 3% openness; PVC and phthalate-free shade fabrics	*	*
<p>Notes:</p> <ol style="list-style-type: none"> 1. Provide dual color shades typically. Dark color facing outwards. Light color facing inwards. 2. Confirm type of shade used in existing building prior to specifying. Review with RED+F’s Design Studio. 3. Shades shall be owner provided, owner installed. 4. Percentage openness to be verified with Design Studio. 5. Provide shades operating from sill upward at windows overlooking public areas such as onto a sidewalk or terrace. 						

Sheers						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Carnegie	Varies	trevira		*	*
	Innovations	Varies	trevira		*	*
	Knoll	Varies	trevira		*	*
	Maharam	Varies	trevira		*	*
	Luum	Varies	trevira		*	*
Notes: 1. Trevira CS and FR are not permitted.						

I. SHOWER CURTAINS

Standard Fabrics						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Varies	100% trevira	Varies (See manuf. info)	No mesh, weighted bottom, 10" off floor	*	*
Notes: 1. Trevira CS and FR are not permitted. 2. Provide 100% attic stock.						

J. CUBICLE CURTAINS

Standard Fabrics						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	Arc Com	Nami	AC-33101 Color: Surf #2	Tisch Hospital and HJD Patient Rooms	*	
	Arc Com	Papillion-X	AC-33190 Color: Spring	ED Pediatric Treatment Areas	*	
	Arc Com	Woodland	AC-32762 Color: Spring #3	ED Adult Treatment Areas	*	
	Carnegie	Canopy	4238 Color: 2	Tisch Hospital 12 West	*	
	Maharam	Progression 2 511477	Color: 009 Kaleidoscope	Pediatric Areas	*	
	Maharam	Sing 511490	Color: 004 Breeze	Winthrop	*	
	Maharam	Sway 511496	Color: 002 Washed	Tisch Hospital and Brooklyn Hospital	*	
<p>Notes:</p> <ol style="list-style-type: none"> 1. NYULH will make selections for each site and each hospital building will have one fabric associated with it. 2. The fabric selection should be limited to 100% Trevira or polyester blend. Trevira CS and FR are not permitted. 3. Silver ion anti-microbial fabrics will be considered but any fabric with an antimicrobial additive or finish will not be considered acceptable for use in any NYULH facility. 4. Cubicle curtains shall be owner provided, owner installed. <p>Curtain Fabrication:</p> <ol style="list-style-type: none"> 1. Top hem to be 1-½" wide triple thick and reinforced with permanent, washable type buckram. Nickel-plated brass grommets to be placed 6" on center across the top of the curtain. 2. Side and bottom hems to be ½" wide double thick and double stitched. 3. Vertical seams to be double needle lock stitched. 4. Where mesh is specified, it is to be 22" high, excluding hems, per NYC fire code. 5. All curtain widths are expressed in feet, height in inches. All curtain heights are including mesh, if any. Curtain lengths shall be 10"-12" off the floor. 6. Fabric shall be joined to mesh with double hem stitch construction, and matching fabric ½" band where mesh and curtain are joined in back. Sides of curtain mesh is also to have matching fabric on edges. 7. In critical care areas only, the leading edge of each curtain is to have a 6' snap out panel made of matching fabric. This panel is to be snapped below the mesh and overlap the main panel by 21". No snaps shall be provided vertically. Each leading panel shall be provided with two weights in the bottom, one at each corner. 8. Curtains are to be supplied with weights in the bottom. <p>Attic Stock:</p> <ol style="list-style-type: none"> 1. Provide 25% of entire curtain order as spares. 2. When using 6' snap panels, provide 100% spares of the 6' panels and 25% of entire curtain order as spares for each area. 3. Curtains are to come tagged with size and location for ease of maintenance when removed for cleaning. 						

K. CUBICLE TRACK

Cubicle Track						
	Manuf.	Model / Series	Color / Finish	Remarks	Clinical	Non-Clinical
	C-S Group	1. Cubicle Tracks: C/S Cubicle Curtains #6062 surface-mounted tracks of heavy extruded aluminum alloy 6063-T5, 1-3/8" x 3/4", slotted to receive roller carriers, complete with accessories and components required for complete and secure installations including splicers, end caps and corner bends.			*	
		<ul style="list-style-type: none"> - Corner Bends: Shall have a 12" radius fabricated in one continuous "L" shape. - Finish: Clear anodized aluminum. 				
		2. Qwik Switch Safety Loading Unit: Tracks are to be provided with a Qwik Switch safety loading unit, hinged unit of track, to allow for safe removal of curtains from the track without the use of a ladder or step stool. Hinge unit of track, when lowered, is to bring the track end and curtains down to four feet above the finished floor so curtain can be removed from the carriers.			*	
		<ul style="list-style-type: none"> - Provide one Qwik Switch unit for each run of track. - Qwik Switch unit to include: Hinge, Locking unit, and Latch. - Provide one Qwik Switch Release Wand for every 20 units of track. 				
		3. Carriers: C-S Cubicle Curtains 1062N, virgin nylon axle with nylon wheels complete with nickel-plated brass bead-chain and hook assembly.			*	
		<ul style="list-style-type: none"> - Provide one carrier for each 6" of cubicle curtain width 				

PAINT COLORS

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, there are specific paint colors we utilize. The list below will give the A/E Team a sense of the preferred color palettes at NYU Langone and help inform the interior finish selections. The typical wall ~~colors~~ and ceiling colors must be from the list below (i.e. “Off-Whites” and “Ceiling White”). Accent wall colors other than those listed will be considered if it is deemed necessary by the RED+F Design Studio. For walls and ceilings Only Benjamin Moore, EcoSpec Silver WB products shall be used, as called out unless noted otherwise in the Room Finish Schedules. For painted elevator doors and frames Scuffmaster, Solid Metal interior paints shall be used, as noted in the Room Finish Schedules.

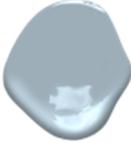
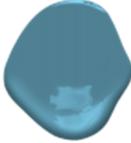
Note: The color swatches shown in the tables below are for reference only. A/E Team shall obtain actual BM color swatches for design, material presentation and approval.

TYPICAL LOGO AND PATHWAY COLORS			
NYU Purple	Green Pathway	Yellow Pathway	Blue Pathway
			
Name: Mystical Grape BM #: 2071-30 Pantone #: 2597C	Name: Cat’s Eye BM #: 2036-10	Name: Jack o’Lantern BM #: 2156-30	Name: Santa Monica Blue BM #: 776

TYPICAL PAINT WALL AND CEILING COLORS			
Ceiling White			
			
Name: Decorator’s White BM #: PM-3			
Off-Whites			
			
Name: Pure White BM #: OC-64	Name: Seapearl BM #: OC-19	Name: White Down BM #: OC-131	Name: American White BM #: 2112-70

 <p>Name: Pale Oak BM #: OC-20</p>	 <p>Name: April Showers BM #: 1507</p>		
Neutrals			
 <p>Name: Mineral Ice BM #: 2132-70</p>	 <p>Name: White Sand BM #: OC-10</p>	 <p>Name: Sea Froth BM #: 2107-60</p>	 <p>Name: Cement Gray BM #: 2112-60</p>
 <p>Name: Metallic Silver BM #: 2132-60</p>	 <p>Name: Cumulus Cotton BM #: 2063-70</p>		

TYPICAL ACCENT <u>WALL</u> COLORS			
Blue Greens			
 <p>Name: Boca Raton Blue BM #: 711</p>	 <p>Name: Caribbean Teal BM #: 2123-20</p>		
Greens			
 <p>Name: Kennebunkport Green BM #: HC-123</p>	 <p>Name: Boreal Forest BM #: AF-480</p>		

Blues			
			
Name: Winter Lake BM #: 2129-50	Name: Fiji BM #: AF-525	Name: Old Blue Jeans BM #: 839	Name: Downpour Blue BM #: 2063-20
Reds			
			
Name: Shy Cherry BM #: 2007-20	Name: Cranberry Cocktail BM #: 2083-20		
Purples			
			
Name: Bonne Nuit BM #: AF-635	Name: Sea Life BM #: 2118-40	Name: Shadow BM #: 2117-30	
Yellows			
			
Name: Straw BM #: 2154-50	Name: Bryce Canyon BM #: 098		
Grays			
			
Name: Cinder BM #: AF-705	Name: Smoke Gray BM #: 2120-40		

TYPICAL ELEVATOR DOOR AND FRAME COLORS			
Metallic			
			
<p>Name: <u>Solid Metal</u> SM #: <u>SM10231</u> WG #: <u>GOH 31951841</u></p>	<p>Name: <u>Solid Metal</u> SM #: <u>SM10232</u> WG #: <u>GOH 31951842</u></p>	<p>Name: <u>Solid Metal</u> SM #: <u>SM10237</u> WG #: <u>GOH 31951844</u></p>	<p>Name: <u>Solid Metal</u> SM #: <u>SM10238</u> WG #: <u>GOH 31951845</u></p>
			
<p>Name: <u>Solid Metal</u> SM #: <u>SM10244</u> WG #: <u>GOH 31951846</u></p>	<p>Name: <u>Solid Metal</u> SM #: <u>SM10250</u> WG #: <u>GOH 31951847</u></p>	<p>Name: <u>Solid Metal</u> <u>Satin Sheen</u> SM #: <u>SM159</u> WG #: <u>GOH 31951848</u></p>	

ART PROGRAM

NYU Langone Health has embarked on a comprehensive visual arts program of the highest quality consistent with our mission devoted to excellence in patient care, education, and research. The NYU Langone Health Art Program and Collection is integrated into the daily life of our organization providing a life-affirming, healing and supportive environment for patients, families, caregivers, students, faculty and staff. This is achieved through acquisitions, exhibitions, donations of art and other related visual arts programming. Acquisitions meet overall quality standards with the aim that the art collection appreciates in value over time.

1. Importance of Art in a Healthcare Environment

- Over the past decade, art has become an integral component in healthcare environments. As indicated in the [State of the Field Report: Arts in Healthcare/2009](#) survey, nearly half of all healthcare institutions reported having arts in healthcare programs with the majority of these in hospital settings. Studies have shown that these programs improve patients' overall health outcomes, treatment compliance and quality of life, and foster a positive environment for caregivers that reduces stress and improves workplace satisfaction and employee retention.



Spot (2018) © Donald Lipski. NYU Langone Art Program and Collection. Hassenfeld Children's Hospital. Photo © Jeff Goldberg/Esto

2. Means of Selecting Art

- The Design Studio's Art Group at RED+F identifies and acquires art through gallery visits, studio visits, recommendations as provided by museum curators, art critics and contemporary art historians and Calls to Artists as posted on visual art websites (New York Foundation for the Arts, Public Arts Network, etc.)

3. Capital Construction Projects

Many capital construction projects provide excellent opportunities to integrate art into the design of these new facilities.

- Emphasis will focus on public spaces with higher visibility resulting in greater impact.
- For patient areas, the inclusion and placement of artwork will be a calming distraction.
- Placement of artwork will also support wayfinding efforts.
- Goal is to create a singular vision and identity throughout an individual project through selection and placement of artwork.
- Selection of site-specific artwork will involve input from user-groups occupying the space.
- Art will be selected from a range of artists, from emerging to established.



Energy of Endless Universe (Ekpyrotic String VI) © Mariko Mori. NYU Langone Art Program and Collection. Science Building. Photo © Rene Perez

4. *Architect's Responsibilities*

Where art integration is part of the project scope, art selection will be the responsibility of the Design Studio's Art Group at RED+F. The A/E Team shall assist with identifying locations for art placement in a project including but not limited to the following:

- During Design Development, the architect will work with the Art Manager, Project Manager and users to identify potential locations for art.
- The A/E Team shall provide drawings sufficient to identify proposed art locations including plans, elevations and perspectives.
- The A/E Team will be responsible for keeping any walls that have been identified for artwork integration, free and clear of any and all electrical devices, room and directional signage, or other potentially distracting items. This includes electrical outlets, telephone/data outlets, light switches, thermostats, fire strobes, furniture, etc.
- The A/E Team shall ensure the art has proper lighting.

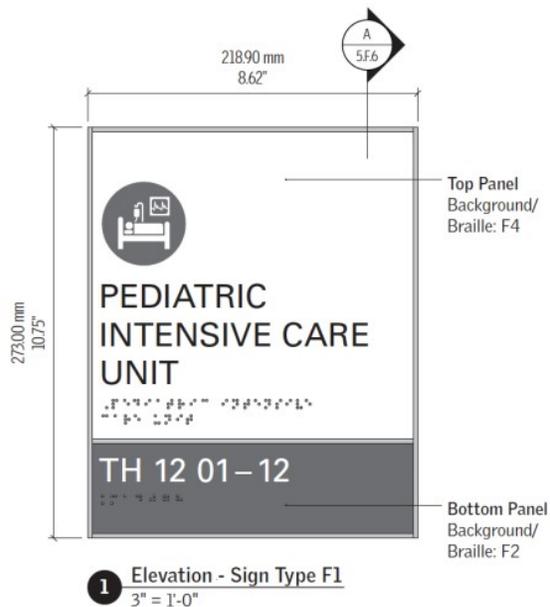
ROOM NUMBERING, SIGNAGE & WAYFINDING

The architect is required to use RED+F’s assigned room numbers, and provide full design and programming services related to signage and wayfinding. The A/E Team shall follow the NYU Langone Wayfinding and Communications Standards Manual, available on the Real Estate Development and Facilities website at: <http://nyulangone.org/vendor-information/design-guidelines>. The manual specifies each signage type approved for use at NYU Langone Health facilities. For off-campus projects, the A/E Team shall follow these guidelines in conjunction with any building landlord requirements.

1. Architect’s Responsibilities

- The architect shall submit the signed-off floor plans to the Space Planning and Management Group at RED+F who shall assign the room numbers. The architect shall insert these room numbers on the drawings. RED+F will not accept any other room numbers shown on the documents.
- Present signage design options to the Design Studio’s Signage/Wayfinding Group at RED+F.
- Produce signage programming documents that include location plans and message schedules for review and approval by the Signage/Wayfinding group.
- Review and approve shop drawings. Shop drawings are also to be forwarded to the Signage/Wayfinding Group for their review and approval.
- Punchlist installed signage.
- Final acceptance of the signage in conjunction with the Signage/Wayfinding Group.

The sign design package may be created by the Architect, a pre-approved signage consultant or one of the NYU Langone-approved signage vendors.



2. Sign Planning and Programming Process

There are five groups of signs comprising the NYU Langone system: identification, directional, informational, regulatory, and pageantry. Before programming a facility's signs, the complete sign typology (contained within the NYU Langone Wayfinding and Communications Standards Manual) should be understood by the signage programmer. The following outlines a step-by-step approach for sign planning and programming.

- **Analysis** - When planning and programming signs the programmer shall know the architectural layout, be familiar with the day-to-day operations and activities of the end-users within the space and consider the perspective of first-time visitors. Whenever possible, it is recommended that the sign programmer(s) meet with end-users to review how the facility will function.

The programmer should explore various visitor scenarios, and locate wayfinding decision points (both clear and obscure) along arrival and departure routes. Consider the route distances and turns from start to end point.

Typical questions to ask: Where are the restricted-access areas, and for what reasons? Who are the visitors, and for what purposes? What kind of sign types are needed, and where?

- **Visualization of the Space** - The programmer should imagine a "visitor-eye-view" through the department. The programmer should enhance comprehension of the architectural character of the visitor experience, of walking the hallways, facing impaired sightlines, or seeking visual landmarks. High and low ceiling space should be noted, along with wall position and angle, both on first entry and closer approach. The programmer should visualize the look and feel of the spaces, and identify optimal sign locations for decision points, avoiding obstacles. If possible, the programmer should suggest the architect revisit particular design details to accommodate sign locations.

Typical questions to ask: Are doors or walls opaque or transparent? What color is the wall finish behind reception, and how tall? Is there any art or furniture nearby when determining placement of signage? Are there any devices (electrical outlets, light switches, thermostats, fire alarm strobes, etc.) or other signs nearby that should be considered when determining placement of signage (with respect to height, alignment, etc.)?

- **Programming Documentation & Clarification** - The programmer should issue documents for sign vendors to produce message layouts and shop drawings. Draft documents should be submitted to the RED+F PM, end-user representative, and the Design Studio's Signage/Wayfinding Group at RED+F for approval and comments. A unique sign number shall designate floor/location ID (if applicable), designation ID and sign type ID.

Typical questions to ask: What is the proper name of the facility? Are there any donor recognition signs?

FURNITURE

In accordance with both our Mission devoted to excellence in patient care, education, and research and our Design Principles of providing timeless designs that are cost effective, efficient, functional and practical, RED+F has compiled a collection of furniture and accessory items that we have found to be successful at NYU Langone Health.

Our goals in listing these items are to:

- Streamline the design process
- Assist the Architect and Interior Designer with specifying furniture and accessory items
- Comply with the Healthier Hospitals Initiative (HHI) Safer Chemicals Challenge, eliminating the use of formaldehyde, perfluorinated compounds, polyvinyl chloride (PVC), antimicrobials, and all flame retardants from all furniture and finishes
- Create spaces that are timeless, durable, easily maintainable and cost-effective
- Create a consistent NYU Langone brand

The Architect and Interior Designer should use this as a guide for specifying furniture and accessories on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying products that are appropriate and code compliant for specific spaces. Also, the Architect and Interior Designer may suggest other products if they believe those proposed products will support our mission, design principles, and the design intent of the project.

The product specifications included in this subsection are organized by type as follows:

- A. Case Goods
- B. Workstations
- C. Tables
- D. Seating
- E. Storage
- F. Accessories
- G. Outdoor Furniture

Note: For trash and recycling receptacles see the Recycling Program subsection of these Design Guidelines.

A. CASEGOODS

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical casegoods used at NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager and the Design Studio to finalize casegood selections. The images shown are for illustrative purposes only and may not be a reflection of a project’s final specification. Please note the following requirements as they pertain to casegoods:

- All substrate shall be formaldehyde free.
- All wood office desks and credenzas are for use in VP level offices and above.
- Convenience outlets should be accessible above the worksurface.
- Credenza and/or lectern selection must be coordinated with the NYU Langone AV/IT team. Any proposed alternates must be similarly vetted.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

The product specifications included in this subsection are organized by type as follows:

- F-A1 Private Office
- F-A2 Lecterns

F-A1 PRIVATE OFFICE				
Geiger		Model	Clinical	Non-Clinical
F-A1a		Levels		*
		Location: <i>Private Office</i> Remarks: Consult with RED+F for approved finishes and typical layouts. Provide wood front overheads (Catalyst model). Include wardrobe if possible.		
Steelcase		Model	Clinical	Non-Clinical
F-A1b		EE6		*
		Location: <i>Private Office</i> Remarks: Consult with RED+F for approved finishes and typical layouts. Provide wood or glass front overheads. Include wardrobe if possible.		

F-A1 PRIVATE OFFICE (COST-SAVING ALTERNATIVES)				
Herman Miller		Model	Clinical	Non-Clinical
F-A1c		Canvas		*
		Location: <i>Private Office</i> Remarks: Consult with RED+F for typical layouts in laminate. Provide laminate or metal overheads. Include wardrobe if possible.		
Steelcase		Model	Clinical	Non-Clinical
F-A1d		Answer		*
		Location: <i>Private Office</i> Remarks: Consult with RED+F for typical layouts in laminate. Provide laminate or metal overheads. Include wardrobe if possible.		
Three h		Model	Clinical	Non-Clinical
F-A1e		Premier		*
		Location: <i>Private Office</i> Remarks: Consult with RED+F for typical layouts in laminate. Provide overheads and wardrobe if possible.		
F-A2 LECTERNS				
Custom		Model	Clinical	Non-Clinical
F-A2a		Custom		*
		Location: <i>Lecture Hall / Auditorium</i> Remarks: Consult with AV/IT and RED+F for lectern design and drawings.		

F-A2 LECTERNS (COST-SAVING ALTERNATIVES)				
Nucraft		Model	Clinical	Non-Clinical
F-A2b		High Tech Lectern / Column		*
		Location: <u>Seminar / Multipurpose Room</u> Remarks: Consult with AV/IT and RED+F for lectern requirements and preferred model.		

B. WORKSTATIONS

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical workstations used at NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager and the Design Studio to finalize workstation selections. The images shown are for illustrative purposes only and may not be a reflection of a project’s final specification. Please note the following requirements as they pertain to workstations:

- All substrate shall be formaldehyde free.
- Convenience outlets should be accessible above the worksurface.
- Vertical storage is preferred to overhead storage.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

F-B1 WORKSTATIONS				
Steelcase		Model	Clinical	Non-Clinical
F-B1a		Answer		*
		Location: <u>Open Work Area</u> Remarks: Consult with RED+F for approved finishes and typical layouts.		
Herman Miller		Model	Clinical	Non-Clinical
F-B1b		Canvas		*
		Location: <u>Open Work Area</u> Remarks: Consult with RED+F for approved finishes and typical layouts.		

Teknion		Model	Clinical	Non-Clinical
F-B1c		<u>Leverage</u>		*
		Location: <u>Open Work Area</u> Remarks: <u>Consult with RED+F for approved finishes and typical layouts.</u>		
F-B1 WORKSTATIONS (COST-SAVING ALTERNATIVES)				
Three h		Model	Clinical	Non-Clinical
F-B1de		Multistations+		*
		Location: <u>Open Work Area</u> Remarks: Consult with RED+F for approved finishes and typical layouts. Laminate only.		
Consolidated		Model	Clinical	Non-Clinical
F-B1e		<u>Standard</u>		*
		Location: <u>Open Work Area</u> Remarks: <u>Consult with RED+F for approved finishes and typical layouts.</u>		

C. TABLES

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical tables used at NYU Langone facilities. It is the Architect's responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager, NYU Langone AV/IT and the Design Studio to finalize table selections. The images shown are for illustrative purposes only and may not be a reflection of a project's final specification. Please note the following requirements as they pertain to tables:

- All substrate shall be formaldehyde free.
- Table selection must be coordinated with the NYU Langone AV/IT team. Any proposed alternates must be similarly vetted.
- Coordinate power/data troughs and core drill requirements with the furniture dealer, Architect or NYU Langone AV/IT.
- Plug-in tables in public areas must be UL-approved and have USB and outlet options.
- Occasional tables in public areas must be provided with power and data.
- Furnishings for In-Patient Rooms have been evaluated by Nursing, Epidemiology, Facilities Operations, Environmental Services, Rehabilitation Medicine and Sustainability. All proposed alternates must be similarly vetted.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

The product specifications included in this subsection are organized by type as follows:

- F-C1 Conference Tables with Integrated Technology
- F-C2 Conference Tables without Power
- F-C3 Collaboration Tables with / without Power
- F-C4 Height Adjustable Tables
- F-C5 Training Tables
- F-C6 Café Tables
- F-C7 Occasional Tables with Power / USB Outlets
- F-C8 Occasional Tables without Power
- F-C9 Inpatient Tables

F-C1 CONFERENCE TABLES WITH INTEGRATED TECHNOLOGY				
Bernhardt		Model	Clinical	Non-Clinical
F-C1a		Trace		*
		<p>Location: <u>Conference Room</u> Remarks: Typical table approved for NYU Langone Health; Floor stub-ups to be noted as “VIF”. Final location to be identified in field by Furniture Dealer. Needs AV credenza, see F-C1b below.</p>		
Bernhardt		Model	Clinical	Non-Clinical
F-C1b		Shift		*
		<p>Location: <u>Conference Room</u> Remarks: Specialty credenza to include access panel, pull-out AV rack and thermostatically controlled exhaust fan. Coordinate location/size of AV rack cabinet, exhaust fan and power/data cut-outs. NYU Langone AV to provide AV Racks. Top surface to be either solid surface, quartz/resin or stone. Wood / <u>laminated</u> finish to match conf. room table. Specify <u>without spacer. Provide 34” counter height.</u> When recycling is required provide (3) 35 liter (equiv. to 9.3 gal) containers within recycling pedestals at credenza. Refer to the Recycling Program subsection of these Design Guidelines for additional information.</p>		
Bernhardt		Model	Clinical	Non-Clinical
F-C1c		a.k.a. wall		*
		<p>Location: <u>Conference Room / Meeting-Discussion Room</u> Remarks: Coordinate power and data requirements with MCIT. Top and base ordered separately. Bullnose end for top available. Coordinate base location with power and data feeds. Provide ganging kit to attach table to credenza/wall assembly unit.</p>		
Salamander		Model	Clinical	Non-Clinical
<u>F-C1d</u>		<u>Unifi Huddle</u>		<u>*</u>
		<p>Location: <u>Discussion Room</u> Remarks: <u>Coordinate power and data requirements with MCIT. Coordinate finish selection with RED+F.</u></p>		

Salamander		Model	Clinical	Non-Clinical
F-C1e		Unifi Huddle Lite		*
		Location: <u>Discussion Room</u> Remarks: <u>Coordinate power and data requirements with MCIT. Coordinate finish selection with RED+F.</u>		

F-C2 CONFERENCE TABLES WITHOUT POWER				
Steelcase		Model	Clinical	Non-Clinical
F-C2a		Convene		*
		Location: <u>Conference Room</u> Remarks: Floor stub-ups to be noted as "VIF". Final location to be identified in field by Furniture Dealer. Coordinate power and data requirements with MCIT.		
Coalesse		Model	Clinical	Non-Clinical
F-C2b		SW1		*
		Location: <u>Conference Room / Meeting Room</u> Remarks: Coordinate power and data requirements with MCIT.		
Nevis		Model	Clinical	Non-Clinical
F-C2c		Elite		*
		Location: <u>Conference Room</u> Remarks: Coordinate power and data requirements with MCIT.		

F-C2 CONFERENCE TABLES WITHOUT POWER (COST-SAVING ALTERNATIVES)				
Steelcase		Model	Clinical	Non-Clinical
F-C2d		Universal		*
		Location: <u>Conference Room</u> Remarks: Coordinate power and data requirements with MCIT.		
Herman Miller		Model	Clinical	Non-Clinical
F-C2e		Everywhere		*
		Location: <u>Conference Room</u> Remarks: Coordinate power and data requirements with MCIT.		

F-C3 COLLABORATION TABLES WITH / WITHOUT POWER				
HBF		Model	Clinical	Non-Clinical
F-C3a		Parker		*
		Location: <u>Lobby / Waiting / Breakout Space</u> Remarks: Hardwire, if possible.		
Prismatique		Model	Clinical	Non-Clinical
F-C3b		Brooklyn		*
		Location: <u>Lobby / Waiting / Breakout Space</u> Remarks: Hardwire, if possible. Also available as occasional table.		

Nevins		Model	Clinical	Non-Clinical
F-C3c		Parsons		*
		Location: <u>Lobby / Waiting Area / Breakout Space</u> Remarks: Hardwire, if possible.		
Arcadia		Model	Clinical	Non-Clinical
F-C3d		Avelina		*
		Location: <u>Lobby / Waiting Area / Breakout Space</u> Remarks: Hardwire, if possible.		
Herman Miller		Model	Clinical	Non-Clinical
F-C3e		Headway		*
		Location: <u>Lobby / Waiting Area / Breakout Space</u> Remarks: Hardwire, if possible.		
F-C3 COLLABORATION TABLES WITH / WITHOUT POWER (COST-SAVING ALTERNATIVES)				
Logiflex		Model	Clinical	Non-Clinical
F-C3f		Link		*
		Location: <u>Lobby / Waiting / Breakout Space</u> Remarks: Hardwire, if possible.		

F-C4 HEIGHT ADJUSTABLE TABLES				
Steelcase		Model	Clinical	Non-Clinical
F-C4a		Ology		*
		Location: <u>Workstation</u> Remarks: Worksurface height range is 22.6” – 48.7”. Power required. Coor’d outlet location w/ power cord length.		
Herman Miller		Model	Clinical	Non-Clinical
F-C4b		Renew		*
		Location: <u>Workstation</u> Remarks: Worksurface height range is 22” – 48”. Electric extended. Coor’d outlet location w/ power cord length.		
F-C4 HEIGHT ADJUSTABLE TABLES (COST-SAVING ALTERNATIVES)				
G2		Model	Clinical	Non-Clinical
F-C4c		Gen2 Up		*
		Location: <u>Workstation</u> Remarks: Work surface height range is 25-50”. 1” leveling glides can add up to 3-3/4” of adjustment. Power required. Coor’d outlet location w/ power cord length.		
Humanscale		Model	Clinical	Non-Clinical
F-C4d		Float		*
		Location: <u>Workstation</u> Remarks: Pneumatic, power not required.		

F-C5 TRAINING TABLES				
Bernhardt		Model	Clinical	Non-Clinical
F-C5a		Traction		*
		Location: <u>Training Room / Multipurpose</u> Remarks: Coordinate base type with configuration of table layout.		
Steelcase		Model	Clinical	Non-Clinical
F-C5b		Akira		*
		Location: <u>Training Room / Multipurpose</u> Remarks: Coordinate base type with configuration of table layout.		
F-C5 TRAINING TABLES (COST-SAVING ALTERNATIVES)				
Senator		Model	Clinical	Non-Clinical
F-C5c		Array		*
		Location: <u>Training Room / Multipurpose</u> Remarks: Rectangular C-Leg, flip top table		
Arcadia		Model	Clinical	Non-Clinical
F-C5d		Flirt		*
		Location: <u>Training Room / Multipurpose</u> Remarks:		

F-C6 CAFÉ TABLES				
Nevins		Model	Clinical	Non-Clinical
F-C6a		Elite Series w/ x series base		*
		Location: <u>Cafeteria / Public Spaces / Administrative Spaces</u> Remarks: Spec with Krystal Cast for Cafeteria / Public Spaces. Spec with formica for Administrative use. Coor'd edge detail w/ RED+F.		
F-C6 CAFÉ TABLES (COST-SAVING ALTERNATIVES)				
Herman Miller		Model	Clinical	Non-Clinical
F-C6b		Everywhere		*
		Location: <u>Cafeteria / Public Spaces / Administrative Spaces</u> Remarks:		
Leland		Model	Clinical	Non-Clinical
F-C6c		M2		*
		Location: <u>Staff Lounge / Cafeteria</u> Remarks:		
Steelcase		Model	Clinical	Non-Clinical
F-C6d		Universal		*
		Location: <u>Staff Lounge / Administrative Spaces</u> Remarks:		

F-C7 OCCASIONAL TABLES (WITH POWER / USB OUTLETS)				
Nevins		Model	Clinical	Non-Clinical
F-C7a		Adler Drum		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Spec with side power/data port installation only. Must spec mouse hole when plugging into wall outlet. Top shall be wood, solid surface, quartz or resin. Stainless Steel Outlet: COV-2US-V Black Outlet: COV-2UB-V Gloss White Outlet: COV2UW-V		
Nevins		Model	Clinical	Non-Clinical
F-C7b		Abbott Cube		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Spec with side power/data port installation only. Must spec mouse hole when plugging into wall outlet. Spec plinth for use with floor outlet. Top shall be wood, solid surface, quartz or resin. Stainless Steel Outlet: COV-2US-V Black Outlet: COV-2UB-V Gloss White Outlet: COV2UW-V		

F-C8 OCCASIONAL TABLES WITHOUT POWER				
Bernhardt		Model	Clinical	Non-Clinical
F-C8a		Chance		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Top surface to be either Corian or wood. Spec at 23" or 27" high.		
Studio-TK		Model	Clinical	Non-Clinical
F-C8b		Kogen		*
		Location: Lobby / Waiting Area Remarks: Available as task table, medium square and large square coffee tables. Top surface to be either Corian or wood.		

Studio TK		Model	Clinical	Non-Clinical
F-C8be		Envita		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Available as task / occasional tables and square / rectangle coffee table. Top surface to be either Corian or wood.		
F-C8 OCCASIONAL TABLES WITHOUT POWER (COST-SAVING ALTERNATIVES)				
Krug		Model	Clinical	Non-Clinical
F-C8ce		Faeron		*
		Location: <u>Lobby / Waiting Area / Lactation Room</u> Remarks: Available as side and coffee table. For Lactation Rooms provide side table with solid surface top and wood base to match approved Krug Faeron Lounge Chair (Highback).		
Arcadia		Model	Clinical	Non-Clinical
F-C8de		Flirt Occasional Table		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Available as side and coffee table		
Nevins		Model	Clinical	Non-Clinical
F-C8ef		Adler Drum		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Top shall be wood, solid surface, quartz or resin.		
Nevins		Model	Clinical	Non-Clinical
F-C8fg		Abbott Cube		*
		Location: <u>Lobby / Waiting Area</u> Remarks: Top shall be wood, solid surface, quartz or resin.		

Coalesse		Model	Clinical	Non-Clinical
F-C8gh		Await		*
		Location: <u>Lobby / Waiting Area</u> Remarks:		
Koleksiyon		Model	Clinical	Non-Clinical
F-C8hi		Bremen		*
		Location: <u>Lobby / Waiting Area</u> Remarks:		
Peter Pepper		Model	Clinical	Non-Clinical
F-C8ij		Pickup		*
		Location: <u>Lobby / Waiting Area</u> Remarks: 23" high portable and stackable table		

F-C9 INPATIENT TABLES				
Nemshoff		Model	Clinical	Non-Clinical
F-C9a		Pristo	*	
		Location: <u>Patient Room</u> Remarks: Bedside table. Spec with one locked drawer and unlocked cabinet door below. Cabinet door is handed. Specify left or right opening.		

Kimball		Model	Clinical	Non-Clinical
F-C9a		<u>Sanctuary</u>	*	
		Location: <i>Patient Room</i> Remarks: <u>Bedside table with Corian top. Spec with one locked drawer and unlocked cabinet door below. Cabinet door is handed. Specify left or right opening.</u>		
Kwalu		Model	Clinical	Non-Clinical
F-C9b		<u>Auburn</u>	*	
		Location: <i>Patient Room</i> Remarks: <u>Bedside table with Corian top. Spec with one locked drawer and unlocked cabinet door below. Cabinet door is handed. Specify left or right opening.</u>		
Stryker		Model	Clinical	Non-Clinical
F-C9c		Tru-Fit Overbed Table	*	
		Location: <i>Patient Room</i> Remarks: Overbed Table. Do not spec with drawers or flip surface. Provide w/ u-base. ICU/PACU – Split-Top w/ Vanity #3150-000-300 Other – Split-Top w/o Vanity #3150-000-200		
MedViron		Model	Clinical	Non-Clinical
F-C9d		<u>Guardian Bassinet</u>	*	
		Location: <i>Patient Room</i> Remarks:		

D. SEATING

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical seating used at NYU Langone facilities. It is the Architect's responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager and the Design Studio to finalize seating selections. The images shown are for illustrative purposes only and may not be a reflection of a project's final specification. Please note the following requirements as they pertain to seating:

- All task seating selections must allow for ergonomic adjustments, such as adjustable arm heights, seat depths, seat heights, etc.
- Provide seating selections with hard casters for carpeted areas and soft casters for hard floor surface areas.
- 20% of all seating in Waiting Areas must meet Bariatric seating requirements.
- Mesh and upholstery shall be PVC-free. Consider silica as an alternative upholstery fabric.
- Foam shall be formaldehyde-free.
- Use manufacturer's graded in upholstery for items identified as Cost-saving Alternatives.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

The product specifications included in this subsection are organized by type as follows:

- F-D1 Conference Seating
- F-D2 Task Chairs
- F-D3 Task Stools
- F-D4 Private Office Guest Seating
- F-D5 Stacking / Nesting Seating
- F-D6 Café / Staff Lounge Seating
- F-D7 Waiting Area Lounge Seating
- F-D8 Waiting Area Tandem Seating with Power / USB Outlets
- F-D9 Waiting Area Tandem Seating without Power
- F-D10 Bench Seating
- F-D11 Banquet Seating
- F-D12 Clinical Guest Seating
- F-D13 Specialty Seating
- F-D13F-D14 Recliners
- F-D14F-D15 Inpatient Sleepers

F-D1 CONFERENCE SEATING				
Keilhauer		Model	Clinical	Non-Clinical
F-D1a		Vanilla #5462		*
		Location: <u>Conference Rooms</u> (NYU Langone Health Preferred) Remarks: Mid back, slim line, polished aluminum arm and base. Use sloped arm version. Coordinate arm heights with table heights to avoid conflict.		
Keilhauer		Model	Clinical	Non-Clinical
F-D1b		6C		*
		Location: <u>Conference Rooms</u> Remarks: Coordinate arm heights with table heights to avoid conflict.		
F-D1 CONFERENCE SEATING (COST-SAVING ALTERNATIVES)				
Keilhauer		Model	Clinical	Non-Clinical
F-D1c		Vanilla #5531		*
		Location: <u>Conference Rooms</u> Remarks: Low back, border with piping, black urethane arm. Use sloped arm version. Coordinate arm heights with table heights to avoid conflict.		
VIA Seating		Model	Clinical	Non-Clinical
F-D1d		Proform 171		*
		Location: <u>Conference Rooms</u> Remarks: Mid back w/ 97A contemporary cantilever arm. Coordinate arm heights with table heights to avoid conflict.		

F-D2 TASK CHAIRS				
Herman Miller		Model	Clinical	Non-Clinical
F-D2a		Aeron		*
		Location: <u>Private Office / Workstation</u> Remarks: Typical model #AER1B23DW-ALP. Typical model includes Aeron B size standard height range chair with adjustable tilt lumbar and seat angle and non-upholstered fully adjustable arms.		
Steelcase		Model	Clinical	Non-Clinical
F-D2b		Gesture*	*	*
		Location: <u>Private Office / Workstation / Clinical Workstation</u> Remarks: Typical model #442A30. Specify w/ upholstery, shell back, adjustable seat depth, 360-degree arms, 5" pneumatic seat height adjustment. Fully upholstered back required at clinical workstations.		
Steelcase		Model	Clinical	Non-Clinical
F-D2c		Leap*		*
		Location: <u>Private Office / Workstation</u> Remarks: Typical model #46216179. Specify w/ height, width, pivot, depth adjustable arms; lumbar option; 5" pneumatic seat height adjustment		
Steelcase		Model	Clinical	Non-Clinical
F-D2d		Think*	*	*
		Location: <u>Private Office / Open Workstation / Reading Room / Laboratory Workstation / Clinical Workstation</u> Remarks: Typical model #465A000. Provide with height, width, pivot, depth adjustable arms, adjustable seat depth and sliding lumbar support. Fully upholstered option preferred for management offices. Fully upholstered back required at laboratory and clinical workstations. Mesh back option preferred for all other locations.		

Steelcase		Model	Clinical	Non-Clinical
F-D2e		Amia*	*	*
		Location: <u>Private Office / Open Workstation / Clinical Workstation / Laboratory Workstation</u> Remarks: Typical model #4821410U. Provide with height, width, pivot, depth adjustable arms; live lumbar feature and 5” high seat range. Fully upholstered back required at clinical <u>and laboratory</u> workstations.		
Haworth		Model	Clinical	Non-Clinical
F-D2fh		Zody*		*
		Location: <u>Private office / Open Workstation</u> Remarks: Confirm model # w/ RED+F Design Studio. Provide with PAL back system, 4D arms, tension tilt control, multi-position backstop.		
F-D2 TASK CHAIRS (COST-SAVING ALTERNATIVES)				
AllSeating		Model	Clinical	Non-Clinical
F-D2gf		YouToo		*
		Location: <u>Private office / Open Workstation</u> Remarks: Typical model #85040-4D-BKN-21R-SS-BHA-AWK-LH-KD-F-PBLA-AS. Provide medium seat, 4D arms, mid back, seat slider, adjustable width bracket knob, back height adjustment, standard lumbar. <u>Highback version “You” shall be used only when deemed necessary as part of an ergonomic assessment / request.</u>		
Humanscale		Model	Clinical	Non-Clinical
F-D2hg		Liberty*		*
		Location: <u>Private office / Open Workstation</u> Remarks: Typical model #L111BM10FT10		

SitOnIt		Model	Clinical	Non-Clinical
F-D2i		Vectra		*
		Location: <u>Private office / Open Workstation</u> / Remarks: Typical model #1073-BK2-MB-L/E3-AR9. Provide with high back, 8 way arms, graphite frame, standard cylinder, <u>advanced synchro mechanism with seat depth adjustment.</u>		
Notes: 1. End-user trial required prior to specification of task chair and/or headrest. 2. Caster selection must be coordinated with floor finish at chair location. 3. * next to model name indicates availability of headrest.				

F-D3 TASK STOOLS				
Keilhauer		Model	Clinical	Non-Clinical
F-D3a		Sky	*	
		Location: <u>Clinical Use</u> (NYU Langone Health Standard) Remarks: Typical model #2ST312. Available with or without back. If provided, back shall be fully upholstered. Provide w/ alum. base, hand activated upholstered seat, medium seat height (17.5" – 25.25"). Coordinate use with height adjustability range. Use siliform for Clean Room or Pharmacy drug mixing. Breaking mechanism optional (can be retrofitted on site)		
Humanscale		Model	Clinical	Non-Clinical
F-D3b		Freedom Pony	*	
		Location: <u>Clinical Use</u> Remarks: Typical model #F400. Provide w/ standard 5" cylinder, polished alum. frame with graphite trim		

Steelcase		Model	Clinical	Non-Clinical
F-D3c		Think	*	
		<p>Location: <u>Laboratory Benching</u> Remarks: Typical model #465B000. Provide with height, width, pivot, depth adjustable arms, adjustable seat depth and sliding lumbar support. Seat height adjustment between 22.5" – 32". Fully upholstered back version only. For Laboratory Workstations, specify coordinating Think chair with fully upholstered back.</p>		
Steelcase		Model	Clinical	Non-Clinical
F-D3b		Amia	*	
		<p>Location: <u>Laboratory Benching</u> Remarks: Typical model #4827410U. Provide with height, width, pivot, depth adjustable arms (if requested by user); live lumbar feature and 5" high seat range. Seat height adjustment between 23" – 31". Fully upholstered back version only. For Laboratory Workstations, specify coordinating Amia chair with fully upholstered back.</p>		

F-D4 PRIVATE OFFICE GUEST SEATING				
Geiger		Model	Clinical	Non-Clinical
F-D4a		Bumper		*
		<p>Location: <u>Private Office</u> Remarks:</p>		
Keilhauer		Model	Clinical	Non-Clinical
F-D4b		Cal		*
		<p>Location: <u>Private Office</u> Remarks: Polished chrome frame preferred. Wallsaver.</p>		

Arcadia		Model	Clinical	Non-Clinical
F-D4c		Nios Guest		*
		Location: <i>Private Office</i> Remarks: 300 lb. capacity; no wallsaver		
Steelcase		Model	Clinical	Non-Clinical
F-D4d		Bindu		*
		Location: <i>Private Office</i> Remarks:		
Bernhardt		Model	Clinical	Non-Clinical
F-D4e		Helium		*
		Location: <i>Private Office</i> Remarks:		
Krug		Model	Clinical	Non-Clinical
F-D4f		Karma		*
		Location: <i>Private Office</i> Remarks:		
Steelcase		Model	Clinical	Non-Clinical
F-D4g		Wrapp		*
		Location: <i>Private Office / Collaboration Areas</i> Remarks:		

Teknion		Model	Clinical	Non-Clinical
F-D4h		Sitara		*
		Location: <i>Private Office</i> Remarks: 300 lb. capacity with wall saver		
F-D4 PRIVATE OFFICE GUEST SEATING (COST-SAVING ALTERNATIVES)				
Steelcase		Model	Clinical	Non-Clinical
F-D4i#		Collaboration		*
		Location: <i>Private Office</i> Remarks:		
SitOnIt		Model	Clinical	Non-Clinical
F-D4j#		Freelance		*
		Location: <i>Private Office</i> Remarks: Wall saver; bariatric and 365/24/7 options available		
Source International		Model	Clinical	Non-Clinical
F-D4k#		Font		*
		Location: <i>Private Office</i> Remarks: Provide with Script arms.		

F-D5 STACKING / NESTING SEATING				
Keilhauer		Model	Clinical	Non-Clinical
F-D5a		Trua		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Provide with 4 legs. Stacks 10 high on a dolly. Wall saver.		
Krug		Model	Clinical	Non-Clinical
F-D5b		Corfu		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Stacking armchair with polished aluminum frame and arms.		
Kusch		Model	Clinical	Non-Clinical
F-D5c		Sevilla SEV4		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Stacking armchair with bright chrome frame and arms. Standard with plastic glides.		
Herman Miller		Model	Clinical	Non-Clinical
F-D5d		Caper		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Reading Room / Seminar</u> Remarks: Stacks 6 on the floor, 15 on caper cart. Available with casters.		
SitOnIt		Model	Clinical	Non-Clinical
F-D5e		<u>Movi Nester</u>		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: <u>300 lb. capacity; Available with and without arms, casters or glides.</u>		

Allermuir		Model	Clinical	Non-Clinical
F-D5fe		Trillipse		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Stacks 5 on the floor or dolly. Comes with casters.		
F-D5 STACKING / NESTING SEATING (COST-SAVING ALTERNATIVES)				
AllSeating		Model	Clinical	Non-Clinical
F-D5gf		Tuck Stacker		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Stacking chair available with or without arms, upholstered and non-upholstered.		
OFS Highmark		Model	Clinical	Non-Clinical
F-D5hg		Acen		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Nesting chair with arms.		
SitOnIt		Model	Clinical	Non-Clinical
F-D5ih		On Call		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Stacks 8 on the floor, 20-25 on optional cart.		
Andreu World		Model	Clinical	Non-Clinical
F-D5ij		Flex		*
		Location: <u>Conference Room / Training Room / Multipurpose Room / Seminar</u> Remarks: Molded plastic stacking chair. Stacks 10 on the floor or 15 on an optional dolly.		

F-D6 CAFÉ / STAFF LOUNGE / <u>WAITING AREA</u> SEATING				
Andreu World		Model	Clinical	Non-Clinical
F-D6a		Flex Chair / Stool		*
		Location: <u>Café / Cafeteria / Waiting Room</u> Remarks: Provide with wood legs.		
Arcadia		Model	Clinical	Non-Clinical
F-D6b		<u>Brink Stool</u>		*
		Location: <u>Café / Cafeteria / Staff Lounge / Waiting Area</u> Remarks: Available in all wood or wood with upholstered seat, counter and bar heights. 350 lb. maximum capacity.		
Kusch		Model	Clinical	Non-Clinical
F-D6c		8500 Ona Plaza		*
		Location: <u>Staff Lounge</u> Remarks: Available with arm pads.		
Stylex		Model	Clinical	Non-Clinical
F-D6d		Verve Chair / Stool		*
		Location: <u>Café / Cafeteria / Staff Lounge</u> Remarks: Provide w/ 4 legs only.		
Global Furniture Group		Model	Clinical	Non-Clinical
F-D6e		Caprice		*
		Location: <u>Staff Lounge</u> Remarks:		

Coalesse		Model	Clinical	Non-Clinical
F-D6fe		Enea Lottus (plastic)		*
		Location: <i>Staff Lounge</i> Remarks: Provide chair w/ 4 legs only.		
F-D6 CAFÉ / STAFF LOUNGE / WAITING AREA SEATING (COST-SAVING ALTERNATIVES)				
SitOnIt		Model	Clinical	Non-Clinical
F-D6gf	 	Inflex Chair / Stool		*
		Location: <i>Staff Lounge</i> Remarks: Chair stacks 5 on the floor, 8-12 on optional cart.		
AllSeating		Model	Clinical	Non-Clinical
F-D6hg		Tuck (4-Leg)		*
		Location: <i>Staff Lounge</i> Remarks: Provide with wall saver.		
Dauphin		Model	Clinical	Non-Clinical
F-D6ih		Cempa (4 post)		*
		Location: <i>Staff Lounge</i> Remarks: Provide with wall saver.		

F-D7 WAITING AREA LOUNGE SEATING				
Keilhauer		Model	Clinical	Non-Clinical
F-D7a		KM Classic Low Arm	*	*
		Location: <u>Waiting Area</u> Remarks: 500 lb. capacity with special order w/ MSQ.		
Carolina		Model	Clinical	Non-Clinical
F-D7b		Rule of Three	*	*
		Location: <u>Waiting Area</u> Remarks: Standard and bariatric options available.		
HBF		Model	Clinical	Non-Clinical
F-D7c		Salon		*
		Location: <u>Waiting Area</u> Remarks:		
Keilhauer		Model	Clinical	Non-Clinical
F-D7d		Cahoots “Meet”	*	*
		Location: <u>Waiting Area</u> Remarks: Available w/ glides or as swivel.		
Keilhauer		Model	Clinical	Non-Clinical
F-D7e		Doon	*	*
		Location: <u>Waiting Area</u> Remarks: 500 lb. capacity with special order w/ MSQ.		

Keilhauer		Model	Clinical	Non-Clinical
F-D7f		Howden	*	*
		Location: <u>Waiting Area</u> Remarks:		
Keilhauer		Model	Clinical	Non-Clinical
F-D7g		KM Tufted Tuxedo	*	*
		Location: <u>Waiting Area</u> Remarks:		
KI		Model	Clinical	Non-Clinical
F-D7ht		Affina	*	*
		Location: <u>Waiting Area</u> Remarks: Available with wood arm caps.		
Krug		Model	Clinical	Non-Clinical
F-D7j		Zola	*	*
		Location: <u>Waiting Area</u> Remarks: No polyurethane upholstery permitted. PVC or Corian arm caps required. 300 lb. capacity.		
Arcadia		Model	Clinical	Non-Clinical
F-D7jk		Leaf Lounge	*	*
		Location: <u>Waiting Area</u> Remarks: 750 lb. weight capacity. Available with modular tables.		

Coalesse		Model	Clinical	Non-Clinical
F-D7k		Joel	*	*
		Location: <u>Waiting Area</u> Remarks: 250 lb. capacity		
Bernhardt		Model	Clinical	Non-Clinical
F-D7j#		Glasgow	*	*
		Location: <u>Waiting Area</u> Remarks:		
Kimball		Model	Clinical	Non-Clinical
F-D7m#		Bloom		*
		Location: <u>Waiting Area</u> Remarks: Provide static base.		
AllSeating		Model	Clinical	Non-Clinical
F-D7n		<u>Ayles</u>		*
		Location: <u>Waiting Area</u> Remarks: <u>Midback, cone mechanism, lounge base</u>		
Steelcase		Model	Clinical	Non-Clinical
F-D7o#		Leela	*	*
		Location: <u>Waiting Area</u> Remarks: Standard 300 lb. capacity. Bariatric models provide 500 lb. capacity per seat.		

F-D7 WAITING AREA LOUNGE SEATING (COST-SAVING ALTERNATIVES)					
Arcadia		Model	Clinical	Non-Clinical	
F-D7 ph			Uptown Social	*	*
			Location: <u>Waiting Area</u> Remarks: 500 lb. capacity with special order		
Global		Model	Clinical	Non-Clinical	
F-D7 qe			Citi		*
			Location: <u>Waiting Area</u> Remarks:		
Kimball		Model	Clinical	Non-Clinical	
F-D7 ip			Boyd	*	*
			Location: <u>Waiting Area</u> Remarks:		
Arcadia		Model	Clinical	Non-Clinical	
F-D7 sf			Domo Lounge	*	*
			Location: <u>Waiting Area</u> Remarks: 750 lb. weight capacity for settee, 350 lb. capacity for lounge. Available with swivel base.		
Notes: 1. Loveseat / sofa versions available with most lounge chairs. 2. 20% of all seating in Waiting Areas must meet Bariatric seating requirements.					

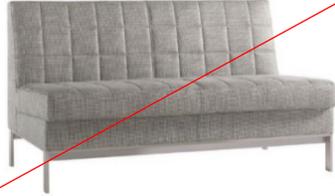
F-D8 WAITING AREA TANDEM SEATING WITH POWER/USB OUTLETS				
Krug		Model	Clinical	Non-Clinical
F-D8a		Zola	*	*
		Location: <u>Waiting Area</u> Remarks: Spec with PVC or Corian arm caps required. One seat version (straight or curved) has standard 300 lb. capacity. One seat bariatric model provides 750 lb. capacity. Available with power/USB outlets.		
Krug		Model	Clinical	Non-Clinical
F-D8b		Faeron	*	*
		Location: <u>Waiting Area</u> Remarks: Bariatric model available. Available with power/USB outlets.		
Krug		Model	Clinical	Non-Clinical
F-D8c		Jordan	*	*
		Location: <u>Waiting Area</u> Remarks: Various seat widths available. Spec with PVC arm caps. 350 lb. capacity. Available with power/USB outlets.		
Carolina		Model	Clinical	Non-Clinical
F-D8d		Modern Amenity	*	*
		Location: <u>Waiting Area</u> Remarks: Spec with polyurethane arm caps. Available with power/USB outlets.		
Arcadia		Model	Clinical	Non-Clinical
F-D8e		Avesa	*	*
		Location: <u>Waiting Area</u> Remarks: Spec with integral power and data. Coordinate power/data installation requirements with the furniture dealer, Architect or NYU Langone AV/IT. Available with power/USB outlets.		

F-D8 WAITING AREA TANDEM SEATING WITH POWER/USB OUTLETS (COST-SAVING ALTERNATIVES)				
Arcadia		Model	Clinical	Non-Clinical
F-D8ef		Domo Modular	*	*
		Location: <u>Waiting Area</u> Remarks: Available with power/USB outlets.		
Notes:				
1. 20% of all seating in Waiting Areas must meet Bariatric seating requirements.				

F-D9 WAITING AREA TANDEM SEATING WITHOUT POWER				
KI		Model	Clinical	Non-Clinical
F-D9a		Affina	*	*
		Location: <u>Waiting Area</u> Remarks: Spec with polyurethane arm caps. For use in tight waiting areas that require modular seating. Bariatric model available.		
Gunlocke		Model	Clinical	Non-Clinical
F-D9b		Molti	*	*
		Location: <u>Waiting Area</u> Remarks: For use in tight waiting areas that require modular seating. Bariatric model available.		

F-D9 WAITING AREA TANDEM SEATING WITHOUT POWER (COST-SAVING ALTERNATIVES)				
Ideon		Model	Clinical	Non-Clinical
F-D9c		Aviera	*	*
		Location: <u>Waiting Area</u> Remarks: Spec with polyurethane arm caps		
Notes:				
1. 20% of all seating in Waiting Areas must meet Bariatric seating requirements.				

F-D10 BENCH SEATING				
Knoll		Model	Clinical	Non-Clinical
F-D10a		Florence		*
		Location: <u>Public Lobby</u> (NYU Langone Health Standard) Remarks:		
Coalesse		Model	Clinical	Non-Clinical
F-D10b		Millbrae		*
		Location: <u>Public Lobby / Waiting Area</u> Remarks:		
Coalesse		Model	Clinical	Non-Clinical
F-D10c		Await		*
		Location: <u>Public Lobby / Waiting Area</u> Remarks:		
Krug		Model	Clinical	Non-Clinical
F-D10d		Zola	*	*
		Location: <u>Waiting Area</u> Remarks: Available in bariatric option.		
F-D10 BENCH SEATING (COST-SAVING ALTERNATIVES)				
Global		Model	Clinical	Non-Clinical
F-D10e		Ballara		*
		Location: <u>Public Lobby / Waiting Area</u> Remarks:		
Notes: 1. 20% of all seating in Waiting Areas must meet Bariatric seating requirements.				

F-D11 BANQUET SEATING				
Coalesse		Model	Clinical	Non-Clinical
F-D11a		Millbrae Contract Lounge		*
		Location: <u>Waiting Areas / Administrative Spaces</u> Remarks:		
Beachley		Model	Clinical	Non-Clinical
F-D11a		Slab Two	*	*
		Location: <u>Café / Cafeteria / Staff Lounge / Waiting Areas / Administrative Spaces</u> Remarks:		
F-D11 BANQUET SEATING (COST-SAVING ALTERNATIVES)				
Beachley		Model	Clinical	Non-Clinical
F-D11b		Constants	*	*
		Location: <u>Café / Cafeteria / Staff Lounge / Waiting Areas / Administrative Spaces</u> Remarks:		
Keilhauer		Model	Clinical	Non-Clinical
F-D11c		Parlez	*	*
		Location: <u>Waiting Areas / Administrative Spaces</u> Remarks:		
Notes:				
1. 20% of all seating in Waiting Areas must meet Bariatric seating requirements.				

F-D12 CLINICAL GUEST SEATING				
Krug		Model	Clinical	Non-Clinical
F-D12a		Karma	*	
		Location: <u>Exam Room</u> Remarks: 500 lb. weight capacity. Provide with wallsaver. Bariatric option available.		
Source International		Model	Clinical	Non-Clinical
F-D12b		Font	*	
		Location: <u>Exam Room</u> Remarks: 325 lb. capacity. Provide with wallsaver and Script arms. Bariatric option available.		
F-D12 CLINICAL GUEST SEATING (COST-SAVING ALTERNATIVES)				
SitOnIt		Model	Clinical	Non-Clinical
F-D12c		Freelance	*	
		Location: <u>Exam Room</u> Remarks: Spec upholstered version. Standard weight capacity is 300 lb. Heavy duty 24/7 version will provide 350 lb. weight capacity. Bariatric option will provide 500 lb. (30") or 1,000 lb. (42") weight capacity.		
Encore		Model	Clinical	Non-Clinical
F-D12d		Mozie	*	
		Location: <u>Exam Room</u> Remarks: 400 lb. capacity. Available in bariatric and caster options. Provide with wall saver.		
AllSeating		Model	Clinical	Non-Clinical
F-D12e		Tuck 4-Leg	*	
		Location: <u>Exam Room</u> Remarks: 320 lb. weight capacity. Available with or without arms. Provide with wall saver.		

Design Within Reach		Model	Clinical	Non-Clinical
F-D12f		Bellini	*	
		Location: <u>MRI (Zone 1)</u> Remarks: Non Ferrous; <u>Provide (2) chairs per MRI scan room</u>		

F-D13 SPECIALTY SEATING				
KI		Model	Clinical	Non-Clinical
F-D13a		Affina	*	*
		Location: <u>Waiting Area</u> Remarks: Hip Chair. 500 lb. capacity. Provide with wallsaver.		
Krug		Model	Clinical	Non-Clinical
F-D13be		Jordan Patient	*	
		Location: <u>Patient Room</u> Remarks:		
Spec Furniture		Model	Clinical	Non-Clinical
F-D13ce		Snowball 2	*	
		Location: <u>Phlebotomy</u> Remarks: Standard option #1854-PH-W20; Bariatric option #1853-PH-W20.		
AllSeating		Model	Clinical	Non-Clinical
F-D13f		Sequel Mid Back #8001	*	
		Location: MRI Remarks: Non Ferrous		

Steelcase		Model	Clinical	Non-Clinical
F-D13d h		Brody WorkLounge (488WO)		*
		Location: <u>Lactation / Wellness Room</u> Remarks: Provide PVC-free upholstery; Available as left and right handed; provide with or without personal work surface; provide w/ USB and electrical outlet; matching side table not required; coordinating Brody footrest available		
Coalesse		Model	Clinical	Non-Clinical
F-D13e		<u>Massaud Work Lounge</u>		*
		Location: <u>Lactation/ Wellness Room</u> Remarks: <u>Provide PVC-free upholstery. Provide with swivel tablet surface; side table not required; coordinating Massaud ottoman available; electric required at wall adjacent to chair</u>		
HBF		Model	Clinical	Non-Clinical
F-D13f i		Dialogue	*	
		Location: <u>Mother-Baby Units</u> Remarks: Provide PVC-free upholstery.		
F-D13 SPECIALTY SEATING (COST-SAVING ALTERNATIVES)				
Krug		Model	Clinical	Non-Clinical
F-D13g h		Faeron	*	*
		Location: <u>Waiting Area</u> Remarks: Hip Chair. 500 lb. capacity. Provide with wallsaver.		
Krug		Model	Clinical	Non-Clinical
F-D13h e		Faeron	*	
		Location: <u>Patient Room</u> Remarks: Provide with wallsaver.		

Krug		Model	Clinical	Non-Clinical
F-D13ig		Faeron Lounge (Highback)		*
		Location: <u>Lactation Room</u> Remarks: Provide w/ open wood arms, no caps and matching side table		

F-D14 RECLINERS				
IOA		Model	Clinical	Non-Clinical
F-D14a13j		Kangaroo	*	
		Location: <u>Mother-Baby Units / NICU</u> Remarks: Bariatric. Add foley bag holder accessory and central locking casters. Confirm model #s w/ RED+F.		
Steelcase Health		Model	Clinical	Non-Clinical
F-D14b13k		Empath	*	
		Location: <u>Patient Rooms / ICU / Cardiac Units Various</u> Remarks: Provide w/ central locking casters. Confirm model #s w/ RED+F.		
Krug		Model	Clinical	Non-Clinical
F-D14c		<u>Jordan</u>	<u>*</u>	
		Location: <u>Various</u> Remarks: Provide w/ central locking casters. Confirm model #s w/ RED+F.		
IOA		Model	Clinical	Non-Clinical
F-D14d		<u>Suspend Recliner</u>	<u>*</u>	
		Location: <u>Various</u> Remarks: Provide w/ central locking casters. Confirm model #s w/ RED+F.		

Carolina		Model	Clinical	Non-Clinical
F-D14e13		Orchestra Recliner #1408-R-OB	*	
		Location: <u>Patient Rooms Various (Bariatric)/PACU</u> Remarks: Provide w/ larger middle footrest to close gap, padded push bar (H1Z), central locking casters (CLC), and pull out foot tray (E1K). Rated for 750 lbs.; Confirm model #s w/ RED+F.		

F-D14F-D15 INPATIENT SLEEPERS

IOA		Model	Clinical	Non-Clinical
F-D15a14a		88 Sleeper Chair	*	
		Location: <u>Patient Room</u> Remarks: Available as single chair, double size or loveseat. Provide w/ central locking casters.		

IOA		Model	Clinical	Non-Clinical
F-D15b		<u>Suspend Sleeper</u>	*	
		Location: <u>Patient Room</u> Remarks: <u>Footrest can support up to 300 lbs.</u> <u>Provide w/ central locking casters.</u>		

IOA		Model	Clinical	Non-Clinical
F-D15c14c		504 Sideline Sofa	*	
		Location: <u>Patient Room</u> Remarks: Provide with Arm Style #507 – Stay and central locking casters.		

F-D15 INPATIENT SLEEPERS (COST-SAVING ALTERNATIVES)

Global		Model	Clinical	Non-Clinical
F-D15d14d		Sleep Eez	*	
		Location: <u>Patient Room</u> Remarks: Provide w/ central locking casters.		

Weiland		Model	Clinical	Non-Clinical
F-D-15614		Sleep Too	*	
		Location: <u>Patient Room</u> Remarks:		

E. STORAGE

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical storage solutions used at NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager and the Design Studio to finalize fixture selections. The images shown are for illustrative purposes only and may not be a reflection of a project’s final specification. Please note the following requirements as they pertain to storage:

- All substrate shall be formaldehyde free.

Please note that it is our mission to decrease the use of paper and to that end please confirm what documents or products must be stored on site when selecting storage fixtures. RED+F can provide assistance in calculating and selecting the proper storage solution.

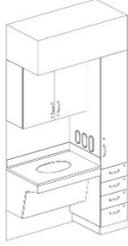
Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

The product specifications included in this subsection are organized by type as follows:

- F-E1 Prefab Millwork
- F-E2 Closed Storage
- F-E3 Open Shelving
- F-E4 Open Storage
- F-E5 Mobile Storage Carts
- F-E6 Lockers

F-E1 PREFAB MILLWORK			
Dirtt	Model	Clinical	Non-Clinical
F-E1a		Dirtt Wall Millwork	*
		Location: <u>Exam Room / Gown Waiting</u> Remarks: Clinical Space Millwork System Provide only if custom millwork is not a viable option.	

F-E1 PREFAB MILLWORK (COST-SAVING ALTERNATIVES)				
Herman Miller		Model	Clinical	Non-Clinical
F-E1b		Mora	*	
		Location: <u>Exam Room / Gown Waiting</u> Remarks: Clinical Space Millwork System Provide only if custom millwork is not a viable option.		

F-E2 CLOSED STORAGE				
Herman Miller		Model	Clinical	Non-Clinical
F-E2a		Canvas		*
		Location: <u>As required</u> Remarks: Metal Storage Units.		
Steelcase		Model	Clinical	Non-Clinical
F-E2b		Universal		*
		Location: <u>As required</u> Remarks: Pedestals, Lateral Files, Cabinets, Bookcases, Towers and Overhead Storage available.		
Watson		Model	Clinical	Non-Clinical
F-E2c		Zo Series		*
		Location: <u>As required</u> Remarks:		

F-E2 CLOSED STORAGE (COST-SAVING ALTERNATIVES)				
Uhuru Design		Model	Clinical	Non-Clinical
F-E2d		Totem Slim Rolling Pedestal		*
		Location: <u>As required</u> Remarks:		
Bludot		Model	Clinical	Non-Clinical
F-E2e		<u>Filing Cabinet No. 1</u>		*
		Location: <u>As required</u> Remarks:		
Herman Miller		Model	Clinical	Non-Clinical
F-E2fe		Meridian		*
		Location: <u>As required</u> Remarks: Storage Units.		
Global Total Office		Model	Clinical	Non-Clinical
F-E2gf		9300 Series		*
		Location: <u>Back of House / Storage Rooms</u> Remarks: Storage Units. Consult w/ RED+F for Statement of the Line Guideline.		

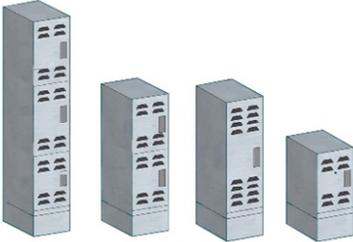
F-E3 OPEN SHELVING				
21C Systems		Model	Clinical	Non-Clinical
F-E3a		System 1		*
		Location: <u>Private Office / Open Work Area</u> Remarks: Wall mounted shelving system with metal or laminate shelves		

F-E4 OPEN STORAGE				
Nexel Industries		Model	Clinical	Non-Clinical
F-E4a		Varies	*	*
		Location: <u>Storage Rooms</u> Remarks: Wire Shelving. Non-caster models available. <u>Solid shelf at the bottom and covers for clinical locations.</u>		
F-E4 OPEN STORAGE (COST-SAVING ALTERNATIVES)				
Metro Shelving		Model	Clinical	Non-Clinical
F-E4b		Varies	*	*
		Location: <u>Storage Rooms</u> Remarks: Wire Shelving. Non-caster models available. <u>Solid shelf at the bottom and covers for clinical locations.</u>		

F-E5 MOBILE STORAGE CARTS				
Herman Miller		Model	Clinical	Non-Clinical
F-E5a		C-Locker	*	
		Location: <u>As required</u> Remarks: Procedure / Supply Cart with tambour door		
Herman Miller		Model	Clinical	Non-Clinical
F-E5b		Varies	*	
		Location: <u>As required</u> Remarks: Procedure / Supply Cart		

F-E6 LOCKERS				
New England Wood Co.		Model	Clinical	Non-Clinical
F-E6a		1-Tier HPL Lockers	*	*
		<p>Location: <u>Gown Waiting / Other Patient Areas</u> Remarks: A/E Team to confirm room size and locker configuration, size (12”w x 24”d x 76”h incl. 6”h closed base, typ), quantity and locking mechanism (Zephyr mechanical push button lock #6510 preferred) w/ end user.</p>		
New England Wood Co.		Model	Clinical	Non-Clinical
F-E6b		HPL Z-Lockers	*	*
		<p>Location: <u>Gown Waiting / Other Patient Areas</u> Remarks: A/E Team to confirm room size and locker configuration (single or double), size (width varies x 24”d x 76”h incl. 6”h closed base, typ), quantity and locking mechanism (Zephyr mechanical push button lock #6510 preferred) w/ end user.</p>		
New England Wood Co.		Model	Clinical	Non-Clinical
F-E6c		Personal HPL Lockers	*	*
		<p>Location: <u>Gown Waiting / Other Patient Areas</u> Remarks: A/E Team to confirm room size and locker configuration, size, quantity and locking mechanism (Zephyr mechanical push button lock #6510 preferred) w/ end user. HPL finished top optional.</p> <p>1-Tier (short): 12”w x 18”d x 29”h, typ. 1-Tier (tall): 12”w x 18”d x 39”h, typ. 2-Tier: 12”w x 18”d x 39”h, typ. 3-Tier: 12”w x 18”d x 56”h, typ.</p>		
Zephyr		Model	Clinical	Non-Clinical
F-E6d		6510 Mechanical Push Button Lock	*	*
		<p>Location: <u>HPL Lockers</u> Remarks: Vertical design; recessed mounting; A/E Team to confirm lock preferences (hasp vs push button) with end user.</p>		

Keyless		Model	Clinical	Non-Clinical
F-E6e		Keyless1-ADA	*	*
		Location: <i>HPL Lockers</i> Remarks: Vertical design; recessed mounting; with ADA style knob A/E Team to confirm Locker Room ADA requirements. ADA-compatible only when properly installed.		
Hallowell or Perfix		Model	Clinical	Non-Clinical
F-E6f		1-Tier Steel Lockers	*	*
		Location: <i>Staff Locker Rooms</i> Remarks: A/E Team to confirm room size and locker configuration, size (12”w x 18”d x 78”h incl. 6”h closed base, typ), quantity and locking mechanism (Hollman high security padlock hasp w/ Zephyr padlock #1925 preferred) w/ end user.		
Hallowell or Perfix		Model	Clinical	Non-Clinical
F-E6g		2-Tier Steel Lockers	*	*
		Location: <i>Staff Locker Rooms</i> Remarks: A/E Team to confirm room size and locker configuration, size (12”w x 18”d x 78”h incl. 6”h closed base, typ), quantity and locking mechanism (Hollman high security padlock hasp w/ Zephyr padlock #1925 preferred) w/ end user.		
Hallowell or Perfix		Model	Clinical	Non-Clinical
F-E6h		3-Tier Steel Lockers	*	*
		Location: <i>Staff Locker Rooms</i> Remarks: A/E Team to confirm room size and locker configuration, size (12”w x 18”d x 78”h incl. 6”h closed base, typ), quantity and locking mechanism (Hollman high security padlock hasp w/ Zephyr padlock #1925 preferred) w/ end user.		

Hallowell or Perfix		Model	Clinical	Non-Clinical
F-E6i		2 Person 1-Tier Steel Lockers	*	*
		<p>Location: <u>Staff Locker Rooms</u> Remarks: A/E Team to confirm room size and locker configuration, size (15”w x 18”d x 78”h incl. 6”h closed base, typ), quantity and locking mechanism (Hollman high security padlock hasp w/ Zephyr padlock #1925 preferred) w/ end user. Closed shoe cubbies at top shall be operable only when corresponding locker below is open.</p>		
Hallowell or Perfix		Model	Clinical	Non-Clinical
F-E6j		Personal Steel Lockers	*	*
		<p>Location: <u>Staff Locker Rooms / Open Staff Areas</u> Remarks: A/E Team to confirm room size and locker configuration, size, quantity and locking mechanism (Hollman high security padlock hasp w/ Zephyr padlock #1925 preferred) w/ end user. HPL finished top optional. 1-Tier (short): 12”w x 18”d x 29”h, typ. 1-Tier (tall): 12”w x 18”d x 39”h, typ. 2-Tier: 12”w x 18”d x 39”h, typ. 3-Tier: 12”w x 18”d x 56”h, typ.</p>		
Herman Miller		Model	Clinical	Non-Clinical
F-E6k		Meridian / Personal Steel Lockers	*	*
		<p>Location: <u>Staff Locker Rooms / Open Work Areas</u> Remarks: A/E Team to confirm room size and locker configuration, size, quantity and locking mechanism (key lock and electronic lock options available) w/ end user. Available w/ 2 lockers per module in 1-high, 2-high or 3-high stacks. Doors are hinged left or right. Each unit comes w/ or w/o laminate top and has 3 base height options or no base option. 1-Tier (2-locker module): 30”w x 20”d x 19-5/8”h, typ. 2-Tier (4-locker module): 30”w x 20”d x 39-1/4”h, typ. 3-Tier (6-locker module): 30”w x 20”d x 58-7/8”h, typ.</p>		

Herman Miller		Model	Clinical	Non-Clinical
F-E6I		TS Series		*
		Location: <u>Staff Locker Rooms / Open Work Areas</u> Remarks: A/E Team to confirm room size and locker configuration, size, quantity and locking mechanism (key lock and electronic lock options available) w/ end user. Available w/ as single and double lockers, quad and cubby lockers, multipurpose and mini lockers.		
Zephyr		Model	Clinical	Non-Clinical
F-E6m		1925	*	*
		Location: <u>Staff Locker Rooms</u> Remarks: Padlock with supervisory key control		
<p>Notes:</p> <ol style="list-style-type: none"> 1. All locker base shall be integral, closed type. Do not provide toe kick, unless noted otherwise. 2. Locker base height to coordinate with adjacent room base. 3. Room base to be applied over HPL locker base, unless noted otherwise. Heights to match. 4. HPL lockers shall have formaldehyde-free substrate. 5. If no drywall soffit in clinical spaces, provide sloped top (adds 6" in height). 6. For rooms with drywall soffit, coordinate locker height with soffit height. 7. Approved colors for Hallowell or Perfix steel lockers are: Grey, Parchment and Marine Blue. 8. Lockers shall be provided as part of the furniture package and not by the GC. 				

F. ACCESSORIES

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical accessories used at NYU Langone facilities to complete a space, increasing its functionality or adding the ergonomic components needed for optimal user comfort. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager and the Design Studio to finalize accessory selections. The images shown are for illustrative purposes only and may not be a reflection of a project’s final specification.

Cost-saving Alternatives:

The RED+F PM will advise the A/E Design Team if items identified as Cost-saving Alternatives shall be allowed on their project. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

The product specifications included in this subsection are organized by type as follows:

- F-F1 Chart Holders
- F-F2 Literature Holders
- F-F3 Drawer Storage Units
- F-F4 Task Lighting
- F-F5 Decorative Lighting
- F-F6 Undercabinet Lighting
- F-F7 IT Accessories
- F-F8 Glass Marker and Magnet Boards
- F-F9 Tack Boards
- F-F10 Specialty Ergonomic Furniture & Accessories

F-F1 CHART HOLDERS				
Peter Pepper		Model	Clinical	Non-Clinical
F-F1a		4001	*	
		<p>Location: <u>Exam / Patient Room</u></p> <p>Remarks: Chart Holder. Confirm chart depth prior to specification.</p>		

F-F1 CHART HOLDERS (COST-SAVING ALTERNATIVES)				
Peter Pepper		Model	Clinical	Non-Clinical
F-F1b		13115	*	
		Location: <u>Exam / Patient Room</u> Remarks: Chart Holder. Confirm chart depth prior to specification.		

F-F2 LITERATURE HOLDERS				
Hightower		Model	Clinical	Non-Clinical
F-F2a		Wave	*	*
		Location: <u>Waiting Area</u> Remarks: Literature Holder		

F-F2 LITERATURE HOLDERS (COST-SAVING ALTERNATIVES)				
Peter Pepper		Model	Clinical	Non-Clinical
F-F2b		600	*	*
		Location: <u>Waiting Area</u> Remarks: Vertical 10 Pocket Literature Holder		

Peter Pepper		Model	Clinical	Non-Clinical
F-F2c		603	*	*
		Location: <u>Waiting Area</u> Remarks: Horizontal 5 Pocket Literature Holder		

Peter Pepper		Model	Clinical	Non-Clinical
F-F2d		606	*	*
		Location: <u>Waiting Area</u> Remarks: Vertical 10 Pocket Literature Holder		

F-F3 DRAWER STORAGE UNITS				
Doug Mockett		Model	Clinical	Non-Clinical
F-F3a		DWR1-WL-90 or DWR1-90	*	
		Location: <u>Reception/Registration Desks and Billing</u> Remarks: DWR1-WL-90 unit w/ locking lid for registration areas with workstations needing cash drawer. DWR1-90 is the non-locking version.		

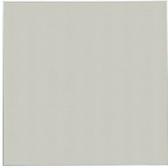
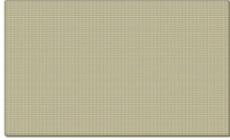
F-F4 TASK LIGHTING				
Humanscale		Model	Clinical	Non-Clinical
F-F4a		Nova Lamp		*
		Location: <u>Private Office / Workstation</u> Remarks: include outlet in base. Provide with technology base.		
Humanscale		Model	Clinical	Non-Clinical
F-F4b		Horizon 2.0 Lamp		*
		Location: <u>Private Office / Workstation</u> Remarks:		
Steelcase		Model	Clinical	Non-Clinical
F-F4c		Dash		*
		Location: <u>Private Office / Workstation</u> Remarks: Dimmable LED		

F-F5 DECORATIVE LIGHTING				
3-Form Light Art		Model	Clinical	Non-Clinical
F-F5a		LA2 Table Lamp		*
		Location: <u>Private Office</u> Remarks: LED Lamp		
Herman Miller		Model	Clinical	Non-Clinical
F-F5b		Ode Table Lamp		*
		Location: <u>Private Office</u> Remarks:		
Nelson		Model	Clinical	Non-Clinical
F-F5c		<u>Cigar Lotus Table Lamp</u>		<u>*</u>
		Location: <u>Private Office</u> Remarks:		

F-F6 UNDERCABINET LIGHTING				
Herman Miller		Model	Clinical	Non-Clinical
F-F6a		Twist		*
		Location: <u>Private Office / Workstation</u> Remarks: Magnetic installation		
Steelcase		Model	Clinical	Non-Clinical
F-F6b		Underline Shelf Light		*
		Location: <u>Private Office / Workstation</u> Remarks:		

F-F7 IT ACCESSORIES				
<u>Refer to the latest MCIT NYU Langone Health – Hardware Standards.</u>				
Ergotron		Model	Clinical	Non-Clinical
F-F7a		StyleView Sit Stand Enclosure	*	
		Location: <u>Staff Lounge</u> Remarks: Confirm model #s w/ RED+F.		
Humanscale		Model	Clinical	Non-Clinical
F-F7ab		CPU 200	*	*
		Location: <u>Private Office / Workstation</u> Remarks: CPU Holder; confirm model w/ MCIT; not necessary for end-users w/ all-in-one computers		
ESI Ergonomic Solutions		Model	Clinical	Non-Clinical
F-F7be		ACPC-1	*	*
		Location: <u>Printer Locations</u> Remarks: Printer Cart; confirm project needs w/ MCIT		
Logiflex		Model	Clinical	Non-Clinical
F-F7cd		T19 Table	*	*
		Location: <u>Printer Locations</u> Remarks: 18" w x 18" d x 19" h printer stand; confirm finishes w/ RED+F; confirm project needs w/ MCIT		

F-F8 GLASS MARKER AND MAGNET BOARDS				
Egan Visual		Model	Clinical	Non-Clinical
F-F8a		GlassWrite MAG (DGM)	*	*
		Location: <u>As required</u> Remarks: Dry-erase magnetic tempered glass marker board; sizes per job requirements; incl. accessories and supplies – Markers, Trays, EganCloth Erasers, EganCloth Caddy (for magnet-compatible glass boards only)		
Clarus		Model	Clinical	Non-Clinical
F-F8b		Glassboard Float	*	*
		Location: <u>As required</u> Remarks: Dry-erase magnetic tempered glass marker board; sizes per job requirements; incl. accessories and supplies – Clarus Markers, Trays, Erasers, Magnets and Caddy (for magnet-compatible glass boards only)		
F-F8 <u>GLASS MARKER AND MAGNET BOARDS (COST-SAVING ALTERNATIVES)</u>				
Bendheim		Model	Clinical	Non-Clinical
F-F8c		<u>QuickKISS</u>	-	-
		Location: <u>As required</u> Remarks: <u>Ready-to-install, quick-ship magnetic dry-erase glass board with built-in wall-mounting hardware; passes 400 lbf (pound-force) impact test; sizes per job requirements; incl. accessories and supplies (i.e. markers, trays, erasers, magnets and caddies for magnet-compatible glass boards only)</u>		
Steelcase		Model	Clinical	Non-Clinical
F-F8d		<u>Edge Series</u>	-	-
		Location: <u>As required</u> Remarks: <u>Whiteboard</u>		

F-F9 TACK BOARDS				
Egan Visual		Model	Clinical	Non-Clinical
F-F9a		MDTB / MDTs	*	*
		Location: <i>As required</i> Remarks: Aluminum Frame Tack board		
F-F9 TACK BOARDS (COST-SAVING ALTERNATIVES)				
CBR		Model	Clinical	Non-Clinical
F-F9b		Mag Tack	*	*
		Location: <i>As required</i> Remarks: Tack board; magnetic fabric wrapped panel		
Forbo		Model	Clinical	Non-Clinical
F-F9c		Bulletin Board	*	*
		Location: <i>As required</i> Remarks: All-natural pin board material; available as framed, surface mounted (i.e. on furniture) or wall applied; non-magnetic		

F-F10 SPECIALTY ERGONOMIC FURNITURE & ACCESSORIES				
Humanscale		Model	Clinical	Non-Clinical
F-F10a		M8	*	*
		Location: <i>Private Office / Workstation</i> Remarks: Monitor Arm		
Humanscale		Model	Clinical	Non-Clinical
F-F10b		See Remarks	*	*
		Location: <i>Private Office / Workstation</i> Remarks: Keyboard Tray Corner: #6G 700 90 Straight: #6G 900 90		

Humanscale		Model	Clinical	Non-Clinical
F-F10c		FM500 FR500	*	*
		Location: <i>Private Office / Workstation</i> Remarks: Foot rest/ <u>rocker; available in cherry and black</u>		
Humanscale		Model	Clinical	Non-Clinical
F-F10d		FM300 FR300	*	*
		Location: <i>Private Office / Workstation</i> Remarks: Foot rest/ <u>rocker; available in natural finish</u>		
Steelcase		Model	Clinical	Non-Clinical
F-F10e		Campfire	*	*
		Location: <i>Private Office / Workstation</i> Remarks: Foot and leg rest		

G. OUTDOOR FURNITURE

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific furniture and accessory items are used. The list below will give the A/E Team a sense of the typical outdoor furniture used at NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager and the Design Studio to finalize outdoor furniture selections. The images shown are for illustrative purposes only and may not be a reflection of a project’s final specification.

The product specifications included in this subsection are organized by type as follows:

- F-G1 Outdoor Seating
- F-G2 Outdoor Tables

F-G1 OUTDOOR SEATING				
Weatherend		Model	Clinical	Non-Clinical
F-G1a		Semicircular Settee		*
		Location: <u>Outdoor Space</u> Remarks: Outdoor Bench finished with “Yacht” paint in satin finish. Color to be approved by RED+F.		
Weatherend		Model	Clinical	Non-Clinical
F-G1b		Quarter Circular Settee		*
		Location: <u>Outdoor Space</u> Remarks: Outdoor Bench finished with “Yacht” paint in satin finish. Color to be approved by RED+F.		
Weatherend		Model	Clinical	Non-Clinical
F-G1c		Campobello		*
		Location: <u>Outdoor Space</u> Remarks: Outdoor Dining Arm Chair finished with “Yacht” paint in satin finish. Color to be approved by RED+F.		

Coalesse		Model	Clinical	Non-Clinical
F-G1d		Emu IVY		*
		Location: <u>Outdoor Space</u> Remarks: Lounge Chair also available as Sofa		
Landscape Forms		Model	Clinical	Non-Clinical
F-G1e		Chipman Chair		*
		Location: <u>Outdoor Space</u> Remarks: Aluminum stacking dining chair finished with silver metallic powder coat.		
Henry Hall Designs		Model	Clinical	Non-Clinical
F-G1f		Tlente Chaise		*
		Location: <u>Outdoor Space</u> Remarks: Chaise in white standard finish; Custom colors available		

F-G2 OUTDOOR TABLES				
Weatherend		Model	Clinical	Non-Clinical
F-G2a		Isleboro		*
		Location: <u>Outdoor Space</u> Remarks: Outdoor Dining Table finished with "Yacht" paint in satin finish. Color to be approved by RED+F.		
Landscape Forms		Model	Clinical	Non-Clinical
F-G2b		Chipman Table		*
		Location: <u>Outdoor Space</u> Remarks: Aluminum dining table finished with silver metallic powder coat.		

PANTRY APPLIANCES

In accordance with both our Mission devoted to excellence in patient care, education, and research and our Design Principles of providing timeless designs that are cost effective, efficient, functional and practical, RED+F has compiled a collection of appliances that we have found to be successful at NYU Langone Health.

Our goals in listing these items are to:

- Streamline the design process
- Assist the Architect and Interior Designer with specifying pantry appliances
- Create spaces that are timeless, durable, easily maintainable and cost-effective
- Create a consistent NYU Langone brand

The Architect and Interior Designer should use this as a guide for specifying pantry appliances on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying materials that are appropriate and code compliant for specific spaces. Also, the Architect and Interior Designer may suggest other products if they believe those proposed products will support our mission, design principles, and the design intent of the project.

The following ratios shall be used when specifying pantry appliances:

Item	Ratio
Microwave	1 per 75 persons
Under-counter Refrigerator	1/3 cu. ft. per person
Refrigerator	
Dishwasher (<i>if required</i>)	1 per 240 persons
Low-Capacity Coffee Maker	1 per 25 persons
Medium-Capacity Coffee Maker	1 per 25 - 50 persons
High-Capacity Coffee Maker	1 per 50 - 100 persons
Water Dispenser	1 per 75 persons

The product specifications included in this subsection are organized by type as follows:

- A1. Microwaves
- A2. Under-counter Refrigerators
- A3. Refrigerators
- A4. Dishwashers
- A5. Coffee Makers
- A6. Water Dispensers

Appliances within the same “Complementary Appliance Set”, as noted in the product specifications below, shall be specified per pantry to ensure compatibility between manufacturer finishes.

A1. MICROWAVES					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
A1a 	Microwave	Kenmore	79393/ Stainless Steel		*
	<p>Dimensions: 24.7" w x 20.7" d x 14.2" h Remarks: 2.2 cu.ft. w/ optional 27" or 30" stl. stl. trim kit Complementary Appliance Set: A</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
A1b 	Microwave	Kitchenaid	KMCS3022GSS/ Stainless Steel		*
	<p>Dimensions: 24" w x 19 5/8" d x 13 1/2" h Remarks: 2.2 cu.ft. w/ optional 27" or 30" stl. stl. trim kit Complementary Appliance Set: B</p>				
Image	Description	Manuf.	Finish	Clinical	Non-Clinical
A1 	<u>Built-in Microwave</u>	<u>See Below</u>	<u>Stainless Steel</u>		* -
	<p>Remarks: 2.0 – 2.2 cu. ft. w/ stainless steel trim kit Manufacturers: GE, Kitchenaid, Frigidaire, LG, Whirlpool, Summit</p>				

A2. UNDER-COUNTER REFRIGERATORS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
A2a 	Compact Refrigerator	Summit	FF63BSSHVADA/ Stainless Steel		*
	<p>Dimensions: 23.63" w x 23" d (w/o handle) x 32.25" h (to top of hinge) Remarks: 5.5 cu. ft. capacity compact refrigerator; w/o freezer or casters; w/ 3 adjustable glass shelves, crisper drawer, and “professional” handle type; right side hinge only, door handing factory reversible only; ADA-compliant height; RED+F PM and A/E Team to determine refrigerator size with user. Complementary Appliance Set: A</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>A2b</p>	Compact Refrigerator	Kitchenaid	Model #s below / Stainless-Steel		*
	<p>Dimensions: 23-3/4" w x 26-3/4" d x 35-1/8" h Remarks: 4.9 cu.ft. capacity compact refrigerator; w/o freezer Right-hand Model # KURR104ESB Left-hand Model # KURL104ESB RED+F PM and A/E Team to determine refrigerator size with user. Complementary Appliance Set: B</p>				
Image	Description	Manuf.	Finish	Clinical	Non-Clinical
 <p>A2</p>	Compact Refrigerator	See Below	Stainless Steel		* -
	<p>Remarks: 5.0 – 6.0 cu. ft.; Energy Star rated, if possible Manufacturers: GE, Kitchenaid, Frigidaire, LG, Whirlpool, Summit</p>				

A3. REFRIGERATORS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>A3a</p>	Refrigerator	Kenmore	79313 / Stainless-Steel		*
	<p>Dimensions: 30" w (w/ dr. closed) x 30.875" d (w/o door handles) x 67" h (to top of hinge) Remarks: 19 cu.ft. capacity refrigerator w/ ice maker (not filtered). Handle is reversible. RED+F PM and A/E Team to determine refrigerator size with user. Complementary Appliance Set: A</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>A3b</p>	Built-in Refrigerator	Kitchenaid	Model #s below / Stainless-Steel		*
	<p>Dimensions: 36-1/4" w (w/ door closed) x 27-3/4" d (w/ door handles) x 83-3/8" h (to top of cabinet) Remarks: 20.9 cu.ft. capacity refrigerator w/ ice maker (filtered). RED+F PM and A/E Team to determine refrigerator size with user. Right-hand Model # KBBR206ESS Left-hand Model # KBBL206ESS Complementary Appliance Set: B</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>A3c</p>	Built-in Refrigerator	Kitchenaid	KBFN406ESS / Stainless-Steel		*
	<p>Dimensions: 36-1/4" w (w/ doors closed) x 27-3/4" d (w/ door handles) x 83-3/8" h (to top of cabinet) Remarks: 20.8 cu.ft. capacity refrigerator w/ ice maker. RED+F PM and A/E Team to determine refrigerator size with user. Complementary Appliance Set: B</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
A3d		Built-in Refrigerator	Kitchenaid	KBFN402ESS / Stainless Steel		*
		<p>Dimensions: 42-1/4" w (w/ doors closed) x 27-3/4" d (w/ door handles) x 83-3/8" h (to top of cabinet)</p> <p>Remarks: 24.2 cu.ft. capacity refrigerator w/ ice maker. RED+F PM and A/E Team to determine refrigerator size with user.</p> <p>Complementary Appliance Set: B</p>				
Image	Description	Manuf.	Finish	Clinical	Non-Clinical	
A3		Built-in Refrigerator	See Below	Stainless Steel / Panel Ready		* -
		<p>Remarks: 30" – 42" wide; counter depth; 19.0 – 24.0 cu.ft. capacity; freezer on the bottom; one / two doors on the top; no water on the door; filtered integrated automatic ice maker; Energy Star rated, if possible</p> <p>Manufacturers: GE, Kitchenaid, Frigidaire, LG, Whirlpool, Summit</p>				

A4. DISHWASHERS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
A4a		Dishwasher	Kenmore	13543 / Stainless Steel		*
		<p>Dimensions: 24" w x 24.875" d x 34" h</p> <p>Remarks: RED+F and A/E Team to confirm if DW is required prior to specification.</p> <p>Complementary Appliance Set: A</p>				
A4b		Dishwasher	Kitchenaid	KDTE354ESS / Stainless Steel		*
		<p>Dimensions: 23-7/8" w x 24-3/4" d x 34-1/2" h</p> <p>Remarks: RED+F and A/E Team to confirm if DW is required prior to specification.</p> <p>Complementary Appliance Set: B</p>				
Image	Description	Manuf.	Finish	Clinical	Non-Clinical	
A4		Built-in Dishwasher	See Below	Stainless Steel / Panel Ready		* -
		<p>Remarks: 24" wide; installed under 34" ADA counter height; controls on top; Energy Star rated, if possible</p> <p>Manufacturers: GE, Kitchenaid, Frigidaire, LG, Whirlpool, Summit</p>				

A5. COFFEE MAKERS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
A5a		Low-Capacity Coffee Maker	FETCO	CBS-2121A (w/o warmers)		*
		Dimensions: 7-5/8" w x 19" d x 19" h Remarks: Plumbed; requires filtered water and backflow prevention valve; incl. hot water spout; uses standard 4-1/2" filter; provide w/ FETCO Stainless Steel 1.9 Thermal Server(s) #D055 Complementary Appliance Set: A or B				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
A5b		Medium-Capacity Coffee Maker	Keurig	K3000SE / Silver		*
		Dimensions: 12" w x 18" d x 17.4" h Remarks: Plumbed; for use w/ k-cup pods; incl. auto-pod ejector Complementary Appliance Set: A or B				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
A5c		High-Capacity Coffee Maker	WMF	1500s		*
		Dimensions: 13" w x 24" d x 27" h (not incl. milk ref.) Remarks: Plumbed w/ 2 coffee and 1 chocolate hopper. Spec w/o warming wand. Separate fresh milk refrigerator required. Coord grind disposal options w/ RED+F based on millwork design. Requires maintenance contract. Complementary Appliance Set: A or B				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
A5d		High-Capacity Coffee Maker	Keurig Commercial	Eccellenza Touch		*
		Dimensions: 20" w x 20.25" d x 28" h Remarks: Plumbed w/ 2 bean and 3 powder dispensers. Brews to 3 brewing strengths and 3 cup sizes. User control via 10.1" programmable interactive touchscreen. Wi-Fi connection required. Requires maintenance contract. Complementary Appliance Set: A or B				
Notes: <ol style="list-style-type: none"> It is the responsibility of the User department to arrange for rental/purchase of a coffee maker through NYULH Finance. RED+F PM and A/E Team shall review the selection of coffee makers with both the User and NYU Langone's Food & Nutrition Services and take into consideration the following : <ul style="list-style-type: none"> Occupancy count User drink preference (traditional coffee vs. espresso style drinks) Daily maintenance requirements (some machines require daily cleaning) As part of the capital construction project the A/E Team shall provide: <ul style="list-style-type: none"> all necessary plumbing and power connections countertop space for a plumbed coffee maker 						

A6. WATER DISPENSERS						
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
A6a		Countertop Cooler	Quench	Q7 Countertop / Black	*	*
		<p>Dimensions: 11.6”w x 17.5”d x 17.9”h</p> <p>Remarks: Bottleless disp.; hot and cold water; plumbed; LED UV light to maintain water quality; RO or carbon filtration <u>unit to be mounted w/in base cabinet below unit; allow for dedicated ¼” cold water line to filtration system w/in base cabinet; allow for ¼” filtered water line from filtration system w/in base cabinet to unit through countertop</u></p> <p>Complementary Appliance Set: A or B</p>				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
A6b		Free-standing Cooler	Quench	Q7 Freestanding / Black	*	*
		<p>Dimensions: 11.6”w x 16.5”d x 49.8”h</p> <p>Remarks: Bottleless disp.; hot and cold water; plumbed ; LED UV light to maintain water quality, RO or carbon filtration</p> <p>Complementary Appliance Set: A or B</p>				
<p>Notes :</p> <ol style="list-style-type: none"> 1. It is the responsibility of the User department to arrange for rental of a water cooler through NYULH Finance. 2. As part of the capital construction project the A/E Team shall provide: <ul style="list-style-type: none"> - all necessary plumbing and power connections - either countertop space or a niche for a plumbed water cooler 						

PLUMBING FIXTURES

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific plumbing fixtures are used. The product list provided in this subsection will give the A/E Team a sense of the typical fixtures used at NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager, Facilities Operations and the Design Studio to finalize fixture selections. Please note the following items:

- Use all-in-one sinks and touchless flushometers in public restrooms.
- Floor mounted toilets are preferred over wall mounted toilets.
- Provide manual flushvalves and faucets in Sabbath identified restrooms.

The following fixtures are required at a minimum in restrooms:

Item	NON-CLINICAL			CLINICAL						
	Multi-Stall Public Toilet (Women's)	Multi-Stall Public Toilet (Men's)	Single-Stall Public Toilet	Multi-Stall Public Toilet (Women's)	Multi-Stall Public Toilet (Men's)	Single-Stall Public Toilet	Staff Restrooms	Toilets (within Clinical-dept.)	Patient Room Toilets	Pediatric Patient Room Toilets
Toilet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Toilet Flush Valve (Automatic)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Urinal		✓			✓					
Urinal Flush Valve (Automatic)		✓			✓					
All-in-One Sink Assembly (incl. sink, faucet, soap disp. + hand dryer)	✓	✓	✓	✓	✓	✓				
Sink			✓			✓	✓	✓	✓	✓
Faucet (Automatic)			✓			✓	✓	✓		
Faucet (Manual)									✓	✓
Bedpan Washer									✓	✓
Shower									✓	✓

Item	CLINICAL										
	Multi-Stall <u>Public Toilet</u> (Women's)	Multi-Stall <u>Public Toilet</u> (Men's)	Single Stall <u>Public Toilet</u>	Multi-Stall <u>Staff Toilet</u> (Women's)	Multi-Stall <u>Staff Toilet</u> (Men's)	Single Stall <u>Staff Toilet</u>	Staff <u>Locker Room</u> (Women's)	Staff <u>Locker Room</u> (Men's)	<u>Patient Room Toilet</u>	<u>Pediatric Patient Room Toilet</u>	Single Stall <u>Patient Toilet</u> (off of corridors)
<u>Toilet (Floor Mounted)</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Toilet Flush Valve (Automatic)</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Urinal</u>		✓			✓			✓			
<u>Urinal Flush Valve (Automatic)</u>		✓			✓			✓			
<u>All-in-One Sink Assembly</u> (incl. sink, faucet, soap disp. + hand dryer)	✓	✓	✓	✓	✓	✓					
<u>Sink</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Automatic Faucet</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓			✓
<u>Manual Faucet</u>									✓	✓	
<u>Bedpan Washer</u>									✓	✓	
<u>Shower</u>							✓	✓	✓	✓	

Item	NON-CLINICAL							
	Multi-Stall Public Toilet (Women's)	Multi-Stall Public Toilet (Men's)	Single Stall Public Toilet	Multi-Stall Staff Toilet (Women's)	Multi-Stall Staff Toilet (Men's)	Single Stall Staff Toilet	Staff Locker Room (Women's)	Staff Locker Room (Men's)
<u>Toilet (Floor Mounted)</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Toilet Flush Valve (Automatic)</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Urinal</u>		✓			✓			✓
<u>Urinal Flush Valve (Automatic)</u>		✓			✓			✓
<u>All-in-One Sink Assembly</u> (incl. sink, faucet, soap disp. + hand dryer)	✓	✓	✓	✓	✓	✓		
<u>Sink</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓
<u>Automatic Faucet</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓
<u>Shower</u>							✓	✓

The product specifications included in this subsection are organized by type as follows:

- P1. Toilets
- P2. Urinals
- P3. Flush Valves
- P4. Bedpan Washers
- P5. All-in-one Sink Assemblies
- P6. Sinks
- P7. P-Trap Covers
- P8. Faucets
- P9. Showers
- P10. Drinking Fountains

P1. TOILETS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>**Preferred**</p>	Toilet	American Standard	Huron 3342.001 / White Vitreous China	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Floor mounted toilet w/ back outlet, back spud, and elongated bowl w/ integral seat, seat holes and Everclean surface; 17-1/8" rim height for ADA-compliance; holds 1,000 lbs. (Bariatric); provide w/ 1.28 gpf flush valve; <u>spec toilet seat separately</u></p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Toilet	American Standard	Huron 3312.001 / White Vitreous China	*	*	
	<p>Location: <u>Restrooms (where backspud is not possible)</u> Remarks: Floor mounted toilet w/ back outlet, top spud, and elongated bowl w/ Everclean surface; 17-1/8" rim height for ADA-compliance; holds 1,000 lbs. (not Bariatric due to top spud); provide w/ 1.28 gpf flush valve; <u>spec toilet seat separately</u></p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Toilet	Kohler	Modflex Adjust-a-Bowl / White Vitreous China	*	*	
	<p>Location: <u>Restrooms (for replacement of existing wall mounted toilets only)</u> Remarks: Floor mounted toilet w/ top or rear spud; replaces wall mounted toilets w/ 15" – 18" rim heights; designed not to require removal of existing wall carrier, adjustment of existing plumbing or patching of existing adjacent finishes; elongated bowl; ADA-compliant; 2,500 lb. static load; provide w/ 1.28 gpf flush valve; <u>spec toilet seat separately</u> #K-25042-SS (top spud) #K-25042-SSL (incl. bedpan lugs) #K-25044-SS (rear spud) #K-25044-SSL (incl. bedpan lugs) GC / Plumber to confirm feasibility prior to purchase and installation</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Toilet	American Standard	Cadet 2988.101 / 2988.813 White Vitreous China	*	*	
	<p>Location: <u>Restrooms (for in-kind replacements only, where conversion to tankless floor mounted toilets is not possible)</u> Remarks: Floor mounted toilet w/ tank; round bowl w/ Everclean surface; 16-1/2" rim height for ADA-compliance; 1.28 gpf; <u>spec toilet seat separately</u></p>					

P2. URINALS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>**Preferred**</p>	Urinal	Toto	UT105UV#01/ Cotton	*	*	
	Location: <u>Public-Multi-stall Restrooms (Men's)</u> Remarks: Commercial Washout Ultra High-Efficiency Urinal w/ concealed integral trap, 0.125 gpf, 3/4" back spud inlet and 2" I.P.S. outlet; ADA-compliant when properly installed					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Urinal	Zurn	Z5759 Retrofit Pint / White Vitreous China	*	*	
	Location: <u>Public-Multi-stall Restrooms (Men's)</u> Remarks: Wall mounted retrofit urinal w/ 3/4" back spud; 0.125 gpf; ADA-compliant when properly installed					

P3. FLUSH VALVES						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>**Preferred**</p>	Auto. Flush Valve (Top & Back Spud Toilets)	Toto	Ecopower Series/Stainless Steel	*	*	
	Location: <u>Public Restrooms</u> Remarks: High-efficiency concealed electronic flushometer for toilets; 1.28 gpf; ADA-compliant when properly installed #TET2LA33#SS – Back Spud Floor #TET2LA32#SS – Top Spud					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>**Preferred**</p>	Automatic Flush Valve (Urinal)	Toto	Ecopower TEU2UA11#SS / Stainless Steel	*	*	
	Location: <u>Public Restrooms</u> Remarks: Ultra high-efficiency concealed electronic flush valve for back-spud urinals; 0.125 gpf; ADA-compliant when properly installed					

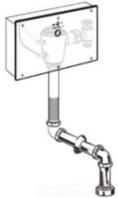
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P3c</p>	Auto. Flush Valve (Back Spud Toilets)	American Standard	Selectronic 606B.322	*	*
	<p>Location: <u>Public Restrooms</u> Remarks: Concealed automatic flushometer for toilets w/ back spud; 1.28 gpf; manual override mounted at ADA height; PK00.WRK 10-year battery kit must be purchased separately</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P3d</p>	Auto. Flush Valve (Top Spud Toilets)	American Standard	Selectronic 606B.323	*	*
	<p>Location: <u>Public Restrooms</u> Remarks: Concealed automatic flushometer for toilets w/ top spud; 1.28 gpf; manual override mounted at ADA height; PK00.WRK 10-year battery kit must be purchased separately</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P3e</p>	Automatic Flush Valve (Urinal)	American Standard	Selectronic 606B.501	*	*
	<p>Location: <u>Public Restrooms</u> Remarks: Concealed automatic flush valve for urinals w/ 3/4" back spud; 0.125 gpf; manual override mounted at ADA height; PK00.WRK 10-year battery kit must be purchased separately</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P3f</p>	Auto. Flush Valve (Back Spud Toilets)	American Standard	Selectronic 606B.222	*	
	<p>Location: <u>Back Spud Toilets w/ Bedpan Washers</u> Remarks: Concealed, sensor operated Selectronic flush valve for toilets (w/ rear access) w/ 1-1/2" concealed back spud bowls; 1.28 gpf; manual override to be mounted at ADA height; PK00.WRK 10-year battery kit must be purchased separately</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P3g</p>	Auto. Flush Valve (Top Spud Toilets)	American Standard	Selectronic / 6066.121.002	*	*
	<p>Location: <u>Back of House Restrooms/ Staff Locker Rooms</u> Remarks: Exposed, sensor-operated flush valve for toilets w/ 1-1/2" top spud bowls; 1.28 gpf; w/ 10-year battery life; ADA-compliant</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Manual Flush Valve (Top Spud Toilets)	American Standard	Flowise 6047.121.002	*	*
	Location: <u>Sabbath Restrooms</u> Remarks: Exposed, manual operation flush valve for toilets w/ top spud, 1.28 gpf; ADA-compliant				

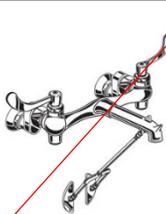
P4. BEDPAN WASHERS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Bedpan Washer	Meiko	Topline 30WC DT NDV RH ADA	*	
	Location: <u>Patient Rooms (mounted above toilet)</u> Remarks: 480V model, flush mount, mounted above toilet; shall meet NYC Plumbing Code requirements and UL Listings; #4 Stainless Steel finish; provide cutout for flushometer P3f sensor Note: Coordination with and shop drawings by Meiko are req'd.				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Bedpan Washer	Meiko	Topline 30 DT NDV RH	*	
	Location: <u>Periop and NIBS Internal Toilets to all Patient Rooms, Soiled Workrooms</u> Remarks: 480V model, flush mount; shall meet all NYC Plumbing Code requirements and UL Listings; #4 Stainless Steel finish				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Bedpan Washer w/ Flushing Rim Sink	American Standard	Clinic Service Sink 9512.999.020	*	
	Location: <u>Soiled Utility and Environmental Services</u> Remarks: Wall hung clinic service sink w/ blow-out flushing rim and 1-1/2" top inlet; Provide stainless steel guards American Std #7832512.075 (2 x side rim guard) and #7832504.075 (1 x front rim guard); provide bedpan cleanser #7880.191; use faucet manual clinic flush valve P4d and flush valve bedpan diverter/washer P4e shown below				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Faucet	American Standard	8355.101	*	
	Location: <u>Soiled Utility and Environmental Services</u> Remarks: Exposed yoke, wall-mounted utility faucet w/ bottom fork brace; provide vandal resistant wrist blade handles; use with bedpan washer P4c				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>P4e</p>	<p><u>Flush Valve (Bedpan Washer)</u></p>	<p><u>Sloan</u></p>	<p><u>Royal 117H</u></p>	<p><u>*</u></p>	
	<p>Location: <u>Soiled Utility and Environmental Services</u> Remarks: <u>Exposed, diaphragm type, chrome plated, service sink flushometer; 6.5 gpf; use with bedpan washer P4c</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>P4d</p>	<p><u>Manual Clinic Sink Flush Valve</u></p>	<p><u>American Standard</u></p>	<p><u>6047.117.002</u></p>	<p><u>*</u></p>	
	<p>Location: <u>Soiled Utility and Environmental Services</u> Remarks: <u>Manual clinic sink flush valve; 6.5 gpm; use with bedpan washer P4c</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>P4e</p>	<p><u>Bedpan Diverter / Washer</u></p>	<p><u>American Standard</u></p>	<p><u>6047.800.002</u></p>	<p><u>*</u></p>	
	<p>Location: <u>Soiled Utility and Environmental Services</u> Remarks: <u>Bedpan washer diverter assembly with straight down tube; operates at 1.28 and 1.6 gpf; use with bedpan washer P4c</u></p>				

P5. ALL-IN-ONE SINK ASSEMBLIES					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>P5a</p> <p>**Preferred**</p>	<p><u>All-in-One Washbar</u></p>	<p><u>Bradley</u></p>	<p><u>Washbar WB1 / Polished Chrome</u></p>	<p><u>*</u></p>	<p><u>*</u></p>
	<p>Location: <u>Restrooms</u> Remarks: <u>All-in-one handwash fixture including soap dispenser (spec foam soap version), faucet (0.5 gpm) and hand dryer (to be field set to “low”); electrical outlet(s) are required below sink assembly w/in stl stl lower enclosure; ADA compliant; use with sink assembly P5b or P5c; (Approval by RED+F Senior Leadership required.)</u></p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P5b a</p> <p>**Preferred**</p>	All-in-One Sink Assembly	Bradley	Verge with Washbar Technology - LVQ-Series	*	*
	<p>Location: Public Restrooms (multiple stall)</p> <p>Remarks: All-in-one Evero quartz trough sink w/ stainless steel lower enclosure, soap dispenser (spec #FSD for foam soap), faucet (0.5 gpm) and hand dryer (to be field set to “low”); provide w/ slotted stainless steel trench drain cap (#DR2); Electrical outlet(s) are required below sink w/in stl stl lower enclosure; ADA compliant</p> <p>1 Sink Model #: LVQD1 2 Sink Model #: LVQD2 3 Sink Model #: LVQD3</p> <p>One-Station Model #: LVQD1 (30” length)</p> <p>Two-Station Model #: LVQD2 (60” length)</p> <p>Three-Station Model #: LVQD3 (90” length)</p> <p>Specify w/ multi-feed top-fill soap kit P5db (sold separately and not provided by Bradley). Provide (1) soap kit P5b at 1- and 2-sink models. Provide (2) soap kits P5b at 3-sink models. Modification of integral Bradley sink required to accommodate top-fill soap kit. Coordinate w/ sink assembly manufacturer for NYULH approved shop drawings; <u>maintain min. 2” gap between sink and adjacent walls if located within niche.</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P5c</p>	All-in-One Sink Assembly	Neo-Metro	Slab-Edge Solid Surface Basin	*	*
	<p>Location: Restrooms</p> <p>Remarks: All-in-one cast solid surface trough sink w/ continuous stainless steel lower enclosure; spec w/ custom overflow and “H1” single hole provided for customer supplied faucet</p> <p>One-Station Model #: 9151 (30” length)</p> <p>Two-Station Model #: 9152 (56” length)</p> <p>Three-Station Model #: 9153 (80” length)</p> <p>Specify w/ multi-feed top-fill soap kit P5d. Modification of integral Neo-Metro sink required to accommodate top-fill soap kit. Coordinate w/ sink assembly manufacturer for NYULH approved shop drawings; <u>maintain min. 2” gap between sink and adjacent walls if located within niche.</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P5d</p>	Multi-feed Top Fill Soap Kit	Bradley	6-SOAP-MFT – PC – A14-029	*	*
	<p>Location: Restrooms</p> <p>Remarks: Verge Multi-Feed Soap Tank in Polished Chrome w/ AC Adapter (#A14-029); Electrical outlet(s) are required below sink w/in stl stl lower enclosure</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P5b 	Multi-feed Top fill Soap Kit	ASI	#0390 soap kit w/ #0390-br support bracket	*	*
	Location: <u>Public Restrooms (multiple stall)</u> Remarks: EZFILL deck mounted top-fill port with multi-feed tank for use with P5a. Soap kit and support bracket are individual products that must be purchased separately. Model #s as called out above.				

P6. SINKS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6a 	Sink	Kohler	Caxton K-2210 / White Vitreous China	*	*
	Location: <u>Public Restrooms (multiple stall)</u> Remarks: Undercounter mount sink w/ overflow, ADA-compliant				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6b 	Sink	American Standard	Ovalyn 9482.000 / White Vitreous China	*	*
	Location: <u>Public Restrooms (multiple stall)</u> Remarks: Undercounter mount sink w/ overflow, ADA-compliant				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6c 	Sink	Kohler	Ladena K-2214/ White Vitreous China	*	*
	Location: <u>Public Restrooms (multiple stall)</u> Remarks: Undercounter mount sink w/ overflow, ADA-compliant				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
P6d		Sink	Kohler	Verticyl K-2881-0 (Oval)	*	*
		Location: Public Restrooms (multiple stall)		Verticyl K-2882-0 (Rectangular)	*	*
		Remarks: Undercounter mount sink w/ overflow, ADA-compliant		Verticyl K-2883-0 (Round)	*	*
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
P6e		Sink	Duravit	Starck 3 #0300655 / White		*
		Location: Public Single Stall Restrooms (Single Occupancy) Remarks: Wall hung sink w/ overflow; faucet hole configurations vary (see manufacturer spec); not ADA-compliant when combined w/ coordinating pedestal, siphon cover or metal console				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
P6f		Sink	Lacava	Block 4500S / White Porcelain		*
		Location: Public Single Stall Restrooms (Single Occupancy) Remarks: Wall hung sink w/o overflow (coordinate compliance w/ overflow code requirements); available w/o faucet hole or single faucet hole; ADA-compliant hole; low-flow faucets with aerator are recommended to prevent splashing				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
P6g		Sink	American Standard	Murro / White Vitreous China		*
		Location: Back of House Restrooms (Single Occupancy) / Staff Locker Rooms Remarks: Wall hung sink w/ overflow, Everclean surface; faucet hole configurations vary (see manufacturer spec); ADA-compliant <u>when properly installed</u> ; provide with #0059.020EC shroud				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
P6h		Sink	Kohler	Soho K-2084 / White Vitreous China	*	*
		Location: Back of House Restrooms (Single Occupancy) / Staff Locker Rooms Remarks: Wall hung sink w/ overflow less soap dispenser hole; drilled for concealed arm carrier; single center hole; ADA-compliant				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Sink	Kohler	Soho K-2053 / White Vitreous China	*	*
	Location: <u>Back of House Restrooms</u> (Single Occupancy) / <u>Staff Locker Rooms</u> Remarks: Wall hung sink w/ overflow less soap dispenser hole; drilled for concealed arm carrier; 8" centers; ADA-compliant				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Sink	American Standard	Lucerne 0355 / 0356 White Vitreous China	*	*
	Location: <u>Back of House Restrooms</u> (Single Occupancy) / <u>Staff Locker Rooms</u> Remarks: Wall hung sink w/ overflow; faucet hole configurations vary (see manufacturer spec)				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Sink	American Standard	ICS Sink 9118.111 / White Vitreous China	*	
	Location: <u>Entryway of Inpatient Rooms</u> Remarks: Wall hung sink w/ permanent Everclean surface; includes offset grid drain and P-trap w/ Saniguard coating; designed w/ sealed overflow; use faucet P8d				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Sink	TBD	Custom / Integral Solid Surface	*	
	Location: <u>Entryway of Inpatient Rooms</u> Remarks: Integral solid surface sink to coordinate w/ solid surface countertops; provide w/ front bowl overflow				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Sink	Corian	Neat 802P / Corian	*	
	Location: <u>Exam Room</u> Remarks: Integral Corian solid surface sink, coordinates w/ Corian solid surface countertops; sink w/ front bowl overflow				

Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6n		Sink	Corian	8254 / Acrylic-modified Polyester	*	
		Location: <u>Exam Room</u> Remarks: Acrylic-modified polyester sink, coordinates w/ Corian vanity tops; sink w/ front bowl overflow				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6o		Sink	Elkay	ELUH1113DBG / Lustertone Stl. Stl.	*	
		Location: <u>Exam Room</u> Remarks: Single bowl undermount sink w/ Lustertone finish; rear center drain placement and sound guard; ADA-compliant				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6p		Sink	Elkay	ELUHAD131655PD / Lustertone Stl. Stl.	*	*
		Location: <u>Lactation Rooms</u> Remarks: Undermount single bowl sink; ADA-compliant				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6q		Sink	Elkay	ELUHAD191655 / Lustertone Stl. Stl.	*	*
		Location: <u>Pantry</u> Remarks: Undermount single bowl sink; ADA-compliant				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6r		Sink	Elkay	ELUHAD211555PD / Lustertone Stl. Stl.	*	*
		Location: <u>Pantry</u> Remarks: Undermount single bowl sink; ADA-compliant				

Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6s		Sink	Kohler	K-3894 / Stainless Steel	*	*
		Location: <u>Pantry</u> Remarks: Under-mount single bowl sink; ADA-compliant				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6t		Sink	Elkay	ELVWO2219 / Satin Stainless Steel	*	
		Location: <u>Laboratories</u> Remarks: Wall hung sink w/ rear overflow; faucet hole configurations vary (see manufacturer spec); ADA-compliant				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6u		Sink (Handwash)	Elkay	LRAD / Lustertone Stl. Stl.	*	
		Location: <u>Clinical Back of House Spaces</u> Remarks: Self-rimming drop in sink w/ grid drain; faucet and drain hole configurations vary (see manufacturer spec); confirm ADA-compliance				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6v		Sink (Large/Deep)	Elkay	DLR191910 / Satin Stainless Steel	*	
		Location: <u>Clinical Back of House Spaces</u> Remarks: Drop in sink w/o overflow; faucet hole configurations vary (see manufacturer spec)				
Image		Description	Manuf.	Model/Finish	Clinical	Non-Clinical
P6w		Mop Sink	Just Mfg.	C-2523 / Satin Stainless Steel	*	
		Location: <u>Building Services (Patient Floors)</u> Remarks: Floor mounted mop sink; use faucet P8m				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Mop Sink	Just Mfg.	A-47699 / Satin Stainless Steel	*	
	Location: <u>Building Services (Procedure Floors)</u> Remarks: Floor mounted mop sink; use faucet P8m				

P7. P-TRAP COVERS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	ADA Undersink P-Trap Covers	Plumbing Supply.com	Pro-eXtreme Series	*	*
	Location: <u>As Required</u> Remarks: ADA-compliant undersink P-Trap cover w/ snap lock fasteners; model and accessories TBD based on sink selection				

P8. FAUCETS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Faucet	Sloan	EAF-275-ISM CP / Polished Chrome	*	*
	Location: <u>Public Restrooms</u> Remarks: Battery powered w/ solar energy harvesting, sensor activated, electronic hand washing faucet for pre-tempered or hot and cold water operation; 0.5 gpm; ADA-compliant				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Faucet	American Standard	6053.105 w/ mixing valve	*	*
	Location: <u>Public Restrooms</u> Remarks: NYC DOH Article 28 compliant Self-closing, thermal mixing faucet, w/ laminar flow and 12-hour auto purge; 0.5 gpm; long-life battery powered; ADA-compliant				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8c</p>	Faucet	American Standard	705B.205 / 705B.215 (w/ pwr kit #PK00.WRK)	*	*
	<p>Location: <u>Restrooms / Entryway of Inpatient Rooms</u> Remarks: Self-closing, thermal mixing faucet w/ 12-hour auto purge, laminar flow and side mixer; long-life battery power kit sold separately; ADA-compliant #705B.205 (at Restrooms) – 0.5 gpm w/ PK00.WRK (10-year battery pack and holder) #705B.215 (at Entryway of Inpatient Rooms)– 1.5 gpm w/ PK00.WRK (10-year battery pack and holder)</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8d</p>	Faucet	American Standard	Selectronic IC Faucet 6053.193 w/ mixing valve 605XTMV	*	*
	<p>Location: <u>Entryway of Inpatient Rooms</u> Remarks: Self-closing, thermal mixing faucet; 12-hour auto purge, laminar flow; 1.5 gpm; w/ long-life battery power; for use w/ ICS Sinks</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8e</p>	Faucet	Kohler	K-7516 / Stl Stl or Polished Chrome	*	*
	<p>Location: <u>Restrooms</u> Remarks: Single hole mounting electronic faucet w/ vandal-resistant aerator, available w/ and w/o mixer, less drain, 0.5 gpm; ADA-compliant</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8f</p>	Manual Faucet (Metering)	Chicago Faucets	3500-E2805ABCP / Polished Chrome	*	*
	<p>Location: <u>Sabbath Restrooms</u> Remarks: Single hole, self-closing, manual, metering faucet w/ vandal proof non-aerating spray; 0.5 gpm; ADA-compliant</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8g</p>	Faucet	Elkay	LK7921SSS / Satin Stl Stl		*
	<p>Location: <u>Pantry / Staff Lounge / Lactation Room</u> Remarks: Single hole, manual kitchen faucet; 1.5 gpm; ADA-compliant</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8h</p>	Faucet	Elkay	LK3000CR / Polished Chrome		*
	<p>Location: <u>Pantry / Staff Lounge / Lactation Room</u> Remarks: Manual kitchen faucet w/ remote lever handle; 1.5 – 2.2 gpm flow regulators included; ADA-compliant; provide 1.5 / 2.2 gpm in Pantries / Staff Lounges depending on user requirements; provide 1.5 gpm in Lactation Rooms</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8i</p>	Faucet	American Standard	Monterrey 7545.170	*	
	<p>Location: <u>Handwash Areas / Soiled Utility / Restrooms</u> Remarks: Two-handle, centerset, gooseneck spout lavatory faucet w/ vandal-resistant wrist blades, ADA-compliant #7545.170-V05 (at Restrooms) – 0.5 gpm vandal-resistant, pressure compensating multi-laminar spray #7545.170-LV15 (at Handwash Areas / Soiled Utility) – 1.5 gpm vandal-resistant, pressure compensating, non-aerated laminar flow outlet</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8j</p>	Faucet	American Standard	Monterrey 6545.170	*	
	<p>Location: <u>Exam Room / Handwash Areas / Soiled Utility / Restrooms</u> Remarks: NYC DOH Article 28 compliant Two-handle, 8" widespread lavatory faucet w/ vandal proof wrist blades and gooseneck spout; ADA-compliant #6545.170-V05 (at Restrooms) – 0.5 gpm vandal-resistant, pressure compensating multi-laminar spray #6545.170-LV15 (at Handwash Areas / Soiled Utility) – 1.5 gpm vandal-resistant, pressure compensating, non-aerated laminar flow outlet</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8k</p>	Faucet	Chicago Faucets	786-GN2FCABCP	*	
	<p>Location: <u>Exam Rooms / Handwash Areas / Soiled Utility</u> Remarks: Deck mounted sink faucet w/ 8" fixed centers, concealed hot and cold water, 4" vandal proof wrist blades, 1.5 gpm laminar flow; ADA-compliant</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8l</p>	Faucet	T & S Brassworks	B-1152	*	*
	<p>Location: <u>Procedure Floor Decontamination</u> Remarks: Deck mounted w/ rigid swing nozzle aerator, wrist blades and 4-ft stainless steel hose w/ spray valve, 2.2 gpm</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P8m</p>	Faucet	Chicago Faucets	897-RCF w/ 317-PRJ KCP Wrist blades / Stainless Steel	*	*
	<p>Location: <u>Building Services (Patient and Procedure Floors)</u> Remarks: Wall mounted manual faucet w/ 8" body, adjustable arms, vandal proof lever handles, vacuum breaker spout w/ pail hook and wall brace; ADA-compliant</p>				

P9. SHOWERS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>P9a</p>	Shower w/ Slide Grab Bar	Moen	52236GBM15 / Chrome + Stl. Stl.	*	
	<p>Location: <u>Patient Rooms and ADA Staff Showers</u> Remarks: Single function, handheld shower w/ stainless steel slide grab bar, mounted at ADA height, w/ non-positive cut off button and plastic hose; provide w/ P9c mixing valve; ADA-compliant * order w/ extra clips</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Shower	Moen	52716EP15 / Chrome Plated	*	
	Location: <u>Non-ADA Staff Showers</u> Remarks: Fixed mount, vandal resistant showerhead; provide w/ P9c mixing valve				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Mixing Valve	Moen	8370 / Chrome Plated	*	
	Location: <u>Patient Rooms and Staff Showers</u> Remarks: Single-handle pressure balancing valve only with integral stops; 1.5 gpm				

P10. DRINKING FOUNTAINS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Drinking Fountain (Hi/Low Combo)	Filtrine	107-16-HL-VP-TM / Satin Stainless Steel	*	*
	Location: <u>Varies</u> Remarks: Vandal proof drinking fountain w/o chiller, w/ bottle filler, integral water filter and bubbler; ADA-compliant <u>when properly installed</u>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Drinking Fountain (Recessed)	Filtrine	B103-C2-TM / Satin Stainless Steel	*	*
	Location: <u>Visitor Lounge (Patient Bed Floors)</u> Remarks: In-wall drinking / water bottle filling station w/ built-in Taste Master water purifier and (approx. 100 count) bottom loading dual cup dispensers; fits in standard 4" wall; ADA-compliant when properly installed				

EMERGENCY PLUMBING FIXTURES

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific emergency fixtures are used. The list below will give the A/E Team a sense of the typical fixtures used at NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager, Facilities Operations and the Design Studio to finalize fixture selections.

The product specifications included in this subsection are organized by type as follows:

- E1. Eyewash / Drench Hose
- E2. Eyewash / Shower
- E3. Supply Box

E1. EYEWASH / DRENCH HOSE				
Image		Description	Manuf.	Model/Finish
E1a		Eyewash/Drench Hose	Guardian	G5026-FSH-VB
		Remarks: Wall mounted combination eyewash and drench hose w/ stainless steel hose and in-line vacuum breaker		
Image		Description	Manuf.	Model/Finish
E1b		Eyewash/Drench Hose	Guardian	G5022-FSH-VB
		Remarks: Deck mounted combination eyewash and drench hose w/ stainless steel hose and in-line vacuum breaker		
Image		Description	Manuf.	Model/Finish
E1c		Eyewash/Drench Hose	Water Saver	EW1022-BP/ Stainless Steel and PVC
		Remarks: Deck mounted combination eyewash and drench hose w/ PVC hose, stainless steel lever handler and backflow preventer		

E2. EYEWASH / SHOWER				
Image	Description	Manuf.	Model/Finish	
E2a		Eyewash/Shower	Water Saver	SSBF2152 / Brushed Stainless Steel
		Remarks: Recessed barrier-free eye/face wash and shower safety station w/ ceiling mounted exposed shower head and drain pan; ADA-compliant		
Image	Description	Manuf.	Model/Finish	
E2b		Eyewash/Shower	Guardian	GBF2452 / Brushed Stainless Steel
		Remarks: Recessed barrier-free eye/face wash and shower safety station for use in clean rooms (ideal for use in semiconductor, electronics and pharmaceutical applications); unit comes w/ ceiling mounted exposed shower head and drain pan; ADA-compliant		
Image	Description	Manuf.	Model/Finish	
E2c		Emergency Shower	Guardian	G1629 SE-575-SD-238-FLW-SSH
		Remarks: Emergency shower for recess mounting in finished ceiling or soffit, w/ stay-open ball valve; shower activated by rigid pull rod		

E3. SUPPLY BOX				
Image	Description	Manuf.	Model/Finish	
E3a		Supply Box	Acorn	M8195-E501-LL
		Location: <u>Emergency Preparedness</u> Remarks: Side opening door w/ hinge on right, brass piping and valve, brass ball valve; door shall be *less logo*; provide quick connect parts 1295-006-000 and 1295-007-000; cold and hot water; provide gasket b/w door and box; provide vacuum breaker on water supply		

TOILET ACCESSORIES

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific toilet accessories are used. The product list provided in this subsection will give the A/E Team a sense of the typical items used at NYU Langone facilities. It is the Architect's responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager, Facilities Operations and the Design Studio to finalize product selections. Please note the following items are preferred over others:

- Electric hand dryers are preferred over manual paper towel dispensers in all non-patient care areas and public restrooms on patient floors.
- Manual paper towel dispensers are preferred in patient care areas.
- Recessed accessories are preferred over surface mounted / semi-recessed accessories.

Abbreviations

- OFCI: Owner-Furnished, Contractor-Installed
- CFCl: Contractor-Furnished, Contractor-Installed

The product specifications included in this subsection are organized by type as follows:

- T1. Toilet Partitions
- T2. Urinal Screen
- T3. Toilet Accessory All-in-One Dispensers
- T4. Toilet Paper Dispensers
- T5. Sanitary Napkin Disposal
- T6. Toilet Seat Cover Dispensers
- T7. Grab Bars
- T8. Coat Hooks
- ~~T912.~~ Soap Dispensers
- ~~T109.~~ Hand Dryers
- ~~T110.~~ Paper Towel Dispensers
- ~~T121.~~ Waste Receptacles
- ~~T135.~~ Door Tissue
- ~~T146.~~ Mirrors
- ~~T157.~~ Shelves
- ~~T163.~~ Air Fresheners
- ~~T174.~~ Baby Changing Station
- T18. Folding Shower Seat
- T19. Recessed in-Shower Soap Shelf
- ~~T2019.~~ Mop and Broom Holder

The following accessories are required at a minimum in restrooms:

Item	NON-CLINICAL			CLINICAL						
	Multi-Stall Public Toilet (Women's)	Multi-Stall Public Toilet (Men's)	Single Stall Public Toilet	Multi-Stall Public Toilet (Women's)	Multi-Stall Public Toilet (Men's)	Single Stall Public Toilet	Staff Restrooms	Toilets (within Clinical Dept.)	Patient Room Toilets	Pediatric Patient Room Toilets
Toilet Partitions	✓	✓		✓	✓					
Urinal Screen		✓			✓					
Toilet Accessory All-in-One Dispenser *	✓	✓	✓							
Toilet Paper Dispenser	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sanitary Napkin Disposal	✓		✓	✓		✓	✓	✓		
Toilet Seat Cover Dispenser	✓	✓	✓	✓	✓	✓	✓			
Grab Bars (as required by code)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Soap Dispenser (Recessed or Wall-Mtd.)							✓	✓	✓	✓
Hand Dryer							✓	✓		
Paper Towel Dispenser (w/ waste recep.)							✓	✓	✓	✓
Waste Receptacle (recessed)	✓	✓	✓	✓	✓	✓				
Mirror	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shelf (adjacent to sink / toilet)	✓	✓	✓	✓	✓	✓	✓			
Coat Hooks	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Built-in Make-up Station (incl. mirror + counter)	✓			✓						
Air Freshener	✓	✓	✓	✓	✓	✓	✓			
Door Tissue	✓	✓	✓	✓	✓	✓	✓			
Baby Changing Station	✓		✓	✓		✓				
Folding Shower Seat									✓	✓
Recessed Soap Shelf (in shower)									✓	✓

* Coordinate with Environmental Services / Building Services and RED+F PM. If used, individual toilet paper dispenser, sanitary napkin disposal and toilet seat cover dispenser are not required.

The following accessories are required at a minimum in restrooms:

Item	CLINICAL										
	Multi-Stall <u>Public Toilet</u> (Women's)	Multi-Stall <u>Public Toilet</u> (Men's)	Single Stall <u>Public Toilet</u>	Multi-Stall <u>Staff Toilet</u> (Women's)	Multi-Stall <u>Staff Toilet</u> (Men's)	Single Stall <u>Staff Toilet</u>	Staff <u>Locker Room</u> (Women's)	Staff <u>Locker Room</u> (Men's)	<u>Patient Room Toilet</u>	<u>Pediatric Patient Room Toilet</u>	Single Stall <u>Patient Toilet</u> (off of corridors)
<u>Toilet Partitions (as required)</u>	✓	✓		✓	✓		✓	✓			
<u>Urinal Screen (as required)</u>		✓			✓			✓			
<u>All-in-One Toilet Accessory Dispenser</u>	✓	✓	✓	✓	✓	✓	✓	✓			✓
<u>Toilet Paper Dispenser</u> (if All-in-One Toilet Accessory Dispenser is not used)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Sanitary Napkin Disposal</u> (if All-in-One Toilet Accessory Dispenser is not used)	✓		✓	✓		✓	✓				✓
<u>Toilet Seat Cover Dispenser</u> (if All-in-One Toilet Accessory Dispenser is not used)	✓	✓	✓	✓	✓	✓	✓	✓			✓
<u>Grab Bars (as required by code)</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Coat Hooks</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>All-in-One Sink Assembly</u> (incl. sink, faucet, soap disp. + hand dryer)	✓	✓	✓	✓	✓	✓					
<u>Soap Dispenser</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Hand Dryer</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓			
<u>Paper Towel Dispenser (w/ waste recep.)</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Door Tissue (as required)</u>	✓	✓	✓	✓	✓	✓					✓
<u>Mirror</u>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<u>Built-in Counter (incl. mirror + counter)</u>	✓	✓		✓	✓		✓	✓			
<u>Shelf (adjacent to sink / toilet)</u>			✓			✓			✓	✓	✓
<u>Air Freshener</u>	✓	✓	✓	✓	✓	✓	✓	✓			✓
<u>Baby Changing Station</u>	✓	✓	✓								
<u>Folding Shower Seat</u>									✓	✓	
<u>Recessed in-Shower Soap Shelf</u>							✓	✓	✓	✓	

Item	NON-CLINICAL							
	Multi-Stall Public Toilet (Women's)	Multi-Stall Public Toilet (Men's)	Single Stall Public Toilet	Multi-Stall Staff Toilet (Women's)	Multi-Stall Staff Toilet (Men's)	Single Stall Staff Toilet	Staff Locker Room (Women's)	Staff Locker Room (Men's)
<u>Toilet Partitions (as required)</u>	✓	✓		✓	✓		✓	✓
<u>Urinal Screen (as required)</u>		✓			✓			✓
<u>All-in-One Toilet Accessory Dispenser</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Toilet Paper Dispenser</u> (if All-in-One Toilet Accessory Dispenser is not used)	✓	✓	✓	✓	✓	✓	✓	✓
<u>Sanitary Napkin Disposal</u> (if All-in-One Toilet Accessory Dispenser is not used)	✓		✓	✓		✓	✓	
<u>Toilet Seat Cover Dispenser</u> (if All-in-One Toilet Accessory Dispenser is not used)	✓	✓	✓	✓	✓	✓	✓	✓
<u>Grab Bars (as required by code)</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Coat Hooks</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>All-in-One Sink Assembly</u> (incl. sink, faucet, soap disp. + hand dryer)	✓	✓	✓	✓	✓	✓		
<u>Soap Dispenser</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓
<u>Hand Dryer</u> (if All-in-One Sink Assembly is not used)	✓	✓	✓	✓	✓	✓	✓	✓
<u>Paper Towel Dispenser (w/ waste recep.)</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Door Tissue (as required)</u>	✓	✓	✓	✓	✓	✓		
<u>Mirror</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Built-in Counter (incl. mirror + counter)</u>	✓	✓		✓	✓		✓	✓
<u>Shelf (adjacent to sink / toilet)</u>			✓			✓		
<u>Air Freshener</u>	✓	✓	✓	✓	✓	✓	✓	✓
<u>Baby Changing Station</u>	✓	✓	✓					
<u>Recessed in-Shower Soap Shelf</u>							✓	✓

T1. -TOILET PARTITIONS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T1a		Toilet Partitions	Bradley	Series 700 / #4 Satin Brushed Stl Stl	*	*
	<p>Location: <u>Multi-stall Restrooms</u> Remarks: Floor-to-ceiling mount w/ heavy duty stainless steel hardware and locking mechanisms; provide ¼” gap max. between partitions and doors or continuous trim to cover gaps >¼” (CFCI)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T1b		<u>Toilet Partitions</u>	<u>Hadrian</u>	<u>Elite Max / #4 Satin Brushed Stl Stl</u>	<u>*</u>	<u>*</u>
	<p>Location: <u>Multi-stall Restrooms</u> Remarks: <u>Floor-to-ceiling mount w/ heavy duty stainless steel hardware and locking mechanisms; specify “no-sightline” solution to achieve no gaps between partitions and doors or at rear wall; provide 84” panels/doors; top of panels/doors shall be 7’-6” AFF w/ a 6” gap from the underside of panels/doors to finish floor; coord. reinforced panels w/mfr when mounting grab bars onto partitions (CFCI)</u></p>					

T2. URINAL SCREEN						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T2a		Urinal Screens	Bradley	#4 Satin Brushed Stl Stl	<u>*</u>	<u>*</u>
	<p>Location: <u>Multi-stall Restrooms (Men’s)</u> Remarks: Wall hung urinal screen w/ stainless steel continuous bracket (CFCI)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T2b		<u>Urinal Screens</u>	<u>Hadrian</u>	<u>#4 Satin Brushed Stl Stl</u>	<u>*</u>	<u>*</u>
	<p>Location: <u>Multi-stall Restrooms (Men’s)</u> Remarks: <u>48” wall hung urinal screen w/ stainless steel continuous bracket (CFCI)</u></p>					

T3. <u>ALL-IN-ONE TOILET ACCESSORY</u> ALL-IN-ONE DISPENSERS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T3a		All-in-One Toilet Accessory Disp	Bobrick	Varies / Satin Stainless Steel	* –	*
		<p>Location: <u>Single and Multi-Stall Public Restrooms (Women’s & Unisex)</u></p> <p>Remarks: Vertical all-in-one toilet accessory dispenser including seat cover dispenser, napkin disposal and double roll toilet paper dispenser; <u>provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p> <p>#B-357 – Partition-mtd., serves 2 toilet stalls, not ADA compliant</p> <p>#B-3571 – Partition-mtd., serves 2 toilet stalls, one side ADA compliant</p> <p>#B-3574 – Recessed, not partition-mtd., serves single stall, ADA compliant</p>				
T3b		All-in-One Toilet Accessory Disp	Bobrick	Varies / Satin Stainless Steel	* –	*
		<p>Location: <u>Single and Multi-Stall Public Restrooms (Men’s)</u></p> <p>Remarks: Vertical all-in-one toilet accessory dispenser including seat cover dispenser and double roll toilet paper dispenser; <u>provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p> <p>#B-347 – Partiant-mtd., serves 2 toilet stalls, not ADA compliant</p> <p>#B-3471 – Partiant-mtd., serves 2 toilet stalls, one side ADA compliant</p> <p>#B-3474 – Recessed, not partiant-mtd., serves single stall, ADA compliant</p>				
T3c		<u>All-in-One Toilet Accessory Disp</u>	<u>Bobrick</u>	<u>Varies / Satin Stainless Steel</u>	<u>* –</u>	<u>* –</u>
		<p>Location: <u>Single and Multi-Stall Restrooms (Women’s & Unisex)</u></p> <p>Remarks: <u>Horizontal all-in-one toilet accessory dispenser including seat cover dispenser, napkin disposal and double roll toilet paper dispenser; provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p> <p><u>#B-3091/3092 – Wall recessed, serves single stall</u></p> <p><u>#B-30919/30929 – Surface mounted, serves single stall</u></p>				
<p>Note: Coordinate use of this item with Environmental Services / Building Services and RED+F PM. If used, individual toilet paper dispenser, sanitary napkin disposal and toilet seat cover dispenser are not required.</p>						

T4. TOILET PAPER DISPENSERS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T4a		Toilet Paper Disp. / Sanitary Disposal	Bobrick	B-3094 / Satin Stainless Steel	* –	*
		<p>Location: <u>Single and Multi-Stall Restrooms (Women’s & Unisex)</u></p> <p>Remarks: Recessed, double roll toilet paper dispenser and sanitary napkin disposal unit; <u>provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T4b</p>	Toilet Paper Dispenser (Double)	Bobrick	B-386 / Satin Stainless Steel	*	*
	<p>Location: <u>Multi-Stall Restrooms</u> Remarks: Partition mounted, dual-sided, multi-roll toilet paper dispenser; serves 2 toilet compartments; <u>provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T4c a</p>	Toilet Paper Dispenser (Double)	Bobrick	B-4288 / Satin Stainless Steel		*
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Surface mounted, vertical double roll toilet paper dispenser; <u>provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T4d</p>	Toilet Paper Dispenser (Single)	Bobrick	B-6697 / Satin Stainless Steel		*
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Recessed, single roll, toilet paper dispenser w/ hood for stud walls and countertop aprons; <u>provide Georgia Pacific spindle kit #50011 for facilities that use Georgia Pacific compact coreless toilet paper</u> (CFCI)</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T4e</p>	Toilet Paper Dispenser (Double)	Georgia Pacific	56798 / Stainless Steel	*	
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Surface mounted compact side-by-side double roll toilet paper dispenser (OFCI)</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T4f</p>	Toilet Paper Dispenser (Double)	Georgia Pacific	56782 / Stainless Steel	*	
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Surface mounted compact vertical double roll toilet paper dispenser (OFCI)</p>				

T5. SANITARY NAPKIN DISPOSAL						
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T5a		Sanitary Napkin Disposal	Bobrick	B-4353 / B-4354 Satin Stainless Steel	*	*
		Location: <u>Single and Multi-stall Restrooms (Women’s & Unisex)</u> Remarks: B-4353 – Recessed sanitary napkin disposal w/ self-closing door (CFCI) B-4354 – Partition-mounted sanitary napkin disposal w/ self-closing door; mounted back-to-back to serve 2 compartments (CFCI)				
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T5b		Sanitary Napkin Disposal	Bobrick	B-354 / B-35303 Satin Stainless Steel	*	*
		Location: <u>Single and Multi-stall Restrooms (Women’s & Unisex)</u> Remarks: B-35303 – Recessed sanitary napkin disposal (CFCI) B-354 – Partition-mounted sanitary napkin disposal; mounted back-to-back to serve 2 compartments (CFCI)				
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T5c		Sanitary Napkin Disposal	Bobrick	B-270 / Satin Stainless Steel	*	*
		Location: <u>Single and Multi-stall Restrooms (Women’s & Unisex)</u> Remarks: Surface mounted sanitary napkin disposal (CFCI)				

T6. TOILET SEAT COVER DISPENSERS						
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T6a		Toilet Seat Cover Dispenser	Bobrick	B-221 / B-3013 Satin Stainless Steel	*	*
		Location: <u>Restrooms</u> Remarks: B-221 – Surface mounted toilet seat cover dispenser (CFCI) B-3013 – Recessed toilet seat cover dispenser (CFCI)				

T7. GRAB BARS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T7a</p>	Grab Bars	Bobrick	B-6806 / Satin Stainless Steel	*	*
	Location: <u>Restrooms / Tubs / Showers</u> Remarks: Stainless steel grab bars w/ concealed mounting flanges and snap flange covers; shapes and sizes vary (CFCI)		B-68137 / Satin Stainless Steel	*	*
			B-6861 / Satin Stainless Steel	*	
			B-68616 / Satin Stainless Steel	*	

T8. COAT HOOKS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T8a</p>	Coat Hook (Single)	Bradley	9114 / Satin Stainless Steel	*	*
	Location: <u>Restrooms</u> Remarks: Surface mounted single hook; locate (2) on back of toilet stall doors, (1) at 48" AFF and (1) at 64" AFF; center on door; provide vandal resistant escutcheons (CFCI) <u>Counts and mounting heights as follows:</u> <u>Non-ADA Toilet Stalls or Restrooms - (1) at 64" AFF</u> <u>ADA Toilet Stalls or Restrooms - (1) at 48" AFF and (1) at 64" AFF</u>				

T9. SOAP DISPENSERS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T9a 12a</p>	ES8 Purell Healthy Soap Dispenser (Hands Free)	Gojo	7730-01 / White Finish	*	*
	Location: <u>Restrooms / Handwash Areas</u> Remarks: Surface mounted, touchfree, ADA-compliant foam soap dispenser w/ "Energy on the Refill"; provide Shield Protector #7745-WHT-18; <u>ADA-compliant when properly installed</u> (OFCI) Purell Healthcare Healthy Soap Gentle & Free Foam Refill #7772-02				
<p><u>Note: When All-in-One Sink Assembly is used, separate soap dispenser is not required. See Plumbing Fixture subsection in these Design Guidelines for further information.</u></p>					

T10. HAND DRYERS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T10 a9a</p>	Hand Dryer	Palmer	Blustorm 2 HD 0955-09 / Brushed Stainless Steel	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Automatic, touchless, recessed, ADA-compliant hand dryer made of stainless steel (CFCI) Note: All hand dryers to be mounted no further than 24" away from edge of sink.</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T10 b9b</p>	Hand Dryer	Dyson	Airblade V / Sprayed Nickel	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Automatic, touchless, surface mounted, ADA-compliant hand dryer made of molded plastic; 4" projection (CFCI) Note: All hand dryers to be mounted no further than 24" away from edge of sink.</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T10 c9c</p>	Hand Dryer	Bobrick	B-7128 / No.4 Satin Stl Stl w/ black trim	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Automatic, touchless, surface mounted, ADA-compliant hand dryer w/ satin stainless steel cover and black trim; 4" projection (CFCI) Note: All hand dryers to be mounted no further than 24" away from edge of sink.</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T10 d9d</p>	Hand Dryer	Toto	HDR111#SS / Stainless Steel	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Automatic, touchless, recessed, ADA-compliant hand dryer w/ stainless steel cover. Note: All hand dryers to be mounted no further than 24" away from edge of sink.</p>					
<p>Note: When an "All-in-One" Sink Assembly is used, separate hand dryer is not required. See Plumbing Fixture subsection in these Design Guidelines for further information.</p>						

T11. PAPER TOWEL DISPENSERS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T11 a 10a</p>	Paper Towel Dispenser	Georgia Pacific	59466A / Stainless Steel	*		
	<p>Location: <u>Restrooms / Exam Rooms / Handwash Areas</u> Remarks: Semi-recessed automatic touchless paper towel dispenser. Hardwired Installation is preferred. Separate transformer kit is required. Consult w/ RED+F for transformer kit model #. (Approval by RED+F Senior Leadership required.)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T11 b 10b</p>	Paper Towel Dispenser	Bobrick	Varies / Satin Stainless Steel	*	*	
	<p>Location: <u>Restrooms / Exam Rooms / Handwash Areas</u> Remarks: Manual paper towel dispenser (Approval by RED+F Senior Leadership required.) B-359033 (recessed with lock and key) <u>specify w/ TowelMate 369-130</u> B-9359039 (surface mounted with lock and key) <u>specify w/ TowelMate 369-130</u></p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T11 c 10c</p>	Paper Towel Dispenser	Bobrick	B-4262 / Satin Stainless Steel		*	
	<p>Location: <u>Restrooms</u> Remarks: Surface mounted manual paper towel dispenser w/ vision slot; lock and key located at top of unit (Approval by RED+F Senior Leadership required.)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T11 d 10d</p>	Recessed Paper Towel Dispenser	Bobrick	B-318 / Stainless Steel	*		
	<p>Location: <u>Exam Rooms / Handwash Areas</u> Remarks: Recessed paper towel dispenser to be concealed within millwork</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>T11 e 10e</p>	Paper Towel Disp. / Receptacle	Bobrick	39003 / Satin Stainless Steel	*	*	-
	<p>Location: <u>Restrooms / Handwash Areas</u> Remarks: Recessed manual paper towel dispenser w/ integral 12-gal waste receptacle; <u>requires 8" wall cavity; specify w/ TowelMate #39003-130</u> (Approval by RED+F Senior Leadership required.)</p>					

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T11 f 10f</p>	Paper Towel Disp. / Receptacle	Bobrick	B-3944 / Satin Stainless Steel	*	*
	<p>Location: <u>Restrooms / Handwash Areas</u> Remarks: Recessed manual paper towel dispenser w/ semi-recessed integral 12-gal waste receptacle-; <u>specify w/ TowelMate #3944-130 and LinerMate #3944-134</u> (Approval by RED+F Senior Leadership required.)</p>				

T12. WASTE RECEPTACLES					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T12 a 11a</p>	Waste Receptacle	Bobrick	B-3644 / Satin Stainless Steel	*	*
	<p>Location: <u>Restrooms / Handwash Areas (trash only)</u> Remarks: 12-gal recessed paper towel waste receptacle; <u>specify w/ LinerMate #3944-134</u> Dimensions – 9.8”D x 19.5”W x 30”H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T12 b 11b</p>	Trash Receptacle (Rectangular)	Rubbermaid	FGSR18SSPL / Stl Stl	*	*
	<p>Location: <u>Restrooms (trash only)</u> Remarks: 22.5-gal freestanding, open top, trash receptacle w/ plastic liner, made from heavy-gauge, fire-safe steel. Dimensions – 12.01”D x 24.02”W x 30.35”H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T12 c 11c</p>	Trash Receptacle (Square)	Rubbermaid	Square Open Top / Silhouette / Stl Stl	*	*
	<p>Location: <u>Restrooms (trash only)</u> Remarks: Freestanding, open top, trash receptacle w/ plastic liner, made from heavy-gauge, fire-safe steel. #FGSC14SSPL – 16 gal. capacity; 14.76”D x 14.76”L x 30.35”H #FGSC18SSPL – 20 gal. capacity; 18.39”D x 18.39”W x 30.35”H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T12 d 11d</p>	Trash Receptacle (Half-Round)	Rubbermaid	FGSH12SSPL / Stainless Steel	*	*
	<p>Location: <u>Restrooms (trash only)</u> Remarks: 12-gal freestanding, open top, half round trash receptacle w/ plastic liner; no plastic bag option available; made from heavy-gauge, fire-safe steel; fits against walls to conserve space. Dimensions – 8.8”D x 17.6”W x 32.40”H</p>				

T13. DOOR TISSUE						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T13 a 15a		Door Tissue	Georgia Pacific	Safe-T-Gard Dispenser / Stainless Steel	*	*
		Location: <u>Restrooms</u> Remarks: Surface mounted toilet door tissue dispenser; mount near toilet room exit door; (OFCl) #59503 (Door tissue dispenser only; waste receptacle below by others) #59502 (Door tissue dispenser and coordinating trash receptacle)				
<p><u>Note: Provide door tissue only when paper towel dispenser (w/ waste receptacle) cannot be located near restroom door.</u></p>						

T14. MIRRORS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T14 a 16a		Mirror	Electric Mirror	Fusion Lighted Mirror FUS – size varies (w/ glass shelf)		*
		Location: <u>Restrooms</u> Remarks: Surface mounted lighted mirror; size varies; electrical power should be controlled by light switch (CFCl)				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T14 b 16b		Frameless Mirror	Custom	Custom	*	*
		Location: <u>Restrooms</u> Remarks: Frameless mirror, sizes and configurations vary, frameless glass to be flush w/ tile and installed prior to tile (CFCl)				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
T14 c 16c		Framed Mirror	Bradley	781 / Bright Annealed Stainless Steel	*	*
		Location: <u>Back of House Restrooms / Staff Locker Rooms</u> Remarks: Surface mounted mirror w/ roll-formed channel frame and theft-resistant mounting; sizes vary (CFCl) Note: To be used only when frameless mirror is not feasible.				
<p>Note: ADA mirrors shall be specified with the bottom of the <i>reflective surface</i> at 40" AFF, not the mirror frame.</p>						

T15. SHELVES						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
 <p>**Preferred**</p>	Glass Shelf	TBD	Glass Stl Stl / Polished Chrome	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Surface mounted tempered clear glass shelf. Review and approval by RED+F required. (CFCI)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Glass Shelf	Nameek's	Windisch 85444, 85445, 85446 / Satin Nickel	*	*	
	<p>Location: <u>Restrooms</u> Remarks: Surface mounted clear glass shelf, 4" deep, lengths vary (16.7"/20.7"/24.6"). Review and approval by RED+F required. (CFCI)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Glass Shelf	HEWI	800.03.10045 / Chrome	*	*	
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Surface mounted shelf with satined glass. 23.62" long x 0.78" high x 3.93" deep. Provide adjacent to sink / toilet. Review and approval by RED+F required. (CFCI)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Glass Shelf	HEWI	162.03.1005XA / Satin or Chrome	*	*	
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Surface mounted shelf with satined glass. 17.71" long x 4.8" deep. Provide adjacent to sink / toilet. Review and approval by RED+F required. (CFCI)</p>					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
	Glass Shelf	hansgrohe	26844000-000 / Chrome w/ Mirror Glass	*	*	
	<p>Location: <u>Single Stall Restrooms</u> Remarks: Surface mounted shelf with mirror glass. 19-3/4" long x 1-1/8" high x 3-1/4" deep. Provide adjacent to sink / toilet. Review and approval by RED+F required. (CFCI)</p>					

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T15 d</p>	<u>Metal Shelf</u>	<u>ASI</u>	<u>0412-M-1814 / Stainless Steel</u>	<u>*</u> <u>-</u>	<u>*</u> <u>-</u>
	<p>Location: <u>Single Stall Restrooms</u> Remarks: <u>Recessed stainless steel shelf. Internal dimensions at 12" high x 16" wide x 4" deep. Provide adjacent to sink / toilet. Review and approval by RED+F required. (CFCI)</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T15 e 17e</p>	Metal Shelf	Bradley	9094 / Satin Stainless Steel	*	*
	<p>Location: <u>Single Stall Restrooms</u> Remarks: <u>Surface mounted, 6-1/4" mounting bracket depth with 5" deep shelf, lengths vary (18"/24"/30"). Provide adjacent to sink / toilet. Review and approval by RED+F required. (CFCI)</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T15 f 17d</p>	Metal Shelf	Bobrick	B-683 / Satin Stainless Steel	*	*
	<p>Location: <u>Single Stall Restrooms</u> Remarks: <u>Surface mounted, 5-3/4" mounting bracket depth with 4-3/4" deep shelf, 24" length. Provide adjacent to sink / toilet. Review and approval by RED+F required. (CFCI)</u></p>				

T16. AIR FRESHNERS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T16 a 13a</p>	Air Freshener	Georgia Pacific	ActiveAire #53258A / Stainless Steel	*	*
	<p>Location: <u>Restrooms</u> Remarks: <u>Surface mounted, whole-room, battery-operated air freshener dispenser; to be mounted min. 7'-0" AFF (CFCI)</u></p>				

T17. BABY CHANGING STATIONS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>T17 a 14a</p>	Baby Changing Station	Bobrick	KB110-SSRE / Satin Stainless Steel	*	*
	<p>Location: <u>Restrooms</u> Remarks: <u>Horizontal, recessed, stainless steel baby changing station (CFCI). Locate within ADA stall wherever possible.</u></p>				

T18. FOLDING SHOWER SEAT						
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T18 a		Folding Shower Seat	Bradley	9562 / 9569 White Phenolic Seat, Stl Stl Frame	*	
		Location: <u>Showers (ADA)</u> Remarks: 9562 – Folding shower seat, ADA-compliant (CFCI) 9569 – Reversible folding shower seat, ADA-compliant (CFCI)				

T19. RECESSED IN-SHOWER SOAP SHELF						
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T19 a		<u>Pre-fab Shower Niche (Tiled)</u>	<u>Schluter</u>	<u>KB 12 SN 305 305A / Tile Ready</u>	<u>*</u> <u>-</u>	<u>*</u> <u>-</u>
		Location: <u>Showers</u> Remarks: <u>Prefabricated shower niche for tile over applications made of KERDIBOARD that can be installed in both KERDI and KERDI-BOARD wall assemblies; 12” x 12” single niche; Review and approval by RED+F required. (CFCI)</u>				
T19 b		<u>Pre-fab Shower Niche (Tiled)</u>	<u>Tile Redi</u>	<u>Redi Niche / Tile Ready</u>	<u>*</u> <u>-</u>	<u>*</u> <u>-</u>
		Location: <u>Showers</u> Remarks: <u>Prefabricated shower niche for tile over applications; single niche configuration preferred; standard and custom sizes available; Review and approval by RED+F required. (CFCI)</u>				
T19 c		<u>Pre-fab Shower Niche (Stl. Stl.)</u>	<u>Redblock</u>	<u>N1014 / Stainless Steel</u>	<u>*</u> <u>-</u>	<u>*</u> <u>-</u>
		Location: <u>Showers</u> Remarks: <u>Prefabricated stainless steel shower niche with perforated soap shelf; Review and approval by RED+F required. (CFCI)</u>				

T19. T20. MOP AND BROOM HOLDER						
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
T20 a 19a		Mop and Broom Holder	Bradley	9953 / 9954 / 9955 Satin Stainless Steel	*	*
		Location: <i>Building Services</i> Remarks: 9953 – Surface mtd mop and broom holder w/ (3) holders, 24” long (CFCI) 9954 – Surface mtd mop and broom holder w/ (4) holders, 36” long (CFCI) 9955 – Surface mtd mop and broom holder w/ (5) holders, 48” long (CFCI)				

BUILDING ACCESSORIES

In order to create and maintain a consistent brand and allow appropriate maintenance at NYU Langone Health spaces, specific building accessories are used. The list below will give the A/E Team a sense of the typical items used throughout NYU Langone facilities. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager, Facilities Operations and the Design Studio to finalize product selections. Please note the following items are preferred over others:

- Recessed accessories are preferable where possible.

The product specifications included in this subsection are organized by type as follows:

- B1. Purell Dispensers and Stands
- B2. Coat Hooks
- B3. Paper Towel Dispensers
- B4. Laundry Grommets
- B5. Umbrella Stand
- B6. Fire Extinguisher Cabinet
- B7. Clocks
- B8. Bike Racks**

B1. PURELL DISPENSERS AND STANDS						
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B1a		Purell Floor Stand (w/ ES8 Disp.)	Gojo	#7308-DS-SLV / Silver Panel	*	*
		Location: <i>Clinical Public Areas</i> Remarks: Floor stand for ES8 Purell Dispensers w/ “Energy-on-the-Refill”. Stand comes w/ White PURELL ES8 PURELL Dispenser w/ Shield Protector. For Replacement Dispenser and Protector Shield info see B1b below. Purell Healthcare Advanced Hand Sanitizer Foam Refill #7753-02				
	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B1b		Purell ES8 Dispenser w/ Shield Protector	Gojo	#7720-01 / White Finish	*	*
		Location: <i>Clinical Public Areas</i> Remarks: PURELL ES8 Dispenser w/ “Energy on the Refill” for use as replacement on floor stand B1a or to be wall mounted to coordinate w/ nearby B1a floor stand mounted dispensers. Provide w/ Shield Protector #7745-WHT-18 Purell Healthcare Advanced Hand Sanitizer Foam Refill #7753-02				

B2. COAT HOOKS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B2a		Coat Hook (Single)	Bradley	9114 / Satin Stainless Steel		*
		Location: <i>Private Office / Exam Room</i> Remarks: Surface mounted single hook; locate (1) on back of Private Office doors; locate (2) on back of Exam Room doors, (1) at 48" AFF and (1) at 64" AFF				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B2b		Coat Hook (Single)	Peter Pepper	2015 / Varies (see below)		*
		Location: <i>Private Office / Exam Room</i> Remarks: Surface mounted single hook. Wood screws included. For wall mounting spec w/ wall anchor #2999 (natural anodized alum); locate (1) on back of Private Office doors; locate (2) on back of Exam Room doors, (1) at 48" AFF and (1) at 64" AFF #2015H – Polished Chrome #2015SH – Satin Chrome				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B2c		Coat Hook (Single)	Peter Pepper	2024 / Varies (see below)		*
		Location: <i>Private Office</i> Remarks: Surface mounted single hook. Wood screws included. For wall mounting spec w/ wall anchor #2999 (natural anodized alum). #2024AL – Polished Aluminum, Natural Anodized #2024H – Polished Chrome				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B2d		Coat Hook (Single)	Peter Pepper	2026 / Varies (see below)		*
		Location: <i>Private Office</i> Remarks: Surface mounted single hook. Wood screws included. For wall mounting spec w/ wall anchor #2999 (natural anodized alum). #2026AL – Polished Aluminum, Natural Anodized #2026H – Polished Chrome				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B2e		Coat Hook (Single)	Peter Pepper	2009H / Polished Chrome		*
		Location: <i>Private Office</i> Remarks: Surface mounted single hook. Wood screws included. For wall mounting spec w/ wall anchor #2999 (natural anodized alum).				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Coat Hook w/ Door Stop (Single)	Peter Pepper	2083 / Polished Alum., Natural Anodized		*
	Location: <u>Private Office</u> Remarks: Surface mounted single hook w/ rubber door stop tip. Wood screws included. For wall mounting spec w/ wall anchor #2999 (natural anodized alum).				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Coat Hooks (Multiple)	Peter Pepper	2143 / 2143XL Natural Anodized Alum.	*	*
	Location: <u>Back-of-House</u> Remarks: 2143 – (3) hooks on flush plate; surface mounted 2143XL – (4) hooks on flush plate; surface mounted				

B3. PAPER TOWEL DISPENSERS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Paper Towel Dispenser	Innovative Gear	PTH-1 / 3mm clear acrylic		*
	Location: <u>Pantry / Lactation Room</u> Remarks: Commercial grade, surface mounted dual dispensing paper towel dispenser for 150 c-fold paper towels; 11" x 4.2" x 6"				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	<u>Paper Towel Dispenser</u>	<u>TrippNT</u>	<u>Varies / clear acrylic</u>		<u>-</u>
	Location: <u>Pantry / Lactation Room</u> Remarks: <u>Commercial grade, surface mounted paper towel dispenser for multi and c-fold paper towels</u> <u>#51912 – Small capacity; 10-7/8"W x 6-1/2"H x 4-1/4"D</u> <u>#51935 – Large capacity; 10-7/8"W x 14-1/2"H x 4-3/8"D</u>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	<u>Paper Towel Dispenser</u>	<u>Bobrick</u>	<u>B-359033 / Satin Stainless Steel</u>		<u>-</u>
	Location: <u>Pantry / Lactation Room</u> Remarks: <u>Manual paper towel dispenser; recessed with lock and key; specify w/ TowelMate 369-130</u>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Paper Towel Dispenser	TrippNT	52916 / clear acrylic		*
	Location: <u>Pantry / Lactation Room</u> Remarks: Commercial grade, countertop paper towel dispenser for multi and c-fold paper towels; w/ clear rubber feet on bottom; 11" x 5" x 7"				

B4. LAUNDRY GROMMETS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Laundry Grommet (Round)	Doug Mockett	TM2C / Satin Stainless Steel	*	*
	Location: <u>Built-in Laundry Receptacles</u> Remarks: 8" dia. X 3" deep trash grommet				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Laundry Chute (Square)	Doug Mockett	TM2A/SQ Satin Stainless Steel	*	*
	Location: <u>Built-in Laundry Receptacles</u> Remarks: 8" square x 6" deep trash grommet				

B5. UMBRELLA STAND					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Umbrella Stand	Medium in Motion	Bono / Satin Stainless Steel		*
	Location: <u>Near exterior entry doors</u> Remarks: Dual umbrella wrapper stand				

B6. FIRE EXTINGUISHER CABINET						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B6a		Fire Extinguisher Cabinet	JL Industries	Embassy Series / #4 Stainless Steel	*	*
				Embassy Series / Painted*	*	*
<p>Location: <u>Locate as required by code</u></p> <p>Remarks: Trimless decorative recessed cabinet (std. paint grade white interior finish) w/ door thickness projecting 7/8" beyond face of adjacent wall surface, ADA compliant <u>when properly installed</u>, w/ vertical duo panel, provide w/ zinc pull and lock in all psychiatric and pediatric areas; provide w/ concealed (edge) pull and no lock all other areas; stainless steel door finish typical</p> <p>*Note: Acceptable under certain design conditions only, subject to RED+F approval. Painted door finish to match adjacent wall color.</p>						

B7. CLOCKS						
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B7a		Digital Clock	Sapling	SBP-31F-404-0W		*
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical	
B7b		Analog Clock	Sapling	Varies / Brushed Alum.	*	

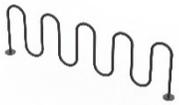
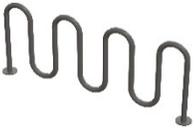
B8. BIKE RACKS					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B8a 	<u>Bike Rack</u>	<u>Varies</u>	<u>Metro / Electro Polished Stainless Steel</u>		<u>* —</u>
	<p>Location: <u>Outdoor Bike Parking</u> Remarks: <u>electro polished stainless steel bike rack; 2-bike capacity per rack; rack can be installed in series to accommodate additional bikes (Approval by RED+F Senior Leadership required.)</u> <u>#MET-2-IG-ES – In-ground mount</u> <u>#MET-2-SF-ES – Surface mount</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B8b 	<u>Bike Rack</u>	<u>Varies</u>	<u>Opal / Electro Polished Stainless Steel</u>		<u>* —</u>
	<p>Location: <u>Outdoor Bike Parking</u> Remarks: <u>electro polished stainless steel bike rack; 2-bike capacity per rack; rack can be installed in series to accommodate additional bikes; 1-5/8" dia. tube; 28" high (Approval by RED+F Senior Leadership required.)</u> <u>#OPR-2-IG-ES – In-ground mount</u> <u>#OPR-2-SF-ES – Surface mount</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B8c 	<u>Bike Rack</u>	<u>Varies</u>	<u>Winder Plus / Stainless Steel</u>		<u>* —</u>
	<p>Location: <u>Outdoor Bike Parking</u> Remarks: <u>stainless steel bike rack; 3-11 bike capacity per rack; 1-5/8" dia. tube; 36" high; 14" to 113" long depending on number of loops specified (Approval by RED+F Senior Leadership required.)</u> <u>#WP36-XX-IG-S – In-ground mount; specify # of loops where XX is shown</u> <u>#WP36-XX-SF-S – Surface mount; specify # of loops where XX is shown</u></p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B8d 	<u>Bike Rack</u>	<u>Varies</u>	<u>Heavy Duty Challenger / Stainless Steel</u>		<u>* —</u>
	<p>Location: <u>Outdoor Bike Parking</u> Remarks: <u>stainless steel bike rack; 3-11 bike capacity per rack; 2-3/8" dia. tube; 36" high; 18" to 113" long depending on number of loops specified (Approval by RED+F Senior Leadership required.)</u> <u>#H36-XX-IG-S – In-ground mount; specify # of loops where XX is shown</u> <u>#H36-XX-SF-S – Surface mount; specify # of loops where XX is shown</u></p>				

	Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
B8e		<p><u>Bike Rack</u></p> <p>Location: <i>Outdoor Bike Parking</i></p> <p>Remarks: <u>stainless steel bike rack; 3-11 bike capacity per rack; 2-3/8" dia. tube; 36" high; 22" to 178" long depending on number of loops specified (Approval by RED+F Senior Leadership required.)</u></p> <p><u>#CHP-XX-IG-S – In-ground mount; specify # of loops where XX is shown</u></p> <p><u>#CHP-XX-SF-S – Surface mount; specify # of loops where XX is shown</u></p>	<p><u>Varies</u></p>	<p><u>Challenger Plus / Stainless Steel</u></p>		<p>* –</p>

RECYCLING PROGRAM

NYU Langone Health has instituted a system-wide recycling program to reduce our waste to landfill, meet our sustainability goals and comply with updated *NYC Local Law 87* rules for business recycling. We want to ensure staff, residents and visitors are able to recycle required materials, that the integrity of our recycling program is maintained and that waste and recycling are properly handled by our private carters. In line with that commitment we are providing additional information about NYU Langone’s Recycling Program organized as follows:

1. General Recycling Program Requirements
2. Specific Recycling Program Requirements
3. Signage Requirements
4. Decal Requirements
5. Locations
6. Trash and Recycling Receptacle Specifications

1. General Recycling Program Requirements

NYU Langone has determined that centralized sorting of trash and recyclables and movement away from individualized collection is the preferred methodology.

DSNY rule of thumb: Wherever there is a trash bin, there should also be recycling bin(s).

When specifying trash and recycling receptacles, the A/E Team shall:

- Confirm project recycling procedures, including any landlord or building requirements. NYU Langone has chosen to pursue source-separated recycling. DSNY defines source-separated recycling collection as:

“The practice of separating the two designated recyclable “streams” from each other and from garbage. These three streams must be kept separate from the point of generation (where staff/customers place an item in a receptacle) until the materials are placed out for collection. Your carter is then required to collect the three streams with three separate trucks or in three separate compartments in a truck.”

The three streams include:

- Trash | Waste | Landfill
 - Paper | Cardboard | Paperboard Recycling
 - Metals | Glass | Plastics | Beverage Cartons Recycling
- Provide adequate space on the plans for trash and recycling receptacles to be located in discreet areas (i.e. niches, alcoves, etc.), but still convenient to staff and visitors.
 - Select container gallon capacities appropriate to the designation, size and type of activity occurring within the space the receptacles serve. Avoid oversized bins (i.e. ***Clinical Article 28*** facilities shall receive receptacles that are no more than 32 gal. per container).
 - For Storage and Hauling, the regulation makes it illegal for any hauler to collect recyclables and trash in the same truck. Therefore, the infrastructure to keep these streams separated from point of generation to hauling must be provided by NYU Langone. Project Teams must ensure adequate storage space and loading dock configuration for separated trash and recycling. It can be in the same room or on the same dock, but must

be clearly separated with its own signage and labeling. Consider predicted waste volume and the activity happening in the space.

- Helpful Resources:
 - City of New York Department of Sanitation - www1.nyc.gov/assets/dsny/site/home
 - <https://www1.nyc.gov/assets/dsny/docs/commercial-recycling-notice-english.pdf>
 - AIA “Zero Waste Design Guidelines”

2. Specific Recycling Program Requirements

When specifying trash and recycling receptacles, the A/E Team shall:

- For Private Offices and Work Stations, do not provide deskside bins. Should staff or departmental representatives opt to have deskside bins 1 “paper only” receptacle shall be provided under the desk. Deskside bins for items other than “paper only” are not permitted.
- For Open Work Areas, provide centralized trash and recycling receptacles. In calculating the capacity use the following as a minimum guideline:

1 person = 1 gallon trash + $\frac{3}{4}$ gallon metal-glass-plastic + $\frac{3}{4}$ gallon paper.

- For custom built-in trash and recycling, such as in:
 - Open Work Areas
 - Conference Rooms
 - Pantries
 - Cafés / Cafeterias

Provide millwork with customized drawers or openings sized to fit a standard plastic bin within. Ensure that the cabinet or drawer does not permit movement of the interior bin as that often causes waste to be dropped between the opening and the bin and presents a vermin, cleanliness and odor issue.

- Provide compost receptacles For Cafés, and Cafeterias and Pantries, provide for compost if composting is available at the site. These receptacles shall be in addition to trash and recycling. ~~Provide accommodation for trays.~~ Inclusion of a ~~drain or~~ sink for disposing of liquids ~~by end users~~ prior to sorting of waste is encouraged, ~~if it can be accommodated.~~
- For Back-of-House Areas, coordinate trash and recycling receptacle specification and locations with the appropriate Facilities department. Any back-of-house bins needed will be the responsibility of the project team to procure through the standard Furniture process. Please note, Building Services will continue to provide tan step cans for clinical / Article 28 spaces.
- For Confidential Paper Recycling, HIPAA paper should always be kept separate for shredding as part of NYU Langone’s existing HIPAA shredding program.
- For Universal Waste Recycling, all universal waste shall be stored in accordance with EH&S safety policies and then recycled by either EH&S or MCIT.
- For Lab Glass, appropriate bins shall be made available to NYU Langone labs for lab glass collection separate from the recycling program.

3. Signage Requirements

There are a variety of different signs required for the Recycling Program at NYU Langone Health. The A/E Team and RED+F PM shall coordinate signage fabrication and installation with NYU Langone Design Studio’s Signage/Wayfinding Group as part of the capital project. The signs shall be located as follows:

- **Exterior** - Business Integrity Commission (BIC) hauler decals shall be displayed where they are visible from the outside of a building (if owned, leased by or occupied exclusively by NYU Langone) or tenant space (if leased by NYU Langone and we provide our own waste hauling). BIC decals are supplied by the contracted waste hauler. To obtain BIC decals coordinate with either Environmental Services or Building Services.

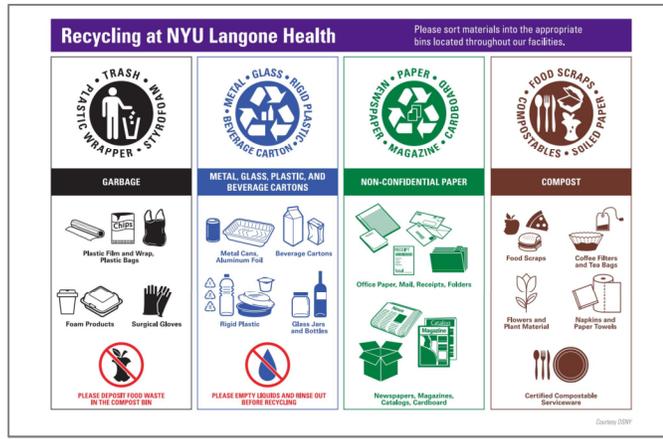
BIC decals shall be aligned to architectural elements and placed in lower corners of storefront windows away from entry doors. BIC decals shall not be placed adjacent to entry doors, unless it cannot be avoided. Recommended locations, listed in order of highest to lowest preference, are loading docks and exterior waste storage areas, exterior building entries and interior tenant entries.



- **Public Areas (w/o Composting)** - The following signage shall be posted wherever trash and recycling centers are provided. Signs shall be printed on Sintra and installed with the bottom edge 3” above the trash and recycling center’s top surface.

<p>Recycling at NYU Langone Health</p> <p>Reduce. Reuse. Recycle.</p> <p>NYU Langone Health is committed to reducing our waste impact and contributing to a safer and healthier environment for our patients, employees, and community.</p> <p>Please support our efforts by sorting your materials into the appropriate bins located throughout our facilities.</p>	<p>RECYCLING • TRASH • WOODS • FOOD SCRAP</p>	<p>METAL • GLASS • RIGID PLASTIC • BEVERAGE CARTON</p>	<p>RECYCLING • PAPER • GARBAGE • MAGAZINE • CARDBOARD</p>	
	<p>GARBAGE</p> <p>Plastic Film and Wrap, Plastic Bags</p> <p>Foam Products, Food Scraps</p> <p>Soiled or Coated Paper, Surgical Gloves</p>	<p>METAL, GLASS, PLASTIC, AND BEVERAGE CARTONS</p> <p>Metal Cans, Beverage Cartons, Rigid Plastic, Glass, Jars, and Bottles</p> <p>PLEASE EMPTY LIQUIDS BEFORE RECYCLING</p>	<p>NON-CONFIDENTIAL PAPER</p> <p>Office Paper, Mail, Receipts, Folders</p> <p>Newspapers, Magazines, Catalogs, Cardboard</p>	
	<p><small>For more information or questions, please contact Building Services Department at (212) 243-4030</small></p>			<p><small>© 2010 ESI</small></p>

- **Public Areas (w/ Composting)** - The following signage shall be posted wherever compost is provided in addition to trash and recycling. Signs shall be printed on Sintra and installed with the bottom edge 3” above the trash, recycling and compost center’s top surface.



- **Back-of-House Areas** – The following signage shall be posted in the back-of-house areas described below:
 - Maintenance/Storage Areas: Areas near compactors or trash and recycling front end loader (FEL) bins, or anywhere else trash and recycling bags are aggregated and stored for more than 20 minutes.
 - Loading Docks: Loading docks of buildings owned or leased by NYU Langone where there is waste hauling infrastructure or storage.



4. Decal Requirements

Decals shall be posted on each trash, metal-glass-plastic, and paper receptacle. Cafés and Cafeterias shall receive an additional decal to be posted at each compost receptacle. The A/E Team and RED+F PM shall coordinate signage fabrication and installation with NYU Langone Design Studio’s Signage/Wayfinding Group as part of the capital project. The decals shall be applied as follows:

▪ **Front-of-House Receptacles**

- Decals shall be 4-1/2” in diameter.
- Each decal shall be centered on and located directly below its respective opening.
- Public facing decals shall be black (trash), blue (metal-glass-plastic), green (paper), or brown (compost in Cafés, ~~and Cafeterias~~ and Pantries only) cut vinyl.



{Cafés / Cafeterias / Pantries
Only(if required)}

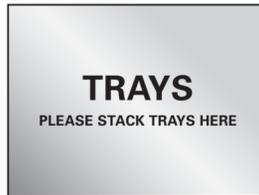
▪ **Back-of-House Receptacles**

- Decals shall be 3” in diameter on the short side and 5” in diameter on the long side.
- Decals shall be centered horizontally on each side of the Slim Jim. The heights of the decals measured from the bottom of the receptacle to the center line of each decal shall be 12”.
- One 3” decal shall be provided on each short side and one 5” decal shall be provided on each long side of the Slim Jim for a total of 4 decals per bin.
- Back-of-House decals shall be custom heat stamped white graphics applied by the manufacturer.



{Cafés / Cafeterias / Pantries
Only(if required)}

- **Cafés / Cafeterias (Wall Mounted)**
 - Decals or signs shall be custom size to fit the architecture. For example, in some cases, the decals will go on a tile wall. In those cases the decal shall be sized to match the height and width of the tiles.
 - Each decal shall be centered on and located directly above its respective opening.
 - Each decal shall be second surface screen printed, back painted on clear acrylic, and no paint on returns.
 - Tray signs should also be provided and be first surface etched and paint-filled on 1/4” thick horizontal-brushed aluminum.



5. **Locations** - To assist the A/E Team, below is a summary of approved locations for each bin type included in the Trash and Recycling Receptacle Specifications provided at the end of this subsection:

Area	Receptacle Specification																	
	R1a – R1d	R1e	R1f	R1g	R1h	R1i	R1j	R1k	R1l	R1m	R2a	R2b	R2c	R2d	R3a R3b	R3c	R4a	R4b – R4d
FRONT-OF-HOUSE AREAS																		
Building Lobbies	✓	✓																
Reception / Waiting Areas	✓	✓	✓					✓										
Miscellaneous Public Areas				✓														
Lecture Halls / Auditoriums (outside of space)	✓		✓															
Training Rooms (outside of space)	✓		✓	✗		✓												
Conference Rooms (12+ occupants)	✓	✓	✓									✓						
Open Work Areas			✓	✗	✓	✓				✓								
Pantries					✓	✓						✓						
Cafés and Cafeterias					✓	✓							✓					
Staff / Student Lounges, Break Rooms & Study Spaces	✓	✓	✓															
Private Office / Workstation (paper by request only)										✓								
Public Corridors (if necessary)								✓	✓									
Exterior Building Entries (trash only, if necessary)																	✓	
Courtyards / Terraces (if necessary)																		✓
BACK-OF-HOUSE AREAS																		
Copy / Printer Rooms (paper only)																	✓	
Staff Lockers														✓	✓			
Laboratories														✓	✓			
Service Corridors														✓	✓			
Service Elevator Lobbies														✓	✓			
Notes:																		
<ol style="list-style-type: none"> 1. Provide adequate space on the plans for trash and recycling receptacles to be located in discreet areas (i.e. niches, alcoves, etc.), but still convenient to staff and visitors. 2. Select container gallon capacities appropriate to the designation, size and type of activity occurring within the space the receptacles serve. Avoid oversized bins (i.e. Article 28 Clinical facilities shall receive receptacles that are no more than 32 gal. per container.) 3. Trash only receptacles shall be provided in Patient Rooms, Exam Rooms, Operating and Procedure Rooms. 4. Do <u>not</u> provide trash or recycling receptacles in Elevator Lobbies, Public Corridors and Discussion Rooms (less than 8 occupants). 																		

6. *Trash and Recycling Receptacle Specifications*

The Architect and Interior Designer should use the information below as a guide for specifying trash and recycling receptacles on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying products that are appropriate and code compliant for specific spaces. It is the Architect’s responsibility to select items that are code compliant and appropriate for the capital project based on the type of space and end-user needs. Architects shall coordinate with the RED+F Project Manager, Facilities Operations, Environmental Services / Building Services and the Design Studio to finalize product selections.

The product specifications included in this subsection are organized by type as follows:

- R1. Front-of-House Receptacles
- R2. Custom Built-in Millwork
- R3. Back-of-House Receptacles
- R4. Outdoor Receptacles

R1. FRONT-OF-HOUSE RECEPTACLES					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>R1a</p>  <p>**Preferred**</p>	<p>Trash / Recycling Center</p>	<p>Magnuson Group</p>	<p>Valuta / Anodized Silver</p>	<p>*</p>	<p>*</p>
	<p>Location: <u>Building Lobbies / Reception -Waiting Areas / Conference Rooms / Staff + Student Lounges / Break Rooms / Study Spaces / Training Rooms (outside) / Lecture Halls + Auditoriums (outside)</u></p> <p>Remarks: Specify the following configuration: 20 gal trash 20 gal metal-glass-plastic 20 gal paper Model – 3 x VA 1809L-NYU (smooth top) Provide with (2) sets of ganging magnets #GNG-MAG-2 Provide with (2) sets of ganging plates # GNG-PLT-2 Openings – 4-1/4” x 13-3/16” trash opening, 4-1/4” dia. metal-glass-plastic opening, and 2” x 12” paper slot <u>w/ custom rounded ends</u> Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Provide 3 decals per receptacle (1 short side + 2 long sides). Refer to Item 5. Decal Requirements within this subsection for add’l labeling information. Dimensions – 18”D x 27”W x 33-3/4”H</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1b</p>	Trash / Recycling Center	Magnuson Group	Valuta / Anodized Silver	*	*
	<p>Location: <u>Building Lobbies / Reception -Waiting Areas / Conference Rooms / Staff + Student Lounges / Break Rooms / Study Spaces / Training Rooms (outside) / Lecture Halls + Auditoriums (outside)</u></p> <p>Remarks: Specify the following configuration: 4032 gal trash 20 gal metal-glass-plastic 20 gal paper Model – (1 x VA 1818L-1814L-NYU + 2 x VA 1809L-NYU (smooth top) Provide with (2) sets of ganging magnets #GNG-MAG-2 Provide with (2) sets of ganging plates # GNG-PLT-2 Openings – 11-1/16" x 11-1/16"10" x 10" trash opening, 4-1/4" dia. metal-glass-plastic opening, and 2"x12" paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Provide 3 decals per "VA 1809L" receptacle (1 short side + 2 long sides). "VA 1818L" shall have 1 decal on the front, opposite the top hinge. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 18"D x 3632"W x 33-3/4"H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1c</p>	Trash / Recycling Center	Magnuson Group	Valuta / Anodized Silver	*	*
	<p>Location: <u>Building Lobbies / Reception -Waiting Areas / Conference Rooms / Staff + Student Lounges / Break Rooms / Study Spaces / Training Rooms (outside) / Lecture Halls + Auditoriums (outside)</u></p> <p>Remarks: Specify the following configuration: 3240 gal trash 3240 gal metal-glass-plastic 3240 gal paper Model – (3 x VA 1818L-1814L-NYU (smooth top) Provide with (2) sets of ganging magnets #GNG-MAG-2 Provide with (2) sets of ganging plates # GNG-PLT-2 Openings – 11-1/16" x 11-1/16"10" x 10" trash opening, 4-1/4"6" dia. metal-glass-plastic opening, and 2"x15-5/8" paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Provide 3 decals per receptacle (1 opposite the top hinge + 2 on either side of that). Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 18"D x 5442"W x 33-3/4"H</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1d</p>	Trash / Recycling Center	MaxR	Custom / Stainless Steel	*	*
	<p>Location: <u>Building Lobbies / Reception -Waiting Areas / Conference Rooms / Staff + Student Lounges / Break Rooms / Study Spaces / Training Rooms (outside) / Lecture Halls + Auditoriums (outside)</u></p> <p>Remarks: Specify the following configuration: 22 gal trash 22 gal metal-glass-plastic 22 gal paper Model – Customized Royal Triple Top Load Openings – 6” x 12” trash opening, 6” dia. metal-glass-plastic opening, and 3” x 12” paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information. Dimensions – 23-5/16”D x 37-5/8”W x 36-1/16”H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1e</p> <p>**Preferred**</p>	Trash / Recycling Center	Magnuson Group	PIC / Silver	*	*
	<p>Location: <u>Building Lobbies / Reception -Waiting Areas / Conference Rooms / Staff + Student Lounges / Break Rooms / Study Spaces</u></p> <p>Remarks: Specify the following configuration: 16 gal trash 16 gal metal-glass-plastic 16 gal paper Model – PIC 3x60L-NYU (w/ standard openings, <u>rigid internal liners and single drop-in lid painted to match the body</u>) Openings – Large square trash opening (<u>left</u>), 6” round metal-glass-plastic opening (<u>middle</u>) and standard paper slot (<u>right</u>) Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information. Dimensions – 11-7/8”D x 35-5/16”W x 26-15/16”H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1f</p> <p>**Preferred**</p>	Trash / Recycling Center	Nucraft	Recycling Center / Varies	*	*
	<p>Location: <u>Reception -Waiting Areas / Conference Rooms / Open Work Areas / Staff + Student Lounges / Break Rooms / Study Spaces / Training Rooms (outside) / Lecture Halls + Auditoriums (outside)</u></p> <p>Remarks: Specify the following configuration: 10.25 gal trash 10.25 gal metal-glass-plastic 10.25 gal paper Model – RYC-3628-3VNT (36” x 28” 3-station unit); Provide with brushed aluminum top and wood to match conference room table. Openings – <u>3-6254</u>” x <u>9-25</u>” trash opening, 6” dia. bottles/cans opening, and <u>1-6252</u>” x <u>9-25</u>” paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection add’l additional labeling information. Dimensions – 18”D x 36”W x 28”H</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Trash / Recycling Receptacle	Safco	9941SS / Brushed Alum.	*	*
	<p>Location: <u>Miscellaneous Public Areas</u></p> <p>Remarks: Specify the following configuration: 20 gal trash 10 gal metal-glass-plastic 10 gal paper Model – 9941SS Openings – one large trash opening; two smaller openings for bottles/cans and paper Decals – Provide custom NYU Langone approved decals in lieu of mfr standard (2 x Trash + 1 x MGP + 1 x Paper). Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 20" dia. x 34"H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Trash / Recycling Center	Peter Pepper	Reform / Varies	*	*
	<p>Location: <u>Open Work Areas / Training Rooms (outside)</u></p> <p>Remarks: Specify the following configuration: 23 gal trash 23 gal metal-glass-plastic 23 gal paper Model – RF36 w/o lid graphics; Coordinate painted metal lid color and custom laminate finish spec's w/ RED+P. Openings – Provide with standard rectangular openings. Coordinate custom openings with manufacturer for large quantities. Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Also provide custom "PUSH" decal to indicate doors are operable via touch-latch. Dimensions – 22"D x 36"W x 32"H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Trash / Recycling Center	Nevins	Thro / Varies	*	*
	<p>Location: <u>Open Work Areas / Existing Cafés, Cafeterias + Pantries</u></p> <p>Remarks: Specify the following configuration: 35-28 gal trash 35-28 gal metal-glass-plastic 35-28 gal paper Model – 3000-1316-MLF (3 bin full wrap; 16" bin width) Custom available without bin wrap for built-in applications. See R2a for additional info. Openings – 14" x 6" trash opening, 58" dia. metal-glass-plastic opening, and 14" x 3" paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 24-1/8"D x 53-31/4"W x 41-13/162"H Note – In cafés, cafeterias and pantries, permitted <u>only</u> when built-ins are not possible.</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1j</p>	Trash / Recycling Center	Steelcase	Victor 2 / Varies	*	*
	<p>Location: <u>Open Work Areas / Training Rooms (outside) / Existing Cafés, Cafeterias + Pantries</u></p> <p>Remarks: Specify the following configuration: 12 gal trash 12 gal metal-glass-plastic 12 gal paper Model – ARM183636 (Mobile 3-Opening); Acrylic inserts shall be adhered to face of receptacle. Access to liners via doors in frontback. Receptacles to be provided without casters. Openings – Provide waste, returnables and paper acrylic inserts less mfr. decals. Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Also provide custom "PUSH" decal to indicate doors are operable via touch-latch. Dimensions – 18"D x 36"W x 36"H Note – In cafés, cafeterias and pantries, permitted <u>only</u> when built-ins are not possible.</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1j *</p>	Space Saver Trash/ Recycling Center	Magnuson Group	Sotare + Valuta Combo / Anodized Silver	*	*
	<p>Location: <u>Reception-Waiting Areas / Public Corridors (if necessary)</u></p> <p>Remarks: Specify the following configuration: 14 gal paper 20 gal trash 14 gal metal-glass-plastic Model – (1 x SO1809L-LEFT w/ circle open'g) + (1 x VA1809L-<u>NYU</u> w/ waste open'g <u>and smooth top</u>) + (1 x SO1809L-RIGHT w/ paper open'g) Provide with (2) sets of ganging magnets #GNG-MAG-2 <u>Provide with (2) sets of ganging plates # GNG-PLT-2</u> Openings – 1-1/2" x 11-3/4" paper slot, 4-1/4" x 13-3/16" trash opening, and 4-1/4" dia. metal-glass-plastic opening Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 9"D x 54"W x 33-3/4"H</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1k ↓</p>	Space Saver Trash/ Recycling Center	Magnuson Group	Sotare / Anodized Silver		*
	<p>Location: <u>Public Corridors (if necessary)</u></p> <p>Remarks: Specify the following configuration: 34 gal trash 14 gal metal-glass-plastic 14 gal paper Model – (1 x SO1818L) + (1 x SO1809L-LEFT) + (1 x SO1809L-RIGHT) Provide with (2) sets of ganging magnets #GNG-MAG-2 <u>Provide with (2) sets of ganging plates # GNG-PLT-2</u> Openings – 12-1/8" x 11-3/4" trash opening, 4-1/4" dia. metal-glass-plastic opening, and 1-1/2" x 11-3/4" paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 18"D x 36"W x 33-3/4"H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R1l ⌘</p>	Deskside Recycling	Glaro	Deskside Recycling Bin / Satin Alum.	*	*
	<p>Location: <u>Private Office / Workstation (paper only)</u></p> <p>Remarks: Specify as follows: 5 gal paper Model – 66SA Opening – Open Top Decals – Provide custom NYU Langone approved decal. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 10"D x 15"H</p>				

R2. CUSTOM BUILT-IN MILLWORK					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R2a **Preferred**</p>	Trash / Recycling Center @ File Bar	Nevins	Thro / Varies	*	*
	<p>Location: <u>Open Work Areas @ File/Locker Bar</u></p> <p>Remarks: Available as follows: 35-28 gal trash 35-28 gal metal-glass-plastic 35-28 gal paper 40 gal trash 40 gal metal glass plastic 40 gal paper Model – Custom without bin wrap for built-in applications. Openings – Single and double-sided access available; 14" x 6" trash opening, 58" dia. metal-glass-plastic opening, and 14" x 3" paper slot Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – <u>24-1/8" D x 53-1/4" W x 41-13/16" H vary</u></p>				

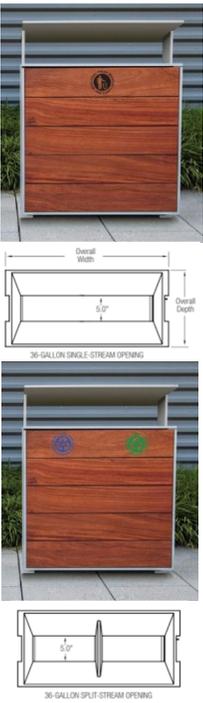
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>R2b</p>  <p>**Preferred**</p>	<p>Built-in Trash / Recycling Center</p>	<p>Custom</p>	<p>Custom / Varies</p>	<p>*</p>	<p>*</p>
	<p>Location: <u>Conference Rooms</u> Remarks: Provide the following configuration: 10 - 25 gal trash 10 - 25 gal metal-glass-plastic 10 - 25 gal paper Model – Custom millwork; Match adjacent conference room credenza and table finishes. Millwork shall be designed to accommodate plastic liners within. Coordinate w/ AV rack equipment. Openings – 5” x 10” trash opening, 6” dia. metal-glass-plastic opening, and 2-1/2” x 10” paper slot. Openings shall be trimmed with stainless steel insert. Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – vary Notes – 1. If countertop is more than 12’ long, provide openings on top. 2. If countertop is less than 12’ long, provide openings on face of cabinet. 3. The selected interior rigid liners should fill the cavity of the millwork to prevent disposed items from falling passed the bins.</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>R2c</p>  <p>**Preferred**</p>	<p>Built-in Trash / Recycling Center</p>	<p>Custom</p>	<p>Custom / Varies</p>	<p>*</p>	<p>*</p>
	<p>Location: <u>Pantries</u> Remarks: Provide the following configuration: 10 - 25 gal trash 10 - 25 gal metal-glass-plastic 10 - 25 gal paper Model – Custom millwork; Match adjacent finishes. Millwork shall be designed to accommodate plastic liners within. Openings – 12” x 5” trash opening, 12” x 5” metal-glass-plastic opening, and 12” x 5” paper opening. Openings shall be trimmed with stainless steel insert. Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – vary</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>**Preferred**</p>	Built-in Trash / Recycling Center	Custom	Custom / Varies	*	*
	<p>Location: <u>Café / Cafeteria</u></p> <p>Remarks: Provide the following configuration: 20 gal trash 20 gal metal-glass-plastic 20 gal compost 20 gal paper 20 gal compost</p> <p>Model – Custom millwork; Match adjacent finishes. Millwork shall be designed to accommodate Rubbermaid #FG262000YEL plastic liners.</p> <p>Openings – 10” x 10” trash opening, 10” dia. metal-glass-plastic opening, 10” x 10” compost opening and 10” dia. paper opening. Openings shall be trimmed with stainless steel insert.</p> <p>Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information.</p> <p>Dimensions – vary</p>				

R3. BACK-OF-HOUSE RECEPTACLES					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Utility Trash Receptacle	Rubbermaid	Slim Jim Container	*	*
	<p>Location: <u>Staff Lockers/ Laboratories / Service Corridors / Service Elevator Lobbies</u></p> <p>Remarks: Specify as follows: 23 gal trash</p> <p>Model – Container: #FG354060 BLA Lid: #FG267360BLA</p> <p>Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information.</p> <p>Dimensions – 22”D x 11”W x 30”H (container only)</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
	Utility Metal-Glass-Plastic Receptacle	Rubbermaid	Slim Jim Container	*	*
	<p>Location: <u>Staff Lockers / Laboratories / Service Corridors / Service Elevator Lobbies</u></p> <p>Remarks: Specify as follows: 23 gal metal-glass-plastic</p> <p>Model – Container: #FG354007 BLUE Lid: #FG269288 BLUE</p> <p>Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information.</p> <p>Dimensions – 22”D x 11”W x 30”H (container only)</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R3c</p>	Utility Paper Receptacles	Rubbermaid	Slim Jim Container	*	*
	<p>Location: <u>Staff Lockers / Laboratories / Service Corridors / Service Elevator Lobbies / Copy and Printer Rooms (paper only)</u></p> <p>Remarks: Specify as follows: 23 gal paper Model – Container: #FG354007GRN Lid: #FG270388 GRN Decals – Provide custom NYU Langone approved decals. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 22”D x 11”W x 30”H (container only)</p>				
<p>Note: Building Services will continue to provide tan step cans for clinical / Article 28 spaces.</p>					

R4. OUTDOOR RECEPTACLES					
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R4a</p>	Covered Outdoor Trash Receptacle	Forms+ Surfaces	Universal / Seastone Stainless Steel	*	*
	<p>Location: <u>Exterior Building Entries</u></p> <p>Remarks: Specify as follows: 30 gal trash Model – SLUNN-30SSS Body Finish – Seastone Stainless Steel Body Pattern – No Pattern Base Material – Polyethylene, Slate Installation Option – Freestanding Lid Tether – None Number of Liners – One full liner Liner Options – Provide w/ bag straps and drain holes Opening – Standard Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 21.5” dia. x 37.5” H</p>				
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
 <p>R4b</p> <p>**Preferred**</p>	Covered Outdoor Trash / Recycling Receptacle	Mmcité	Crystal / Stainless Steel	*	*
	<p>Location: <u>Courtyards / Terraces</u></p> <p>Remarks: Specify as follows: 14.5 gal trash 8.5 gal metal-glass-plastic 8.5 gal paper Model – CS350n; no ashtray; no opening covers Openings – Provide with standard openings. Decals – Provide custom NYU Langone approved decals in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add'l labeling information. Dimensions – 10.2”D x 37.2”W x 38.8”H</p>				

Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>R4c</p> 	<p>Covered Outdoor Trash / Recycling Receptacle</p> <p>Location: <i>Courtyards / Terraces</i></p> <p>Remarks: Specify the following configurations, one of each is required to form a triple stream set:</p> <p>36 gal single-stream trash Model – SLAPX-136S Finish – Sandstone Stainless Steel Graphic Message – None Rain Cover – Yes Latch Options – Std. Lift Latch Liner Options – Provide w/ bag straps and drain holes Mounting – Freestanding w/ Levelers</p> <p>Dimensions – 15”D x 32”W x 40.5”H (w/ Rain Cover)</p> <p>36 gal split-stream (18 gal metal-glass-plastic 18 gal paper) Model – SLAPX-36S Finish – Sandstone Stainless Steel Graphic Message – None Rain Cover – Yes Latch Options – Std. Lift Latch Liner Options – Provide w/ bag straps and drain holes Mounting – Freestanding w/ Levelers</p> <p>Dimensions – 15”D x 32”W x 40.5”H (w/ Rain Cover)</p> <p>Openings – Standard</p> <p>Decals – Provide custom NYU Langone approved decal in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information.</p> <p>Note – Receptacles are to be placed side-by-side 6” apart.</p>	Forms+Surfaces	Apex / Sandstone Stainless Steel		*
Image	Description	Manuf.	Model/Finish	Clinical	Non-Clinical
<p>R4d</p> 	<p>Covered Outdoor Trash / Recycling Receptacle</p> <p>Location: <i>Courtyards / Terraces</i></p> <p>Remarks: Specify the following configurations, one of each is required to form a triple stream set:</p> <p>36 gal single-stream trash Model – SLAPX-136J Finish – Jatoba Wood + Sandstone Stainless Steel Graphic Message – None Rain Cover – Yes Latch Options – Std. Lift Latch Liner Options – Provide w/ bag straps and drain holes Mounting – Freestanding w/ Levelers</p> <p>Dimensions – 15”D x 32”W x 40.5”H (w/ Rain Cover)</p> <p>36 gal split-stream (18 gal metal-glass-plastic 18 gal paper) Model – SLAPX-36J Finish – Sandstone Stainless Steel Graphic Message – None Rain Cover – Yes Latch Options – Std. Lift Latch Liner Options – Provide w/ bag straps and drain holes Mounting – Freestanding w/ Levelers</p> <p>Dimensions – 15”D x 32”W x 40.5”H (w/ Rain Cover)</p> <p>Openings – Standard</p> <p>Decals – Provide custom NYU Langone approved decal in lieu of mfr standard. Refer to Item 5. Decal Requirements within this subsection for add’l labeling information.</p> <p>Note – Receptacles are to be placed side-by-side 6” apart.</p>	Forms+Surfaces	Apex / Jatoba Wood + Sandstone Stainless Steel		*

DOOR HARDWARE

Instructions to Architects for preparing a hardware specification.

- A. The Architect and Interior Designer should use this section as a guide for specifying door hardware on NYU Langone capital projects. This information does not relieve the Architect or Interior Designer of specifying products that are appropriate and code compliant for specific spaces. The Architect and Interior Designer may suggest other products if they believe those products meet the design intent of the project and this section of the Design Guidelines.
- B. The architect shall develop a hardware schedule that is code compliant to: NYC Building Code, CMS, Joint Commission, NFPA and all other applicable codes.
- C. These hardware guidelines are for the main campus at NYU Langone Health. The architect shall follow these guidelines in conjunction with any applicable building codes. In addition:
 - for the NYU Winthrop Hospital campus, the architect shall follow these guidelines in conjunction with their standard hardware.
 - for NYU Langone Hospital – Brooklyn campuses, the architect shall follow these guidelines in conjunction with their standard hardware. Yale hardware sets shall be used in lieu of Sergeant.
 - for Off-site locations, the architect shall follow these guidelines in conjunction with the building landlord's hardware requirements.
- D. The Architect shall follow the Fire-Rated Hollow Metal Door Standards by RED+F's Facilities department.
- E. It shall be the Architect's responsibility to coordinate all work with NYU Langone Security, Fire Alarm, and Infant Abduction System (if applicable) Vendors and associated NYU Langone personnel. Where power and control is required to electrical hardware that is not being furnished by the Security Vendor, the Architect and/or the Electrical Engineer shall provide wiring diagrams for all hardware specified in the Finish Hardware portion of this Specification. It shall also be the Architect's responsibility to provide a sequence of operations for all automatic doors for all scenarios (i.e.: daytime, nighttime, upon activation of fire alarm, etc.).
- F. Where automatic operators are specified, it shall be the Architect's responsibility to coordinate all power and control to the automatic operators and accessories (proximity readers, paddles, intercom systems, etc.), including logic for tie-in to fire alarm and infant abduction systems. The Architect and/or the Electrical Engineer shall provide wiring diagrams that show all wiring and power requirements to the automatic operator and accessories. The Architect shall include in the specifications that the automatic operator shall be furnished and installed by an authorized Stanley distributor. The same automatic operator provider and installer shall also furnish and install all electronic locking hardware, as may be required, for all automatic operated doors.

- G. The Architect shall include in the specification a paragraph stating that the GC is responsible for setting up a pre-installation meeting between the hardware installer, the automatic door vendor and the security vendor to coordinate installation of all trades.
- H. The Architect shall include in the specification the submission of a Quality Control Plan (QCP) for fire-rated doors, frames and hardware to RED+F Commissioning within 30 days of contract award. The QCP shall require that:
- NYU Langone engage an independent on-site commissioning agent dedicated to the inspection of fire-rated doors, frames and hardware.
 - The inspection will be based on the requirements set forth in the NYC Building Code and NFPA 80 – Standards for Fire Doors & Other Opening Protectives. The door, frame and hardware installation shall comply with the requirements set forth in NFPA 80 for all clearance and install requirements and NFPA 101 for inspection of door openings.
 - The agent shall use an electronic inventory tracking system (EITS) made accessible to RED+F staff and the A/E Team to track inventory and installation/inspection status.
 - The agent shall inspect each fire-rated door, frame and hardware installation for compliance and acceptance and prepare a report at the intervals described below:
 - Stage 1: Inspect the frame installation upon completion of the preliminary bracing of pressed steel frames prior to wall installation.
 - Stage 2: Re-inspect the frame installation upon completion of the wall construction by the masonry and drywall trades.
 - Stage 3: Re-inspect the assembly upon completion of the hollow metal doors and architectural hardware.
 - Stage 4: Re-inspect the assembly upon completion of electrical work including security and fire alarm installation.
 - The Contractor shall not proceed to the next stage until all deficiencies have been corrected, re-inspected and approved.

Contents**1.1 Hanging Devices**

- A. Full Mortise Hinges
- B. Swing Clear Hinges
- C. Lead Lined Pivots
- D. Center Hung Pivots
- E. Continuous Hinges

1.2 Locking and Latching Devices

- A. Mortise Locks and Latches
- B. Cylinders and Keying
- C. Cylindrical Locks at Existing Doors
- D. Combination Locks
- E. Hospital Push Pull Latches
- F. Exit Devices
- G. Electric Locks

1.3 Door Closing Devices

- A. Surface Mounted Door Closers
- B. Floor Closers

1.4 Door Stops

- A. Wall and Floor Stops
- B. Overhead Stops

1.5 Protection Plates

- A. Kick Plates
- B. Mop Plates
- C. Armor Plates

1.6 Flush Bolts

- A. Automatic Flush Bolts
- B. Manual Flush Bolts

1.7 Automatic Operators**1.8 Card Access Doors****2.1 Typical Hardware Sets****2.2 Typical Electrical Hardware Sets**

1.1 Hanging Devices

A. Full Mortise Hinges:

1. Unless otherwise noted, all doors shall be hung on full mortise five knuckle ball bearing type, template hinges, with non-rising loose pins. All out-swing doors shall be furnished with non-removable pins (NRP).
 - a. All hinges for 1-3/4" thick doors shall be 4-1/2" wide in the open position. For other thickness doors, hinges shall be of a width to permit unobstructed swing of the doors.
 - b. Size and weight of hinges shall conform to the following:
 - Up to 36" ----- 4-1/2" heavy weight
 - Over 36" to 46" ----- 5" heavy weight
 - Over 46" ----- Roton 780 series
 - c. Quantity of hinges shall be provided to conform to the following:
 - Doors up to 60" in height----- 2 hinges
 - Doors 60" to 90" in height ----- 3 hinges
 - Doors 90" and over ----- 1 hinge every 30" in height
 - d. Approved Manufacturers: No other manufacturer’s products are approved.
 - PBB: Standard Duty BB81/51 series & Heavy Duty 4B81/51 series.
 - Stanley: Standard Duty FBB179/191 series & Heavy Duty FBB168/199 series.
 - McKinney: Standard Duty TA2714/2713 series & Heavy Duty T4A3786/ T4A3386.

B. Swing Clear Hinges:

1. Unless otherwise noted, all patient room doors and doors that will receive heavy cart traffic shall be furnished with heavy weight full mortise five knuckle ball bearing type, template swing clear hinges.
 - a. Size and weight of hinges shall conform to the following:
 - All Doors----- 5" heavy weight
 - b. Quantity of hinges shall be provided to conform to the following:
 - Doors up to 60" in heights ----- 2 hinges
 - Doors 60" to 90" in height ----- 3 hinges
 - Doors 90" and over ----- 1 hinge every 30" in height
 - c. Approved Manufacturers: No other manufacturer’s products are approved.
 - PBB: Heavy Duty SC4B81-5”
 - Stanley: Heavy Duty FBB268-5”
 - McKinney: Heavy Duty T4B3795-5”

C. Lead Lined Pivots:

1. Unless otherwise noted, all lead lined doors shall be furnished with lead lined top and bottom pivots including lead lined intermediate pivots.
 - a. Quantity of intermediate pivots shall be provided to conform to the following:
 - Doors up to 84" in height----- 1 intermediate pivot
 - Doors 84" and over ----- 1 intermediate pivot every 30" in height
 - b. Approved Manufacturers: NO SUBSTITUTIONS.
 - Rixson: ML 19-26D.

D. Center Hung Pivots:

1. Unless otherwise noted, all patient toilet doors that swing into the toilet and require emergency hardware shall be furnished with a top and bottom center pivot. The bottom pivot leg shall be mortised into the frame. Where marble saddles are being installed, the bottom pivot shall be installed on top of the marble saddle.
 - a. Approved Manufacturers: NO SUBSTITUTIONS.
 - Rixson: 127 ¾ x US26D.

E. Continuous Hinges:

1. Unless otherwise noted, all continuous hinges shall be heavy gauge aluminum alloy with self-lubricating bearings.
 - a. Approved Manufacturers: NO SUBSTITUTIONS.
 - Roton: 780 series

1.2 Latching and Locking Devices

All automatic and manual sliding doors that are installed within egress exit corridors shall be self-latching. Refer to applicable codes for further information.

A. Mortise Locks and Latches:

1. Unless otherwise noted, all latchsets and locksets shall be heavy duty mortise type conforming to ANSI A156.13 Grade 1. Furnish a wrought steel box strike and a curved lip strike with each unit. All locksets are to be ordered less cylinder.
 - a. Approved Manufacturers: NO SUBSTITUTIONS.
 - Sargent: 8200 series x LL lever and rose x US26D.
 - b. Lock Functions are as follows:
 - Office Function: Sargent 8205 x LL x US26D.
 - Passage Function: Sargent 8215 x LL x US26D.
 - Privacy Function: Sargent 49-8265 x LL x US26D.
 - (Specify at all single gang public toilets, staff toilets and all patient toilets)

Privacy Function: Sargent 8265 x LL x US26D.
(Specify at all single gang patient toilets within patient bedrooms)

Classroom Function: Sargent 8237 x LL x US26D.

Storeroom Lock: Sargent 8204 x LL x US26D.

B. Cylinders and Keying:

1. Unless otherwise noted, all cylinders shall be keyed to the existing ASSA large format interchangeable core keying system. The hardware supplier shall furnish all cylinders and temporary brass construction cores. The NYU Langone Lock Shop will furnish and install all permanent cores. The hardware supplier shall furnish 5 control keys and 5 construction keys to be used during construction. It shall be the GC/Hardware supplier's responsibility to return the temporary cores to the manufacturer.

***Contractor shall provide and install temporary cores as work requires; NYU Langone locksmith shall provide all permanent ASSA cylinders upon completion of the work. ***

- a. Approved Manufacturers: NO SUBSTITUTIONS.

ASSA: Keyed to the existing NYU Langone key system.

C. Cylindrical Locks at Existing Doors:

1. Unless otherwise noted, where new locksets/passage sets are to be installed in existing doors that have a cylindrical lock preparation, furnish a Yale AU5400 series x US26D. Lock function is to match existing lock function.

- a. Approved Manufacturers: NO SUBSTITUTIONS.

Yale: AU5400 x 1210-less core series x US26D.

D. Combination Locks:

1. Unless otherwise noted, furnish combination locks at all soiled and clean utility rooms, staff locker and staff work rooms, on-call rooms and other spaces as requested by the user of the space. Key as directed by the NYU Langone Lock Shop.

- a. Approved Manufacturers: NO SUBSTITUTIONS.

ALARM LOCK: DL2700-T2 x Schlage C Keyway x US26D.

E. Hospital Push Pull Latches:

1. Unless otherwise noted, furnish hospital push pull latch at all patient bedroom doors and other spaces as requested by the user of the space. Mount both paddles down (except for OR's). Backset to be 2 ¾".

- a. Approved Manufacturers: NO SUBSTITUTIONS.

Glynn Johnson: HL6 x US26D.

F. Exit Devices:

1. Unless otherwise noted, all exit devices to be Von Duprin 98 series, rim, mortise or surface vertical rod. Concealed vertical rod devices will not be permitted.
2. Where electrified exit devices are required for interface with security or automatic operators, furnish Von Duprin EL (electric latch retraction), Quiet Electrified Latch (QEL) and RX (request to exit) features. The use of a Von Duprin EPT10 (power transfer) and a PS873 series (power supply) is required.
 - a. Approved Manufacturers: NO SUBSTITUTIONS.

Von Duprin: 98 series x US26D.

G. Electric Locks:

1. Unless otherwise noted, electric locks shall be specified at all card access doors. Electric strikes may be permitted in certain applications. Electric locks shall be mortise type complying with 1.2A as listed above. Electric locks shall be specified to have a built-in request to exit switch.
2. The Architect shall include in their documents all wiring, power and control required to the electric lock and interface to other electrical equipment.
3. The Architect shall specify a fail secure lock typically (with a manual key over-ride). When a door is required to unlock in a fire condition or loss of power, specify a fail-safe electric lock.
 - a. Approved Manufacturers: NO SUBSTITUTIONS.

Sargent: 8270RX (Fail Safe) x LL x 24VDC x US26D.

Sargent: 8271RX (Fail Secure) x LL x 24VDC x US26D.

1.3 Door Closing Devices**A. Surface Mounted Door Closers:**

1. Unless otherwise noted, all surface mounted door closers shall meet ANSI A156.4 Grade 1 requirements. All closers shall be barrier free with a delayed action feature. Furnish all required brackets, filler plates and any others items required to ensure proper installation and operation.
2. All surface mounted door closers shall be installed so that closer bodies are positioned on room-side of doors to and from corridors, (i.e. ~~i~~n-swing doors shall be regular arm). Out-swing doors shall have a parallel arm.) Regular arm shall be used in connecting doors between rooms.

- a. Approved Manufacturers: NO SUBSTITUTIONS.

LCN: 4040XP-RW PA-689

LCN: 4040XP-HW PA 689 HOLD OPEN

LIFE SAFETY CLOSER SHALL BE LCN: 4040SE-24V

Note: NYU Winthrop uses Norton door closers.

- b. Surface Mounted Door Closers shall be specified as follows:

Regular Arm Mount: Used on doors that swing into a space. The door closer will mount on the pull side of the door, 4040XCP.

Parallel Arm Mount: Used on doors that swing out of a space. The door closer will mount on the push side of the door, 4040XP.

Regular Arm Mount with built-in stop: Used on doors that swing into a space, where an auxiliary stop cannot be used. The door closer will mount on the pull side of the door, 4040XP.

Parallel Arm Mount with built-in stop: Used on doors that swing out of a space, where an auxiliary stop cannot be used. The door closer will mount on the push side of the door, 4040XP.

B. Floor Closers:

1. Floor closers shall only be used where it is virtually impossible for a surface mounted closer to be used. Approval from NYU Langone must be received before specifying floor closers. Floor closers may be used without approval on all glass doors.

- a. Approved Manufacturers: NO SUBSTITUTIONS.

RIXSON: 27/28 AHO/NHO 26D

1.4 Door Stops

A. Wall and Floor Stops:

1. Unless otherwise noted, all door stops shall be wall mounted type, Trimco 1270WV series. Furnish appropriate concealed fasteners as required. Where wall stops cannot be installed, furnish Trimco W1211 floor stops.

- a. Approved Manufacturers: No other manufacturer's products are approved.

Trimco, Rockwood and Ives.

B. Overhead Stops:

1. Unless otherwise noted, furnish overhead stops at doors where wall or floor stops will not work. Furnish a Rixson 2 series x US32D for all hollow metal doors and Rixson 1 series for all heavy duty doors.

- a. Approved Manufacturers: No other manufacturer's products are approved.

Rixson and Glynn Johnson.

1.5 Protection Plates

A. Kick Plates:

1. Unless otherwise noted, furnish kick plates on all doors, with the exception of closet doors within rooms. Kick plates shall be 16" high x 2" less than door width x .050 thick x beveled three sides.
 - a. Approved Manufacturers: No other manufacturer's products are approved.

Trimco, Rockwood and Ives.

B. Mop Plates:

1. Unless otherwise noted, furnish mop plates on all doors, with the exception of closet doors within rooms. Mop plates shall be 6" high x 2" less than door width x .050 thick x beveled three sides.
 - a. Approved Manufacturers: No other manufacturer's products are approved.

Trimco, Rockwood and Ives.

C. Armor Plates:

1. Unless otherwise noted, furnish armor plates on all doors that are subject to heavy abuse. Armor plates shall be 34" high x 2" less than door width x .050 thick x beveled three sides. Armor plates furnished on fire-rated doors must have a UL listing.
 - a. Approved Manufacturers: No other manufacturer's products are approved.

Trimco, Rockwood and Ives.

1.6 Flush Bolts

A. Automatic Flush Bolts:

1. Unless otherwise noted, furnish automatic flush bolts on pairs of doors where there is an inactive leaf. Furnish Trimco 3810 x 3810 for all metal doors and IVES for all wood or composite doors. A dustproof strike by IVES must be used.
 - a. Approved Manufacturers: No other manufacturer's products are approved.

Trimco, Rockwood and Ives.

B. Manual Flush Bolts:

1. Furnish manual flush bolts only in locations that are allowed by code to secure the inactive leaf on pairs of non-rated doors (i.e. Closets, etc.). Furnish Trimco W3917 for all metal doors. Top bolts shall be furnished with proper extensions to allow for easy operation. Furnish Trimco W3913 for all wood doors. A dustproof strike by IVES must be used.

- a. Approved Manufacturers: No other manufacturer's products are approved.

Trimco, Rockwood and Ives.

1.7 Automatic Operators

1. Unless otherwise noted, all Automatic Operators shall be Stanley Magic Force surface mounted. Specify all associated products required to meet ANSI A156.10.
2. The Architect shall specify that all automatic operators be furnished and installed by a Stanley authorized installer. The same automatic operator provider and installer shall also furnish and install all electronic locking hardware, as may be required, for all automatic operated doors.
3. The Architect shall include in their documents all wiring, power and control required to the automatic operator and accessories.
 - a. Approved Manufacturers: NO SUBSTITUTIONS.

STANLEY: Magic Force x Alum.

1.8 Card Access Doors

1. The Architect shall coordinate all security and electrical requirements with the security consultant and the electrical engineer. Where card readers are furnished, an electric lock with built-in request to exit switch shall be installed (see 1.2.G above). The Architect shall indicate which doors are required to have door and frame preparation for door contacts.

2.1 Typical Hardware Sets

- A. The following is a general listing of hardware requirements and is not intended for use as a final hardware specification. It shall be the responsibility of the Architect to specify any items of hardware required by established standards or practices, or to meet state and local codes or proper door operation. Coordinate final door hardware requirements with user-groups.

This hardware set is used for doors to suite offices that are non fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Office Lock	Sargent 8205 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Stop	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for doors to offices that are fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Office Lock	Sargent 8205 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Closer	LCN
1	Stop	(see description) x US32D
1	Gasketing	Legacy 5881S-BK @ jamb/head

This hardware set is used for doors to public or staff toilets that are non fire-rated and fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Privacy Set	Sargent 49-8265 x LL x US26D
1	Closer	LCN
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
3	Silencers	Trimco 1229A

Note: NYU Winthrop uses Arrow and Sargent privacy sets.

This hardware set is used for doors to patient toilets within a patient room that swing out of the toilet.

Each to have:

	Hinges	(see description) x US26D
1	Spring Hinge	(to match) x US26D
1	Passage Set	Sargent 8215 x LL x US26D
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
1	Mop Plate	(see description) x US32D
1	Gasketing	Legacy 5881S-BK @ jamb/head

This hardware set is used for doors to patient toilets within a patient room that swing into the toilet.

Each to have:

1	set Pivots	Rixson 127 ¾ x US26D
1	Passage Set	Sargent 8215 x LL x US26D
1	Emergency Release	Stanley ES-1 x US26D
1	Double Lip Strike	Stanley DLS series x US26D
1	Stop	(see description) x US32D
2	Kick Plates	(see description) x US32D
2	set Sight Seals	Zero 335A @ wood doors
2	set Sight Seals	Zero 137P @ metal doors

Note:

- Sight seals to be installed at pivot side and lock side of door only.
- Where marble saddles are used, mount pivot set on top of the marble saddle.
- Saddles shall have no lip, even if permissible by code, as patients cannot navigate with IV pole.

This hardware set is used for doors to conference rooms, consulting rooms, and administrative staff lounges that are non fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Passage Set	Sargent 8215 x LL x US26D
1	Classroom Lock	Sargent 8237 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Stop	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for doors to conference rooms, consulting rooms, and administrative staff lounges that are fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Passage Set	Sargent 8215 x LL x US26D
1	Classroom Lock	Sargent 8237 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Closer	LCN
1	Stop	(see description) x US32D
1	Gasketing	Legacy 5881S-BK @ jambs/head

This hardware set is used for doors to utility type rooms that are non fire-rated and fire-rated and do not require access control.

Each to have:

	Hinges	(see description) x US26D
1	Storeroom Lock	Sargent 8204 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Closer	LCN
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
3	Silencers	Trimco 1229A @ non fire-rated doors
1	Gasketing	Legacy 5881S-BK @ jambs/head @ fire-rated doors

This hardware set is used for double doors to utility type rooms that are non fire-rated and fire-rated and do not require access control.

Each to have:

	Hinges	(see description) x US26D
2	Flush Bolts	(see description) x US26D
1	Storeroom Lock	Sargent 8204 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Closer	LCN
1	Stop	(see description) x US32D
2	Kick Plate	(see description) x US32D
2	Silencers	Trimco 1229A @ non fire-rated doors
1	Gasketing	Legacy 5881S-BK @ jambs/head @ fire-rated doors
2	Astragal Seals	Legacy 799A

This hardware set is used for doors to closets within rooms that are non fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Storeroom Lock	Sargent 8204 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Stop	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for doors to patient rooms.

Each to have:

	Swing Clear Hinges	(see description) x US26D
1	Hospital Push Pull Latch	GJ (see description) x US26D
1	Friction OH Stop	Rixson 1 or 9 series x US32D
1	Armor Plate	(see description) x US32D
1	Mop Plate	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for doors to patient isolation rooms.

Each to have:

	Swing Clear Hinges	(see description) x US26D
1	Hospital Push Pull Latch	GJ (see description) x US26D
1	Closer	LCN
1	Stop	(see description) x US32D
1	Armor Plate	(see description) x US32D
1	Mop Plate	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for doors to exam rooms that are non fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Passage Set	Sargent 8215 x LL x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for doors to exam rooms that are fire-rated.

Each to have:

	Hinges	(see description) x US26D
1	Passage Set	Sargent 8215 x LL x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Closer	LCN
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
1	Gasketing	Legacy 5881S-BK @ jams/head

This hardware set is used for all clinical staff lounges, medication rooms, on-call rooms, soiled and clean linen rooms, clinical break rooms and any other space that is user required.

Each to have:

	Hinges	(see description) x US26D
1	Combination Lock	(see description) x US26D
1	Cylinder	Schlage (see description) x US26D
1	Closer	LCN
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
3	Silencers	Trimco 1229A

This hardware set is used for all lead lined doors.

Each to have:

1	set Pivots	Top Pivot Rixson L-180 / Center Pivot if needed ML-19 / Top and Bottom Rixson Pivot set L-1471
1	Classroom Lock	Sargent 8237 x LL x LC x US26D
1	Cylinder	Assa (see description) x US26D
1	Temporary Core	Assa (see description) x US26D
1	Permanent Core	(by NYU Langone Lock Shop)
1	Closer	RIXON
1	Stop	(see description) x US32D
1	Kick Plate	(see description) x US32D
3	Silencers	Trimco 1229A

Note:

- If doors are non fire-rated, furnish hold open closers.

2.2 Typical Electrical Hardware Sets

A. The following is a general listing of electrical hardware sets. Coordinate with electrical engineer, security vendor and fire alarm vendor.

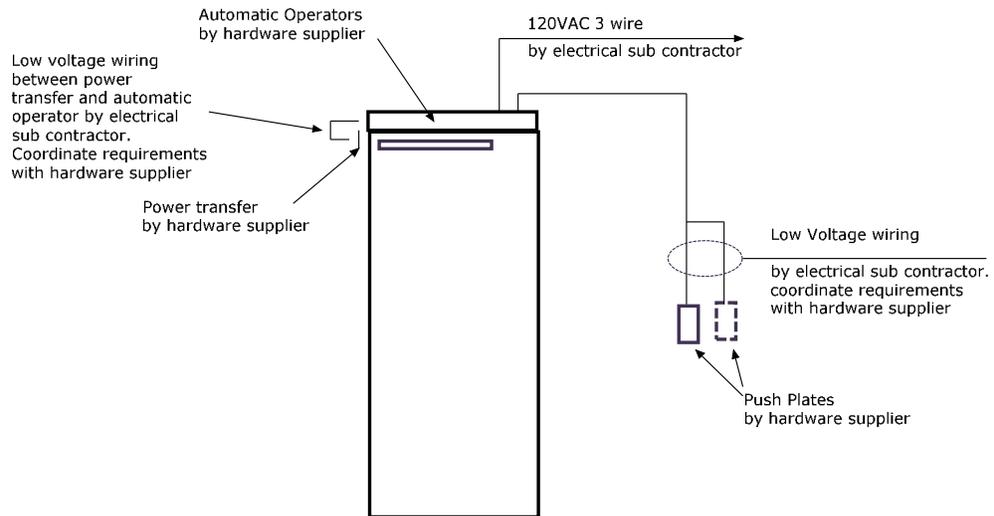
This hardware set is used for all single doors with automatic operators no latching (see wiring diagram E1)

Each to have:

- | | | |
|---|--------------------|---|
| 1 | Continuous Hinge | Zero 910DBAA x CE4 (CE4 is for Presence Sensor) |
| 1 | set Push Pulls | Trimco 1894-4B x US32D |
| 1 | Automatic Operator | Stanley Magic Force x Alum |
| 2 | Presence Sensors | BEA Super Scan |
| 2 | Wall Actuators | WIKK x 4 x 4-2 x US32D |
| 1 | Door Stop | Trimco (as required) x US26D |
| 1 | Armor Plate | Rockwood (see description) x US32D |
| 1 | Mop Plate | Trimco (as required) x US32D |
| 3 | Silencers | Trimco 1229A |

Operation:

Wall actuator on either side signals automatic operator to open door. Free egress at all times.



OPERATION: Push Plate on either side of the door signals automatic operator to open door. Safety sensors prevent door from opening when someone is standing in front of door.

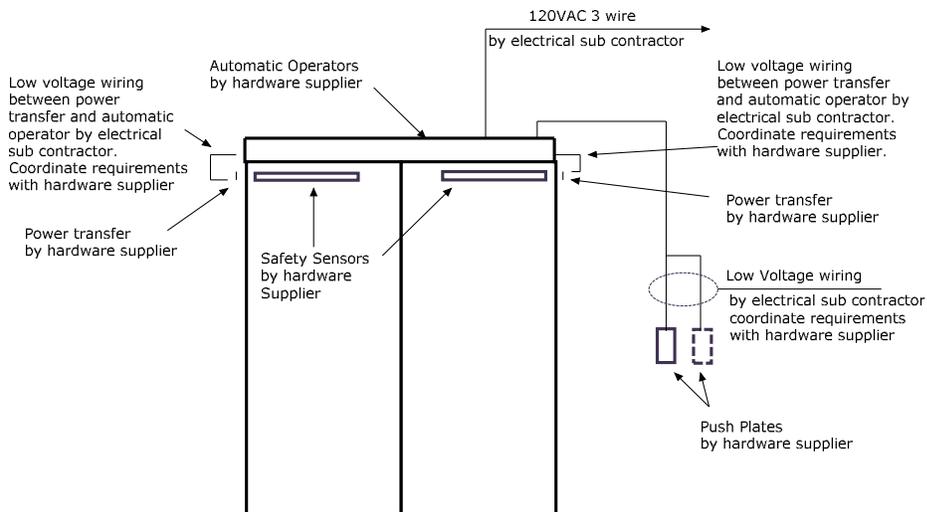
PROJECT: NYULMC	DRWG#	DATE
Automatic Door No Latching (Single)	E1	8-20-10

This hardware set is used for all double doors with automatic operators no latching (see wiring diagram E2)

Each to have:

- | | | |
|---|--------------------|--|
| 2 | Continuous Hinge | Zero 910DBAA x CE4
(CE4 is for Presence Sensor) |
| 2 | sets Push Pulls | Trimco 1894-4B x US32D |
| 1 | Automatic Operator | Stanley Magic Force x Alum |
| 2 | Presence Sensors | BEA Super Scan |
| 2 | Wall Actuators | WIKK x 4 x 4-2 x US32D |
| 2 | Door Stop | Trimco (see description) x US26D |
| 2 | Armor Plate | Trimco (see description) x US32D |
| 2 | Mop Plate | Trimco (as required) x US32D |
| 2 | Silencers | Trimco 1229A |

Operation: Wall actuator on either side signals automatic operator to open door. Free egress at all times.



OPERATION: Push Plate on either side of the door signals automatic operator to open door. Safety sensors prevent door from opening when someone is standing in front of door.

PROJECT: NYULMC	DRWG#	DATE
Automatic Door No Latching (Pair)	E2	8-20-10

This hardware set is used for all single doors with card access (see wiring diagram E3)

Each to have:

- | | | |
|---|----------------|---|
| | Hinges | PBB (as required) x US26D |
| 1 | Electric Hinge | PBB 4 wire (to match) x US26D |
| 1 | Electric Lock | Sargent RX8271 x LL x US32D |
| 1 | Door Closer | LCN |
| 1 | Door Stop | Trimco (see description) x US26D |
| 1 | Kick Plate | Trimco (see description) x US32D |
| 3 | Silencers | Trimco 1229A @ non fire-rated doors |
| 1 | Gasketing | Legacy 5881S-BK @ jamb/head
@ fire-rated doors |
| 1 | Door Contact | (by security vendor) |
| 1 | Card Reader | (by security vendor) |

Operation:

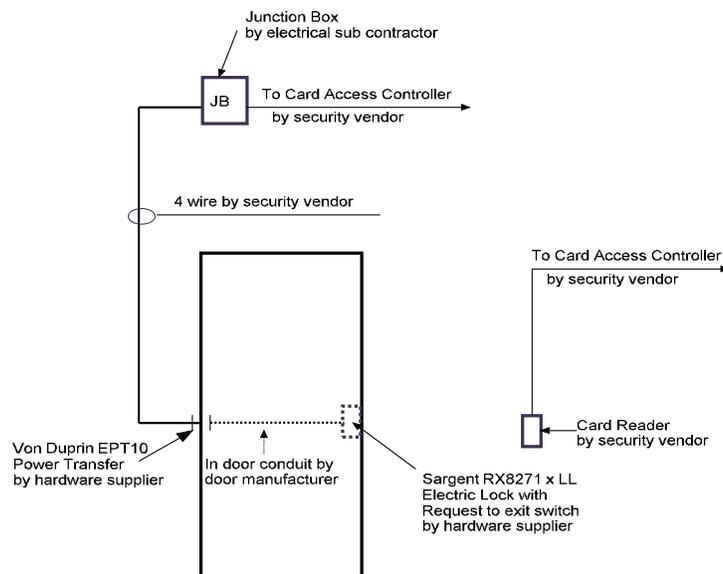
Non Secure Side: Card reader unlocks electric lock.

Secure Side: Free egress. RX switch in electric lock shunts alarm.

Emergency Operation:

Non Secure Side: Door remains locked.

Secure Side: Free egress.



OPERATION: Card reader outside unlocks electric lock. Free egress inside, request to exit switch in lockset shunts alarm

PROJECT: NYULMC	DRWG#	DATE
Card Reader-Electric Lock with Request to Exit Switch	E3	8-20-10

This hardware set is used for all double doors with card access (see wiring diagram E4)

Each to have:

- | | | |
|---|--------------------------|--|
| | Hinges | PBB (as required) x US26D |
| 1 | Electric Hinge | PBB 4 wire (to match) x US26D |
| 1 | Electric Lock | Sargent RX8271 x LL x US32D |
| 2 | Automatic Flush Bolts | Trimco (see description) x US26D |
| 2 | Coordinating Door Closer | Dorma TS93GSR series x Alum |
| 1 | Door Stop | Trimco (see description) x US26D |
| 2 | Kick Plate | Trimco (see description) x US32D |
| 2 | Silencers | Trimco 1229A @ non fire-rated doors |
| 1 | Gasketing | Legacy 5881S-BK @ jambs/head
@ fire-rated doors |
| 2 | Astragal Seals | Legacy 799A |
| 2 | Door Contact | (by security vendor) |
| 1 | Card Reader | (by security vendor) |

Operation:

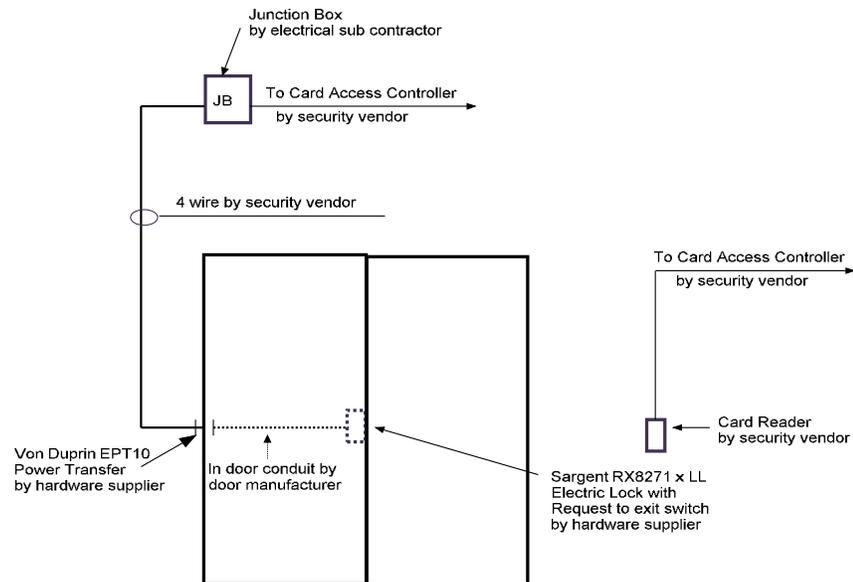
Non Secure Side: Card reader unlocks electric lock.

Secure Side: Free egress. AE switch in electric lock shunts alarm.

Emergency Operation:

Non Secure Side: Door remains locked.

Secure Side: Free egress.



OPERATION: Card reader outside unlocks electric lock. Free egress inside. request to exit switch in lockset shunts alarm

PROJECT: NYULMC	DRWG #	DATE
Double Door Card Reader-Electric Lock with Request to Exit Switch	E4	8-20-10

This hardware set is used for all double egress doors with card access (see wiring diagram E5)

Each to have:

2	Continuous Hinge	Zero 910DBAA x CE4 x EPT Note: CE4 is for the Presence Sensor and the EPT cutout is for the Electric Power Transfer
2	Electric Exit Devices	Von Duprin ELRX 9827EO-F x LBR x US26D
2	Automatic Operators	Stanley Magic Force x Alum
1	Wall Actuator (Inside)	WIKK x 4 x 4-2 x US32D
4	Kick Plates	Trimco (see description) x US32D
2	Silencers	Trimco 1229A @ non fire-rated doors
1	Gasketing	Legacy 5881S-BK @ jambs/head @ fire-rated doors
2	Astragal Seals	Legacy 799A
2	Magnetic Locks	Deltrex 810-DS x Alum
1	Power Supply	Von Duprin PS873-2
1	Relay Module	Deltrex 530-2ARCM2
2	Door Contacts	(by security vendor)
1	Motion Sensor	(by security vendor)
1	Card Reader	(by security vendor)

Operation:

During normal operation, electric exit devices are electrically dogged to allow for automatic operators to open doors freely. Magnetic locks secure doors. When signaled from the fire alarm system, or loss of power, electric exit devices latch, automatic operators are shut off and magnetic locks unlock.

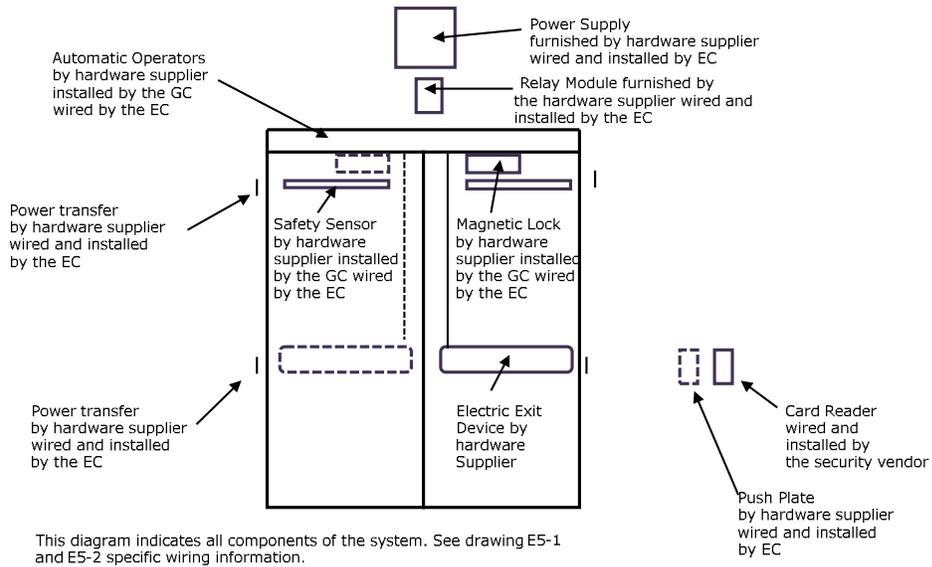
Non Secure Side: Card reader unlocks magnetic lock and signals automatic operator to open both doors.

Secure Side: Free egress. Wall actuator unlocks magnetic lock and signals automatic operator to open both doors.

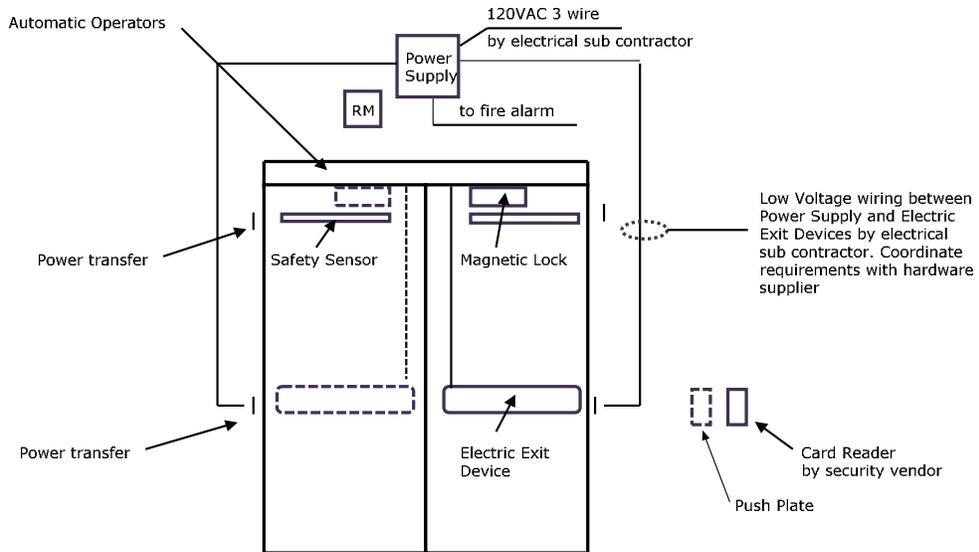
Emergency Operation:

Non Secure Side: Door remains locked.

Secure Side: Free egress.

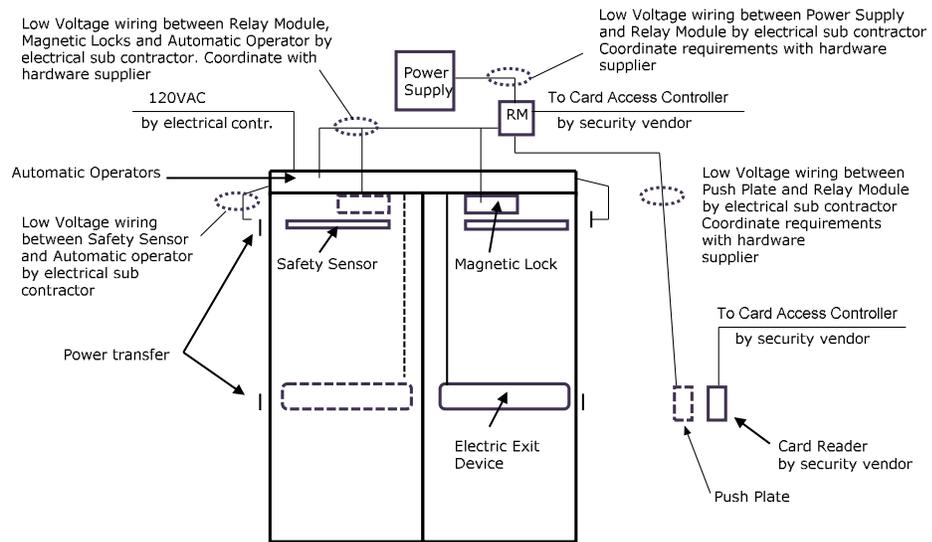


PROJECT: NYULMC	DRWG#	DATE
Cross Corridor Automatic Doors with Card Readers and Magnetic Locks	E5	8-20-10



The wiring shown on this diagram is only for the electric exit device system.

PROJECT: NYULMC	DRWG#	DATE
Cross Corridor Automatic Doors with Card Readers and Magnetic Locks	E5-1	8-20-10



The wiring shown on this diagram is only for the automatic operator and card access interface.

PROJECT: NYULMC	DRWG#	DATE
Cross Corridor Automatic Doors with Card Readers and Magnetic Locks	E5-2	8-20-10

This hardware set is used for all single locked stair doors (see wiring diagram E6)

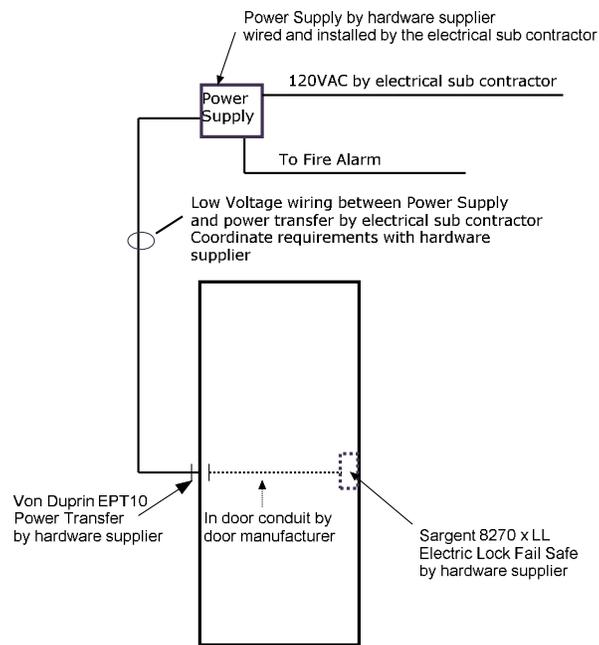
Each to have:

- | | | |
|---|----------------|----------------------------------|
| | Hinges | PBB (as required) x US26D |
| 1 | Electric Hinge | PBB 4 wire (to match) x US26D |
| 1 | Electric Lock | Sargent RX8270 x LL x US32D |
| 1 | Closer | LCN |
| 1 | Door Stop | (see description) x US32D |
| 1 | Kick Plate | Trimco (see description) x US32D |
| 1 | Power Supply | Deltrex 551CCM-ERI |
| 1 | Gasketing | Legacy 5881S-BK @ jambs/head |

Operation:

Stair Side: During normal operation, doors are locked electrically from the stair side. When signaled from the fire alarm system, or loss of power, electric lock unlocks automatically.

Egress Side: Free Egress at all times.



OPERATION: During normal operation stair doors are locked on the stair side. When signaled from the fire alarm system or loss of power, electric lock unlocks to allow re-entry.

PROJECT: NYULMC	DRWG #	DATE
Stair Door Fail Safe Electric Lock	E6	8-20-10

ENVIRONMENTAL HEALTH & SAFETY

NYU Langone Health’s Environmental Health and Safety (EH&S) division develops and manages programs that (1) protect personnel in all departments and on all levels from health and safety hazards, (2) ensure waste is discarded in an environmentally sound manner and (3) facilitate compliance with regulatory requirements for environmental and occupational health and safety. EH&S’s programs cover a broad spectrum of health and safety issues, including but not limited to: asbestos, biosafety, bulk storage tanks, chemical safety, ergonomics, fire safety, hazard communication, hearing conservation, indoor air quality, laboratory and animal safety, mold prevention and remediation, and waste management.

1. *Architect’s Responsibilities*

The A/E Team, to the best of their ability, shall incorporate Best Management Practices for environmental and occupational health and safety into the design of the space. The A/E Team responsibilities include:

- Anticipating, identifying and eliminating potential health and safety hazards (i.e. ergonomics, hazardous materials, noise, etc.) associated with the proposed use of the space, to the extent reasonably practical.

Note: Eliminating hazards is not intended to limit creativity, but to ensure the designer minimizes foreseeable risks to the health and safety of those who:

- Carry out construction work, including demolition.
 - May be affected by the project, including building occupants and the general public.
 - Occupy the space post-construction.
 - Clean and maintain the space.
- Specifying the least toxic, flammable/combustible and reactive products available for construction and renovation.
 - Where health and safety hazards cannot be eliminated, proposing alternate engineering controls to minimize or eliminate the risk.
 - The A/E Team shall use and comply with the design and safety regulations, guidelines and references listed in the References subsection below, as well as other health and safety guidelines received from NYU Langone’s Project Manager or division of EH&S. The A/E Team shall utilize the latest editions of the references available at the time of the design contract award.
 - If the design does not incorporate Best Management Practices for environmental and occupational health and safety, and comply with the References listed below, the A/E design firm shall obtain approval from NYU Langone’s division of EH&S.

- The A/E Team shall not specify any of the following without approval from NYU Langone’s division of EH&S:
 - Chemical products containing known (IARC group 1) or probable (IARC group 2a) human carcinogens*.
 - Chemical products containing toxic and hazardous substances listed in OSHA 1910 subpart Z*.
 - Chemical products containing volatile organic compounds (VOCs) in excess of 50 grams/liter.
 - Chemical products for which the Safety Data Sheet (SDS) rates the health, fire or reactivity hazard as greater than “1” (slight hazard) on the NFPA/HMIS scale or as less than “4” (slight hazard) on the GHS hazard scale.
 - Chemical products which emit strong odors.

* Exceptions may be made for products containing chemicals which do not pose a hazard to persons during their application/use (i.e. paints containing silica).

- In order to minimize potential delays associated with asbestos abatement, the A/E Team shall submit a set of Design Development Drawings that identify the scope of work including 100% complete Demolition Drawings. The Demolition Drawings shall provide sufficient information to initiate an asbestos investigation and pull a demolition permit. The Demolition Drawings submitted shall be the same drawings that are filed with the DOB.

2. *References*

Federal Regulations	Consensus Standards
<ul style="list-style-type: none"> - US DHHS - US DOL OSHA 1910 and 1926 - US EPA - US FDA - US NRC 	<ul style="list-style-type: none"> - ACGIH - ANSI - ASHRAE - ASTM - BOCA - NFPA
State Regulations	Ergonomics
<ul style="list-style-type: none"> - NYS DEC - NYS DOH - NYS DOL - NYS Building and Fire Codes 	<ul style="list-style-type: none"> - Facilities Guidelines Institute (FGI): Patient Handling and Movement Assessments: A White Paper - NIH Design Requirements Manual - NIOSH - ANSI/HFES 100-2007
Local Regulations	
<ul style="list-style-type: none"> - NYC Building and Fire Codes - NYC DEP - NYC DOH 	
NYU Langone Standards	Noise
<ul style="list-style-type: none"> - Safety Policy Manual - Radiation Safety Manual 	<ul style="list-style-type: none"> - NSF - TJC

ENVIRONMENTAL SUSTAINABILITY

NYU Langone Health believes that healthy people and a healthy environment are inextricably linked. As a healthcare organization, it is imperative that we act as a community leader in environmental stewardship. Creating a vital and healing environment is also central to our mission devoted to excellence in patient care, education, and research and is integral to the comfort and lifelong wellness of our staff, students and patients. This sustainability commitment extends across every facet of NYU Langone, including how we design, construct and operate our facilities. Furthermore, the health system recognizes the risks associated with climate change and has committed to a 50% carbon reduction goal by 2025 and intends to build facilities that are both sustainable and resilient.

The goal of NYU Langone’s sustainability program is to fulfill a quadruple bottom line approach where decision-making is based on balancing the potential impacts on people, the planet, business economics and patient care. The goal is not only to design green buildings and use environmentally-preferable materials, but to augment our benefit to the community and reduce the negative environmental and human wellness impacts of operations once occupied. In line with that commitment we are providing additional information about NYU Langone’s sustainability program organized as follows:

1. Sustainable Building Design Guidelines
2. Green Roof and Solar PV Guidelines
3. Sustainable Furniture and Furnishings Guidelines
4. Sustainable Flooring Guidelines
5. Bicycle Transportation Guidelines
- 5-6. Building Energy Efficiency Rating Label Guidelines
- ~~6-7. Related Components or Policies~~

More can be read about the scope and progress of NYU Langone’s sustainability program, called GreenFirst, at <http://nyulangone.org/our-story/sustainability>.

1. *Sustainable Building Design Guidelines*

For all **new construction and major renovation**, NYU Langone has instituted a goal of achieving Gold or higher level certification under the LEED v4 or LEED v4 for Healthcare ratings system. Projects should assess the appropriate project type including BD+C, ID+C or others that may apply. Designers are to discuss the LEED and energy performance requirements with RED+F Project Managers from the outset and to follow an integrative design process. Where achievement of these goals presents significant hurdles for a project, the requirements should be discussed with the RED+F Project Manager, RED+F Leadership, and the Sustainability Program Manager early during the design process. Good communication of goals, requirements and challenges will help all projects achieve the highest levels of performance and innovation while containing costs.

Designers shall assist NYU Langone Health with preparation of the Owner’s Project Requirements (OPR). The OPR shall outline the Project’s environmental and sustainability goals and measures, waste and recycling requirements, energy performance requirements, and other system expectations. A template OPR can be provided by the Sustainability Program Manager. It shall be reviewed and approved by the RED+F PM and the Sustainability Manager.

This information is mandatory for LEED certification and will be reviewed by the commissioning agent.

If an option, projects must also complete a NYSERDA or whole building energy model simulation as part of meeting its LEED goals and take advantage of available funding or incentives for this work.

For **fit-outs, interior-only and smaller projects**, the LEED and energy goals should be discussed with the RED+F Project Manager, RED+F Leadership, and the Sustainability Program Manager at the outset of the design process to establish requirements and goals on a case by case basis.

Other guidelines or certification standards that NYU Langone encourages project developers to take into consideration include the WELL Building Standard, the NYC Active Design Guidelines: Promoting Physical Activity and Health in Design, the CDC's **fFitwel** standard and resources from the International Institute for Sustainable Laboratories (www.i2SL.org).

NYU Langone believes that LEED and green buildings aim to protect, restore and work in harmony with the local environment, existing transit infrastructure and underlying natural systems. In general, green buildings are energy efficient, water conserving, durable and nontoxic, with high-quality spaces that incorporate nature. NYU Langone seeks to integrate the following features of well-designed green buildings where possible and applicable:

- Demonstrate resiliency and adaptability in response to a changing climate and extreme weather events
- Maximize use of energy efficient infrastructure and renewable energy sources along with energy storage
- Reduce reliance on fossil fuels, in particular, as it relates to carbon emissions targets set by municipal or state authorities
- Incorporate recycled, local and renewably sourced materials that are highly recyclable at end of life or that can be upcycled into new product
- Provide well-incorporated waste and recycling segregation and bins using the built environment to inspire proper recycling behavior in occupants (see the Recycling Program subsection of these Design Guidelines)
- Maximize use of passive solar and natural lighting
- Facilitate social connections
- Provide views to the outside
- Employ good sound and noise management
- Provide for improved indoor air quality and minimize the use of chemicals of concern to increase the productivity of staff and reduce recovery time for patients
- Minimize building stormwater runoff by incorporating green roofs, gardens, permeable pavers, bioswells and other green infrastructure (GI) or low-impact development (LID) techniques as well as maintain compliance with NYC LL94 where applicable.
- Use native and adaptive plants that minimize landscaping and irrigation needs

- Make use of open space, incorporate green spaces and provide access to the outdoors for patients and staff
- Incorporate facilities and design that encourage the use of alternative transportation methods, particularly biking and public mass transit
- Minimize or eliminate the use of mercury-containing materials where safe, effective alternatives exist in compliance with NYU Langone Health Safety Policy 170

An integrative design approach and a life cycle assessment approach are both essential to meet these guidelines and marry green building with sustainable operations and resiliency for the life of the facility. Finding synergies between the built environment and eventual operations is an important concept. For example, incorporation of a green roof feature can provide insulation and lower energy needs, help manage stormwater runoff on the campus and reduce the heat island effect in the NYC community. Or designing with the understanding that the flooring material used not only has an embedded energy, carbon and natural resource footprint, but that the type of material used impacts how the facility needs to be cleaned post-occupancy. Material decisions such as these can either facilitate or hinder a reduction in chemical and water usage as part of green cleaning practices. Or designing into the built environment smart waste sorting stations that cater to the type of activity (research, clinical or office) taking place in each space can ultimately drive employees to practice good recycling behaviors. By using an integrative project approach that brings in multiple stakeholders from the outset, project teams can more readily discover synergies and areas for true innovation.

2. *Green Roof and Solar PV Guidelines*

New York City Local Laws 92 and 94 of 2019 require all new and existing buildings undergoing major roof construction or renovation to have a green roof system, solar photovoltaic system, or a combination of both. The regulation also requires projects to meet new, higher solar reflective index (SRI) requirements.

Examples of projects affected include new construction, vertical or horizontal building extensions, and replacements of the entire roof deck or assembly.

Even when not required by code, Architects are encouraged to consider implementation of green roofs, solar photovoltaics or both on NYU Langone projects to take advantage of the benefits of sustainable roof systems as outlined below:

- Achieve points under USGBC LEED v4 standard
- Improve resiliency and backup generation
- Lower energy costs either through direct offset or through better building insulation
- Feed additional distributed energy resources and renewables back into the grid
- Reduce the urban heat island effect
- Manage stormwater via use of green roof systems

3. *Sustainable Furniture and Furnishings Guidelines*

NYU Langone has committed to the Practice Greenhealth [Healthier Hospitals: Safer Chemicals Challenge](#), which impacts furniture purchasing and design decisions. This goal means that at least 30% of all purchases of freestanding furniture and medical furnishings¹ for any individual project are to be specified **without** the intentional use of the following chemicals of concern: halogenated and brominated flame retardants², formaldehyde, perfluorinated compounds, PVC (also known as vinyl) and antimicrobials³. Project teams should discuss with the RED+F Project Manager, RED+F Leadership, the RED+F Design Studio, and the Sustainability Program Manager throughout the process to meet these guidelines and evaluate feasibility.

For all projects, regardless of the level of certification or LEED ratings system being pursued, NYU Langone also encourages the use of locally-sourced furniture and textiles, furniture that contains pre or post-consumer recycled content and the use of wood that is FSC-certified.

Other standards or certifications to refer to include the ANSI/BIFMA e3 Furniture Sustainability Standard, SCS certified and Cradle to Cradle.

Notes:

¹ Furniture and medical furnishings include seating (i.e. chairs, stools, sofas, benches, etc.), worksurfaces (i.e. tables, desks, etc.), built-in and modular casework systems (i.e. walled desks with seating), beds (including mattresses), storage units (i.e. cabinets, filing cabinets, dressers, drawers, etc.), shelving (i.e. bookshelves, built-in shelves, etc.), panels and partitions, cubicle curtains, and window coverings.

² Eliminate the intentional use of all flame retardants where code permits. When flame retardant chemicals are necessary to meet code requirements, use chemicals that meet GreenScreen Benchmark 3 or 4 of their equivalent.

³ Triclosan and triclocarban are explicitly prohibited. No other added or built-in chemical antimicrobials are allowed unless they are registered with the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and have published data that show efficacy in a hospital/clinical setting measured by a reduction in healthcare-associated infections (HIAs) as part of comprehensive infection control measures. Antimicrobials added to materials or products for the sole purpose of preserving the product are exempt.

4. *Sustainable Flooring Guidelines*

Depending on the materials selected, flooring can be a negative contributor to indoor air quality. Some of the materials and chemicals used in flooring can contribute to a wide range of adverse health effects including asthma, cancer, and developmental impacts, among others. It can also lead to unsustainable cleaning practices once occupied. It is important to NYU Langone that choosing safer alternatives be prioritized.

5. *Bicycle Transportation Guidelines*

NYU Langone Health is committed to supporting a comprehensive bicycle transportation program for the NYU Langone community. This means fostering a bike-friendly culture with bike commuter amenities such as parking, security, safety and bike registration.

Inclusion of bike amenities shall be discussed with the RED+F Project Manager as well as representatives of the Real Estate team and the Sustainability Manager regardless of pursuit or requirements around LEED certification for a project as specified in these Design Guidelines.

- Bike Parking and Amenities
 - Indoor Bike Parking - When provided indoors, bike parking shall be within secure bike parking rooms for use by approved staff, faculty and students. These rooms shall be accessible through a keycard pad.

For fit-outs within leased premises, the A/E Team shall follow the landlord’s rules for the management of indoor bike parking/storage within NYU Langone’s own premises. The Real Estate team can advise on a particular building’s policies.
 - Outdoor Bike Parking - Outdoor bike parking may be located outside building entrances and exits, in parking lots or garage structures, within secure courtyards or on terraces. NYU Langone’s preference is for outdoor bike parking to be covered or protected from the outside elements.
 - Bike Commuter Shower Facilities - If a project, particularly new construction, can accommodate male/female or a unisex individual shower facility, the A/E Team shall include them in the design.
 - Refer to the Building Accessories subsection of these Design Guidelines for bike rack specifications.

6. Building Energy Efficient Rating Label Guidelines

New York City Local Law 33 of 2018 and 95 of 2019 require the display of an energy efficiency score and grade provided annually by the New York City Department of Buildings. This regulation applies to owned properties that are listed on the Covered Buildings List for benchmarking compliance as per Department of Finance records. Consult with NYU Langone Design Studio’s Signage / Wayfinding Group to coordinate location and frame.

6.7. Related Components or Policies

- NYU Langone Health Design Guidelines
- NYU Langone Health: Bicycle Transportation Policy
- NYU Langone Health Safety Policy 170: Mercury Elimination Program
- NYU Langone Health Safety Policy 108: Chemical Waste Minimization and Disposal Program
- NYU Langone Health Safety Policy 108a: Hazardous Waste from Contractors (Construction & Building Maintenance)
- NYU Langone Health Safety Policy 108c: Universal Waste Management Program

INFORMATION TECHNOLOGY

NYU Langone’s MCIT (Medical Center Information Technology) division is responsible for the planning, design, construction, implementation, and operational aspects of all information technology systems, inclusive of both clinical and non-clinical systems. Our mission is to ensure technology systems are deployed in a manner to improve patient outcomes, increase patient safety, and provide state-of-the-art platforms to conduct world-class medical research initiatives. MCIT is responsible for all aspects of IT spaces, including data center, BDF/IDF, and TER’s as well as the following IT systems: networking, cabling, telephony, audio/visual (AV), electronic medical record, nurse call, telemetry, end-user devices, and real-time location services (RTLS).

The standards listed below apply to IDF Rooms that are typically found in capital improvement projects. This guideline is a subset of a larger technology design standards document (*NYU Langone Health Medical Center Information Technology EPMO - Structured Cabling Standards and Best Practices*) and should be used in conjunction with the latest version of that document.

The purpose of the *NYU Langone Health Medical Center Information Technology EPMO – Structured Cabling Standards and Best Practices* is to provide specific criteria in the design and planning of technology spaces. It is intended to be used by internal and external project management administrators, project architects and engineers, as well as facility managers. It shall be referenced for specific guidelines, standards and specifications for the design, construction and commissioning of technology spaces and/or facilities. Any deviation from the *NYU Langone Health Medical Center Information Technology EPMO – Structured Cabling Standards and Best Practices* must be reviewed and approved by MCIT.

1. IDF - Planning Requirements

An IDF is a technology space provided on every floor in a NYU Langone building from which all horizontal services to users are served, including low-voltage data and voice services. On a floor, (1) one or more IDF Rooms will be provided, converging IT, AV, Security, BMS, RF, Nurse Call, Telemetry, Public Address, etc., into one room.

- **Quantity of IDFs** - A minimum of one (1) IDF per floor is required at all clinical and smaller non-clinical facilities. IDF quantities shall be based on the square footage of the floor and outlet density. TIA 569 recommends one (1) IDF per 10,000 square feet.
- **Location of IDFs** - IDFs (and BDF Rooms providing IDF functionality) shall be positioned to be within 250 feet of horizontal distance from the farthest outlet point (using right angle measurements). Final locations of all IDFs, including the intended primary path(s) of horizontal cabling and the associated 250 foot rule must be presented to and approved by MCIT prior to the architectural layout being approved by NYU Langone project management.

IDF Rooms shall be located on separate sides of the core, however, these rooms shall be positioned to provide maximum coverage to the entire floor.

IDFs located below the Design Flood Elevation (D.F.E.) shall only serve areas within the FEMA defined flood zone.

IDF Rooms shall be stacked to maintain a vertical adjacency. Equipment that is not related to the support of the IDF (i.e. piping, conduits, duct work, etc.) should not be located in, or pass through, the IDF.

- **Room Size and Layout** - The room size is to be ultimately confirmed by the final determination of racks and cabinets, which must be identified for use by the IT Designer and approved by NYU Langone MCIT prior to coordination with the Architect. A minimum clearance of 36 inches is required around three sides of any cluster of racks.
- **Rack Requirements** - Otronics Mighty Mo 20 is the preferred rack. It is 23.75" wide x 24" channel depth complete with dust cover and isolation pad kit. The preferred color is black. Preferred height shall be 7'-0", and shall only be reduced or increased based on room constraints.
- **Unacceptable Occupancies or Uses above IDF's** - All use types that involve water supply and removal, such as kitchens, locker room showers, toilets, pantries, etc. shall not be permitted to be located above or adjacent to a technology room.
- **Horizontal Pathways** - Space must be established by the IT Designer to account for horizontal cabling distribution, regardless of whether ladder rack is provided or not, as a means of cabling support. Sufficient clearance and access methods must also be included to facilitate future cabling changes. This path shall be presented to MCIT when the IDF locations are being submitted for preliminary approval.
- **Raceways Penetrating Walls and Floors** - Where cabling is required to traverse rated walls and/or floors and is not to be routed in conduit, fire-rated Hilti Speed sleeves must be employed. Non-rated penetrations shall use the Hilti Smoke Sleeve. Hilti sleeves shall not be filled in excess of 60% fill. 40% spare capacity shall be provided for future use.

All sleeves which traverse rated walls and/or floors must be properly firestopped, where Hilti is not required or applicable by NYU Langone MCIT. Sleeves and conduits penetrating into technology spaces shall not exceed 4".

2. IDF - Electrical Requirements

- **UPS Power** - Refer to NYU Langone Electrical Guidelines.
- **PDU and Distribution Level Capacity** - PDU's shall not exceed 90% of rating. Capacity shall assume a total load on a PDU in the event one-half of a circuit in a 2N pair has failed.
- **Lighting** - 45 to 55 fc (450 to 550 lux)
- **Telecommunication Grounding** - A Telecommunications Grounding Busbar (TGB) must be provided in all technology rooms, mounted at 7'-6", and at a minimum, be connected to building structural steel or an already established telecommunications ground. The TGB is the grounding connection point for telecommunications systems and equipment. This should be shown on the electrical plans for electrician to install. The IT contractor shall bond the IDF equipment to the TGB.

All two-post racks shall utilize Chatsworth Rack Base Insulator Kits or Ortronics Cooper B-line Isolators to create isolation between floor slab/rebar and the metal of the technology equipment rack.

3. *IDF's – Mechanical Requirements* - Refer to NYU Langone Mechanical Guidelines.

4. *IDF's – Architectural Requirements*

- **Ceiling Construction** - No hung ceiling. Any exposed fireproofing shall be encapsulated in an appropriate material. All ceilings shall be painted white. No penetrations or sky lights over IT areas.

- **Floor Treatment** - All concrete surfaces shall be erosion and vapor sealed (i.e. oil-based paint, epoxy coating, etc.). Provide Static Dissipative Floor Tile (SDT) installed as a system per manufacturer installation instructions. Grounding strips shall be connected to the TGB by the electrician. An electrical back-box shall be provided to accommodate this connection.

All floors above technology spaces shall be treated in the areas of the technology room to provide a waterproofing layer in order to prevent the migration of water to the technology room below.

- **Fire Rating** - As required by Code. (Perimeter Wall -2 hour minimum. Interior Walls – 1 hour minimum.)

All pipes, duct ladder racks, cable trays and conduit penetrations shall be fire-sealed at penetrations through rated walls.

- **Windows** - Fenestration (i.e. windows) at exterior walls is not permissible.
- **Finishes** - Paint over vapor barrier primer/sealer at perimeter walls and paint at interior walls. Coordinate paint specification with RED+F.
- **Walls** - Interior walls shall be insulated stud walls with gypsum board finish.
- **Plywood Backboard** - Provide fire-retardant plywood painted with two (2) coats of fire-retardant paint (white in color) on the major wall space.
- **Doors** - Where permissible, doors are to swing out and not have a threshold. Doors shall be a minimum 3'-0" width x 7'-0" height. All IDF doors shall be fitted with card access with electrified mortise lock with transfer hinge. Doors shall have a fire rating as required by code.

5. *IDF's – Miscellaneous Requirements*

Card readers required on door. Off-campus locations require remote access.

Provide (2) two CCTV cameras. One to monitor the door and front rack activity. The second to monitor activity at the rear of the racks. Camera locations shall be coordinated with Security and the MCIT PM.

6. *Miscellaneous IT Design Requirements*

Cable trays external to technology spaces are to be provided by the electrical contractor. They are to be designed by IT Designer and shown on the Electrical drawings. It is critical the cable tray path is coordinated with the MEP.

All IDFs require a dedicated pathway back to the BDF. This can take the form of a dedicated telecommunications shaft way, sleeves through the floors of stacked IDFs, and/or conduit runs. Sizing and routing should be determined by the Designer and approved by MCIT.

SECURITY

Given its location in the heart of New York City, NYU Langone pays special attention to security in its facilities and operations. In order to bring existing and new locations undergoing renovations in line with our security standards, new security components are required to be installed as additions to existing security systems or completely new installations. Security system design and installation will require varied approaches depending on the Project Type as outlined below:

1. *Project Types*

- ***Facilities with Existing Security Systems*** - In nearly all facilities that NYU Langone owns or leases, there is an existing security system to which follow-on installations will link and we will use that vendor's equipment for the follow-on installation. The vendor of that equipment is the Security Vendor. The RED+F PM and the A/E Team will work with the Security Vendor to develop equipment placement requirements and will meet with NYU Langone's Security Department at key points during the design and construction process for their review of the security design. Among other things, the Security Department will review the equipment the Security Vendor proposes to use and the pricing. The Security Vendor will work under contract to the construction contractor.
- ***Facilities without Existing Security Systems*** - If the facility is new, there will not be an existing Security Vendor. Accordingly, the Architect shall provide security design services or shall engage the services of a Security Consultant (pre-approved by NYU Langone's Security Department) to provide such services and the Architect will be responsible for the services the Security Vendor would otherwise provide. The project team will work with RED+F's Project Support Office to determine how to procure the Security Vendor. Alternatively, RED+F may direct the use of an existing Security Vendor.

2. *Project Development and Design*

The following are required milestones for meetings with NYU Langone to determine security needs, develop scope and coordinate final recommendations:

- ***Schematic Design*** - During Schematic Design a meeting with the A/E Team, RED+F's PM, User-Group leadership and any additional stakeholder(s) of the new space shall be held. The purpose of the meeting is to review security needs for the project.
- ***Design Development*** - During the Design Development Phase, the Architect shall provide Floor plans, Furniture plans, Reflected Ceiling plans and Door Hardware information to and meet with the Security Department and Security Vendor at the same time. The Architect will propose for Security Department approval a security system design that incorporates User-Group requests, Stakeholder requests, NYU Langone security standards and industry security standards.
- ***Construction Documents*** - During the Construction Document Phase, the Architect (through the RED+F PM) will organize a meeting of the A/E Team, Security Department, and RED+F's PM to review the proposed security solutions and seek Security Department approval thereof. The Security Vendor will provide the A/E Team with equipment cut

sheets, cabling and rough-in requirements. The A/E Team will incorporate this information into the Construction Documents. A final meeting will be held with the A/E Team, Security Department, RED+F's PM, User-Group leadership and any additional stakeholder(s) of the new space to present the final coordinated security design. The decision for systems cabling responsibility will also be determined at this time.

- ***“As-Built” Documentation*** - The Architect shall provide the Security Vendor and Security Department with copies of the finalized “As-Built” in electronic form acceptable for import into BuildFlow.

3. *General Requirements for Security Design*

The Architect shall follow the security requirements listed below in the design of the project:

- Any code issues, such as fire and life safety, that affect security operations must be addressed by the Architect.
- Interior
 - Common spaces should not be isolated from entrances or stairs.
 - Consider location of permanent staff in multiple locations within spaces to limit possibility of unoccupied spaces that cannot be monitored.
 - Consider use of interior glazing and other strategies to improve visibility and accessibility.
 - If a security officer post is included in the design, consider sightlines from the seated position.
- Security access control and alarm systems on the superblock must be compatible and integrated with the existing system at the NYU Langone Security Operations Center. Systems off the superblock will be evaluated on a case-by-case basis as to their need to be tied into the existing system or if they can be stand-alone and tied into a central station for monitoring and subsequent response.
- Cameras are required at all lobbies, laundry rooms, cash handling areas, elevators, stair doors, entrance and egress doors, as well as any other areas as recommended by NYU Langone Health.
- All windows should be lockable.
- A/E Team should alert NYU Langone Health to security conditions that are not immediately apparent but would have operational impact, such as emergency egress doors that are on hold-opens.
- Areas of high security risk generally include where cash, narcotics, or retail operations are planned, as well as areas housing behavioral health (i.e. Psychiatry), Infant/Pediatric, Emergency Department, TBI (Traumatic Brain Injury) or ICU patients. These areas require greater access control, panic alarms and camera coverage. In some cases, specialized systems, such as Infant/Patient tracking and monitoring systems need to be incorporated into the design to include emergency card reader override buttons and one button lockdown feature as required.

- IDF closets require Lenel security systems and IP camera installed within. Access will be controlled by the MCIT Department.
- Exterior
 - Lighting design must carefully consider appropriate light levels without compromising security.
 - Employ “passive” security design strategies such as avoiding dead-end spaces and blind corners, and areas that are isolated from foot traffic or out of sight.
 - Consider relationship of ground floor spaces to the exterior for sightlines and access to open windows and doors.
 - Where security officer posts are required, consider issues of congestion, sightlines, ADA compliance and the physical comfort (furniture and HVAC) of the personnel.

4. *Related Security Design Guidelines*

- NYPD has published security guidelines entitled Engineering Security, Protective Design for High Risk Buildings. Where applicable these guidelines are to be referenced and utilized as necessary.

MISCELLANEOUS

This subsection is a running list of miscellaneous items that the A/E Team should consider during the Design and Construction process.

1. Firestopping

- Only Hilti products installed as UL-approved systems are permitted (unless otherwise allowed in the Design Guidelines).
- All firestopping must be performed by certified tradespersons qualified to use Hilti products.
- The A/E Team and RED+F Project Manager shall require the GC / CM to retain a certified independent firestopping firm to perform all firestopping work. Making individual trades responsible for firestopping their own penetrations is NOT acceptable.
- Please note firestopping requires a Special Inspection required by the NYC DOB and NYU Langone Facility Operations.

2. New Fire Extinguishers, Cabinets and Signs

- New fire extinguishers, recessed wall cabinets, and signs shall be purchased and installed as part of the capital project. Fire extinguishers shall be appropriate type and size specified in quantities that provide sufficient coverage.
- The NYU Langone standard is a 10 lb. ABC fire extinguisher (except OR's, MRI's, Kitchens and specific MER's).
- Fire extinguishers for OR's, MRI's, Kitchens and MER's shall meet the following requirements:
 - OR – Consult with EH&S
 - MRI – AC or MRI-safe ABC
 - Kitchens – K
 - MER – BC
- Fire extinguisher cabinets shall be able to house the appropriate fire extinguisher without modification. The cabinet must NOT have break-glass or any kind of key locking mechanism to access the extinguisher.
- When closed, the cabinet door shall latch shut without the use of any key.
- The cabinet door shall be opened by simply pulling on the handle.
- Fire extinguishers in cabinets must be identified by 3D signs. Coordinate with RED+F Signage / Wayfinding Project Manager.
- Contact Environmental Health & Safety (EH&S) for additional guidance.

3. *Temporary Interior Construction Partitions*

- All NYU Langone interior construction projects, which are not confined to an enclosed room or space (i.e. corridor, etc.) and do not require a rated barrier, shall use the Edge Guard partition system.
- The A/E Team and RED+F Project Manager shall require the GC / CM to order this product in advance of start of construction as it may take several days for delivery.

4. *Ceiling Type Selection*

Existing infrastructure in some cases may prevent proper pressurization of specialized rooms. Selection of the appropriate ceiling type can mitigate these issues.

- For spaces requiring positive or negative pressure, the Architect shall meet with the RED+F Project Manager and Facilities Operations to determine the type of ceiling construction to be provided (i.e. acoustical ceiling tile or gypsum board ceiling with access panels).

5. *Refrigerator and Freezer Monitoring*

ELPRO is NYU Langone Health’s standard, centralized temperature monitoring system for clinical and research refrigerators and freezers, and any moveable refrigeration equipment. It is not to be used for any other monitoring, such as room temperatures, pressures or humidity.

- For Clinical Facilities:
 - ELPRO is **required** for all Nourishment, Specimen, Medication (including vaccinations) and Breast Milk refrigerators and freezers.
 - For moveable equipment requiring temperature monitoring, such as reagent refrigerators and incubators, ELPRO can be installed at the clinician’s request with approval from MCIT and RED+F Commissioning.
 - If your facility is an FHC, Community Medicine or School Health (Elementary/Middle School) site, notify RED+F Commissioning as additional monitoring and reporting may be required.
 - For the Vaccine for Children Sites only, the ELPRO CE Digital Data Logger shall be installed. In addition to the logger, an audible alarm must also be installed. The recommended model is the Health Care Logistics Memory Monitoring Refrigerator / Freezer Alarm, product number 10368.
- For Research Facilities:
 - ELPRO is **required** for all freezers housing research materials rated at -40°C or below, as well as for all Liquid Nitrogen tanks and cryogenic storage.
 - ELPRO can be installed in refrigerators and freezers of all temperatures, as well as incubators, at the research unit’s request, with approval from MCIT and RED+F Commissioning.

- For ALL Applications:
 - ELPRO is **not** to be used for monitoring ambient room temperature, humidity or for monitoring pressure relationships. The Building Automation System (BMS or BAS) **must** be used for environmental monitoring. In areas where a BMS network may not be available, contact RED+F Commissioning for direction.
 - All research -80°C through -140°C as well as liquid nitrogen dewar tanks and freezers shall be equipped with the ELPRO Central Monitoring System (CMS).

6. *Roofing and Waterproofing*

- All roofs and waterproofing shall be designed with a minimum 20 year warranty.
- Roof membranes, coatings and waterproofing products shall be cold apply, low VOC (less than 50 grams per liter) and low-odor emitting.
- 100% flood testing of roofs and waterproofing shall be specified.
- The use of torch down or other hot roof methods is prohibited unless specifically reviewed and approved by NYU Langone’s Facilities Management and EH&S.
- The following roof and waterproofing systems have been reviewed and used on NYU Langone projects:
 - Garland Green-lock
 - Kemper 2K PUR
 - Siplast Paraflex (Note: Siplast Parapro shall not be used unless reviewed and approved by Facilities Management and EH&S due to the respiratory and odor hazards it poses).
 - TQ3

7. *Pressurized Rooms*

- All areas listed in Table 7.1 of ASHRAE Standard 170 – Ventilation of Health Care Facilities that have a pressure relationship requirement need to have full height deck to deck walls (gypsum board finish the entire height from top of structural deck to underside of structural deck) with all penetrations sealed (inclusive of spaces with a hard gypsum ceiling).
- All conduits and back boxes leading out of the room shall be sealed with an approved product.

8. Security Control in Operational Technology Systems

- The A/E Team shall follow the latest version of NYU Langone Health’s *Guidelines for Security Control in Operational Technology Systems*.
- It shall apply to all NYULH projects where Operational Technology (OT) systems to monitor and control facility-related equipment and systems will be installed, upgraded or replaced.
- All OT system network designs shall be submitted to and reviewed by NYULH Information & Engineering Strategy for compliance with the guidelines and industry best practice standards.

DOS AND DON'TS

As part of our approach to continually improve the Design and Construction process, we at RED+F maintain a running list of Dos and Don'ts. This is a detailed list of items that we have found to work well (or not work well) for NYU Langone Health capital construction projects. We have listed these items in the following order:

- Architectural
- Engineering
- Interior Design
- Medical & Lab Equipment
- AV/IT & A/E Team Coordination

Architectural

1. Make sure patient room and patient toilet room saddles have no lip (not even code allowable 1/4"). Patients cannot negotiate with IV pole.
2. Make sure there are bed stops.
3. Where wall mounted soap dispensers are used, place them above countertops instead of above floors, so any drippings go on the counter.
4. For Article 28 facilities do not specify storage cabinets under sinks; use ADA-compliant panels instead. The area under sinks should be clear. It will fail DOH survey if storage is located underneath.
5. Provide the construction budget and schedule to the A/E Team before start of design. The A/E Team needs to design within budgetary and time constraints. They can't do that without a budget and schedule.
6. Obtain user equipment lists and determine infrastructure requirements (i.e. power requirements) ASAP so that a test fit can be performed.
7. Floating ceilings might require sprinkler coverage ON TOP of them. Check it.
8. Be sure that room numbering adheres to NYU Langone standards. Device schedules need to match (for Fire Alarm Programming).
9. The Tisch Ancillary building is a balloon frame construction. There is no fire-stopping between the slab and curtain wall. Design dwgs to address this. Millhauser is similar.
10. Do not 'float' HIPPA divider panels between desks. Sandwich the panels tight to the desks with no gaps for added stability and to prevent pens, papers, etc. from falling through.
11. Add card readers to all clean supply rooms.
12. Make sure mounting height of ADA mirrors is specified for the bottom of the *reflective surface* to be 40" AFF, not the mirror frame.
13. Camera locations need to be coordinated with the Security PM, Security vendor and the MCIT PM.
14. The Architect should do a file/storage survey during planning to make sure adequate file and storage space is factored into the design.

15. Provide electric locks for single doors and overhead electric strikes for glass doors. ~~No maglocks are allowed.~~ Avoid the use of maglocks whenever possible.
16. All interior finish and furniture drawings and specifications are to be ~~forwarded to RED+F's Design Studio~~ uploaded to BuildFlow upon closeout.
17. MER doors to have Trilogy keypad locksets with T2 keyway. Must coordinate with NYU Langone locksmith.
18. Firestopping products shall not be used unless required for fire or smoke barriers. All firestopping must be performed by a certified tradespersons in firestopping, contracted under either the GC/CM. Making individual trades responsible for firestopping their own penetrations is not acceptable. They must use only Hilti products (unless otherwise allowed in the Design Guidelines), and must use UL-approved systems. A Special Inspection is required by NYC DOB and NYU Langone Facility Operations.
19. Cable trays are not to penetrate smoke or fire barriers. Cable trays are to stop at wall with cables traversing through EZ-Path devices, then resume with cable trays past penetration. Coordinate with MCIT PM.
20. Consideration must be given to additional data drop conduits and back boxes (with drag lines) to all rooms. Furniture layouts change, often times during construction, and the only drops in the room are behind furniture. This is especially the case with wall mounted computer work stations. Similarly, additional wall grounds are to be provided on a second wall in the event this location changes as well to avoid tearing open newly created walls.
21. Avoid ceiling tile slivers less than 6" wide. Spec larger tile for that wall location where this may occur and cut the tile. For example, if 2'x2' ACT is specified and it will end up with some spaces with slivers of less than 6" cut tile, ~~they~~ the A/E Team should consider specifying larger 2'x4' ACT for that wall location and cutting the larger tile down. Therefore, instead of a 2'-0" x 0'-6" sliver, ~~we~~ you end up with 2'-0" x 2'-6" ACT. This will look more consistent.

Engineering

1. If an item is not included in the guidelines, follow up with facilities.
2. Confirm with RED+F PM team that Commissioning has been bought out to a third party to include specs in engineering subsections. This is a code requirement for Article 28 spaces. In addition, commissioning is a DOB requirement for non-Article 28, please reference the NYC Energy Code for specifics.
3. Design engineer to confirm with RED+F PM that a page turn has been setup with facilities at different stages of design (schematic, design development, contract drawings).
4. Design Engineer or Architect to carry meeting minutes during page turn with facilities and submit to facilities after meeting.
5. If designing an Article 28 space, provide drawing notes for all trades to prevent any object from touching, laying or hanging from sprinkler piping.
6. Ensure BMS sequence operations lines up with control sensors indicated on one-line drawings.
7. Ensure BMS network is not on the IT network.

8. Do not have all similar equipment on the same electrical panel. Distribute the electrical loads. (i.e. like pumps, AHUs, etc.)
9. If designing HVAC for sterilizers, heat load calculation shall be run for skin loss as well as cooling of cleaned items right after a sterilization cycle. Common engineering mistake is to not calculate for the heat load of sterilized items that are cooling in the space and sufficient cooling is never provided.
10. Enforce the completion of “as-builts” and turnover to NYU Facilities.
11. Obtain HVAC traverse readings and electrical tracing at the start of design process.
12. Do not discharge steam condensate pump vents into MER. Vents to discharge to the outdoors.
13. Steam condensate piping shall be pitched by gravity to condensate pump, No trapping or lifting of condensate via steam shall be allowed.
14. Provide filtration and chemical treatment on closed loop systems.
15. AHU control devices shall be located outside of the airstream. Do not mount inside unit.
16. All primary chilled water coils and valves in the main campus shall be designed to 400 psi at an ANSI pressure class of 300lbs.
17. Outdoor ductwork shall be pitched on top to prevent water accumulation.
18. In the main campus, all automatic transfer switches shall be specified with a dead neutral position and delay transfer feature.
19. Sprinkler system shall have a means of draining, do not trap water in sprinkler piping.
20. In the main campus, do not send generated steam condensate from clean steam generators that serve air handler humidifiers back to Energy Building. Generated clean steam condensate shall be removed from campus via drains per DEP standards. Primary steam condensate from the Energy Building shall be pumped back to the plant.
21. Do not substitute Terminal Reheat Units for Induction Units and vice versa without a Facilities Operations engineering review.
22. Provide power for Lighting Circuits from lighting panels. Receptacles and convenience outlets shall be provided power from utility panels and receptacle panels.
23. Give the construction budget to the A/E Team before start of design.
24. NYU Langone’s main campus does not provide natural gas to lab benches. Do not design for this service, and include removal of same on the demolition plans.
25. Define that power tie in's to furniture are to be performed by the electrical contractor. Engineer to include on the "E" drawings. PM to confirm with the GC/CM.
26. Do not locate IT room HVAC equipment in ceilings of the rooms. Locate outside the rooms and duct in. Or use a split system and hang the evaporator on the wall and drain outside the room.
27. Use only concealed sprinkler heads, not recessed.

28. Specify tamperproof receptacles in all waiting rooms, regardless of the clinical function of the practice.
29. For laboratory equipment rooms, provide exhaust registers directly above heat generating equipment.
30. Include UL-approved pass-thru sleeves for future use in all smoke/fire partitions to prevent non-firestopped penetrations resulting from future cable pulls.
31. Thought must be given to redundancy for critical MEP systems. If a system loss will result in compromised patient safety or revenue loss to the institution, redundant systems need to be included in the design (i.e. emergency power, UPS, etc.)
32. DO NOT USE **USG Sheetrock Acoustical Sealant** at medical gas copper pipe penetrations. It corrodes the pipes. Use an alternate.
33. Include Hands-on Training for maintenance staff for all MEP equipment. In the main campus, two training sessions shall be provided, one early in the morning and one at night. For off-site locations, contact RED+F for amount of sessions.
34. Indicate on drawings where high point vents shall be required on pipework.
35. For phased projects that may have multiple contractors of the same trade, ensure that submitted equipment and components remain consistent throughout the project (i.e. same manufacturer, same model, etc.).
36. If existing services are to remain in a renovated space, those existing services are to be brought up to NYU Langone current standards.
37. Piping taps for pressure sensing devices shall be top tap only. Side or bottom taps are not allowed.
- 35-38. Medical gas takeoffs from riser shall be full size throughout floor loop. The piping size shall not be reduced on a floor loop. Takeoffs from floor loops shall be sized adequately.

Interior Design

1. Coordinate power/data drops with under-counter pedestal files, etc.
2. Make best efforts to marry up to a column / wall to reduce core drilling for power and data.
3. Specify wardrobe closets in workstations whenever possible.
4. No visible whips are allowed when connecting to workstations.
5. Coordinate cable management with furniture (V30 training room - cables hanging from desktops and visible).
6. Purchase construction cores on wall / door systems, not pre-keyed cores. The main campus locksmith will provide final cores. For off-campus facilities, engage a locksmith.
7. Get signage requirements early to have permanent signage at opening. PM to provide the Signage / Wayfinding PM the project schedule.
8. Specify and install door hooks in each toilet stall, and single occupancy restroom, office, and exam and lactation room.

9. Avoid specifying products that require overseas delivery unless stocked in the United States.

Medical / Lab Equipment

1. Do not provide UV lights as an option when ordering new Bio-Safety Cabinets for a lab or other type of project.
2. Do not specify direct-ducted bio-safety cabinets. Canopy connected A-2's with 70/30 air circulation are preferred. There are exceptions. Please review with EH&S before specifying.
3. Provide cabinets with side ports to allow tubing and wiring to be passed through the side as opposed to the front as a default. Review exceptions with EH&S before specifying.
4. Provide height adjustable biosafety cabinets as a default. Review exceptions with EH&S before specifying.

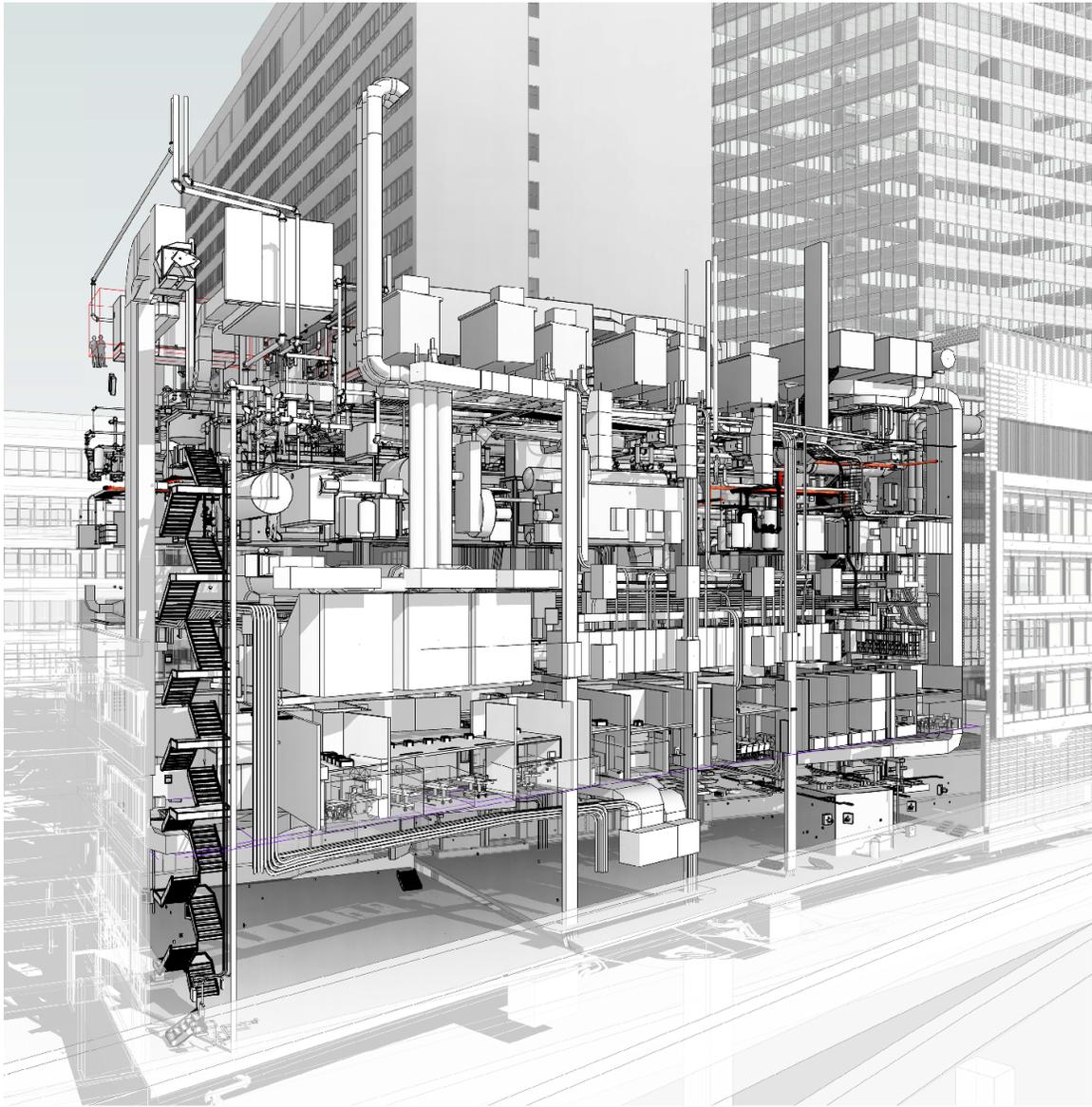
AV / IT & A/E Team Coordination

1. A/E Team shall fully coordinate with the IT consultant engaged directly with NYU Langone. Refer to the Information Technology subsection for further information.
2. IT Engineer infrastructure specification needs to be placed on the "E" drawings so that the electrical contractor can buy and install.
3. No MEP Services should pass through the IDF rooms that are not servicing the room.
4. Cable trays to be shown on all A/E drawings and coordinated appropriately with MCIT and the contractors. "Coordinate in field" is not acceptable.
5. Define who will buy the server UPS, Electrical or Low Voltage contractor PRE-BID.
6. Determine the power requirement at the rack early in the project.
7. Define AV equipment credenza ventilation requirements.
8. Coordinate light fixture locations to avoid racks / ladder racks. Wall mounted lights are acceptable.
9. Multiple outlets mounted above rack. Specifications should come from IT designer. Place the information on the Electrical plans for electrician to install.
10. Provide UPS to the rack. IT designer to specify the UPS. Electrical drawings shall show the UPS to be bought.
11. Each IDF room gets its own electrical panel. Power panels are to have surge suppressors.
12. Security panels typically go in IDF rooms. They require power and data connection. Coordinate requirements with the MCIT PM.
13. Cable Trays are to be designed by the IT designer, shown on the Electrical drawings and bought by the electrical contractor. It is critical that the cable tray path is coordinated with the MEP systems.
14. Coordinate pathway for conduits to building main IT rooms (BMS). Architects should include some allowance for demolition, temporary protection, patching, firestopping, etc. in the architectural plans.

2. ENGINEERING

Instructions to Engineer for preparing a design and specification:

- I. It shall be the Engineer's responsibility to follow these NYU Langone Health guidelines on all projects located on the main campus. For projects that are located off-campus, the Engineer shall follow these guidelines in conjunction with the building landlord's requirements.
- II. The information listed below is a guideline only. It shall be the Engineer's responsibility to conform to all appropriate building code requirements.
- III. All projects shall be designed in accordance with the applicable New York City Building Code, Mechanical Code, Fuel Gas Code, Fire Code, Energy Conservation Code, and the applicable standards referenced by these codes.
- IV. These Guidelines will be updated periodically and suggestions for updates may be made to the NYU Langone Project Manager. Requests and proposals for changes to the guidelines should be made in writing to a NYU Langone Project Manager assigned to the project who will forward such requests to RED+F Facilities Operations, as appropriate for review. RED+F Facilities Operations will advise the PM and Engineer in writing whether an exception to the Guidelines will be permitted or not.



BIM Model of Energy Building – Ennead Architects

TABLE OF CONTENTS

- 1. GENERAL 354**
 - A. End of Project Requirements 354
 - B. Training 355
 - C. Mercury Elimination Program Compliance 355
 - D. Equipment Manufacturers 355
 - E. Equipment Access 355
- 2. MECHANICAL 356**
 - A. Codes, Regulations and Design Standards 356
 - B. Design Criteria 356
 - C. Mechanical Naming Convention 360
 - D. Various **(UPDATED)** 361
 - E. Pandemic Upgrades **(NEW)** 363
 - F. Equipment 363
 - 1. Access Doors 363
 - 2. Air Compressors 364
 - 3. Air Curtains 364
 - 4. Air Filters 364
 - 5. Air Handling/Conditioning Units **(UPDATED)** 364
 - 6. Air Outlets 367
 - 7. Air Volume Regulators 367
 - 8. Baseboard Radiation (Steam/Water) 367
 - 9. Boilers 368
 - 10. Clean Steam Generators 368
 - 11. Chillers **(UPDATED)** 368
 - 12. Condensate Pumps 369
 - 13. Cooling/Heating Coils 370
 - 14. Cooling Towers 370
 - 15. Controllers (Water Level) 371
 - 16. Dampers (ALD's) 371
 - 17. Dampers (Dynamic Fire/Smoke) 372
 - 18. Expansion Compensation 372
 - 19. Expansion Tanks 372
 - 20. Fans 373
 - 21. Fan-Powered Boxes 373
 - 22. Fan Coil Units 374
 - 23. Firestopping Products 374
 - 24. Flow Measuring Devices 374
 - 25. Fuel Oil Pumping Systems 375
 - 26. Fuel Oil Specialties 375
 - 27. Fuel Oil Tanks 375
 - 28. Fuel Oil Tank Gauging and Leak Detection Systems 376
 - 29. Freezestats 376
 - 30. Hangers, Anchors and Guides **(UPDATED)** 376
 - 31. Heat Exchangers 377
 - 32. Heat Trace 377
 - 33. Humidifiers 377
 - 34. Insulation (Duct and Pipe) 378
 - 35. Insulation Adhesives 378

36. Insulation Pipe Shields	379
37. Meters and Gauges	379
38. Motors.....	380
39. Motor Starters.....	381
40. Motor Control Centers.....	381
41. Motor Controllers Variable Speed (VFD)	381
42. Orifice Steam Traps (Venturi Orifice Type)	381
43. Pipe and Fittings (UPDATED)	381
44. Pressure-Regulating Valves/Stations	383
45. Pumps	384
46. Radiant Heating Systems	384
47. Refrigerant Monitoring Systems	385
48. Sound Traps (UPDATED)	385
49. Steam Traps	385
50. Steam Piping	385
51. Strainers	386
52. System Identification	386
53. Unit Heaters	387
54. Valves (UPDATED)	387
55. Variable Air Volume (UPDATED)	390
56. Variable Frequency Drives	390
57. Variable Refrigerant Flow System (VRF)	391
58. Vibration Isolators.....	392
59. Water Filtration.....	392
60. Waterproof Sleeves	393
62. Water Treatment/Cleaning.....	393
G. Cost-saving Alternatives (NEW)	394
3. ELECTRICAL	396
A. Codes, Regulations and Design Standards.	396
B. Design Criteria	396
C. Electrical Naming Convention	398
D. Various	402
E. Equipment.....	403
1. Automatic Transfer Switches	403
2. Busway and Accessories.....	403
3. Cable Pulling Lubricants	403
4. Cable Tray and Fittings.....	404
5. Clocks	404
6. Dry-type Transformers.....	404
7. Electric Heating Cable Systems	404
8. Electrical Conductors, Copper, 600 Volt or Less	405
9. Electrical Metallic Tubing (EMT)	405
10. Electronic Fluorescent Ballasts	405
11. Electronic Fluorescent Dimming Ballasts	405
12. Electronic Dimming System (UPDATED)	405
13. Enclosed Switches	405
14. Exit Signs	406
15. Fire Detection, Alarm and Communication.....	406
16. Flexible Metal Conduit	406
17. Flexible Metal Conduit Fittings	406

18. Fluorescent Lamps	406
19. Fuses	406
20. Generator.....	407
21. High Intensity Discharge Lamps	407
22. LED Light Fixtures	407
24. Lighting Controls	408
25. Line Voltage Switches, Wall Plates, and Coverplates.....	408
26. Liquid-tight Flexible Metal Conduit.....	408
27. Liquid-tight Flexible Metal Conduit Fittings	408
28. Motor Control Centers	409
29. Motor Controllers Variable Speed (VFD)	409
30. Multi-outlet Assemblies	409
31. Outlets and Boxes	409
32. Overcurrent Protective Devices	409
33. Panelboard	410
34. Receptacles (UPDATED)	410
35. Rigid Aluminum Conduit and Fittings.....	410
36. Rigid Nonmetallic Electrical Conduit and Fittings	411
37. Rigid Steel Conduit and Fittings (exposed to the weather)	411
38. Rigid Steel and Intermediate Metal Conduit.....	411
39. Rigid Steel and Intermediate Metal Conduit Fittings	411
40. Service Switch Assemblies and Distribution Switchboards.....	412
41. Submetering and Power Quality Metering	412
42. System Identification	412
43. Transient Voltage Surge Suppression	413
44. Type "AC" (Armored Cable) Conductor Cables, 600 Volts or Less	413
45. Vibration Isolation Devices and Seismic Restraints	413
46. Wall Dimmers (UPDATED)	413
47. Wire Connectors and Lugs	413
48. UPS (Central).....	414
49. UPS (Rack Mounted)	414
50. Heat Trace	414
F. Cost-saving Alternatives (NEW)	414
4. PLUMBING	415
A. Codes, Regulations and Design Standards	415
B. Design Criteria (UPDATED)	415
C. Equipment.....	416
1. Acid Neutralization.....	416
2. Backflow Preventers	416
3. Baseboard Radiation (Steam/Water).....	417
4. Drains	417
5. Electric Water Coolers.....	417
6. Fixture Supports	417
7. Gauges and Thermometers.....	417
8. Hot Water Heaters	418
9. Insulation	418
10. Medical Air Compressors	418
11. Medical Gas Equipment	418
12. Medical Gas Outlets	419
13. Motors.....	419

14. Motor Starters.....	419
15. Motor Controllers Variable Speed (VFD)	420
16. Orifice Steam Traps (Venturi Orifice Type)	420
17. Pipe and Fittings (UPDATED)	420
18. Pipe Hangers and Supports	422
19. Pipe Joint Compound	422
20. Plumbing Fixtures.....	423
21. Purified Water System Equipment (Reverse Osmosis and Deionized Systems)	423
22. Safety Showers/Eyewashes.....	423
23. Seismic Restraints	423
24. Sump Pumps and Ejectors.....	423
25. System Identification	424
26. Toilet Seats.....	424
27. Vacuum Pumps	424
28. Valves (UPDATED)	424
29. Water Supply Pumps.....	425
D. Cost-saving Alternatives (NEW)	426
5. FIRE PROTECTION.....	427
A. Codes, Regulations and Design Standards	427
B. Design Criteria	427
C. Equipment.....	429
1. Anchors and Inserts	429
2. Motor Starters.....	429
3. Motors.....	429
4. Pipe Hangers and Supports	429
5. Piping	429
6. Preaction Control Panel/Equipment (UPDATED)	430
7. Preaction/Dry Pipe Valves.....	430
8. Pressure-Reducing Valves	430
9. Pumps	430
10. Standpipe System Equipment	431
11. Seismic Restraints	431
12. Sprinkler Heads, Valves, Alarms, Etc.	431
13. System Identification	431
14. Tamper Switches.....	432
15. Valves	432
16. Vibration Isolators.....	432
17. Water Flow Switches.....	432
18. Water Proof Sleeves.....	433
D. Cost Saving Alternatives (NEW)	433
6. FIRE ALARM.....	434
A. Codes, Regulations and Design Standards	434
B. Design Criteria	434
C. Equipment.....	434
1. Fire Alarm System	434
2. Heat Detectors	434
3. Strobe/Speaker	434
4. Strobe/Horn	435
5. Strobe.....	435
6. Smoke Detector	435

7. Duct Detector.....	435
8. Manual Pull Station.....	435
7. BUILDING MANAGEMENT SYSTEM.....	436
A. Codes, Regulations and Design Standards.....	436
B. Executive Summary.....	436
C. General Requirements.....	436
D. BMS Approved Manufacturers (UPDATED)	438
E. Existing Systems.....	439
F. Submittals (UPDATED)	440
G. Decommissioning Requirements.....	442
H. System Architecture (UPDATED)	444
I. Communication Protocols (UPDATED)	448
J. System Security.....	449
K. Network Security.....	449
L. User Access Levels and Passwords (UPDATED)	449
M. Power Requirements.....	451
N. Product Standards (UPDATED)	451
O. System Equipment Standards and Sequence of Operations (UPDATED)	487
P. OEM Equipment Interface (UPDATED)	524
Q. Graphics Standards (UPDATED)	527
R. BMS I/O Point, Addressing and Naming Standards (UPDATED)	534
S. Alarms (UPDATED)	536
T. Trend & Historian.....	542
U. Reports.....	544
V. Project Closeout.....	545
W. Appendix A - Sample Floor Plans.....	549

1. **GENERAL**

A. **End of Project Requirements**

As part of a break-out cost, the design engineer shall review the as-built documentation provided by the subcontractors and edit the project design documents to reflect the “as-built” condition. The engineer shall confirm the collaborated as-builts are correct and complete. To create these collaborated as-builts the design engineers shall use the contractor as-builts as a reference, which shall be provided to the engineer in PDF form and native (AutoCAD or Revit).

I. Single Line Diagrams

- Steam Distribution
- CHW Distribution
- CW Distribution
- Domestic Water Distribution
- Sanitary and Storm Drainage Distribution
- Medical Gas Distribution
- Medical Vacuum Distribution
- Electrical Distribution (Normal and Emergency)
- Controls System

II. Floor plans

III. Life Safety Drawings which include the following but not limited to:

- Sprinklers
- Fire Standpipe
- Strobes
- Pull stations
- Smoke doors
- Magnets for doors
- Smoke compartments
- Egress paths
- Flow tamper switches
- Exit Signs
- Fire/smoke and smoke dampers

IV. Floor Plans indicating room pressure relationships

V. Campus Wide Equipment Schedules

All major MEP/FP/FA equipment removed and installed (in excel format).

B. Training

Training for new equipment or controls shall be written into design specifications. There shall be two training sessions, one in the morning and one in the afternoon to pick up all worker shifts. Training syllabus shall be provided to design engineer as well as NYU Langone Health RED+F Facilities Operations for review prior to training sessions for review and comment. Training must be done by qualified personnel with intricate knowledge of equipment and system and not by salesman.

C. Mercury Elimination Program Compliance

In an effort to protect patients, staff, researchers and the environment, it is the policy of NYU Langone Health to prohibit the use of mercury-containing equipment, materials and instrumentation where safe, effective alternatives exist. This program is outline in more detail in NYU Langone Health Safety Policy No. 170. Typical mercury-containing materials could include—thermostats, switches, float controls and lamps. Approved suppliers with known mercury-free alternatives are identified herein, but this list should not be assumed to be complete. If a designer or engineer believes the use of mercury-containing materials (besides UV, florescent and LED light bulbs, ballasts and mercury-containing batteries, which are exempted) is mandatory, the need must be formally presented to the NYU Langone Health RED+F Facilities Operations Department to obtain express permission for its use prior to any deviation from this guideline.

- I. If permission for use of mercury-containing materials (besides UV, florescent and LED light bulbs, ballasts and mercury-containing batteries) is given by RED+F Facilities Operations then engineers, designers or installers must ensure the proper inventorying, reporting and safe handling of any mercury-containing materials and equipment. These requirements include:
 - a. Labeling of Material - Proper “mercury-containing material” stick-on labels can be obtained from Facilities Operations (Greenberg Hall, SC2, Rm 122)
 - b. Inventorying of Material – An inventory log of properly labeled materials/equipment with installation date and specific location must be submitted to Facilities Operations by the end of project as part of closeout documentation.
 - c. Complying with all safe handling and disposal guidelines outlined by NYU Langone Health Environmental Health & Safety in its policies available on its website and referenced in contracts.

D. Equipment Manufacturers

U.S.-made is strongly preferred. Non US manufacturers will be considered. Example: Ventrol, Mammoth, Alliance Air, etc.

E. Equipment Access

All equipment shall be installed with manufacturer’s recommended clearance or code required clearance for maintenance and repair.

END OF GENERAL SUBSECTION

2. MECHANICAL

A. Codes, Regulations and Design Standards

Comply with all current New York City Building Codes, Joint Commission Standards, National Institutes of Health and all authorities having jurisdiction and applicable national, state and local codes, laws and regulations governing or relating to any portion of this work.

Laboratory and Hospital environmental conditions, air filtration, air change rates and pressurization relationships will be in accordance with the requirements set forth in American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), American Institute of Architects (AIA), National Institute for Occupational Safety and Health (NIOSH), National Fire Protection Association (NFPA), Centers of Disease Control and Prevention (CDC), and all other applicable governmental Codes.

If any design standard within this document contradicts codes or regulations, the design engineer shall notify NYU Langone Health.

B. Design Criteria

I. Chilled Water

- a. General Chilled Water Supply and Return Temperatures: 45°F/57°F
- b. Operating Room Chilled Water Supply and Return Temperatures: Contact Facilities Operations for proper values.
- c. If Chilled Water will be decoupled from main campus, Chilled Water system with a heat exchanger, higher design temperatures shall be used and approved by Facilities Operations
- d. 2-way control valves shall be used

II. Condenser Water (campus)

- a. Condenser Water Supply Temperature: 85°F
- b. Condenser Water Return Temperature: 95°F
- c. 2-way control valves shall be used

III. Condenser Water (process)

- a. Condenser Water Supply Temperature: 80°F
- b. Condenser Water Return Temperature: 90°F

IV. Steam

- a. Working pressure of steam is
 - 1) LPS – 5 psi
 - 2) MPS – 25-80 psi
 - 3) HPS – operating: ~~125-150-180~~ psi, maximum: 200 psi
 - 4) HHPS – 600 psi
- b. Clean steam generation shall be used for humidification and for direct injection sterilization.

V. Perimeter Heating

- a. Non potable hot water shall be designed to an Outside Air Temperature reset control scheme.

VI. Outside Design Conditions

- a. The mechanical systems shall be selected to serve a facility as specified within the New York City Building Code.

VII. Internal Design Conditions

- a. Offices, Conference Rooms, Classrooms, Student Areas and Similar Areas
 - 1) Occupied:
 - a) Heating: 68-74°F D.B.
 - b) Cooling: 68-75°F D.B. with a maximum of 60% R.H.
 - c) Conference rooms, libraries, study halls and similar spaces shall have CO2 monitoring and demand ventilation control.
 - 2) Unoccupied Setback:
 - a) Heating: 65°F D.B.
 - b) Cooling: 85°F D.B.
 - c) Airflow Setback (non-critical only): 15-20% of design. Control shall be on a room-by-room basis with a local over-ride at the respective temperature sensor.
- b. Laboratories, Lab Support Areas and Similar Areas
 - 1) Occupied:
 - a) Heating: 68°F D.B. with a minimum of 35% R.H. ±5%
 - b) Cooling: 75°F D.B. with a maximum of 50% R.H.
 - c) Air Change Rate shall be determined based upon minimum code requirement or cooling load, whichever is greater. In no instance shall it be less than 6 air changes per hour unless an air sampling system is being used. Demand control ventilation is allowed on a case by case basis which shall be reviewed with Facilities Operations.
 - 2) Unoccupied Setback:
 - a) Heating: 65°F D.B.
 - b) Cooling: 85°F D.B.
 - c) Airflow Setback (non-critical only): pressurization shall be maintained with reduced airflow. Methodology shall be reviewed with facilities operation prior to design.
 - d) Air Change rate shall be determined based upon minimum code requirement or cooling load, whichever is greater. In no instances shall it be less than 6 air changes per hour unless an air sampling system is being used. Demand control ventilation is allowed on a case by case basis which shall be reviewed with Facilities Operations.

- c. Health Care Facility Areas
 - 1) Operating Rooms: 68-78°F D.B. depending on function of Operating Room. Temperature shall be discussed with Facilities Operations and with end user. Minimum of 30% R.H. and maximum of 60% R.H.
 - a) The ventilation systems shall be capable of flow tracking for the supply, exhaust, and return on a room by room basis.
 - b) Sequence of operations shall be coordinated with requirements in the Building Management System design guidelines.
 - 2) All other Health Care Facility Areas shall be designed to the data listed within the latest edition of the FGI Guidelines and ASHRAE 170 – Ventilation for Health Care Facilities.
 - 3) Procedure Rooms/Isolation Rooms/Protected Environment Rooms
 - a) The ventilation systems shall be capable of flow tracking for the supply, exhaust, and return on a room by room basis.
 - b) Temperature shall be discussed with Facilities Operations and with end user
 - c) Sequence of operations shall be coordinated with requirements in the Building Management System design guidelines.
- d. Vivarium and Support Areas

The data within this subsection shall be superseded by the most current version of NIH Guidelines. All temperature conditions shall be reviewed with NYU Langone Health DLAR and Facilities Operations. The final design shall be confirmed by all parties.

 - 1) Unoccupied Setback:
 - a) Areas with animal habitats shall not be allowed a temperature or airflow setback.
 - b) Any rooms that are designed with an unoccupied schedule shall be confirmed with NYU Langone Health DLAR and Facilities Operations.
- e. Electrical Closets
 - 1) Ventilated to 80°F D.B. average, 85°F D.B. maximum.
- f. Switchgear Rooms
 - 1) Air Conditioned to 78°F D.B. The design shall be an N+1 configuration.
- g. Communication Closets
 - 1) Heating: 65°F D.B. minimum (if room is on perimeter of building)
 - 2) Cooling: 78°F D.B. average, 83°F D.B. maximum. (within Superblock)
 - 3) Cooling: 75°F D.B. average, 80°F D.B. maximum. (Real Estate Properties)
- h. Storage/mechanical areas:
 - 1) Ventilated

- i. Elevator machine rooms:
 - 1) Air conditioned to 78°F dry bulb minimum.

- j. Sterilizers:

Calculation for heat gain from a sterilizer shall be the skin loss of the sterilizer plus cooling load required during cooling of cleaned/sterilized items. Engineers shall note on a design drawing what the skin loss of the sterilizer is as well as what the cooling load for sterilized/cleaned items is.

- k. Toilets: Ventilate to New York City Mechanical Code requirement.

VIII. Internal Load Criteria

Refer to ASHRAE Handbook – Fundamentals; Nonresidential Cooling and Heating Load Calculations Chapter and ASHRAE Handbook – Applications; Laboratories Chapter and Health Care Facilities Chapter.

IX. Lighting and Equipment Heat Gains

- a. Base design on data listed within ASHRAE Handbook – Fundamentals; Nonresidential Cooling and Heating Load Calculations Chapter and ASHRAE Handbook – Applications; Laboratories Chapter and Health Care Facilities Chapter.

X. Hours of Operation

- a. Offices: 12hrs/day, 5 days/week
- b. Laboratories/Support Areas: case by case basis to be discussed with end user.
- c. Health Care Facility/Support Areas: 24 hrs/day, 7 days/week
- d. Vivarium: 24 hrs/day, 7 days/week

C. Mechanical Naming Convention

I. Equipment Naming Scheme

Example: AHU-TH-1-2

<u>AHU</u> <u>Unit Type</u>	-	<u>TH</u> <u>Building Name (Location of Unit)</u>	-	<u>1</u> <u>Floor #</u>	-	<u>2</u> <u>Unit #</u>
AC – Air Conditioning Unit (cooling only)		ALH – Alumni Hall				
ACB – Active Chilled Beams		BRK – Brooklyn Lutheran				
ACC – Air Cooled Condenser		BRG – Berg				
ACCH – Air Cooled Chiller		EB – Energy Building				
AF – Air Filter		GBH – Greenberg Hall				
AHU – Air Handling Unit		HCC – Health Care Center				
B – Boiler		KP – Kimmel Pavilion				
CAV – Constant Air Volume Unit		MSB – Medical Science Building				
CH – Chiller		SB – Science Building				
CP – Condensate Pump		SKB – Skirball				
CSG – Clean Steam Generator		SRC – Smilow Research Center				
CT – Cooling Tower		TH – Tisch Hospital				
CWP – Condenser Water Pump						
ET – Expansion Tank		For all offsite locations, confirm				
EX – Exhaust Fan		Building name with RED+F				
FCU – Fan Coil Unit		Space Planning division.				
FOP – Fuel Oil Pump						
GX – General Exhaust Fan						
HWP – Hot Water Pump						
KEF – Kitchen Exhaust Fan						
PCHP – Primary CHW Pump						
PFHX – Plate and Frame Heat Exchanger						
PRV – Pressure Reducing Station						
RAF – Return Fan						
SAF – Supply Fan						
SCHP – Secondary CHW Pump						
STHX – Shell and Tube Heat Exchanger						
SX – Smoke Exhaust Fan						
TX – Toilet Exhaust Fan						
UH – Unit Heater						
VAVS – Variable Air Volume Supply Box						
VAVR – Variable Air Volume Return Box						
VAVX – Variable Air Volume Exhaust Box						
VFD – Variable Frequency Drive						
WSHP – Water Source Heat Pump						

*NOTE: for renovation projects the engineer shall inquire what the existing labelling scheme is on the floor and continue with the last number using the labeling scheme above. Example: if the floor has VAV’s on the 2nd floor of MSB labelled as VAV-1 through VAV-11, engineer shall start new labeling as VAVS-MSB-2-12

- II. FSD/FD labeling scheme:
Example: HCC-1-FD-2

<u>HCC</u> See building labeling scheme in previous table	-	<u>1</u> Floor #	-	<u>FD</u> FD – Fire Damper FSD – Fire Smoke Damper SD – Smoke Damper	-	<u>2</u> FSD #
--	---	--------------------------	---	--	---	------------------------

D. Various

I. Testing and Balancing –

- a. All projects shall have a TAB baseline taken of space prior to design/demo to confirm existing conditions.
- b. All Testing and Balancing values shall be within +5% / -10% of design values on a per outlet basis.
- c. Duct Leakage Testing Standards:

Duct Class	Pressure	Seal Class	Leakage Class
Medium Pressure Horizontal	3” – 4”	A	4
Medium Pressure Risers	3” – 4”	A	4
Low Pressure	2” and below	A	6

*Note: Low Pressure testing only applicable to sections greater than 100 square feet of duct surface area.

- d. All hydronic piping shall be hydrostatically tested to 1.5 working pressure but not less than 100psi for a minimum of 4 hours. All tests to be witnessed by owner.
- e. All refrigerant piping shall be tested per the following:
Pressure Testing for leaks
 - Charge system with regulated dry nitrogen and the appropriate tracer gas to pressure defined by engineer of record (EOR) or Manufacturer.
 - Branches may be tested in segments to reduce the time needed to locate leaks. However, for the final test, entire system must be tested as one.
 - When all leaks have been repaired and sections have been retested, the system must stand, unaltered, for 24 hours with no more than a +/- 1 pound pressure change.
 - If system does not drop below specified pressure within 24 hours, the system is then ready to be evacuated.

Evacuation Procedure

- Pull a system vacuum down to at least 1000 microns (+/- 50 microns) and close the vacuum header valves. If the system cannot pull a vacuum at any step and returns to atmospheric pressure, which is an indication of a leak, test for and repair the leak using the previously described procedure with tracer gas.
 - If the 1000 micron vacuum holds for 30 minutes, break the vacuum with dry nitrogen to a pressure of 2 psig
 - Install system suction and liquid drier cores.
 - Pull a second vacuum to a minimum of 500 microns.
 - Close vacuum header valves.
 - If the 500 micron vacuum holds for a minimum of 30 minutes, then break the vacuum with the refrigerant to be used in the system to a pressure of 2 psig.
 - Pull a third vacuum to a minimum of 300 microns.
 - Close vacuum header valves and allow system to stand for a minimum of 24 hours
- f. All pressure sensitive rooms shall have pressure relationship between room and outside space shown on report.
 - g. Pressure sensitive rooms shall be tested prior to ceiling being installed to confirm design pressure relationships between pressurized room and adjacent spaces.
 - h. Article 28 space balancing reports shall show pressure in and pressure out per FGI Guidelines.
 - i. Balancing reports for any rooms designed to be positive or negative pressure must include the room's pressure on the report. Report cannot be approved unless $-.01''\text{wc}/.01''\text{wc}$ is obtained while also meeting design flow CFM +/-10%.
 - j. Testing and Balancing contractors shall be NEBB~~, or~~ TABB or AABC certified. Non-certified TAB contractors are not allowed.
- II. All equipment shall be cleaned prior to starting/turnover.
 - III. Hydronic systems with bottom of system make-ups must have a manual make-up connection RPZ/backflow preventer at the top of the system as a backup
 - IV. Heat Recovery systems shall be enthalpy wheels, hydronic glycol based systems or air to air heat exchangers. These shall be designed on a case by case basis and will need to be reviewed and approved by Facilities Operations.
 - V. Pressure dependent rooms shall always have a schedule shown on drawings indicating location, room name, room use and pressures required to meet code criteria. Testing and Balancing reports for these rooms shall always indicate design pressure and actual pressure of room.

VI. Factory Witness Tests –

- a. The following equipment shall be factory witness tested. See individual equipment subsections for further information regarding required tests. Maximum of two people (not including manufacturer).
 - 1) Air Handling Units
 - 2) Chillers
 - 3) Boilers

VII. Field Testing

- a. The following equipment shall be field witness tested. See individual equipment subsections for further information regarding required tests.
 - 1) Field Assembled Air Handling Units

VIII. Flexible ductwork is not allowed in healthcare projects.

IX. Slip and Drive connections for ductwork are only permitted when space in ceiling is limited.

X. Provide futures when tapping off piping risers.

XI. Brass caps shall be provided on all drain lines.

E. Pandemic Upgrades:

I. All upgrades shall be discussed with Facilities Management. The HVAC systems shall have the following upgrades:

- a. Minimum MERV 13 filters
 - i. For clinical areas: Ability to add HEPA filtration when needed
- b. Ability to operate spaces at a humidity level of 40% when needed
- c. Ability to operate with 100% OA when needed with OA intake of unit minimum 50 feet from the exhaust of any system and street level
 - i. Base design to be return air (or enthalpy recovery)

E-F. Equipment

1. Access Doors

Access doors shall be provided in any spaces where maintenance of any system (air or water) will need to be provided. A minimum size of 24x24 shall be provided, if smaller size is requested, obtain permission from Facilities Operations. Access shall be provided to all piping trim, dampers, actuators, shut off valves, BMS Sensors, equipment both sides of reheat preheat and cooling coils and any other equipment required maintenance access. The doors shall not be blocked by piping, electrical conduit, ceiling support iron or hangers.

Approved Manufacturers:

a. Finished Construction:

- 1) Karp
- 2) Mil-Cor
- 3) Ruskin

b. Sheetmetal (doors):

- 1) Duct Mate
- 2) Flexmaster
- 3) Ruskin

c. Sheetmetal (hardware):

- 1) Arlan
- 2) Duro Dyne
- 3) Ventlok

2. Air Compressors

Medical air compressors – see plumbing design guidelines.

Approved Manufacturers:

- a. Sullair
- b. Quincy
- c. Ingersoll Rand

3. Air Curtains

Air curtains shall be provided with a door switch to operate only when doors are open.

Approved Manufacturers:

- a. Berner International Corp.
- b. King
- c. Mars Air Door
- d. Powered Aire Inc.

4. Air Filters

Approved Manufacturers:

- a. Viledon
- b. Flanders
- c. Fiber Bond

5. Air Handling/Conditioning Units

Units shall be furnished with unit controls to comply with the requirements of the most current New York City Energy Conservation Code (NYCECC).

Fan array technology shall be used on all Air Handling Units. Provide one VFD per fan array and one VFD as backup, total of two VFDs per fan array. Do not provide bypass on VFDs. The VFDs shall be programmed to operate all fans simultaneously and at the same ramp speeds. Each fan motor in the fan array shall have its own local

~~disconnect. The VFDs shall swap at a determined time interval to equal out run time. Provide one VFD per fan motor with no bypass.~~ All fans in a fan array system shall be provided with low pressure drop backdraft dampers that will prevent recirculating air when a fan is down due to maintenance or failure. Do not provide blank off plates in lieu of backdraft dampers.

Non-Ducted filter boxes shall have a minimum of 1 foot clearance. Ducted intake filter boxes shall have removable panels.

If unit is provided with factory mounted controls; the unit shall have ability for read/write access to the existing BMS system through BACnet or Modbus protocol.

Motor section shall have doors or removable panels that are 25% larger than the motor for maintenance access. All floor plating inside each compartment shall be sheetmetal. Provide hoist type access for maintenance purposes.

If a unit is a double stack unit with access doors/panels on an upper level of the unit, the unit shall be provided with a permanent walkway/catwalk for maintenance access. Ladders without a walkway/catwalk are not allowed.

Units are to be provided with access windows for each unit section. Lighting shall also be provided in each section. If unit is outdoors, lighting suitable for outdoor use (flood light type) shall be provided to illuminate all walkways/catwalks and access points.

Pre-assembled units shall be factory witness tested. Tests shall consist of: Unit Leakage, Coil Leakage, Deflection, Fan Vibration, and Acoustical.

Field assembled units shall have the same test criteria as factory witness test but shall be field tested by manufacturer.

Duct seal putty shall be used in all AHU conduit connections to VFDs, control enclosures, and other sensitive electronics.

Switches, dampers, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

On units that require UV lighting, AHU UV light sections shall be provided with UV protected glass so that personnel can look into unit section without damaging eyes.

Humidity valve actuators shall fail closed based through an auxiliary contact from the fan current sensor.

Approved Manufacturers:

- a. Factory Assembled Custom Air Handling Units
 - 1) Air Enterprise
 - 2) Buffalo Air Handling
 - 3) Temtrol
 - 4) Ventrol
 - 5) Carrier
 - 6) Ingenia
 - 7) Alliance Air Products
 - 8) Trane
 - 8)9)Haakon

- b. Packaged Roof-Mounted Air Handling Units
 - 1) Enviro-Tec
 - 2) Trane
 - 3) York
 - 4) Carrier
 - 5) Mammoth

- c. Packaged Roof-Mounted DX Air Handling Units
 - 1) Trane
 - 2) York
 - 3) Liebert
 - 4) Carrier
 - 5) Mammoth

- d. Packaged Self-Contained Chilled Water Air Handling Units
 - 1) Buffalo Air Handling
 - 2) Trane
 - 3) Ventrol
 - 4) Carrier
 - 5) Mammoth

- e. Packaged Self-Contained Computer Room Air Conditioning Units
Units shall not exceed 65db.
 - 1) Data Aire
 - 2) Liebert
 - 3) APC (in-row cooling only)
 - 4) Stulz
 - 5) United Coolair

- f. Packaged Self-Contained Air Conditioning Units (Ceiling-Mounted)
Units shall not exceed 65db.
 - 1) Data Aire
 - 2) Enviro-Tec
 - 3) Liebert
 - 4) United Coolair

 - g. Packaged Self-Contained DX Air Conditioning Units (Ceiling-Mounted)
Units shall not exceed 65db.
 - 1) Data Aire
 - 2) Liebert
 - 3) Mammoth
 - 4) United Coolair

 - h. Spot Coolers (Data Closets)
 - 1) Movin Cool
6. Air Outlets
Any outlets that are to be installed in labs, Operating Rooms or any specialized medical space shall be specific to the usage of the room. Standard outlets are not allowed in these areas.
- Approved Manufacturers:
- a. Anemostat
 - b. Krueger
 - c. Nailor Industries
 - d. Titus
 - e. Ruskin
7. Air Volume Regulators
Approved Manufacturers:
- a. Anemostat
 - b. Krueger
 - c. Nailor Industries
 - d. Titus
8. Baseboard Radiation (Steam/Water)
Approved Manufacturers:
- a. Rittling
 - b. Slantfin
 - c. Sterling Radiator
 - d. Vulcan Radiator

9. Boilers

Approved Manufacturers:

- a. Condensing Modular
 - 1) Lochinvar
 - 2) Peerless
 - 3) Fulton
 - 4) Cleaver Brooks

- b. Fire Packaged Watertune
 - 1) Lochinvar
 - 2) Peerless
 - 3) Burnham

- c. Firetube Boilers up to 150,000lbs/hr
 - 1) Cleaver Brooks

- d. Heat Recovery Steam Generators / Waste Heat Boilers
 - 1) Rentech

10. Clean Steam Generators

Clean steam generators shall be steam to steam type. Screen control panels with PLC shall be provided. Shell shall be pitched to completely drain the condensate.

Approved Manufacturers:

- a. Diversified Heat Transfer DHT.
- b. Patterson-Kelley, Company.
- c. Acme Engineering Products, Inc.
- d. Precision Boilers, Inc.
- e. Armstrong
- f. Dri-Steam
- g. Cem-line

11. Chillers

Chiller redundancy to be reviewed by Facilities Operations. All new chillers shall be reviewed and approved by Facilities Operations. Provide hoist type access for maintenance purposes.

Chillers located outdoors shall have capabilities of operating low ambient temperature conditions.

Factory witness tests shall consist of all tests required under AHRI Standard 550. Chillers shall have a four point tests - 25%, 50%, 75% and 100% design load.

Switches, dampers, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Approved Manufacturers:

- a. Centrifugal
 - 1) Carrier
 - 2) York
 - 3) Trane

- b. Absorption
 - 1) York
 - 2) Carrier
 - 3) Trane

- c. Modular Air Cooled
 - 1) ArcticChill
 - 2) Carrier
 - 3) Multistack
 - 4) York
 - 5) Trane

- d. Modular Water Cooled
 - 1) ArcticChill
 - 2) Multistack
 - 3) York

- e. Packaged Air Cooled
 - 1) Carrier
 - 2) York
 - 3) Trane

- f. Magnetic Levitation
 - 1) York
 - 2) Daikin
 - 1)3)Trane

12. Condensate Pumps

Approved Manufacturers:

- a. Cold Condensate
 - 1) Federal
 - 2) Hartell
 - 3) Little Giant

- b. Hot Condensate (Low Pressure Steam Return)
 - 1) Armstrong International
 - 2) Bell & Gossett
 - 3) Federal Pump
 - 4) Weinman

13. Cooling/Heating Coils

Coil pressure rating shall be designed to 400 psi at an ANSI pressure class of 300 lbs.

All coils shall be Copper/Copper/Stainless with a minimum 0.035" wall thickness. Dielectric fittings shall be installed between all dissimilar metals. Fins shall be copper.

All coils shall be drainable (drain downs downstream of isolation valve ¾" hose bib) and have means of removal for service or replacement. Coils shall be pitched to a low point for draining purposes. If coils have different levels, all levels shall have separate drain pans. Coils shall have capability to be removed without removing any piping trim. All coils shall have clear access for removal. Multi coils shall be staggered for ability to be removed on the same side of unit. Provide hoist type access for maintenance purposes. Vents shall be provided at the top of the coil with drains at the bottom, vent and drain shall exist between the coil's isolation valves.

Cooling Coils must have a stainless steel condensate pan pitched in three directions toward drain. Drain pan nipples shall be stainless steel with dielectric fittings connecting to a drain plug.

If return air is coming from the top, the coils shall be designed to have a top and bottom section. If return air is coming from the side, the coils shall be designed to have a left and right section.

Separate Freezestats shall be provided on EACH section of coil within a unit. If a unit has multiple coils, each coil section shall be provided with its own control valve.

Freeze type plug valves are not allowed.

Coils to be provided with a full size manual bypass ball or gate valve.

Traps for cooling and steam coils shall have proper heights for the removal of condensate.

Coils not specifically listed in approved manufacturers below are acceptable only if the Air Handling manufacturer builds and tests the coils in their factory.

Approved Manufacturers:

- a. Water/Steam
 - 1) Aero-fin
 - 2) Heat Craft
 - 3) Temtrol
 - 4) RAE

14. Cooling Towers

All towers shall have accessible fan motors for removal. Catwalks shall be provided for fan motors that are installed on the outside of the unit. Provide means of removal of fan motor. Railings shall always be provided on top of the unit. Ladders shall be provided for access to the top of the unit. Freeze protection (steam or electric) shall be provided on towers that will not be drained down during the winter season –

freeze protection pump shall be provided on a case by case basis as secondary protection.

Major cooling towers shall be induced draft type and have stainless steel basins with PVC piping inside. If towers have multiple cells, each cell shall have means of walking between each cell. Catwalks shall be installed inside all cells for maintenance. Catwalks/platform shall be installed around entirety of cooling tower at the level of the bottom of the basin.

Minor cooling towers shall be force draft type and have stainless steel basins with PVC piping inside. Catwalks/platform shall be installed around entirety of cooling tower at the level of the bottom of the basin.

¾" hose bib shall be installed for cleaning purposes.

All cooling towers shall be reviewed and approved by Facilities Operations.

Approved Manufacturers:

- a. Marley
- b. Baltimore Aircoil Company
- c. Evapco

15. Controllers (Water Level)

Controllers shall be floats or digital type. Design shall be discussed with Facilities Operations.

Floats, controls, switches, dampers, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Approved Manufacturers:

- a. McDonnell Miller
- b. B&W
- c. Magnatrol International, Inc.

16. Dampers (ALD's)

Shafts of dampers shall be notched to indicate the position of the damper blade. Damper adjustment hardware and actuators shall extend past ductwork insulation.

Provide Access Doors for damper blades and actuator (if access is an issue). If actuator has to be installed inside ductwork due to size requirements, the design shall be reviewed and approved by Facilities Operations.

Dampers and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Double actuators are not allowed. Actuators shall be sized to provide proper torque via one actuator.

Approved Manufacturers:

- a. Arlan
- b. Imperial
- c. Ruskin (preferred)
- d. Tamco

17. Dampers (Dynamic Fire/Smoke)

All fire smoke dampers to be full throat and shall not obstruct the air stream or reduce the area of the duct in any manner. Shafts of dampers shall be notched to indicate the position of the damper blade.

Fire Smoke Dampers shall be provided with limit switches.

Dampers and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Approved Manufacturers:

- a. Arlan
- b. Imperial
- c. Ruskin (preferred)
- d. Tamco

18. Expansion Compensation

Expansion compensators shall be designed and shown on drawings with proper guiding and anchors.

Approved Manufacturers:

- a. Ball Type Expansion Joints
 - 1) Advanced Thermal Systems
 - 2) Hyspan-Barco
- b. Braided Type Expansion Loops
 - 1) Metraflex
- c. Corrugated Type Expansion Joints
 - 1) Hyspan-Barco
 - 2) Keflex
 - 3) Metraflex
- d. Slip Type Expansion Joints
 - 1) Hyspan-Barco
 - 2) Metraflex

19. Expansion Tanks

Expansion tanks shall have waterside and airside gauges on bladder type tanks. Drain points shall be provided on waterside section. All expansion tanks shall have replaceable bladders.

Approved Manufacturers:

- a. Adamson
- b. Amtrol
- c. Bell & Gossett
- d. John Woods
- e. RECO
- f. TACO

20. Fans

Spring type vibration isolators shall always be provided. Neoprene type isolators can be provided for fans less than 100lbs. If neoprene is used, the design shall be reviewed and approved by Facilities Operations.

Motors which are located on the outside of the fan housing shall have an internal access point to provide access to internal sheave. Provide hoist type access for maintenance purposes.

Patient isolation rooms shall have a dedicated exhaust system, which shall not be picked up by the air handling unit.

Fumehood chemical exhaust shall be stainless steel welded ductwork. All fume hood risers shall be pitched back to the chemical fume hood. Fume hoods shall be tested to ANSI/ASHRAE 110 standards.

Bearings shall have a life grade of L5 with a minimum of 50,000 hours.

Fan inlet boxes shall follow SMACNA HVAC Systems Design Handbook and shall not be field fabricated without verification the SMACNA standards were followed.

Approved Manufacturers:

- a. Howden-Buffalo
- b. Strobic Air
- c. Greenheck
- d. Cook
- e. PennBarry
- f. Twin City
- g. Aerovent

21. Fan-Powered Boxes

Fan-Powered Boxes shall have pressure independent control. Units shall be designed with a local disconnect switch.

Approved Manufacturers:

- a. Anemostat
- b. Nailor Industries
- c. Titus

22. Fan Coil Units

Provide with 2-way controls and condensate pump (or gravity drain). Separate stainless steel drain pan shall be installed underneath unit.

Pumps, switches, dampers, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Approved Manufacturers:

- a. York
- b. Liebert
- c. Data Aire
- d. International

23. Firestopping Products

Firestopping products shall not be used unless required for fire or smoke barriers. The following shall not be specified without approval from NYU Langone's division of EH&S:

- Chemicals that are known (IARC group 1) or probable (IARC group 2a) human carcinogens.
- Hazardous substances listed in OSHA 1910 subpart Z.
- Products containing volatile organic compounds (VOCs) in excess of 50 grams/liter.
- Products whose Safety Data Sheet (SDS) rates health, fire and/or reactivity as exceeding "1" on a scale of 0 to 4.
- Products emitting strong odors.

Approved Manufacturers:

- a. Hilti

24. Flow Measuring Devices

Floats, controls, switches, dampers, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

When a metered feed to a building is removed or changed, the new feed shall be similarly metered.

Hot wire type air flow measurement devices are not acceptable.

Approved Manufacturers:

- a. Air Systems
 - 1) Air Monitor Corporation
 - 2) Tek-Air Systems, Inc.
 - 3) Paragon Controls
 - 4) Ebtron

- b. Water Systems (Permanently Installed Clamp On Ultrasonic)
 - 1) Flexim
- c. Water Systems (Permanently Installed Electromagnetic Flow Meter)
 - 1) Krohne
 - 2) Yokogawa
 - 3) Emerson
 - 4) Siemens
- d. Steam Systems (Insertion Turbine or Vortex or Clamp On Ultrasonic)
 - 1) Flexim
 - 2) Spirax Sarco ILVA
 - 3) Rosemount
 - 4) Vortek Instruments

25. Fuel Oil Pumping Systems

Pumping system shall be installed in a space that will provide access for periodic maintenance including removal of motors, impellers, and accessories. In flood prone area (refer to Facilities Department for flood prone locations) provide water tight enclosure that will allow the pumps to operate during a flood. Controls and all power conduits to be within water tight installations until outside of flood zone.

Fuel oil containment piping which is horizontal shall be pitched back to leak containment drum. Vertical fuel oil risers shall also drain into leak containment drum. Horizontal containment shall be a pipe in pipe – no other means of containment is allowed.

Approved Manufacturers:

- a. ISP
- b. IMO
- c. Deval
- d. Viking

26. Fuel Oil Specialties

Approved Manufacturers:

- a. ISP
- b. Preferred Utilities Mfg. Corp.

27. Fuel Oil Tanks

Fuel oil tank shall be bolted to the structure to prevent floating in case of a flood. All preventable flood requirements shall be analyzed if fuel oil tank is to be installed in a flood prone area (refer to Facilities Department for flood prone locations).

Approved Manufacturers:

- a. Fiberglass
 - 1) Xerxes Corp.
 - 2) Cardinal Fiberglass Industries
 - 3) Containment Solutions
- b. Steel
 - 1) ISP
 - 2) Highland Tank & Mfg. Co.
 - 3) Adamson Global Technology Corporation
 - 4) Cardinal Tank Corporation

28. Fuel Oil Tank Gauging and Leak Detection Systems

Approved Manufacturers:

- a. ISP
- b. Veeder-Root

29. Freezestats

See controls subsection for Low Temperature Switches.

30. Hangers, Anchors and Guides

All exposed threaded rods shall be capped with an orange protective cap either rubber or plastic. All threaded rods shall be cut down to an inch of final nut – rods shall not be left at full length for safety reasons.

~~Approved Manufacturers:~~~~a. Cable Support Systems for Ducts~~

- ~~1) Duct Mate (Gripple)~~
- ~~2) Erico Caddy Speed Link~~

~~b. Hangers~~

- ~~1) Anvil International~~
- ~~2) Bee-Line~~
- ~~3) Carpenter Patterson~~
- ~~4) Empire Industries, Inc.~~
- ~~5) Erico, Michigan Hanger~~
- ~~6) Hilti~~
- ~~7) National Pipe Hanger Corporation~~
- ~~8) Piping Technologies, Inc.~~

~~c. Inserts~~

- ~~1) Bee-Line~~
- ~~2) Carpenter Patterson~~
- ~~3) Erico, Michigan Hanger~~
- ~~4) Fee & Mason~~
- ~~5) F & S Central~~

- ~~6) Grinnell~~
- ~~7) Piping Technologies, Inc.~~
- ~~8) Simpson StrongTie~~

~~d. Mechanical Anchors (Undercut Type Only)~~

~~Powder or power actuated devices, grip nails, expansion nails and adhesive anchors are permitted.~~

- ~~1) Hilti~~

31. Heat Exchangers

For shell and tube heat exchangers, relief valves shall be located on the hot and cold side of heat exchanger and sized to the working pressure of the system.

Plate and Frame heat exchangers shall be located on a housekeeping pad. No equipment shall be installed on the plate side of a heat exchanger – proper access for removal of plates shall always be maintained.

Heat exchangers shall be provided with strapped or clipped removable shrouds.

Approved Manufacturers:

- a. Plate-and-Frame
 - 1) Alpha-Laval
 - 2) Plate Concepts
 - 3) GEA
- b. Shell-and-Tube
 - 1) Bell & Gossett

32. Heat Trace

Refer to electrical guidelines for details.

33. Humidifiers

Humidifiers shall be supplied with Humidstat and also an airflow switch for preventing humidifier operation without airflow. Humidstat shall be designed to be controlled via a cascaded loop. Humidifiers shall be resistive type not electrode type.

Approved Manufacturers:

- a. Steam
 - 1) Armstrong
 - 2) Dri Steam
 - 3) Nortec
- b. Water Spray (cannot be used in Article 28 spaces)
 - 1) Armstrong
 - 2) Herrmidifier
 - 3) Cold Fog

34. Insulation (Duct and Pipe)

All supply ductwork shall be insulated on the outside. No acoustic insulation is allowed inside the ductwork unless encapsulated with a mylar, tedlar, or approved equivalent type membrane. Insulation shall not cover any damper adjustment hardware.

All acoustical lining on the inside of any ducts to be reviewed with Facilities Operations.

Piping insulation shall comply with latest codes and energy conservation codes.

Ductwork located outside shall have proper weatherproofing for use outdoors. Outdoor ductwork must have internal rigid supports to create a pitched top and prevent water accumulation on top of the duct.

Steam station and steam piping shall have insulation designed such that no point of insulation is greater than 10 degrees above ambient temperature.

The following ductwork shall be insulated:

- Supply Air.
- Outdoor air.
- Return located in unconditioned space.
- Type I, commercial, kitchen hood exhaust.
- Oven and warewash exhaust.
- Exhaust between isolation damper and penetration of building exterior.
- Supply and return located outdoors.

Generator exhausts located indoors shall be insulated with Calcium Silicate.

Approved Manufacturers:

- a. Armacell
- b. Armstrong
- c. Knauf
- d. Johns-Manville
- e. Owens-Corning Fiberglas (O-C-F)
- f. P.P.G. (Pittsburgh Plate Glass)

35. Insulation Adhesives

The following shall not be specified without approval from NYU Langone's division of EH&S:

- Chemicals that are known (IARC group 1) or probable (IARC group 2a) human carcinogens.
- Hazardous substances listed in OSHA 1910 subpart Z.
- Products containing volatile organic compounds (VOCs) in excess of 50 grams/liter.

- Products whose Safety Data Sheet (SDS) rates health, fire and/or reactivity as exceeding “1” on a scale of 0 to 4.
- Products emitting strong odors.

Approved Manufacturers:

- a. Benjamin Foster Company
- b. Elgen
- c. Venture Tape Corp

36. Insulation Pipe Shields

Approved Manufacturers:

- a. Buckaroos, Inc.
- b. Pipe Shields Inc.
- c. Taylor Pipe Supports

37. Meters and Gauges

Controls, thermometers, meters, gauges and other components shall be mercury-free in compliance with NYU Langone Health’s Mercury Elimination Program.

No gauge cocks allowed.

Compound gauges shall be used on suction side of pumps when required due to system pressure.

Temperature Scale Ranges:

- Chilled-Water Piping: 0 to 100 deg F
- Condenser-Water Piping: 0 to 150 deg F
- Heating, Hot-Water Piping: 20 to 250 deg F
- Steam-Condensate Piping: 0 to 250 deg F
- Steam Piping: 212 to 500 deg F

Pressure Scale Ranges:

Design engineer shall specify proper scales based on operating pressures.

Approved Manufacturers:

- a. Instrument Test Ports
 - 1) Peterson Equipment
 - 2) Sisco
 - 3) Watts Regulator
- b. Pressure Gauges 1.00% Accuracy
 - 1) Ashcroft
 - 2) Trerice
 - 3) Weiss
 - 4) Weksler

- c. Pressure Switches
 - 1) Barksdale
 - 2) Dwyer
 - 3) Mercoïd
- d. Thermometers 1.00% Accuracy
 - 1) Trerice
 - 2) Weiss
 - 3) Weksler

38. Motors

Conform to NEMA MG 1. Motors shall not operate continuously at a service factor greater than 1. Design to a service factor of a minimum of 1.15. Provide hoist type access for maintenance purposes.

Motors to be with permanently greased bearings (preferred). If permanently greased bearings are not provided, grease ports shall be provided with adequate access – grease capillaries are not allowed.

Bearings shall have a life grade of L10 with a minimum of 200,000 hours. If motor is part of a fan array system and over-hertzing is being implemented, L10 life shall be greater than 200,000 hours.

If motor is part of a VFD system, the motor shall be inverter duty rated.

Approved Manufacturers:

- a. Standard Efficiency (Less Than 1 hp)
 - 1) Baldor
 - 2) General Electric
 - 3) Toshiba
 - 4) U.S. Motors
 - 5) Dayton
 - 6) Marathon
 - 7) Weg
- b. Premium Efficiency (1 hp and Above)
 - 1) Baldor
 - 2) General Electric
 - 3) Toshiba
 - 4) U.S. Motors
 - 5) Dayton
 - 6) Marathon
 - 7) Weg

39. Motor Starters

Approved Manufacturers:

- a. Asea Brown Boveri (ABB)
- b. ASCO
- c. Allen Bradley
- d. Siemens
- e. Yaskawa Electric America

40. Motor Control Centers

See Electrical Design Guidelines

41. Motor Controllers Variable Speed (VFD)

Provide two VFDs – one lead and one lag unless part of a fan array system – see Air Handling Unit subsection for fan array VFDs. VFDs shall be reviewed and approved by Facilities Operations. All conduits in a controlled enclosure or electrical enclosure shall have sealed conduits.

VFDs shall not be installed under any piping trim or joints. If VFD is installed under piping due to physical install constraints, NEMA 4 or 6 shall be used. All locations of VFDs that are below piping shall be approved by Facilities Operations.

Harmonic Filtering is required on all variable speed drives. Design engineer to discuss with Facilities Management prior to design if active or passive harmonic filtering to be required.

Field Testing on all VFDs powering 25hp motors and larger shall be provided and confirmed that Total Harmonic Distortion does not exceed 5%. At the point of common connection, current Total Harmonic Distortion shall not exceed 10%.

Startup and setup shall be done by the current NYU Langone VFD vendor. Contact Facilities Operations for current campus vendor.

Duct seal putty shall be used on all conduit connections to air handling VFDs.

Approved Manufacturers:

- a. Asea Brown Boveri (ABB)
- b. Yaskawa Electric America

42. Orifice Steam Traps (Venturi Orifice Type)

Steam traps to have unions upstream and downstream of traps

Approved Manufacturers:

- a. Steam Gard

43. Pipe and Fittings

Dielectric fittings shall be installed between all dissimilar metals. Piping ball joints for movement between buildings shall be flanged and not welded.

Steam pipe gaskets are to be solid graphite type (Equalseal EQ FG-P). Spiral wound gaskets will not be accepted.

For piping within technology space, no piping shall be provided in the technology space unless it is required for equipment within the room. All piping that is in the technology room must not be routed over technology equipment. All valves and metering associated with piping must have a drip pan located underneath with water detection.

~~Approved Manufacturers:~~

~~a. Brass & Copper Pipe & Tube~~

- ~~1) Ansonia Copper and Brass, Inc.~~
- ~~2) Alaskan Copper and Brass Company~~
- ~~3) Kobe Wieland Copper Products, LLC.~~
- ~~4) National Bronze & Metals, Inc.~~

~~b. Copper Pipe Fittings~~

- ~~1) American Brass Co.~~
- ~~2) Bridgeport Brass~~
- ~~3) Chase Brass~~
- ~~4) Elkhart Products Corporation~~
- ~~5) Lewin Matheis~~
- ~~6) Mueller Brass Company~~
- ~~7) NIBCO~~
- ~~8) Phelps Dodge~~
- ~~9) Reading Tube Corp.~~
- ~~10) Revere~~
- ~~11) Wolverine Tube Co.~~

~~c. Steel Pipe~~

- ~~1) Allies Tube~~
- ~~2) Indutech~~
- ~~3) Ipsco (TMK Ipsco)~~
- ~~4) Koppel~~
- ~~5) Lakeside~~
- ~~6) Lonestar~~
- ~~7) Tex Tube~~
- ~~8) USX~~
- ~~9) V & M Star~~
- ~~10) Wheatland/Sharon Tube/Sawhill~~

~~d. Steel Pipe Fittings~~

- ~~1) Anvil International~~
- ~~2) Bonney Forge~~
- ~~3) Kerkau~~
- ~~4) Mills Iron Works~~

- ~~5) Phoenix Forge~~
- ~~6) Penn Machine~~
- ~~7) Tube Forging of America~~
- ~~8) Weldbend~~

~~e.a.~~ Mechanical Couplings for Grooved Pipe

- 1) Grooved piping shall be discussed with Facilities Operations and shall be based on a project-by-project basis prior to its use in design.

~~f.~~ CPVC Pipe and Fittings

- ~~1) George Fischer Harvel, LLC.~~
- ~~2) IPEX Inc.~~
- ~~3) Spears Manufacturing Company~~

~~g.~~ Underground Piping Systems

- ~~1) Insul Pipe Systems~~
- ~~2) Insul-Tek Piping Systems, Inc.~~
- ~~3) Perma-Pipe~~
- ~~4) Rovanco Piping Systems, Inc.~~
- ~~5) Thermacor Process, L.P.~~
- ~~6) Tricon Piping Systems, Inc.~~

~~h.b.~~ Gaskets

- 1) Garlock
- 2) Flexitallic
- 3) Lamons
- 4) Equalseal EQ FG-P (All Steam Piping shall be this type.)

44. Pressure-Regulating Valves/Stations

High, Low, Medium pressure steam pipe gaskets are to be graphite type. Flexseal gaskets will not be accepted.

All steam station pneumatic lines must match the size of the controller's pneumatic connection and be run as copper hard piping, soft tubing not accepted.

Approved Manufacturers:

a. Steam

- 1) Leslie
- 2) Fairchild
- 3) Fische
- 4) Circor
- 5) Warren Controls

b. Water

- 1) Leslie
- 2) Cla-Val
- 3) Watts

45. Pumps

All pumps shall be premium efficiency. Pumps shall not be provided with triple-duty valves unless install restrictions require such an install. If triple-duty valves are required, they shall be reviewed and approved by Facilities Operations. Pumps shall be provided with either a strainer or suction diffusers with drain. Pump trim shall not have a balancing valve if pump will be provided with a VFD.

Piping and pumps are to be independently supported. Spring type isolators on piping shall be recommended by acoustical consultant. If no consultant is on project, all piping within 50 feet of pump shall have spring type isolators.

Install pumps in such a way to allow periodic maintenance which includes removal of motors, impellers and couplings. Pumps are required to be able to be drained down.

Provide hoist type access for maintenance purposes.

Bearings shall have a life grade of L10 with a minimum of 200,000 hours.

Approved Manufacturers:

a. Horizontal Split, End Suction and In-Line

- 1) Armstrong
- 2) Aurora
- 3) Bell & Gossett
- 4) Gould
- 5) Peerless
- 6) Weinman
- 7) Grundfos

b. Fuel Oil

- 1) IMO
- 2) Viking
- 3) Simplex

46. Radiant Heating Systems

Unit shall be supplied with a wall thermostat and a manually operated on-off switch.

Approved Manufacturers:

a. Ceiling

- 1) Rittling
- 2) Runtal

b. Floor

- 1) Aero Tech
- 2) Airtex
- 3) Aztec
- 4) Uponor

47. Refrigerant Monitoring Systems

Relay outputs for alarms and control shall be provided to connect to BMS. The unit shall also be provided with visual and audible alarms at the panel. Monitoring system shall have multi point capabilities.

Approved Manufacturers:

- a. Mine Safety Appliances Company (MSA)

48. Sound Traps

Approved Manufacturers:

- a. I.A.C. (Industrial Acoustics Co.)
- b. Dynasonics
- c. Vibro-Acoustics
- e-d. Price

49. Steam Traps – See also Orifice steam traps

Steam traps to have unions upstream and downstream of traps

Approved Manufacturers:

- a. Armstrong
- b. Sarco

50. Steam Piping

- a. All steam traps shall be steamgord venturi orifice type wherever possible. The design engineer shall review each trap with the manufacturer to confirm if orifice-type traps can be used.
- b. Steam traps shall be provided at all low points, end of mains, riser heels and at equipment connections. Base of drip legs to be provided with separate blowdown valves.
- c. Ensure all components of the details are installed (unions, shutoff valve, check valve, etc.)
- d. All piping from coils shall be pitched to the inlet of the condensate pump (no trapped piping).
- e. Drip legs shall be provided periodically for long runs of pipe at intervals between 100 to 125 feet.
- f. Drip legs shall be no less than half the size of the pipe it serves.
- g. Blow-off valves to be provided at all drip legs and at the base of all risers.
- h. Flash tank trap shall be located 6 inches above the water level of the tank. Flash tanks to be provided with F&T trap.
- i. Test-t shall be provided on all condensate piping downstream of steam trap and upstream of condensate shut off / check valve.
- j. Warmup bypass shall be provided for all steam valves 6 inches and larger.
- k. High pressure steam shutoff valves at the incoming service to each building shall be provided with two shutoff valves for safety purposes.
- l. All steam piping shall be insulated.
- m. Condensate pumps and flash tanks shall be vented to atmosphere.

- n. Condensate piping exposed to the outdoors shall be heat traced.
- o. Outdoor steam and condensate piping shall have two layers of insulation.
- p. High pressure steam shutoff valves shall be high performance OS&Y valves (not butterfly valves).
- q. Prior to startup – A/E team and construction team shall review NYULH Steam Insulation Quality Control Checklist – obtain checklist from Facilities Management.

51. Strainers

Strainers installed on steam piping shall not be installed in the vertical direction (facing towards ground). Steam strainers shall be installed to be in line with the horizontal piping such that when looking at the pipe and strainer, the clean out shall be facing directly towards you.

Dielectric fittings shall be installed between all dissimilar metals.

Approved Manufacturers:

- a. Fabrotech
- b. Hoffman
- c. McAlear Mfg. Co.
- d. Metraflex
- e. Mueller
- f. Sarco
- g. Titan
- h. Yarway

52. System Identification

Equipment Labels shall be high quality stickers.

Pipe Labels shall be installed every 5 feet in concealed areas and every 10 feet in un-concealed areas and shall be self-adhesive labels with direction-of-flow arrows and the name of the service printed in letters not less than 1 inch high for pipe 2-1/2 inches and smaller, 2 inches high for 3 inch pipe and larger. Markers shall have backgrounds of different colors for the various service groups. Pipe labels shall be color coded as follows:

(Lettering color- Background Color)
 Fire Quenching Fluids – White on Red
 Toxic and Corrosive Fluids – Black on Orange
 Flammable Fluids – Black on Yellow
 Combustible Fluids – White on Brown
 Potable, Cooling, Boiler Feed and other Water – White on Green
 Compressed Air – White on Blue
 Steam – Black on Yellow
 Chilled Water - White on Cyan
 Condenser Water - White on Light Green
 Hot Water/Reheat Hot Water - White on Red

Condensate - Black on Orange
Fuel Oil - White on Brown

Duct Labels shall be installed every 20 feet and shall be self-adhesive labels with direction-of-flow arrows and the name of the service printed in black letters not less than 4 inches high.

OA - Blue background with white lettering
Gen exhaust - White background with black lettering
Toilet exhaust - Orange background with black lettering
Return air - Yellow background with black lettering
Supply air - Green background with white lettering

Valve Tags: Each valve tag shall be 3 inch diameter, brass, aluminum or stainless steel with letters minimum 1 inch in height. A schedule showing all valve locations, size, and service shall be provided.

Approved Manufacturers:

- a. Brimar Industries Incorporated
- b. Seton Nameplate Corp.
- c. W. H. Brady Co.

53. Unit Heaters

Unit shall be supplied with a unit mounted thermostat.

Approved Manufacturers:

- a. Electric
 - 1) Berko
 - 2) Brasch
 - 3) Chromalox
 - 4) Indeeco
 - 5) Dayton
- b. Steam/Water
 - 1) Modine
 - 2) Rittling
 - 3) Sterling

54. Valves

Dielectric fittings shall be installed between all dissimilar metals.

All campus primary chilled water valves to be 300lb rated. Secondary chilled water valves shall be designed based upon their designed system pressure. All system pressures shall be specified on design drawings. Ball valves (2 ½" maximum) must be used for manual isolation on all chilled water, secondary water, reheat water and radiation water systems. Butterfly valves are to be used for this purpose on larger piping (3" and above).

All valves and piping systems shall be designed to be able to close off to atmospheric pressure on either side of valve. All valves 3" and larger shall be pressure checked and bench tested at the factory. Factory shall provide a certified report based on testing. Testing shall show that valve can hold rated pressure based on atmospheric pressure on either side of valve.

Any valve that is above 7 feet shall be provided with a chain wheel for manipulation of valve from the floor.

All high pressure steam isolation valves shall have manual warmup valves for startup. High Pressure steam valves shall be high performance OS&Y gate valves – butterfly valves are not allowed. Valves shall be rated to 500 degrees F.

Approved Manufacturers:

- a. Balanced Check
 - 1) Fabrotech
 - 2) Hager
 - 3) Mueller

- b. Balancing Valves (Water)
 - 1) T & A
 - 2) Armstrong
 - 3) Autoflow
 - 4) Flow Design
 - 5) Milliken Valve Company, Inc.
 - 6) Bell and Gosset

- c. Ball Type
 - 1) Apollo
 - 2) Jamesbury
 - 3) Milwaukee
 - 4) Rockwell

- d. Butterfly
 - 1) DeZurik
 - 2) Flow Seal
 - 3) Bray
 - 4) Jamesbury
 - 5) Keystone
 - 6) W.K.M.

- e. Pressure Relief Valves
Provide at each expansion tank, plate-and-frame heat exchanger or any pressurized water vessel, and as required by Code. Relief valve shall match maximum allowable working pressure of piece of equipment. Relief piping shall be sized according to outlet size of relief valve and shall be piped to floor not floor drain. Steam relief vents shall be piped to atmosphere.
 - 1) Apollo
 - 2) Consolidated
 - 3) Farris
 - 4) Fulflo Specialties Co.
 - 5) Kunkle
 - 6) Lunkenheimer
 - 7) Watts
 - 8) Aquatrol series 69 (water)
 - 9) Aquatrol series 740 (steam)

- f. Soft-Seated
 - 1) Bray
 - 2) DeZurik
 - 3) Keystone
 - 4) Milwaukee

- g. Swing Check
 - 1) Crane
 - 2) Grinnell
 - 3) Hammond (I.B. Series only)
 - 4) Milwaukee
 - 5) Powell
 - 6) Rockwell-Nordstrom
 - 7) Stockham
 - 8) Walworth

- h. Globe Valves
 - 1) Crane
 - 2) Grinnell
 - 3) Hammond (I.B. Series only)
 - 4) Milwaukee
 - 5) Nordstrom
 - 6) Powell

- i. Plug Valves (Lubricated Type)
 - 1) DeZurik
 - 2) Milliken Valve Company, Inc.
 - 3) Nordstrom
 - 4) Walworth

- j. Plug Valves (Non-Lubricated Type)
 - 1) DeZurik
 - 2) Homestead
 - 3) Milliken Valve Company, Inc.
- k. Solenoid Valves
 - 1) ASCO
- l. Combination Valves
 - 1) Victaulic
- m. Gate Valves
 - 1) Crane

55. Variable Air Volume

Variable Air Volume Boxes shall have pressure independent control. All VAVs shall have a local disconnect switch.

Unit shall be BMS controlled with read/write access through Modbus or Bacnet. Local thermostat shall be provided local manipulation of a +/- 2.5 degree Fahrenheit differential.

All VAVs shall be marked with individual equipment ID's. This shall be specified on design drawings as well. Design drawings equipment schedule for VAVs shall be specific and general based on size.

Supply boxes with reheat coils shall have an access door upstream and downstream of the coil for cleaning purposes. Supply boxes without reheat coils shall have an access door for the damper. Exhaust boxes shall have an access door upstream of the cross flow sensors for cleaning purposes.

There shall be a maximum of 4 rooms per one VAV. These rooms shall be typical spaces and not corner spaces. Corner rooms shall have their own VAV box.

Access doors shall not be hinged.

Approved Manufacturers Non Critical Applications:

- a. Anemostat
- b. Nailor Industries
- c. Titus

Approved Manufacturers Critical Applications:

- a. LCS

56. Variable Frequency Drives

See Motor Controllers Variable Speed (VFD) subsection

57. Variable Refrigerant Flow System (VRF)

Outdoor Unit (Condenser)

All variable refrigerant flow system (VRF) components shall be of the same manufacturer. The unit shall be factory assembled and prewired with all necessary electronic and refrigerant controls. The unit internal controls shall interface with the base building, building management system (BACnet, Modbus, etc.).

All refrigerant and gas lines shall be insulated with Armorflex (1/2" or more).

The unit shall be provided with a minimum of the following safety devices; high pressure switch, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal compressor protectors, thermal fan motor protectors, overcurrent protection for the inverter and anti-short cycling timers. In the event of power failure the system shall store all settings and programs so reprogramming is not required. The system shall automatically restart operation after power failure.

The compressor shall be hermetic digital scroll and the inverter shall permit a capacity control range from 10% to 100%.

The outdoor fan shall be direct drive variable speed propeller type and configured for vertical discharge airflow. The fan motor shall have inherent protection and have permanently lubricated bearings.

The condenser coil shall be copper tubes with mechanically bonded aluminum fins and aluminum end casings. The coils shall be applied with a corrosion resistant coating.

Ensure refrigerant piping is brazed (do not use flux when brazing copper to copper refrigerant piping)

Branch Controller

The branch controller shall have sufficient number of ports as required for connection to zoned equipment. The unit shall contain piping, valves, and controls to divert refrigerant controlling each port to operate in either a heating or cooling mode. Units shall be completely factory assembled, internally piped and wired.

Branch controllers shall have factory installed control boards that interface with the VRF equipment controls and shall perform all functions to effectively and efficiently control simultaneous heat and cooling. Isolation valves shall be field supplied and installed for ease of service to the branch controller without evacuating the entire system refrigerant charge.

Indoor Fan Coil Units

The indoor fan coil unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The indoor fan coil unit shall have an auto restart function. Indoor fan coil unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

The indoor fan coil unit shall be direct-drive type with a minimum of three (3) fan speeds. The fan motor shall be ECM type.

A condensate drain and pan shall be installed under the coil with leak detection device (in instances where condensate cannot be piped to drain). Provide a factory installed / wired condensate pump with integral check valve.

Provide wall mounted programmable thermostat for each indoor fan coil unit (unless multiple units will be grouped and control to one (1) thermostat).

Ensure all indoor fan coil unit DIP switches (local at each unit) are set to monitor room/space temperature (ceiling mounted units typically set to read return air temperature).

Approved Manufacturers

- a. Daikin
- b. Mitsubishi
- c. Toshiba
- d. LG

58. Vibration Isolators

Vibration isolators are to be installed on all rotating equipment including fans, air handling units, chillers, cooling towers, pumps, etc. Piping shall have braided vibration isolators unless piping is isolated with spring type isolators within a minimum of 50 feet of pump.

All piping in a mechanical plant shall be isolated with spring type isolators.

Approved Manufacturers:

- a. Mason Industries
- b. Amber Booth
- c. Kinnetics Noise Control, Inc.
- d. Vibration Eliminator Co.
- e. Vibration Mountings and Controls

59. Water Filtration

Sand filtration shall be installed on Condenser Water. All other systems shall have pot feeders. Sand filters shall have backwash capabilities.

All water filtration to be capable of filtering a minimum of 10% of total flow. Pot feeders to have 5 micron filtration with a coupon rack.

All water filtration shall be reviewed and approved by Facilities Operations.

Approved Manufacturers:

- a. Ameri Water
- b. Chemworks
- c. Diamond Water Systems, Inc.

60. Waterproof Sleeves

Approved Manufacturers:

- a. Link Seal
- b. Zurn

61. Water Source Heat Pumps

Approved Manufacturers:

- a. AAON
- b. Carrier
- c. Mitsubishi

62. Water Treatment/Cleaning

Open loop systems shall have an automatic chemical feed with integral controls. Closed loop systems shall have a manual bypass feeder system. All chemicals are to be recommended by the water-treatment system manufacturer. Chemicals shall be compatible with the piping system and components. A water analysis shall be performed to determine quality of water.

Any new equipment or piping needs to be pre-cleaned to remove the oils of manufacture, which can be accomplished with an alkaline phosphate cleaner supplied by the water treatment supplier. It is necessary that all valves and fan coil units in the system be opened to flow during the cleaning process. The cleaning process shall be as follows:

- All coils shall be bypassed for the first two hours of a flush and then opened to flow through the coils for the rest of the flush.
- System shall be filled with fresh water and then circulated with all process and booster pumps running.
- Alkaline phosphate detergent shall be added following the manufacturer's instructions concerning the correct dosage. It may be necessary to add de-foamer in some instances.
- System shall be circulated for a minimum of four hours, and hourly flushed all low-point drains to remove any suspended solids that may have been displaced.
- Upon completion of the cleaning, system shall be drained and refilled with fresh water. Fresh water shall be circulated for 20 minutes and then bled heavily until the water is clear and free of foam. Flushing shall continue until the ortho phosphate level is within 1 PPM of that of the city water and the conductivity is close to that of the make-up water. If the flushing occurs over an extended period in time (more than 24 hours), the flush water should be treated water.

- The system shall be immediately sterilized by maintaining a minimum of 1 PPM as free halogen for one hour and then treated to passivate the clean metallurgies. Systems containing copper should be treated with azole levels of 20 PPM as a minimum. Molybdenum should be used to passivate mild steel piping by achieving a minimum of 50 PPM. The recommended inhibitor levels must be maintained for 24 hours.

Systems that are having piping added that cannot be isolated for alkaline phosphate cleaning must have a surfactant added for 48 hours.

Systems that are having galvanized towers added must undergo a white rust passivation step for the first 90 days of operation.

Flushing and cleaning is allowed through new construction house pumps. Flushing and cleaning is not allowed through existing house pumps. It shall be the responsibility of the flushing and cleaning contractor to provide a pump sized properly for the system to be flushed.

Approved Manufacturers:

- Contact Facilities Operations for current campus vendor.

G. Cost-saving Alternatives

This section provides cost-saving alternatives for certain components of a project. The RED+F PM will advise the A/E Design Team if this section shall be used on their project. When so stipulated, the A/E Team shall follow the NYU Langone Health – Design Guidelines except the items below will be utilized for all affected components. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

#	Item	Type of Build-Out		
		Science / Clinical (Article 28)	Leased Science / FGP (Non-Article 28)	Admin / Office
<u>1</u>	<u>Remove low pressure duct leakage testing.</u>		<u>✓</u>	<u>✓</u>
<u>2</u>	<u>Change cooling / heating coil construction from Copper/Copper/Stainless to Aluminum in all non-Article 28 spaces.</u>		<u>✓</u>	<u>✓</u>
<u>3</u>	<u>Remove requirement for each coil to have a freeze stat in multiple coil units and only provide one long freezestat in all non-Article 28 spaces.</u>		<u>✓</u>	<u>✓</u>
<u>4</u>	<u>Allow double actuators.</u>		<u>✓</u>	<u>✓</u>
<u>5</u>	<u>Allow triple duty valves in off-site locations.</u>		<u>✓</u>	<u>✓</u>

<u>6</u>	<u>Substitute venturi type orifice traps to F&T type in off-site locations.</u>		<u>✓</u>	<u>✓</u>
<u>7</u>	<u>Change pipe labeling from every 5 feet in concealed and 10 feet in unconcealed to 10 feet concealed and 20 feet unconcealed.</u>		<u>✓</u>	<u>✓</u>
<u>8</u>	<u>Change valve tags from metal to printed plastic in off-site locations only.</u>		<u>✓</u>	<u>✓</u>
<u>9</u>	<u>Change cooling / heating coil fins from copper to aluminum.</u>			<u>✓</u>

END OF MECHANICAL SUBSECTION

3. ELECTRICAL

A. Codes, Regulations and Design Standards.

- I. The installation will comply with applicable provisions of the New York State Building Code and New York City Electrical Code, Department of Health (DOH) standards, Centers for Medicare and Medicaid Services (CMS) standards and all other applicable Codes.

B. Design Criteria

- I. All connections to the existing electrical distribution systems to be done with double hole lugs (long barrel) and utilize compression type copper connectors. If this is not possible, the design scheme shall be discussed and approved by Facilities Operations.

II. Emergency Power

- a. Emergency Power shall be provided per NFPA Standards, Joint Commission Standards, CMS Standards and New York City Electrical Code requirements. Emergency power to be reviewed with Facilities Operations prior to design.

III. Design criteria for sizing power risers and (connected load) electric panels

- a. Administration/Office: 5.0 W/sq.ft.
- b. Clinical Office/Exam: 5.0 W/sq.ft.
- c. Storage: 1.5 W/sq.ft.
- d. Laboratories (Basic Research): 50 W/sq.ft.
- e. Support Areas: 12.5 W/sq.ft.
- f. Technology Rooms: 50 W/sq.ft.
- g. Procedure Rooms: 30 W/sq.ft.
- h. Specialty Rooms: 3 W/sq.ft.
- i. Offices: 6 W/sq.ft.
- j. Seminar and Classrooms: 4 W/sq.ft.
- k. Lobby: 6 W/sq.ft.
- l. Mechanical Rooms: 2.5 W/sq.ft. (Lighting and Small Power)
- m. Lounge/Waiting Area: 4 W/sq.ft.
- n. Café/Cafeteria: 15 W/sq.ft.
- o. Kitchen: 20 W/sq.ft.

IV. Lighting

- a. All lighting located outdoors, in mechanical, electrical, IT or other utility spaces, closets and storage spaces, stairwells, restrooms, and any space 16' above the finish floor and higher shall be LED type and shall be by a NYSERDA and/or ConEd rebate/incentive eligible manufacturer. All deviations must be reviewed on a case by case basis with Facilities Operations.

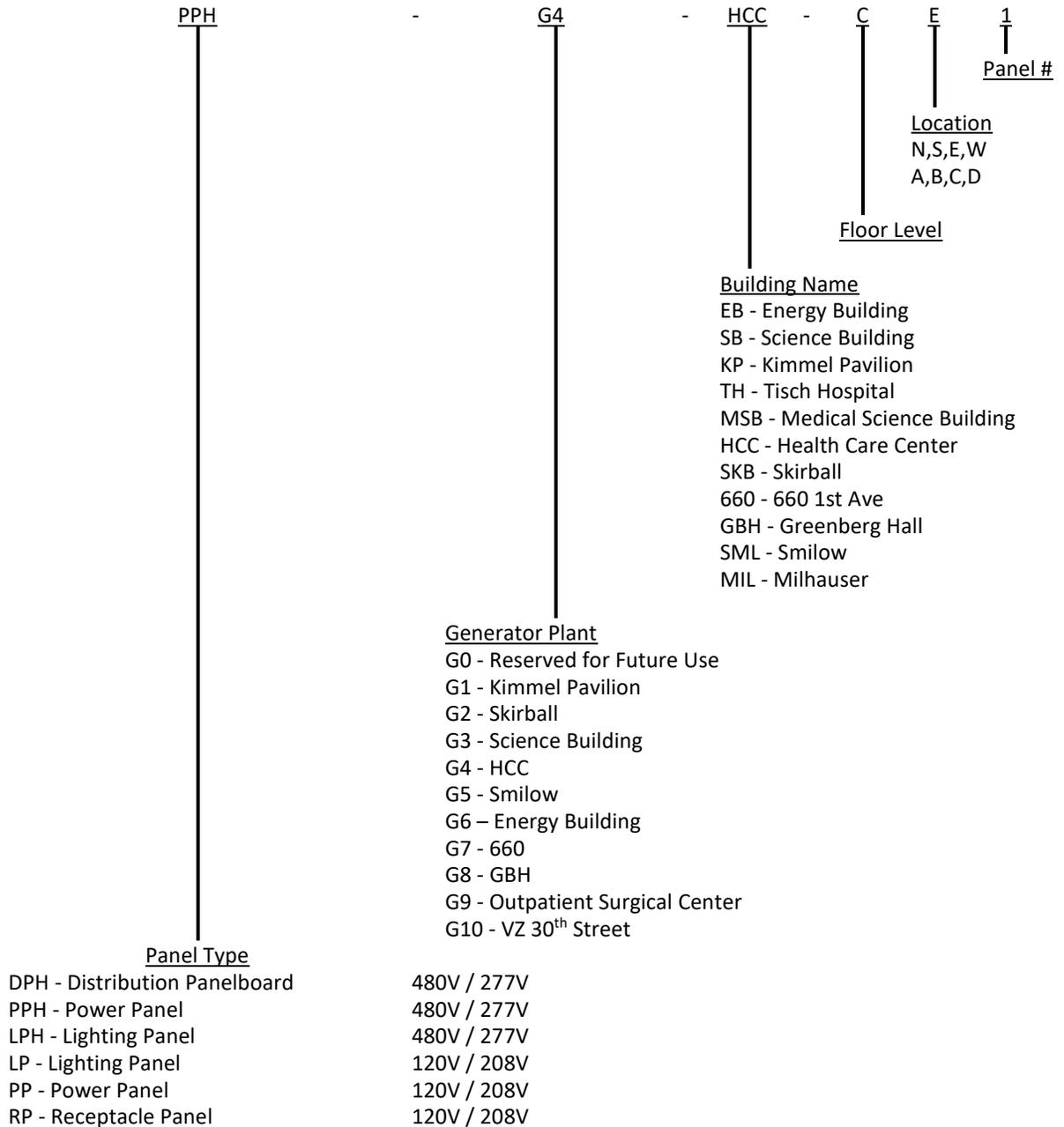
- b. All lamp sources shall be 3500K color temperature in non-patient care spaces, except where a different temperature is requested by end-users for clinical or technical reasons. Patient care areas will be evaluated on a case-by-case basis for color temperature and color rendering index.
 - c. In spaces where linear tubes are used, they shall be LEDs where possible and T-5 with high efficiency electronic ballasts in areas where LEDs are not possible for above listed reasons.
 - d. All other lamping should be LED or CFL. Incandescent lighting is acceptable in spaces with specialized requirements (ex. Research support spaces).
 - e. Emergency lighting shall be connected to Life Safety Emergency Power. Battery packs shall only be utilized for emergency generator rooms, emergency switchgear rooms, fuel oil rooms, ATS rooms, and at least one emergency light with battery pack in a procedure area where anesthesia is being administered.
 - f. 5% excess attic stock shall be provided for integrated, architectural LED fixtures (i.e. fixtures that need to be replaced entirely after failure).
- V. Distribution
- a. All power loads, such as elevators, motor control centers, etc., shall operate at 480/277 volts and shall be connected to distribution switchboards with single or multiple conduit and cable feeders.
 - b. Unless serving specialty equipment/lighting, receptacles as well as fluorescent and incandescent lighting shall be wired to 120 or 277 volt circuits.
 - c. All conduits shall be run concealed in finished areas and exposed in Machine Rooms and Electrical Rooms.
 - d. All lighting circuits shall emanate from lighting panels and power circuits from power panels. Lighting and Power circuits shall not be mixed in the same panel.

C. Electrical Naming Convention

COORDINATE NOMENCLATURE WITH NYU LANGONE ELECTRICAL SYSTEMS MANAGER
 PRIOR TO LABELING OR RE-LABELING ELECTRICAL EQUIPMENT DESIGNATIONS.

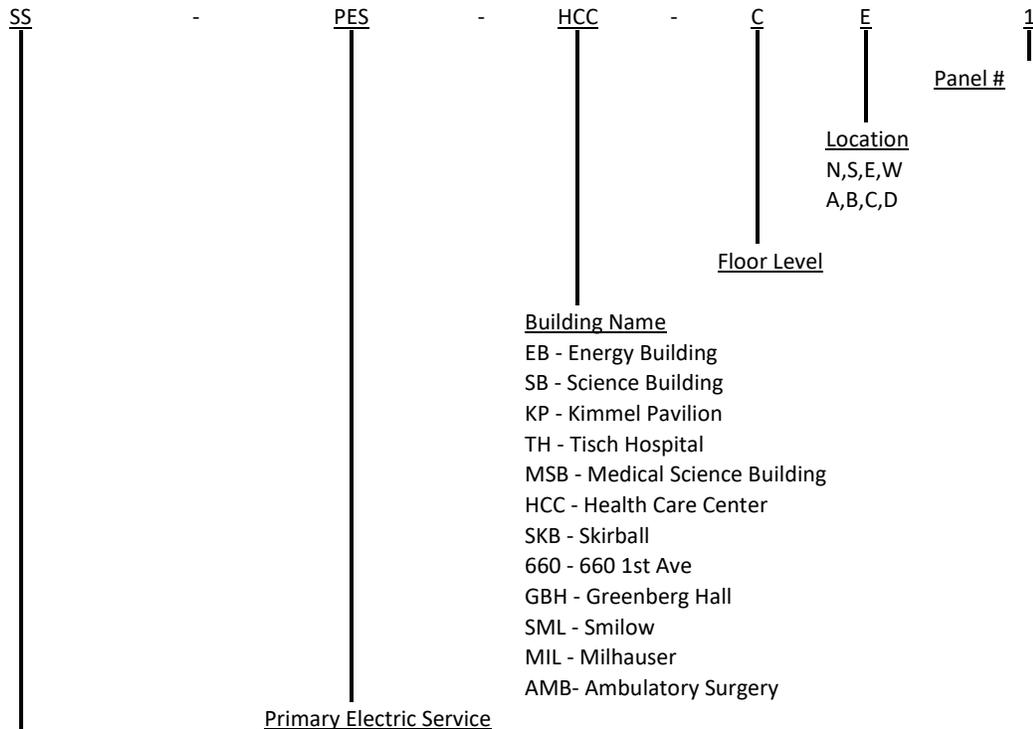
I. Generator Panel Naming Scheme

Example: PPH-G4-HCC-CE1



II. Normal Power Panel Naming Scheme

Example: SS-PES-HCC-CE1

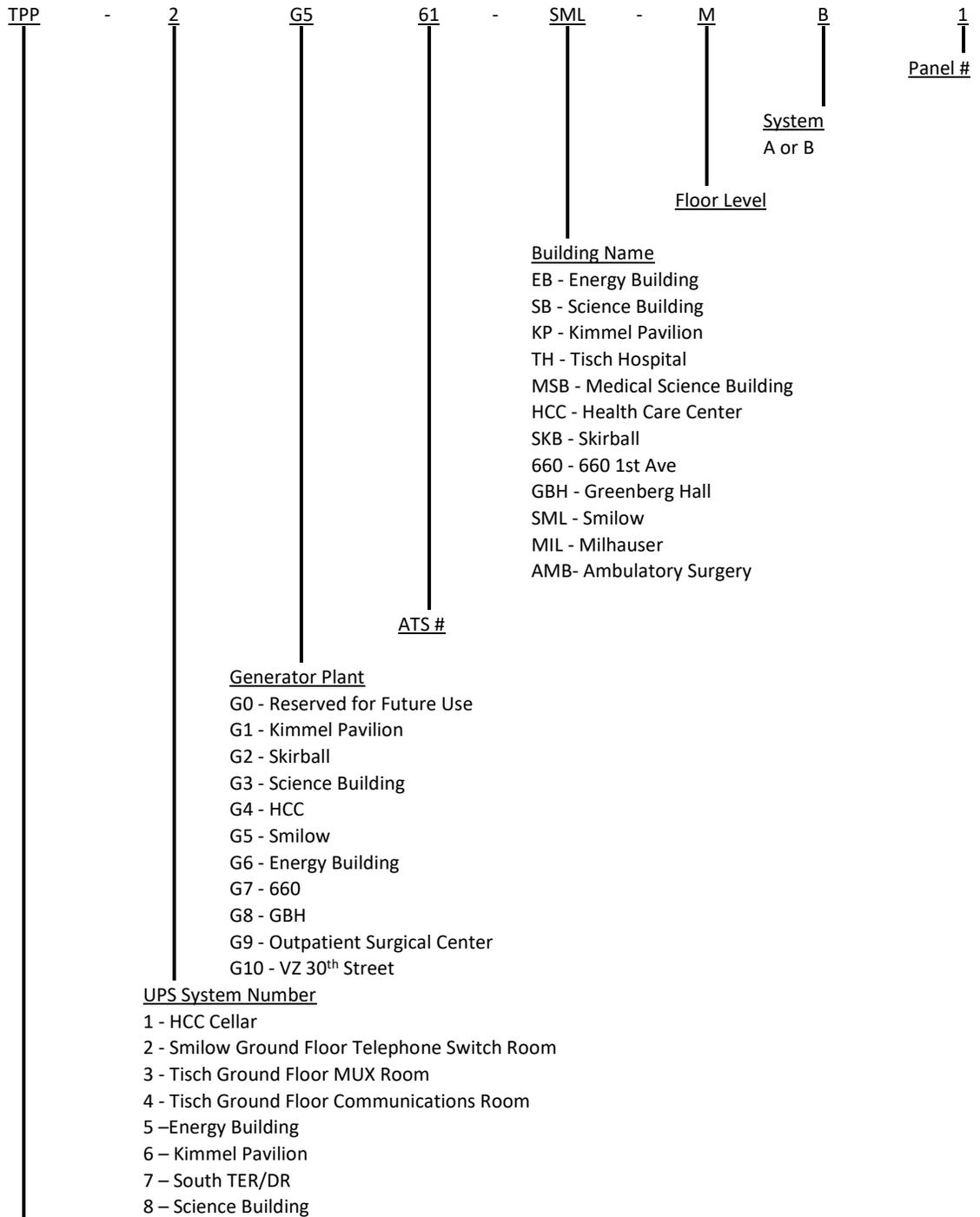


Normal Panel Type

SSH - Service Switchboard	460V / 265V
DPH - Distribution Panelboard	460V / 265V
LPH - Lighting Panel	460V / 265V
PPH - Power Panel	460V / 265V
SS - Service Switchboard	120V / 208V
DP - Distribution Panelboard	120V / 208V
LP - Lighting Panel	120V / 208V
PP- Power Panel	120V / 208V
RP - Receptacle Panel	120V / 208V
BD – Bus Duct	
DESS – Double Ended Substation	

III. UPS Naming Scheme

Example: TPP-2-G5-61-SML-M-B1



UPS Panel Types

- TDP - Technology Distribution Board – 120/280V
- TPP - Technology Power Panel – 120/280V
- TDPH – Technology Distribution Panel – 480/277V
- MDSH – Medical Distribution Switchboard – 480/277V
- MDPH – Medical Distribution Panel – 480/277V

Generator Plant

- G0 - Reserved for Future Use
- G1 - Kimmel Pavilion
- G2 - Skirball
- G3 - Science Building
- G4 - HCC
- G5 - Smilow
- G6 - Energy Building
- G7 - 660
- G8 - GBH
- G9 - Outpatient Surgical Center
- G10 - VZ 30th Street

UPS System Number

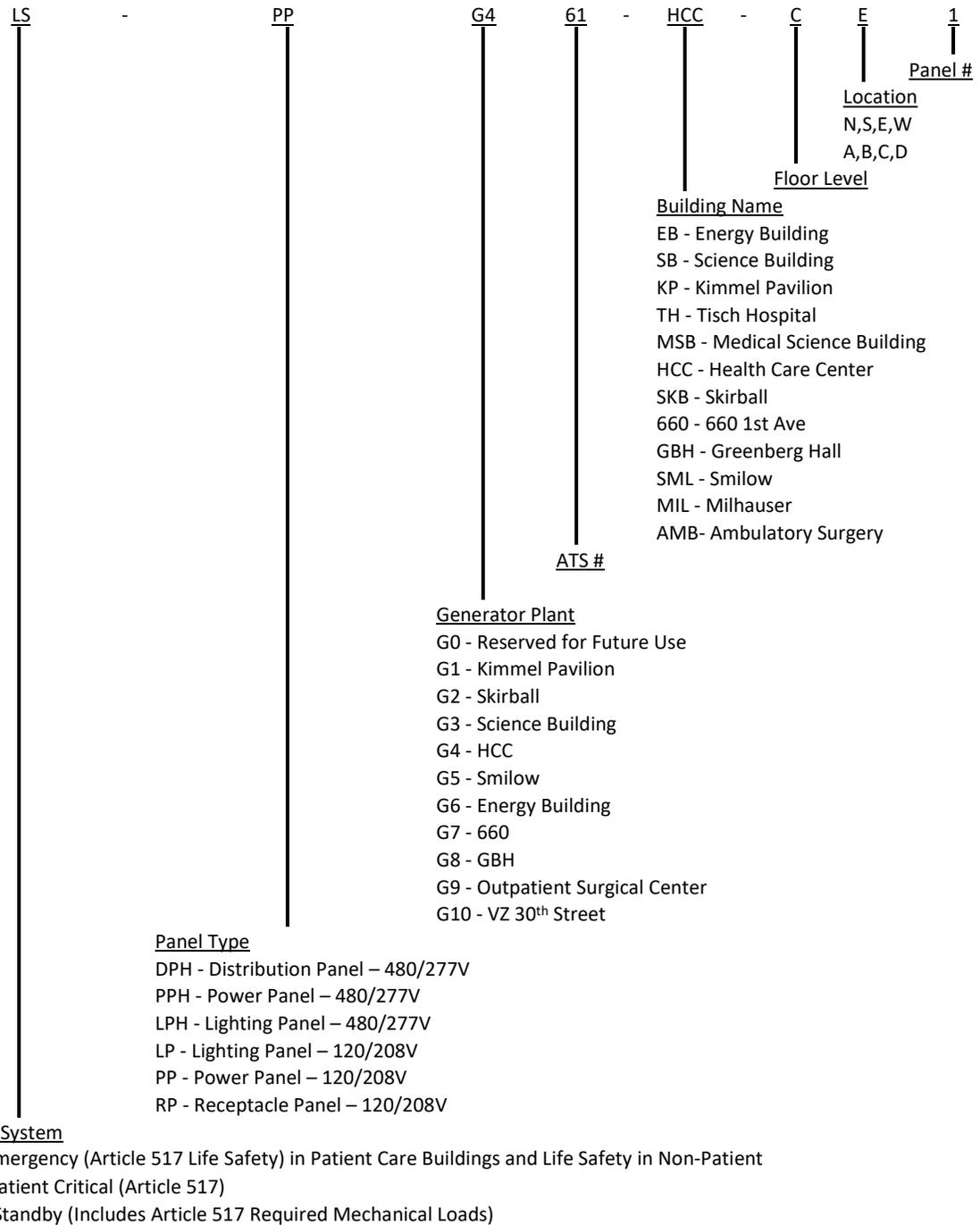
- 1 - HCC Cellar
- 2 - Smilow Ground Floor Telephone Switch Room
- 3 - Tisch Ground Floor MUX Room
- 4 - Tisch Ground Floor Communications Room
- 5 –Energy Building
- 6 – Kimmel Pavilion
- 7 – South TER/DR
- 8 – Science Building

Building Name

- EB - Energy Building
- SB - Science Building
- KP - Kimmel Pavilion
- TH - Tisch Hospital
- MSB - Medical Science Building
- HCC - Health Care Center
- SKB - Skirball
- 660 - 660 1st Ave
- GBH - Greenberg Hall
- SML - Smilow
- MIL - Milhauser
- AMB- Ambulatory Surgery

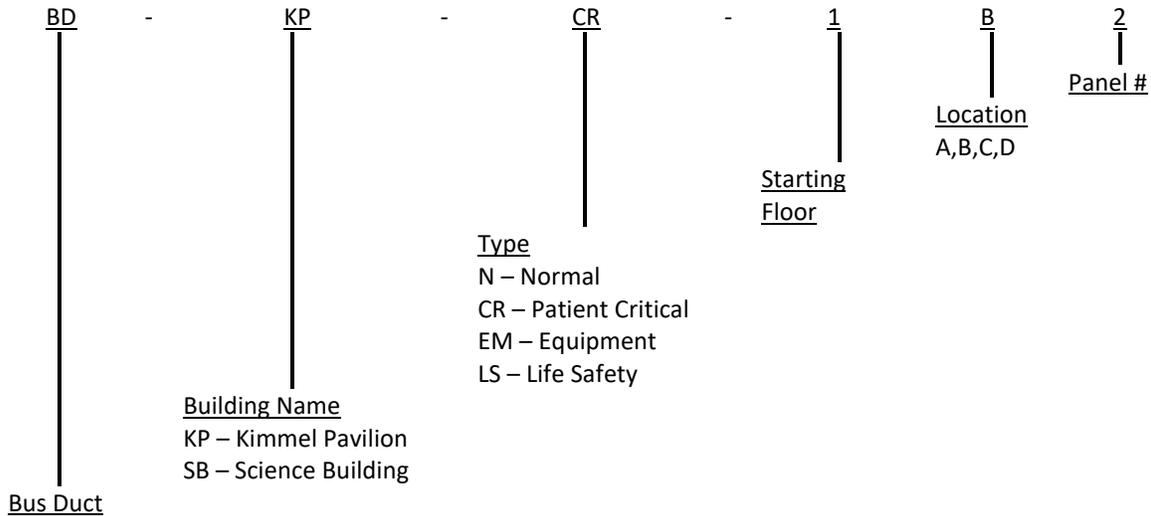
IV. Emergency Panel Naming Scheme

Example: LS-PP-G4-61-HCC-CE1



V. Bus Duct Naming Scheme

Example: BD-KP-CR-1B2



D. Various

- I. The following is a list of electrical gear that shall have heat runs/burn-ins performed prior to turnover. All burn ins/heat runs shall be at rated load (full load).
 - a. Uninterruptible Power Supply (UPS) – 12 hour burn in
 - b. Uninterruptible Power Supply Rack Type – 30 minute burn in
 - c. Automatic Transfer Switch (ATS) – 4 Hour Burn In
 - d. Static Transfer Switch (STS) – 12 hour Burn In
 - e. Generator – 12 hours
 - f. Power Conditioner – 8 hour burn in

- II. Factory Witness Tests -
 - a. The following equipment shall be factory witness tested. See individual equipment subsections for further information regarding required tests. Maximum of two people (not including manufacturer).
 - 1) Generators
 - 2) Medium Voltage Transformers
 - 3) Paralleling Gear
 - 4) Uninterruptable Power Supply
 - 5) Double Ended Substation
 - 6) Power Conditioner
 - 7) Static Transfer Switch
 - 8) Medium Voltage Switches
 - 9) Transformer 1,000 kVa or higher

- III. Proper wire color schemes shall be used for all panels.

- IV. Isolated Ground (IG) receptacles are not allowed. If project team deems IG receptacles are necessary, engineer to discuss with Facilities Management.

V. All emergency power shall be in conduit.

VI. All boxes (splice, pull, etc.) shall be labelled with source and load.

E. Equipment

1. Automatic Transfer Switches

Depending on application, ATS shall be bypass isolation type with load shedding capabilities. This shall be reviewed with Facilities Operations. A full monitoring package on all phases, KW, Voltage and Amperage shall be designed.

All ATS connected to cogeneration shall be delayed transition type. Each ATS must include communication package that can communicate with sitewide CPMS. Each ATS must also allow for the acceptance of a permissive signal for retransfer to be received from the cogeneration plant.

Engineer to add specifications testing section:

- 4 hour full load burn in. One hour each for the following: Normal, Normal Bypass, Emergency, Emergency Bypass.
 - i. At 30 minute intervals, record voltage, frequency, load current.
 - ii. Provide resistive load bank and all necessary temporary cables and connections for full load test.
- Simulate Power Failure

Approved Manufacturers:

- a. Asco

2. Busway and Accessories

Approved Manufacturers:

- a. General Electric "Spectra Series"
- b. Siemens

3. Cable Pulling Lubricants

Cable pulling lubricant shall not be used on isolated power systems.

The following shall not be specified without approval from NYU Langone's division of EH&S:

- Chemicals that are known (IARC group 1) or probable (IARC group 2a) human carcinogens.
- Hazardous substances listed in OSHA 1910 subpart Z.
- Products containing volatile organic compounds (VOCs) in excess of 50 grams/liter.
- Products whose Safety Data Sheet (SDS) rates health, fire and/or reactivity as exceeding "1" on a scale of 0 to 4.
- Products emitting strong odors.

Approved Manufacturers:

- a. American Polywater Corporation - Type "J"
- b. Electro Compound Company - "Poly-Ease" or "Y-ER Ease"
- c. Ideal Industries - "Wire Lube"

4. Cable Tray and Fittings

Approved Manufacturers:

- a. Atlas
- b. Burndy
- c. Cooper B-Line Systems
- d. M.P. Husky Corp.
- e. P-W Industries
- f. Legrand

5. Clocks

In procedure areas clocks shall be wireless, synchronized, digital, and power over Ethernet.

Approved Manufacturers:

- a. Sapling

6. Dry-type Transformers

Factory testing shall be provided on medium voltage transformers and shall be discussed with NYU Langone Facilities Management prior to completing specifications. Factory witness testing shall at a minimum meet NETA Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

Approved Manufacturers:

- a. General Electric
- b. Hammond Power Solutions
- c. Jefferson Magnetek
- d. Siemens
- e. Rex Transformers
- f. ABB

7. Electric Heating Cable Systems

Approved Manufacturers:

- a. Chromalox
- b. Raychem

8. Electrical Conductors, Copper, 600 Volt or Less
All shall be UL Listed.

Approved Manufacturers:

- a. American Insulated Wire
- b. General Cable/Cablec
- c. Pirelli
- d. Rome
- e. Southwire
- f. Belden

9. Electrical Metallic Tubing (EMT)
All shall be UL Listed.

Approved Manufacturers:

- a. Allied Tube & Conduit/Tyco
- b. Republic
- c. Robroy Industries
- d. Triangle
- e. Western
- f. Wheatland

10. Electronic Fluorescent Ballasts

Approved Manufacturers:

- a. Advance
- b. MagneTek
- c. Universal

11. Electronic Fluorescent Dimming Ballasts

Approved Manufacturers:

- a. Advance
- b. Lutron
- c. Universal

12. Electronic Dimming System

Approved Manufacturers:

- a. Lutron
- ~~a-b. Wattstopper~~

13. Enclosed Switches

Approved Manufacturers:

- a. General Electric
- b. Siemens
- c. Square D

14. Exit Signs

Exit signs shall meet the NYC Energy Code wattage requirements

Approved Manufacturers:

- a. Light Guard Vintage Series edge-lit
- b. Philips Caliber Series Edge-Lit LED

15. Fire Detection, Alarm and Communication

See Fire Alarm Guidelines

16. Flexible Metal Conduit

All shall be UL Listed.

Approved Manufacturers:

- a. AFC
- b. ALFLEX
- c. American Metal Molding
- d. Anaconda
- e. Cerro
- f. International Metal Hose

17. Flexible Metal Conduit Fittings

All shall be UL Listed.

Approved Manufacturers:

- a. Appleton
- b. Efcor
- c. Midwest
- d. OZ/Gedney
- e. Raco/Hubbell
- f. Steel City/Thomas & Betts

18. Fluorescent Lamps

See Design Criteria lighting subsection at the beginning of the Electrical Design Guidelines for further design information.

Approved Manufacturers:

- a. General Electric 3500°K. T-5

19. Fuses

Approved Manufacturers:

- a. Ferraz –Shawmut – Amp-Trap 2,000 with a fuse window
- b. Cooper Bussmann

20. Generator

Generators shall be provided with a generator monitoring system. Base building monitoring system is a Monico System.

Factory testing shall be discussed with NYU Langone Facilities Management prior to completing specifications. Factory witness testing shall at a minimum meet NFPA 37 and NFPA 110 Standards.

All new generators ordered for sites in NY, NJ and CT shall be EPA Tier 4.

Approved Manufacturers:

- a. Caterpillar

21. High Intensity Discharge Lamps

Not allowed.

22. LED Light Fixtures

See Design Criteria lighting subsection at the beginning of the Electrical Design Guidelines for further information. LED Fixtures to be approved on a project to project basis. All LED fixtures to be 3500K. Chipset must be Phillips.

Approved Manufacturers:

- a. General Electric
- b. Phillips (Tubes)
- c. RAB Lighting (Panels)

23. Lighting

- a. All lighting located outdoors, in mechanical, electrical, IT or other utility spaces, closets and storage spaces, stairwells, restrooms, and any space 16' above the finish floor and higher shall be LED type and shall be by a NYSERDA and/or ConEd rebate/incentive eligible manufacturer. All deviations must be reviewed on a case by case basis with Facilities Operations.
- b. All lamp sources shall be 3500K color temperature in non-patient care spaces, except where a different temperature is requested by end-users for clinical or technical reasons. Patient care areas will be evaluated on a case-by-case basis for color temperature and color rendering index.
- c. In spaces where linear tubes are used, they shall be LEDs where possible and T-5 with high efficiency electronic ballasts in areas where LEDs are not possible for above listed reasons.
- d. All other lamping should be LED or CFL. Incandescent lighting is acceptable in spaces with specialized requirements (ex. Research support spaces).

- e. Emergency lighting shall be connected to Life Safety Emergency Power. Battery packs shall only be utilized for emergency generator rooms, emergency switchgear rooms, fuel oil rooms, ATS rooms, and at least one emergency light with battery pack in a procedure area where anesthesia is being administered.
- f. Ultrasonic sensors are not allowed in/near animal holding, animal procedure areas, corridors outside holding/procedure areas, or adjacent spaces. Only infrared type sensors are allowed in these spaces.

24. Lighting Controls

To be reviewed with Facilities.

Approved Manufacturers:

- a. Lutron
- b. Wattstopper
- c. Legrand

25. Line Voltage Switches, Wall Plates, and Coverplates

Stainless steel finish plates shall be used in all patient areas. Hospital grade type shall be used in all areas of the facility (non-patient and patient areas)

Approved Manufacturers:

- a. Hubbell
- b. Legrand

26. Liquid-tight Flexible Metal Conduit

All shall be UL Listed.

Approved Manufacturers:

- a. American Brass Company
- b. Anaconda (Type “UA”)
- c. Electri-Flex Company

27. Liquid-tight Flexible Metal Conduit Fittings

All shall be UL Listed.

Approved Manufacturers:

- a. American Brass Company
- b. Midwest
- c. O.Z./Gedney

28. Motor Control Centers

Pilot lights shall be LED. Lamp test button shall be provided.

Approved Manufacturers:

- a. Allen Bradley
- b. General Electric
- c. Siemens

29. Motor Controllers Variable Speed (VFD)

Refer to Mechanical subsection Motor Controllers Variable Speed (VFD) for design requirements.

30. Multi-outlet Assemblies

Information Technology multi-outlet assemblies shall comply to NYU Langone Health IT Design Standards.

Approved Manufacturers:

- a. Legrand

31. Outlets and Boxes

Approved Manufacturers:

- a. Appleton Electric Company
- b. Midland Ross
- c. Raco
- d. Steel City/Thomas & Betts
- e. Thepitt

32. Overcurrent Protective Devices

All field adjustable breakers 100-750 amperes shall be secondary injection tested. All field adjustable breakers over 750 amperes shall be primary injection tested.

Approved Manufacturers:

- a. Eaton
- b. General Electric
- c. Square D
- d. Siemens

33. Panelboard

All panels shall have a local main breaker, double hinged door and a locking #47 key cover. Panels to have an arc-flash study performed and coordinated. Circuit breakers directories must be populated and accurate.

Approved Manufacturers:

- a. American Switchboard
- b. All-City Switchboard
- c. Atlas Switchboard
- d. Electrotech
- e. Lincoln Electric Co.

34. Receptacles

All receptacles shall be hospital grade and illuminated.

Receptacle coverplates shall be engraved stainless steel finish plates. Hospital grade type shall be used in all areas of the facility (non-patient and patient areas). Switched outlets shall have labeling on receptacle coverplate stating "Receptacle shuts off when no one present; plug in cellphones or laptops only."

Receptacles shall be consistent in orientation with ground facing upwards. In addition to any other code requirements, all receptacles that are accessible to the general public shall be tamper proof.

Normal Power color shall be gray, duplex and illuminated face. Emergency power shall be red, duplex and illuminated face. Emergency receptacles shall be located in main service electrical rooms, substation rooms, ATS rooms, emergency paralleling switchgear rooms, and fuel oil pump rooms. Duplex emergency receptacles shall be located next to each sump and ejector pit.

All receptacles must be GFCI type within 6 feet of sink.

Approved Manufacturers:

- a. Hubbell
- b. Legrand

35. Rigid Aluminum Conduit and Fittings

All shall be UL Listed.

Approved Manufacturers:

- a. Alcoa
- b. Anchor-Harvey
- c. Harvey
- d. Kaiser
- e. Reynolds

36. Rigid Nonmetallic Electrical Conduit and Fittings

All shall be UL Listed.

Approved Manufacturers:

- a. Carlon/Lamson & Sessions
- b. Certainteed
- c. Triangle

37. Rigid Steel Conduit and Fittings (exposed to the weather)

All shall be UL Listed.

Approved Manufacturers:

- a. Ocal Inc.
- b. Occidental Coating Company
- c. Perma-Cote
- d. Robroy Industries "Plasti-Bond-Red"
- e. Triangle

38. Rigid Steel and Intermediate Metal Conduit

All shall be UL Listed.

Approved Manufacturers:

- a. Allied
- b. Republic
- c. Triangle
- d. Western
- e. Wheatland

39. Rigid Steel and Intermediate Metal Conduit Fittings

All shall be UL Listed.

Approved Manufacturers:

- a. Appleton
- b. Cooper Crouse-Hinds
- c. Efcor
- d. Midwest
- e. O.Z./Gedney
- f. Raco/Hubbell
- g. Spring City
- h. Steel City/Thomas & Betts
- i. Thomas & Betts

40. Service Switch Assemblies and Distribution Switchboards

Approved Manufacturers:

- a. American Switchboard
- b. All-City Switchboard
- c. Atlas Switchboard
- d. Electrotech
- e. Lincoln Electric Co.

41. Submetering and Power Quality Metering

When a metered feed to a building is removed or changed, the new electrical feed shall be similarly metered.

Approved Manufacturers:

- a. Siemens
- b. Ion/Schneider
- c. General Electric
- d. PQube
- e. Satec

42. System Identification

Equipment Labels shall conform to equipment nomenclature found within these design guidelines and shall be engraved plastic nameplates with a black surface and white core with engraved letters for normal power and red surface and white core for emergency power. Engraved lettering shall be a minimum of 2" in letter height for:

- Panels
- Disconnect switches
- Main Switch boards
- ATS
- Transformers
- UPS

Distribution branch circuits shall have ½" lettering.

Conduit and cable labelling identifying the circuit designation shall be every 5' in concealed areas and 10' in un-concealed areas.

Raceway identification color coding shall be provided as follows:

- Normal power – Black with White lettering
- Emergency power, fire alarm, ATS/MTS – Red with White lettering
- Life Safety Branch – Red with White lettering
- Critical Branch – Blue with White lettering
- Optional standby systems – Blue with White lettering
- UPS – Yellow with Black lettering

43. Transient Voltage Surge Suppression

Surge suppression shall be integral to electrical panels located in IDF and BDF rooms.

Approved Manufacturers:

- a. Current Technology
- b. General Electric
- c. Liebert
- d. United Technologies

44. Type "AC" (Armored Cable) Conductor Cables, 600 Volts or Less

All shall be UL Listed. Armored Cable shall be hospital grade BX. In lieu of armored cable, metal clad (aluminum) is allowable.

Approved Manufacturers:

- a. AFC
- b. Alflex
- c. Southwire

45. Vibration Isolation Devices and Seismic Restraints

Approved Manufacturers:

- a. Amber/Booth Company
- b. Korfund Dynamics Corporation
- c. Mason Industries, Inc.
- d. Vibration Eliminator Company
- e. Vibration Mounting and Controls, Inc.

46. Wall Dimmers

Approved Manufacturers:

- a. Lutron
- ~~a-b.~~ Wattstopper

47. Wire Connectors and Lugs

All shall be UL Listed.

Approved Manufacturers:

- a. AMP
- b. Anderson/Hubbell
- c. Burndy
- d. Homac
- e. Ideal
- f. ITT-Blackburn
- g. MAC
- h. Thomas & Betts
- i. Tyco Electronics/AMP
- j. Union Connector Co.
- k. 3M

48. UPS (Central)

Factory testing shall be discussed with NYU Langone Facilities Management prior to completing specifications. Factory witness testing shall at a minimum meet NETA Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

UPS shall have webserver capabilities to login (with credentials) to view all operating characteristics of unit. This link shall be integrated within the BMS.

Approved Manufacturers:

- a. Liebert (data equipment only)
- b. Mitsubishi (medical equipment only)

49. UPS (Rack Mounted)

Refer to IT design guidelines.

50. Heat Trace

All outdoor piping containing fluid shall be heat traced. Heat trace shall be monitored by the building automation system. Heat trace shall turn on by main outdoor air temperature sensor. Alarm shall be sent to BMS when heat trace is to turn on but there is no current flow or heat trace monitoring panel shows there is an error.

F. Cost-saving Alternatives

This section provides cost-saving alternatives for certain components of a project. The RED+F PM will advise the A/E Design Team if this section shall be used on their project. When so stipulated, the A/E Team shall follow the NYU Langone Health – Design Guidelines except the items below will be utilized for all affected components. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

#	Item	Type of Build-Out		
		Science / Clinical (Article 28)	Leased Science / FGP (Non-Article 28)	Admin / Office
<u>1</u>	<u>Remove bypass from Automatic Transfer Switch for off-site locations.</u>		<u>✓</u>	<u>✓</u>
<u>2</u>	<u>Change conduit labeling from every 5 feet in concealed and 10 feet in unconcealed to 10 feet concealed and 20 feet unconcealed.</u>		<u>✓</u>	<u>✓</u>

END OF ELECTRICAL SUBSECTION

4. **PLUMBING**

A. Codes, Regulations and Design Standards.

The entire installation shall comply with the City of New York Building Codes, NYC Department of Health, Department of Environmental Protection Agency, and all other applicable local Codes.

B. Design Criteria

- I. Domestic Hot Water Plant Temperature shall be: 140°F in Kimmel Pavilion, all other spaces shall be 120°F.
- II. Patient room maximum domestic water temperature shall be: 110°F.
- III. Plumbing fixtures shall be of high efficiency conserving type to comply with the City of New York Water Conservation requirements.
- IV. All domestic water piping shall be type “L” copper, unless otherwise dictated by code.
- V. Point of use mixing valves shall be provided under all lavatories, hand sinks, pantry sinks and similar fixtures where required by code.
- VI. Pressure at fixtures shall be designed to provide a maximum of 85 psi.
- VII. Pressure reducing valves shall be installed wherever the water pressure exceeds 85 psi.
- VIII. The piping shall be sized to provide a maximum velocity of 6 feet per second (fps) in the mains, and 4 fps in all branch piping.
- IX. Hose bibs with ¾ inch male hose threads and vacuum breaker shall be provided in all mechanical spaces.
- X. Mechanical rooms and water service rooms shall be provided with floor drains and waterless trap seals (Liquid Breaker Green Drain).
- XI. All sanitary, vent and storm drainage piping above the design flood elevation (DFE) shall be hubless cast iron pipe with heavy-duty couplings or hub and spigot piping with push-on gaskets. Piping 4” and less shall be hubless, 5” and greater shall be hub and spigot. All piping within cellars shall be hub and spigot.
- XII. Storm piping, sump discharge piping and ejector discharge piping located below the design flood elevation shall be grooved, schedule 40 galvanized steel pipe with mechanical couplings. Alternative materials shall be used for sump discharge piping where dictated by ground water quality.

- XIII. All sanitary, vent and storm drainage piping buried below slab, draining to an ejector or sump pit shall be extra heavy hub and spigot cast iron with push on gaskets.
- XIV. All sanitary, vent, and storm piping below the design flood elevation (DFE) shall be ductile iron with mechanical couplings.
- XV. All natural gas piping with gas pressures $\frac{1}{2}$ psig and less shall be schedule 40 steel piping with threaded fittings for sizes up to and including 3 inches and natural gas piping larger than 3 inches shall be schedule 40 piping with welded joints.
- XVI. All natural gas piping with gas pressures greater than $\frac{1}{2}$ psig shall be schedule 40 steel piping with welded joints.
- XVII. All medical gas piping and vacuum piping shall be brazed.
- XVIII. Medical fittings, valves and piping shall come cleaned and flushed in sealed packaging from the manufacturer.
- XIX. Polypropylene piping shall be mechanically joined with coupling and additional restraints shall be provided at all offsets. Fused joints shall not be used.
- XX. Hydronic systems with bottom of system make-ups must have a manual make-up connection RPZ/backflow preventer at the top of the system as a backup.

XXI. Brass caps shall be provided on all drain lines.

~~XXI-XXII.~~ Medical gas takeoffs from riser shall be full size throughout floor loop. The piping size shall not be reduced on a floor loop. Takeoffs from floor loops shall be sized adequately.

C. Equipment

1. Acid Neutralization

Systems shall be centralized and comprised of sediment tank, pre-treatment tank (no limestone), chemical injection tank and sampling tank in compliance with DEP standards.

Approved Manufacturers:

- a. Town and Country

2. Backflow Preventers

Approved Manufacturers:

- a. Watts
- b. Febco

3. Baseboard Radiation (Steam/Water)

See Mechanical subsection

4. Drains

Weep hole drains are not allowed unless liners are designed as part of the system and installed as such.

Approved Manufacturers:

- a. Josam
- b. JR Smith
- c. Zurn

5. Electric Water Coolers

Approved Manufacturers:

- a. Elkay
- b. Filtrine
- c. Halsey Taylor

6. Fixture Supports

Approved Manufacturers:

- a. Jay R. Smith
- b. Josam
- c. Wade
- d. Zurn

7. Gauges and Thermometers

Temperature Scale Ranges:

Domestic Hot Water Piping: 20 to 250 deg F

Steam-Condensate Piping: 0 to 250 deg F

Steam Piping: 212 to 250 deg F

Compound gauges shall be used on suction side of pumps when required due to system pressure. Digital Vari-Angle Thermometers (Digital-Solar) to be used in place of Liquid-In-Glass type.

Pressure Scale Ranges:

Design engineer shall specify proper scales based on operating pressures.

Switches, thermometers, meters, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Approved Manufacturers:

- a. Instrument Test Ports
 - 1) Peterson Equipment
 - 2) Watts Regulator

- b. Pressure Gauges 1.00% Accuracy
 - 1) Ashcroft
 - 2) Trerice
 - 3) Weiss
 - 4) Weksler
 - c. Pressure Switches
 - 1) Barksdale
 - 2) Dwyer
 - 3) Mercoïd
 - 4) Square D
 - d. Thermometers 1.00% Accuracy
 - 1) Trerice
 - 2) Weiss
 - 3) Weksler
8. Hot Water Heaters
Approved Manufacturers:
- a. Patterson-Kelley Company
 - b. A.O. Smith
9. Insulation
Piping insulation shall comply with latest codes and energy conservation codes.
- Approved Manufacturers:
- a. Armacell
 - b. Armstrong
 - c. Knauf
 - d. Johns-Manville
 - e. Owens-Corning Fiberglas (O-C-F)
 - f. P.P.G. (Pittsburgh Plate Glass)
10. Medical Air Compressors
Compressors shall be oil-less reciprocating compressors and compliant with the latest NFPA-99 standards.
- Approved Manufacturers:
- a. Beacon-Medaes
11. Medical Gas Equipment
Approved Manufacturers:
- a. Beacon-Medaes

12. Medical Gas Outlets

Outlets shall be DISS type, having a minimum pig tail connection point of ½” for all services. Vacuum and WAGD piping shall drop individually to each outlet. Header piping shall be readily accessible and shall be a minimum of 1”.

Approved Manufacturers:

- a. Beacon-Medaes made by Hill Rom

13. Motors

Conform to NEMA MG 1. Motors shall not operate continuously at a service factor greater than 1. Design to a service factor of a minimum of 1.15. Provide hoist type access for maintenance purposes.

Motors to be with permanently greased bearings (preferred). If permanently greased bearings are not provided, grease ports shall be provided with adequate access – grease capillaries are not allowed.

Bearings shall have a life grade of L5 with a minimum of 50,000 hours.

Approved Manufacturers:

- a. Standard Efficiency (Less Than 1 hp)
 - 1) Baldor
 - 2) General Electric
 - 3) Toshiba
 - 4) U.S. Motors
 - 5) Dayton
 - 6) Marathon
 - 7) Weg
- b. Premium Efficiency (1 hp and Above)
 - 1) Baldor
 - 2) General Electric
 - 3) Toshiba
 - 4) U.S. Motors
 - 5) Dayton
 - 6) Marathon
 - 7) Weg

14. Motor Starters

Approved Manufacturers:

- a. Asea Brown Boveri (ABB)
- b. ASCO
- c. Allen Bradley
- d. Siemens
- e. Yaskawa Electric America

15. Motor Controllers Variable Speed (VFD)

VFDs and VFD bypass shall be reviewed and approved by Facilities Operations.

Approved Manufacturers:

- a. Asea Brown Boveri (ABB)
- b. General Electric
- c. Toshiba
- d. Yaskawa Electric America

16. Orifice Steam Traps (Venturi Orifice Type)

Steam traps to have unions upstream and downstream of traps.

Approved Manufacturers:

- a. Steam Gard

17. Pipe and Fittings

Dielectric fittings shall be installed between all dissimilar metals. Piping ball joints for movement between buildings shall be flanged and not welded.

Steam pipe gaskets are to be solid graphite type (Equalseal EQ FG-P). Spiral wound gaskets will not be accepted.

~~Approved Manufacturers:~~

~~a. Brass & Copper Pipe & Tube~~

- ~~1) Ansonia Copper and Brass, Inc.~~
- ~~2) Alaskan Copper and Brass Company~~
- ~~3) Kobe Wieland Copper Products, LLC.~~
- ~~4) National Bronze & Metals, Inc.~~

~~b. Copper Pipe Fittings~~

- ~~1) American Brass Co.~~
- ~~2) Bridgeport Brass.~~
- ~~3) Chase Brass.~~
- ~~4) Elkhart Products Corporation.~~
- ~~5) Lewin Matheis.~~
- ~~6) Mueller Brass Company.~~
- ~~7) NIBCO.~~
- ~~8) Phelps Dodge.~~
- ~~9) Reading Tube Corp.~~
- ~~10) Revere.~~
- ~~11) Wolverine Tube Co.~~

~~c. Bronze Fittings~~

- ~~1) Elkhart~~
- ~~2) Flagg Co.~~
- ~~3) Jamesbury~~
- ~~4) Mueller~~
- ~~5) NIBCO~~
- ~~6) N. Y. Brass Foundry~~
- ~~7) Walworth Co.~~

~~d. Cast Iron and Ductile Iron Pipe and Fittings~~

- ~~1) Charlotte Pipe and Foundry~~
- ~~2) Tyler Pipe~~
- ~~3) U.S. Pipe~~

~~e. Flanges~~

- ~~1) Grinnell~~
- ~~2) Ladish~~
- ~~3) National Flange~~
- ~~4) Taylor Forge~~
- ~~5) Weld Bend~~

~~f. Screwed Fittings~~

- ~~1) Central~~
- ~~2) Grinnell~~
- ~~3) Ward~~

~~g. Steel Pipe~~

- ~~1) Allies Tube~~
- ~~2) Indutch~~
- ~~3) Ipsco-TMK-Ipsco)~~
- ~~4) Koppel~~
- ~~5) Lakeside~~
- ~~6) Lonestar~~
- ~~7) Tex Tube~~
- ~~8) USX~~
- ~~9) V & M Star~~
- ~~10) Wheatland/Sharon Tube/Sawhill~~

~~h. Steel Pipe Fittings~~

- ~~1) Anvil International~~
- ~~2) Bonney Forge~~
- ~~3) Kerkau~~
- ~~4) Mills Iron Works~~
- ~~5) Phoenix Forge~~
- ~~6) Penn Machine Tube Forging of America~~
- ~~7) Weldbend~~

~~i. Mechanical Couplings for Grooved Pipe~~

- ~~1) Anvil International (Gruvlok) Figure 7401 Rigidlok Coupling~~
- ~~2) Grinnell Figure 772 Rigid Coupling~~
- ~~3) Victaulic Zero Flex Couplings to 12 inches.~~
- ~~4) Victaulic AGS Rigid Coupling 14 inches and larger.~~

~~j. Underground Piping Systems~~

- ~~1) Insul Pipe Systems.~~
- ~~2) Insul Tek Piping Systems, Inc.~~
- ~~3) Perma Pipe.~~
- ~~4) Rovanco Piping Systems, Inc.~~
- ~~5) Thermacor Process, L.P.~~
- ~~6) Tricon Piping Systems, Inc.~~

~~k.a.~~ Gaskets

- 1) Garlock
- 2) Flexitallic
- 3) Lamons
- 4) Equalseal EQ FG-P (All Steam Piping shall be this type.)

18. Pipe Hangers and Supports

All exposed threaded rods shall be capped with an orange protective cap either rubber or plastic. All threaded rods shall be cut down to an inch of final nut – rods shall not be left at full length for safety reasons. All components shall be galvanized or red-oxide coated.

Approved Manufacturers:

- a. B-Line
- b. Grinnell
- c. Hilti
- d. Michigan Hanger
- e. PHD
- f. Tolco

19. Pipe Joint Compound

The following shall not be specified without approval from NYU Langone’s division of EH&S:

- Chemicals that are known (IARC group 1) or probable (IARC group 2a) human carcinogens.
- Hazardous substances listed in OSHA 1910 subpart Z.
- Products containing volatile organic compounds (VOCs) in excess of 50 grams/liter.
- Products whose Safety Data Sheet (SDS) rates health, fire and/or reactivity as exceeding “1” on a scale of 0 to 4.
- Products emitting strong odors.

Approved Manufacturers:

- a. LACO
- b. Rector-Seal
- c. Hercules

20. Plumbing Fixtures

Approved Manufacturers:

- a. American Standard
- b. Kohler
- c. Toto
- d. Zurn
- e. Elkay
- f. Moen
- g. Sloan
- h. Bradley
- i. Just Mfg.
- j. Chicago Faucets
- k. T&S Brassworks

21. Purified Water System Equipment (Reverse Osmosis and Deionized Systems)

Approved Manufacturers:

- a. Hydro (except for dialysis)
- b. Evoqua

22. Safety Showers/Eyewashes

Eyewash stations shall be manual hand type. Showers shall be ball valve pull type.

Approved Manufacturers:

- a. Guardian Equipment
- b. WaterSaver Faucet Co.

23. Seismic Restraints

Approved Manufacturers:

- a. Mason Industries
- b. Tolco

24. Sump Pumps and Ejectors

Pumps shall be provided with hoisting capabilities within area of equipment. There shall be a hook in the ceiling slab or rail system.

Switches, thermometers, meters, gauges and other components shall be mercury-free in compliance with NYU Langone Health's Mercury Elimination Program.

Approved Manufacturers:

- a. Flygt
- b. Tsunami
- c. Gorman Rupp

25. System Identification

Equipment Labels shall be high quality stickers.

Pipe Labels shall be installed every 5 feet in concealed areas and every 10 feet in un-concealed areas and shall be self-adhesive labels with direction-of-flow arrows and the name of the service printed in letters not less than 1 inch high for pipe 2-1/2 inches and smaller, 2 inches high for 3 inch pipe and larger. Markers shall have backgrounds of different colors for the various service groups. Pipe labels shall be color coded as follow:

Valve Tags: Each valve tag shall be 3 inch diameter, brass, aluminum or stainless steel with letters 1 inch in height. A schedule showing all valve locations, size, and service shall be provided.

Approved Manufacturers:

- a. Brimar Industries Incorporated
- b. Seton Nameplate Corp.
- c. W. H. Brady Co.

26. Toilet Seats

Approved Manufacturers:

- a. Church
- b. Olsonite

27. Vacuum Pumps

Approved Manufacturers:

- a. Beacon Medaes
- b. Nash
- c. Camel

28. Valves

Dielectric fittings shall be installed between all dissimilar metals. All mixing valves shall be installed with check-valves on the hot and cold water lines.

Ball valves must be used for manual isolation on all domestic hot and cold water systems. Butterfly valves shall be reviewed by Facilities Operations. Gate valves are not permitted unless specifically required by codes or DEP.

All valves used in plumbing systems shall close bubble tight and be suitable for dead-end service designed to be able to close off to atmospheric pressure on either side of valve.

All valves located more than 7 feet above the finished floor, shall be provided with a chain wheel for operation from the floor. All fire protection valves installed 7 feet above floor or stair landing shall be provided with chain wheels and shall be padlocked securely in place.

All valves 4" and larger shall be stainless steel or all hot and cold water.

Ball valves shall be installed on piping up to 3" in size. Butterfly valves shall be installed on piping 4" and above.

Approved Manufacturers:

- a. Ball Valves
 - 1) Apollo
 - 2) Nibco

- b. Butterfly Valves
 - 1) Apollo

- c. Pressure Relief Valves

Provide at each pressurized water vessel and as required by Code. Relief valves shall meet the maximum allowable working pressure of piece of equipment for which it is installed. Relief valve piping shall be full sized according to outlet size of relief valve and shall be piped to the floor. Steam relief vents shall be piped to atmosphere.

 - 1) Apollo
 - 2) Febco
 - 3) Watts
 - 4) Aquatrol series 69 (water)
 - 5) Aquatrol series 740 (steam)

- d. Temperature Mixing Valves (under sink)
 - 1) Leonard
 - 2) Powers
 - 3) Holby
 - 4) Watts

- e. Master Mixing Stations
 - 1) Holby

29. Water Supply Pumps

All pumps shall be provided with premium efficiency motors. Pumps shall not be provided with triple-duty valves unless install restrictions require such an install. If triple-duty valves are required, they shall be reviewed and approved by Facilities Operations. Butterfly valves shall not be used on the pump suction.

Piping and pumps shall be independently supported. All piping within 50 feet of pump shall be supported with hangers having spring type isolators.

Install pumps in such a way to allow periodic maintenance, which includes removal of motors, impellers and couplings. Pumps are required to be able to be drained down.

Bearings shall have a life grade of L5 with a minimum of 50,000 hours.

Provide hoist type access for maintenance purposes.

Approved Manufacturers:

- a. Armstrong
- b. Aurora
- c. Bell & Gossett
- d. Gould
- e. Peerless
- f. Weinman
- g. US Pump Corp

D. Cost-saving Alternatives:

This section provides cost-saving alternatives for certain components of a project. The RED+F PM will advise the A/E Design Team if this section shall be used on their project. When so stipulated, the A/E Team shall follow the NYU Langone Health – Design Guidelines except the items below will be utilized for all affected components. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

#	Item	Type of Build-Out		
		Science / Clinical (Article 28)	Leased Science / FGP (Non-Article 28)	Admin / Office
<u>1</u>	<u>Substitute venture type orifice traps to F&T type for off-site locations only.</u>		<u>✓</u>	<u>✓</u>
<u>2</u>	<u>Change pipe labeling from every 5 feet in concealed and 10 feet in unconcealed to 10 feet concealed and 20 feet unconcealed.</u>		<u>✓</u>	<u>✓</u>
<u>3</u>	<u>Change valve tags from metal to printed plastic in off-site locations only.</u>		<u>✓</u>	<u>✓</u>

END OF PLUMBING SUBSECTION

5. FIRE PROTECTION

A. Codes, Regulations and Design Standards.

The entire installation shall comply with the current City of New York Building Codes, NFPA, NYC Fire Department, Factory Mutual Global Insurance or another insurance underwriter and all other applicable local Codes.

Architectural and Engineering construction drawings shall specifically state that fire protection systems (standpipe, sprinkler and fire alarm/detection systems) and construction partitions during construction shall comply with the following:

All projects:

- The contractor shall provide the required fire watch for the duration of any fire protection system or rated construction partition impairment.
- NYULH safety policy 120 - Construction Safety Requirements
- NFPA 13 - Standard for the Installation of Sprinkler Systems
- NFPA 72 - National Fire Alarm and Signaling Code

Projects in New York City:

- Building Code Chapter 33 – Safeguards during Construction or Demolition
- Department of Buildings Technical Bulletin 2017-009 (or superseding bulletin)
- Fire Code Chapter 14 – Fire Safety during Construction, Alteration and Demolition

Projects in New York State:

- Building Code Chapter 33 – Safeguards during Construction
- Fire Code Chapter 33 – Fire Safety during Construction and Demolition

Healthcare and Ambulatory Care occupancies:

- NFPA 101 - Life Safety Code
- NFPA 241 – Standard for Safeguarding Construction, Alteration and Demolition Operations

B. Design Criteria

- I. Buildouts shall be provided with full sprinkler protection and sprinkler systems shall be hydraulically calculated in accordance with the current City of New York Building Code and NYC Fire Department requirements.
- II. Fire department standpipe connections shall be provided with a 2-1/2 fire hose valve and hose rack on every landing of every required stairway.
- III. Areas without ceilings (storage, mechanical spaces, etc.) shall utilize upright sprinkler heads.
- IV. Areas with suspended ceilings (back of house areas, bathrooms, offices, etc.) shall utilize concealed sprinkler heads.

- V. Areas subject to freezing shall utilize a dry pipe sprinkler system with upright sprinkler heads.
- VI. Generator Rooms shall be provided with dry pipe system or pre-action sprinkler systems. Contact Facilities Operations for review and approval.
- VII. Fuel Oil storage rooms shall be protected with a wet type foam sprinkler system or as reviewed and approved by Facilities Operations.
- VIII. New and retro-fitted sprinkler systems shall have at least a 1-1/2" valve connection for draining.
- IX. Electrical Closets shall be provided with wet side wall sprinkler heads each with protective cages.
- X. All head end technical (IT) rooms are to be provided with a preaction sprinkler system. All intermediate data distribution (IT) rooms shall be provided with wet sprinklers.
- XI. Elevator machine rooms that fall under DOH jurisdiction shall be protected by alternate means of fire suppression. This shall apply to new construction or major overhaul.
- XII. System types (wet, dry, preaction, foam, alternatives) must be reviewed with NYU Langone project managers and also with Facilities Operations during design development.
- XIII. Pre-Action systems shall be installed in X-Ray, Gamma Knife, LINAC and any other similar sensitive equipment rooms.
- XIV. Flexible sprinkler connections are allowed to be used in non-New York City projects where applicable by code. Hoses shall be braided stainless steel with proper pressure rating. The flexible sprinkler connection shall be used in conjunction with an approved manufacturer ceiling mounting bracket. Mounting brackets shall be attached to a ceiling's main tee bar support and not cross support rail members. Care shall be taken to prevent unnecessary movement which can dislodge ceiling mounting bracket when sprinkler is discharging. This may include supporting flexible sprinkler connection to building structure independent of the ceiling suspension and support system.

C. Equipment

1. Anchors and Inserts

Approved Manufacturers:

- a. Grinnell
- b. Hilti
- c. Philips
- d. Simpson Strong Tie

2. Motor Starters

Approved Manufacturers:

- a. Allen Bradley
- b. ASCO
- c. General Electric
- d. Gould Westinghouse

3. Motors

Approved Manufacturers:

- a. Baldor
- b. General Electric
- c. Toshiba
- d. U.S. Electric

4. Pipe Hangers and Supports

Approved Manufacturers:

- a. B-Line
- b. Grinnell
- c. Hilti
- d. Michigan Hanger
- e. PHD
- f. Tolco

5. Piping

Piping shall be painted per building codes. Piping up to flow control assemblies shall be painted red.

Approved Manufacturers:

- a. Flanges
 - 1) Grinnell
 - 2) Ladish
 - 3) National Flange
 - 4) Taylor Forge
 - 5) Weld Bend

- b. Screwed Fittings
 - 1) Central
 - 2) Grinnell
 - 3) Ward

- 6. Preaction Control Panel/Equipment
Approved Manufacturers:
 - ~~a. Fenwal~~
 - ~~b.a.~~ Simplex
 - b. Notifier
 - c. Kidde Fire Systems

- 7. Preaction/Dry Pipe Valves
Approved Manufacturers:
 - a. Reliable
 - b. Viking
 - c. Victaulic

- 8. Pressure-Reducing Valves
Approved Manufacturers:
 - a. Cla-Val
 - b. Watts

- 9. Pumps
Approved Manufacturers:
 - a. Fire Pump Controllers
 - 1) ASCO/Firetrol
 - 2) Joslyn-Clark
 - 3) Hubbell (mercury-free options)

 - b. Fire Pump Controller Automatic Transfer Switch
 - 1) ASCO/Firetrol
 - 2) Eaton
 - 3) Russelectric

 - c. Fire Pumps
 - 1) Aurora
 - 2) Patterson
 - 3) Peerless

 - d. Jockey Pumps
 - 1) Aurora
 - 2) Groundfos
 - 3) Peerless

10. Standpipe System Equipment

(Siamese, fire hose valves, fire hose cabinets, and racks, etc.)

Approved Manufacturers:

- a. Badger-Powhattan
- b. Croker
- c. Elkhart
- d. Potter-Roemer

11. Seismic Restraints

Approved Manufacturers:

- a. Mason Industries
- b. Tolco

12. Sprinkler Heads, Valves, Alarms, Etc.

Approved Manufacturers:

- a. Grinnell
- b. Reliable
- c. Viking

13. System Identification

Equipment Labels shall be high quality stickers.

Pipe Labels shall be installed every 5 feet in concealed areas and every 10 feet in un-concealed areas and shall be self-adhesive labels with direction-of-flow arrows and the name of the service printed in black letters not less than 1 inch high for pipe 2-1/2 inches and smaller, 2 inches high for 3 inch pipe and larger. Markers shall have backgrounds of different colors for the various service groups. Pipe labels shall be color coded (per ASME A13.1) as follow:

Fire Quenching Fluids – White on Red

Toxic and Corrosive Fluids – Black on Orange

Flammable Fluids – Black on Yellow

Combustible Fluids – White on Brown

Potable, Cooling, Boiler Feed and other Water – White on Green

Compressed Air – White on Blue

Valve Tags: Each valve tag shall be 3 in diameter, brass, aluminum or stainless steel with letters 2in in height. A schedule showing all valve locations, size, and service shall be provided.

Specify in specifications to post laminated valve tag schedules in space.

Approved Manufacturers:

- a. Brimar Industries Incorporated
- b. Seton Nameplate Corp.
- c. W. H. Brady Co.

14. Tamper Switches

Approved Manufacturers:

- a. Acme
- b. Grinnell
- c. Potter (mercury-free options)
- d. System Sensor (mercury-free options)
- e. Viking

15. Valves

Approved Manufacturers:

- a. Butterfly Valves
 - 1) Grinnell
 - 2) Jamesbury
 - 3) Jenkins
 - 4) NIBCO
 - 5) Victaulic

- b. Check Valves
 - 1) Crane
 - 2) Grinnell
 - 3) Kennedy
 - 4) Mueller
 - 5) NIBCO
 - 6) Victaulic

- c. Gate Valves
 - 1) Crane
 - 2) Grinnell
 - 3) Jenkins
 - 4) Kennedy
 - 5) NIBCO
 - 6) Walworth

16. Vibration Isolators

Approved Manufacturers:

- a. Amber Booth
- b. Korfund Dynamics Corp.
- c. Mason Industries
- d. Vibration Eliminator Co.
- e. Vibration Mountings & Controls

17. Water Flow Switches

Approved Manufacturers:

- a. Potter Electric Signal Company (mercury-free options)
- b. System Sensor

18. Water Proof Sleeves

Approved Manufacturers:

- a. Thunderline Corp. “Link Seal”

D. Cost Saving Alternatives:

This section provides cost-saving alternatives for certain components of a project. The RED+F PM will advise the A/E Design Team if this section shall be used on their project. When so stipulated, the A/E Team shall follow the NYU Langone Health – Design Guidelines except the items below will be utilized for all affected components. There may be risks associated with using such items, including the need to repair or replace them more often, but it has been determined they are within acceptable range for use on certain NYU Langone Health projects.

#	Item	Type of Build-Out		
		Science / Clinical (Article 28)	Leased Science / FGP (Non-Article 28)	Admin / Office
<u>1</u>	<u>Change pipe labeling from every 5 feet in concealed and 10 feet in unconcealed to 10 feet concealed and 20 feet unconcealed.</u>		<u>✓</u>	<u>✓</u>
<u>2</u>	<u>Change valve tags from metal to printed plastic in off-site locations only.</u>		<u>✓</u>	<u>✓</u>

END OF FIRE PROTECTION SUBSECTION

6. **FIRE ALARM**

A. Codes, Regulations and Design Standards.

The entire installation shall comply with the current City of New York Building Codes, NFPA, NYC Fire Department, and all other applicable local Codes.

B. Design Criteria

I. The following buildings have their separate respective EST3 fire alarm systems:

- a. Tisch Hospital
- b. Smilow Research Center
- c. Medical Science Building/Alumni Hall and Coles
- d. Schwartz Health Care Center
- e. 660 First Avenue
- f. 545 First Avenue

II. All audibles and strobes shall be synced.

III. Chimes shall be installed in all sensitive areas in lieu of tones/horns. Sensitive areas include Operating Rooms, NICU, Anesthesiology, and Pre-Surgical. Contact Facilities Operations prior to designing in sensitive areas. Contractor shall obtain waiver if chimes are used in lieu of tones/horns.

IV. For Operating Rooms:

- a. During a detected fire/smoke alarm, only the fan/unit serving the Operating Room which the alarm was generated at shall shut down. All other operating room fans shall stay operational. For central AHU systems a variance is required to be filed with the FDNY and DOB and shall be reviewed with Facilities Operations prior to design.

V. Newly installed smoke heads shall stay covered until completion of project. No more than 20% dirty heads shall be accepted upon project completion.

C. Equipment

1. Fire Alarm System

Approved Manufacturers (no substitutes):

- a. Edwards – EST3

2. Heat Detectors

Approved Manufacturers (no substitutes):

- a. Edwards EST SIGA2-HFS

3. Strobe/Speaker

Approved Manufacturers (no substitutes):

- a. Wheelock LSPSTR Series

4. Strobe/Horn
Approved Manufacturers (no substitutes):
 - a. Wheelock LHSR Series

5. Strobe
Approved Manufacturers (no substitutes):
 - a. Wheelock LSTR Series

6. Smoke Detector
Approved Manufacturers (no substitutes):
 - a. Edwards EST SIGA2-PS

7. Duct Detector
Above ceiling devices shall have separate LED indication and test buttons with magnetic test switch.

Approved Manufacturers (no substitutes):
 - a. Edwards EST SIGA-SD

8. Manual Pull Station
Approved Manufacturers (no substitutes):
 - a. Edwards EST 270 Series

END OF FIRE ALARM SUBSECTION

7. BUILDING MANAGEMENT SYSTEM

A. Codes, Regulations and Design Standards.

The entire installation shall comply with the current City of New York Building Codes, NFPA, NYC Department of Fire, Department of Environmental Protection Agency and all other applicable local Codes.

B. Executive Summary

NYU Langone Health (NYULH) is served by a state-of-the-art building management system (BMS) that consists of a network of microprocessor-based direct digital control (DDC) units communicating with each other and multiple servers and operator workstations. The communication network consists of a high-speed Ethernet and fiber based network, designed for both ring and collapsed topology.

C. General Requirements

NYULH has standardized on Alerton and Automated Logic Corporation as the acceptable manufacturers for building management systems. Other systems will not be considered. An NYULH Facility/Building equipped with Alerton controllers cannot have an ALC controller installed without approval by Facilities Management.

These standards apply to all projects on the NYULH campus.

For renovation work in existing buildings, the existing manufacturer shall be used. For example, the Kimmel Pavilion is served by an Automated Logic Corporation system. Any modifications to the existing control system shall utilize Automated Logic Corporation controllers.

All products provided shall be the most current the manufacturer has to offer at the time of installation.

All system components shall be designed and conform to NYULH standards. This document provides the minimum performance criteria and operational requirements as required by NYULH.

All controllers shall utilize ANSI/ASHRAE 135 BACnet for communication protocol.

All controllers, sensors, field devices, etc., shall be UL-listed. Control units shall be listed for UL - 916 Energy Management Equipment.

Field-mounted sensors and transmitters will be electronic.

Actuation of automatic control valves and dampers will be electric.

Each mechanical system and/or major piece of mechanical equipment shall have one (1) dedicated DDC controller with sufficient input/output capacity such that it shall be directly connected to all field devices and sensors associated with that system and/or piece of equipment. Distributed control of one (1) single piece of major mechanical equipment or system shall not be performed by multiple controllers. In applications where expansion modules are used, they must reside in the same enclosure of the control

unit interfaced with the modules. Any deviations to this requirement must be approved by NYULH facility management team prior to installation.

The communication loop shall always be daisy chained and shall not be T-Tapped.

I. Quality Assurance

Manufacturers and Products: The products and manufacturers specified in this subsection establish the standard of quality for the Work. Subject to compliance with all requirements, provide specified products from the manufacturers in Product Standards.

Reference Standards: Products in this subsection shall be built, tested, and installed in compliance with the specified quality assurance standards; latest versions, unless noted otherwise.

- **Electrical Standards:** Provide electrical products that have been tested, listed and labeled by UL and comply with NEMA standards as well as NFPA 70 (National Electric Code).
- **NEMA Compliance:** Comply with NEMA standards pertaining to components and devices for electrical control systems.
- **NFPA Compliance:** Comply with NFPA 90A “Standard for the Installation of Air Conditioning and Ventilating Systems” where applicable to controls and control sequence
- Install all BMS components, panels, and wiring in compliance with NEC and all local electrical codes.
- DDC devices shall use the latest version of ANSI/ASHRAE Standard 135 “BACnet – Building Automation and Control Networking Protocol” standard for communications and have passed BTL certification as available
- **UL Compliance:** DDC Controllers shall comply with UL916 Standard for Energy Management Equipment. DDC Controllers associated with equipment utilized in a smoke control application shall also comply with UUKL-UL 864 “Standard for Control Units and Accessories for Fire Alarm Systems”.
- National Institute of Standards and Technology (NIST), NIST IR 6392 Annex B: Profiles of Standard BACnet Devices.
- Electronics Industries Association(EIA)
 - EIA-232: Interface between Data Terminal Equipment and Data Circuit-Terminating Equipment employing serial binary data interchange
 - EIA-485: Standard for Electrical Characteristics of Generator and Receivers for Use in Balanced Digital Multi-Point System

II. Delivery, Storage and Handling

Shipping and storage protection shall be provided by manufacturer to insure that the interior and exterior of components are completely protected from damage, dirt or weather. Components shall be continuously covered with plastic or other durable means, until just prior to installation. Maintain protection after installation to protect against on-going construction activities.

D. BMS Approved Manufacturers

The following BMS manufacturers are acceptable for the furnishing and installation of DDC products as specified in this subsection for Superblock main campus and off-site facilities.

I. Superblock Main Campus Facility

The approved installing BMS manufacturer shall be the following:

- a. Kimmel Pavilion and Science Building: Automated Logic Corporation.
- b. Main Campus: Skyline Automation LLC.

NYULH Facilities Management will consider the use of 3rd party BMS vendors on a case-by-case basis. The design consultants shall be responsible for reviewing approved contractors with NYULH Facilities Management during the project’s design phase.

II. Off-site Campus Facilities

The installing BMS manufacturers shall be one of the following:

- a. Alerton Controls
- b. Schneider Electric Buildings
- c. Johnson Controls Inc.
- d. Siemens Building Technologies
- e. Automated Logic Corporation
- e-f. Tridium – Niagra 4 (NYU Langone Hospital – Long Island)

III. Approved BMS Product Lines

a. Automated Logic Corporation

- 1) Product Line: WebCtrl Building Automation System
- 2) Vendor Contact: Mr. Bruce Ravel (973) 569-4700
Automated Logic Corporation
335 Broad Street
Clifton, New Jersey 07013

b. Alerton Controls

- 1) Product Line: BACtalkAscent Compass
- 2) Vendor Contact: Mr. Kevin Kerr (862) 238-8088
Skyline Automation LLC
341 Broad Street
Clifton, New Jersey 07013

c. Schneider Electric Buildings

- 1) Product Line: [EcoStruxureware](#) Buildings Operation
- 2) Vendor Contact: Mr. David Rellinger (201) 348-9240
Schneider Electric Buildings – NY/NJ Division
210 Meadowlands Pkwy Suite D
Secaucus, New Jersey 07094

d. Johnson Controls Inc.

- 1) Product Line: Metasys Building Automation Systems
- 2) Vendor Contact: Ms. Carol Korus (201) 462-0700
Johnson Controls Inc. – NY/NJ Division
777 Terrace Avenue
Hasbrouck Heights, New Jersey 07604

e. Siemens Building Technologies

- 1) Product Line: APOGEE Building Automation Systems
- 2) Vendor Contact: (973) 593-2600
Siemens Building Technologies
8 Fernwood Rd
Florham Park, New Jersey 07932

f. [Tridium \(NYU Langone Hospital – Long Island\)](#)

- 1) [Product Line: Niagara 4](#)

g. [Trane \(NYU Langone Hospital – Brooklyn\)](#)

- 1) [Product Line: Trane Building Management System](#)

E. Existing SystemsI. Direct Digital Control Systems

In general, each building on the NYULH campus is served by either an Alerton or Automated Logic Corporation direct digital control (DDC) system. Intent is to utilize only one (1) manufacturer's controllers within a building. In rare cases, there may be both manufacturers controllers located within the same building. If so, contact the NYULH facility management team for direction. Manufacturer's equipment is located as follows:

- Automated Logic Corporation
 - Kimmel Pavilion
 - Science Building

- Alerton
 - Alumni Hall
 - Berg
 - Coles Student Laboratory
 - Energy Building
 - Greenberg Hall
 - Medical Science Building
 - Schwartz Health Care Center
 - Skirball Institute
 - Smilow Research Center
 - Tisch Hospital

II. Flow-Tracking Systems

Each of the following buildings is served by a flow-tracking system as manufactured by Laboratory Control Systems Inc. The intent is to utilize Laboratory Control Systems Inc. for all flow-tracking applications.

- Smilow Research Center
- Tisch Hospital
- Science building
- Kimmel Pavilion
- Medical Science Building

F. Submittals

Design and Submittal Review

- a. All BMS submittal designs shall be reviewed by the NYULH Facilities Management team (specifically the Senior Control Specialists) for compliance with the NYULH guidelines, standards, and industry best practice standards.
- b. All comments or concerns shall be documented and forwarded to the engineering design team and contractors.

Submittals for each project, regardless of scope and size, shall include the following:

- Compliance document consisting of Specifications 23 0900 and 23 0993 and, at each section, paragraph and subparagraph, identify compliance or non-compliance by C (Comply), D (Deviate) or E (Exception). For each D and E item, describe what specific alternative approach has been taken.
- Specification sheets for each type of electronic sensors, transmitters, controllers, actuators, relays, switches and miscellaneous control devices.
- Schedule and specification sheets for control damper actuators, including material and construction details, duct size, damper size, actuator mounting location and quantity of actuators. Actuator sizing calculations and configuration shall be submitted. Actuators to be selected based on approved sheet metal shop drawings and damper submittals.

- Schedule of automatic control valves and motorized block valves with specification sheets for each valve. The schedule shall list body pressure rating, close-off pressure rating, Cv factor, pressure drop at specified capacity, rangeability and valve flow characteristics. Valves shall be sized based on approved equipment shop drawings, not mechanical schedules.
- System Architecture Drawing Indicating Tie-In Points, Hardware, Cabling Distances, Controllers, Equipment Served, Etc.: In addition to the initial submittal of system architecture drawings, at the completion of each project, the BATC Contractor is responsible for updating the Owner's existing system architecture drawing as per modifications made during the project construction.
- DDC controller point list.
- DDC Alarm point list.
- Control diagrams for each system with a written sequence of operation and control devices identified with instrument tag numbers. Control diagrams to include symbol and abbreviation list. Note: For variable air volume air handling systems, control diagrams are to indicate field installed location of end of duct static pressure transmitters.
- Ladder-type electrical diagrams for each control system with terminal connections identified by number and location. Include symbol and abbreviation list for electrical control diagrams.
- Complete listing and description of program routines resident in direct digital control units.
- Detailed description of software program for return from power failure or controller reboot.
- Schedule of all points trended for each system. Schedule to include system name, system tag, control panel serving equipment, point name, point description and trend interval.
- Schedule of all alarms (hardwired and software-generated) for each system. Schedule to include system name, system tag, control panel serving equipment, point name, point description and alarm value.
- Description of smart alarm program as it applies for each system.
- Riser diagrams for power and communication with locations labeled for all controllers, transformers and other relevant control components.
- Panelboard from which power shall be taken, along with total power to be taken from each panelboard.
- Point nomenclature.

- Interfaces (software and hardware) with equipment provided in other subsections of the specifications. Show connection details based upon the approved submittals of the equipment being interfaced with. For software interfaces (i.e., BACnet, Modbus, etc.), submit list of all interface points transmitted to or received from the equipment.
- List of OEM equipment interface points as well as configuration point mapping.
- Architectural floor plans indicating proposed locations of all wall-mounted devices (i.e., DDC units, control panels, sensors, thermostats, risers, etc.).
- Architectural floor plans indicating proposed location of communication loop and risers.
- Mechanical piping shop drawings indicating proposed locations of all temperature, flow and pressure transmitters.
- Final calibration, commissioning and testing reports.
- Wiring and control diagrams, dimension and specification sheets, and sequence of operation for the flow-tracking system and all of its components.
- Controller reboot sequence.
- Controller power failure restart program sequence.

Note: For projects where minor modifications are made to an existing control system, submittal documentation shall be inclusive of all existing control work associated with the system as well as the new work provided as part of the project. Existing work shall be identified as shadowed block areas or other means acceptable to NYULH facility management team. New work shall be bold. Intent is to have a comprehensive submittal indicating all existing and new control work associated with the system.

G. Decommissioning Requirements

I. General Requirements

The following items must be included within the “General Scope of Work” section of the Contract Documents.

- As existing mechanical and electrical systems are demolished and replaced with new systems, the existing control system serving the demolished equipment must also be removed from the BMS, in its entirety, inclusive of all field devices, controllers, wiring and server-related programming (i.e., associated graphics, trends, alarms, database, etc.)
- The BATC Contractor is responsible for removing all items described below. Failure to complete any item listed below will require the BATC Contractor to perform this service free of charge when discovered, regardless of how much time has lapsed since the original demo project.

- Prior to starting the decommissioning process, determine whether all points located within the controller are required to be decommissioned. If not, notify NYULH facility management team to determine if the remaining points are to be relocated to a different controller or the controller is to remain.
- The BATC Contractor shall be responsible for updating existing “as-built” drawings for any systems/equipment which is demolished.

II. Decommissioning Process

a. Server Work

- Remove all controller database.
- Transfer all alarms associated with the system to Decommissioned Links graphic.
- Transfer all trends associated with the system to Decommissioned Links graphic.
- Transfer all graphics associated with the system to Decommissioned Links graphic.
- Update all building and campus summary graphics accordingly.
- Note: Decommissioned Links graphic shall not be made available to typical users. For use by the BATC Contractor or NYULH facility management team management.

b. Field Work

- Determine whether the controller is the only controller on the power circuit. If so, label the circuit breaker (located in existing power distribution panel) as Spare.
- Determine if the controller is at end-of-run of communication loop or if communications loop is dedicated to this controller. If controller is not at end of run in communications loop, then re-terminate communications wiring such that existing controllers on same loop continue communications to server.
- Disconnect communication wiring to controller.
- Disconnect power wiring.
- Disconnect all field wiring.
- Remove conduit and wiring as much as possible. At a minimum, conduit and wiring shall be removed up to shaft or wall penetrations. Remaining conduit and wiring shall be tagged Not-In-Use.
- Remove all control panels and field devices. Coordinate with NYULH facility management team to determine whether any of the existing controllers and field devices may be used as attic stock.

H. System Architecture

I. General

The system architecture shall consist of a network of independent, stand-alone direct BACnet I/P-based digital control units and BACnet MSTP unitary controllers communicating over a two-tier local area network. Each control unit shall perform all specified control functions independently, including scheduling, alarming and storage of trend data. Failure of one (1) control unit shall have no effect upon any other unit in the network.

Each direct digital control unit shall communicate with each other and with the existing servers. The DDC units, servers and workstations shall interface to the main communication network via multiple multi-port managed communication switches.

II. Locally Separated BMS Local Area Network (LAN)

BMS network shall be independent and isolated from MCIT WAN with one physical connection via CAT6/Ethernet. This connection will be between an approved NYULH BMS LAN switch and MCIT switch.

For new work in existing buildings, re-use of ethernet or Ethernet couplers.

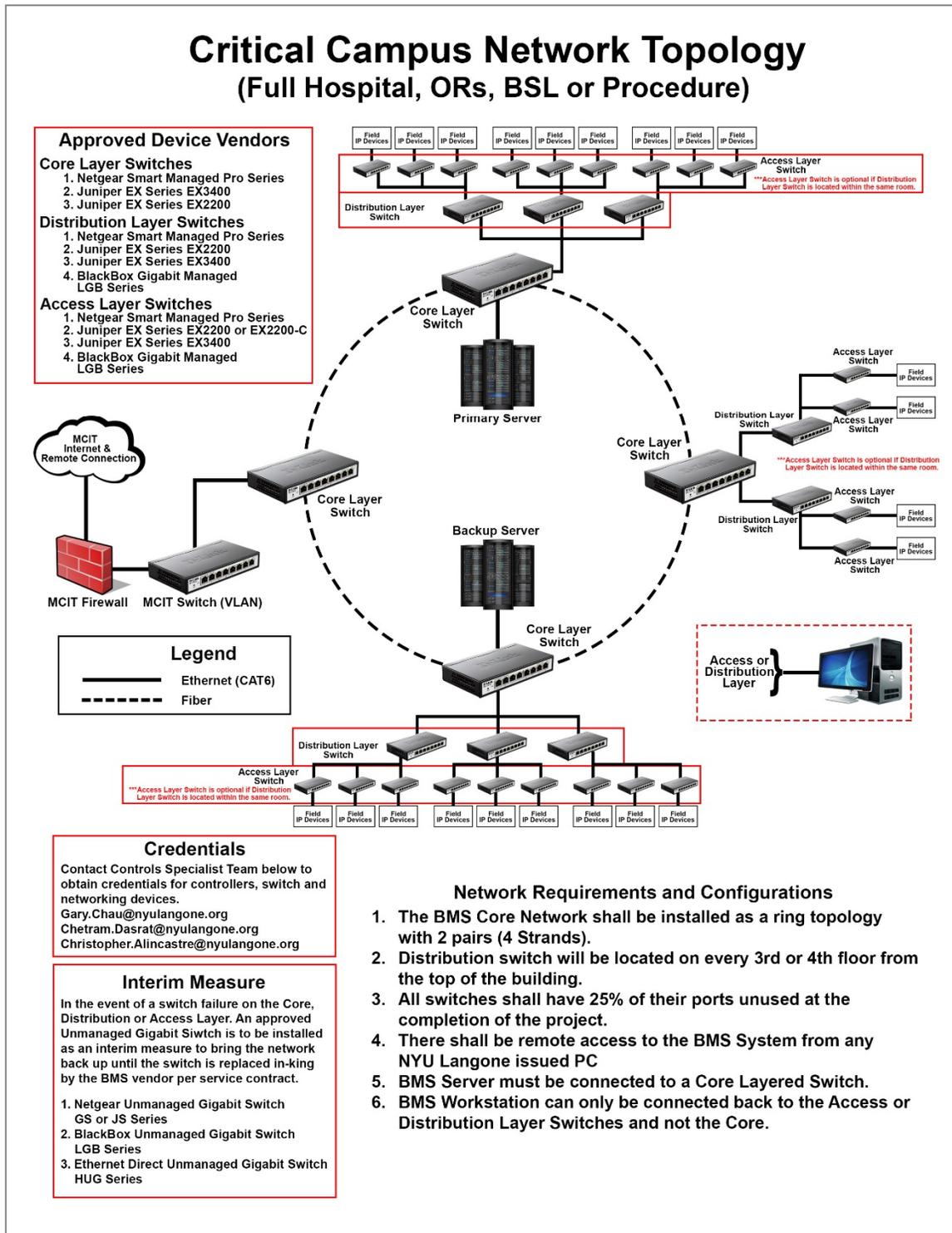
Critical campus network topology shall be utilized for hospital infrastructure and Article 28 compliance spaces (e.g. operating, procedure, vivarium, Bio-Safety Labs). This network configuration is designed using three-tier ring network topology.

Midsize campus network topology shall be utilized for clinical practice and laboratory infrastructure. This network configuration is designed using three-tier hierarchical network topology.

General campus network topology shall be utilized for office and residential infrastructure. This network configuration is designed using three-tier hierarchical network topology.

Approved NYULH core, distribution and access switch shall only be used. All switches shall have 25% of their ports unused at the completion of the project. For an interim measure in the event of network switch failure, an approved unmanaged switch shall be installed until faulty switch is in kind replaced by the BMS vendor. BMS network architecture and connection to MCIT shall be approved by NYULH Facilities operations before procurement. Below are approved NYULH BMS network topologies to be used:

Critical Campus Network Topology (Full Hospital, ORs, BSL or Procedure)



Critical Campus Network Topology (Hospitals, Article 28 Space, O.R & BSL)

Midsize Campus Network Topology (Client Practice, Procedure, Clinic, Office and Labs)

Approved Device Vendors

Core Layer Switches

1. Netgear Smart Managed Pro Series
2. Juniper EX Series EX3400
3. Juniper EX Series EX2200

Distribution Layer Switches

1. Netgear Smart Managed Pro Series
2. Juniper EX Series EX2200 or EX2200-C
3. Juniper EX Series EX3400
4. BlackBox Gigabit Managed LGB Series

Access Layer Switches

1. Netgear Smart Managed Pro Series
2. Juniper EX Series EX2200 or EX2200-C
3. Juniper EX Series EX3400
4. BlackBox Gigabit Managed LGB Series

Interim Measure

In the event of a switch failure on the Core, Distribution or Access Layer. An approved Unmanaged Gigabit Switch is to be installed as an interim measure to bring the network back up until the switch is replaced in-king by the BMS vendor per service contract.

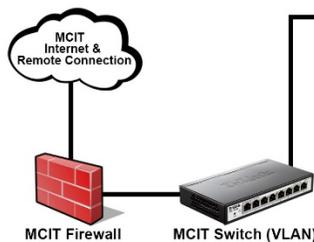
1. Netgear Unmanaged Gigabit Switch GS or JS Series
2. BlackBox Unmanaged Gigabit Switch LGB Series
3. Ethernet Direct Unmanaged Gigabit Switch HUG Series

Credentials

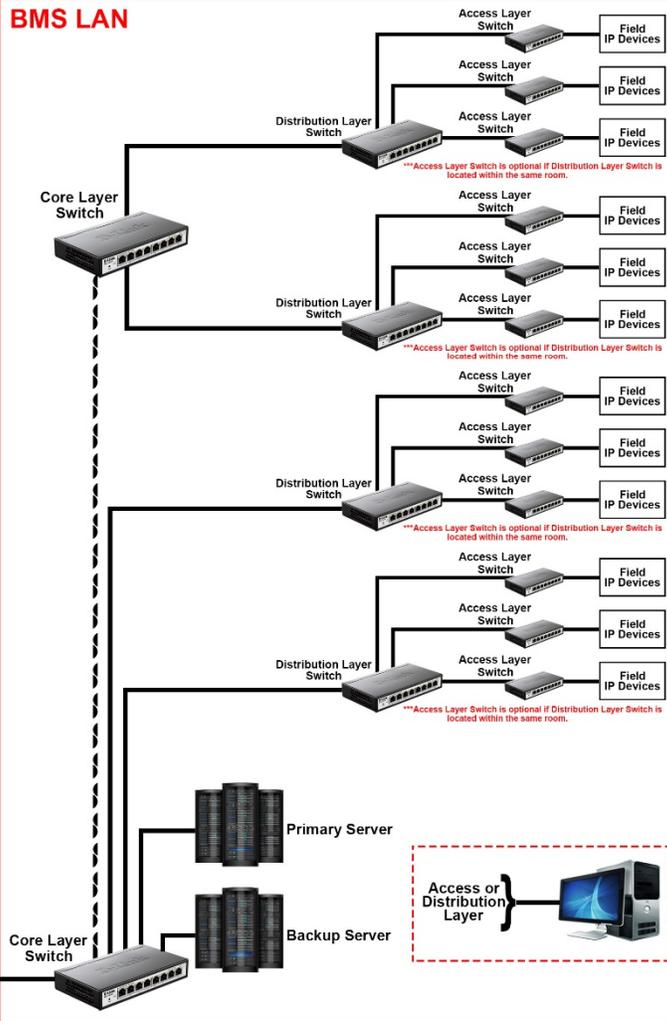
Contact Controls Specialist Team below to obtain credentials for controllers, switch and networking devices.
 Gary.Chau@nyulangone.org
 Chetram.Dasrat@nyulangone.org
 Christopher.Alincastre@nyulangone.org

Legend

- Ethernet (CAT6)
- - - Ethernet (CAT6)
- Optional: Fiber



BMS LAN



Network Requirements and Configurations

1. Distribution switch will be located on every 3rd or 4th floor from the top of the building with a minimum of 2 Core Switches.
2. All switches shall have 25% of their ports unused at the completion of the project.
3. There shall be remote access to the BMS System from any NYU Langone issued PC
4. BMS Server must be connected to a Core Layered Switch.
5. BMS Workstation can only be connected back to the Access or Distribution Layer Switches and not the Core.

Midsize Campus Network Topology (Client Practice, Clinic, Labs and Office)

General Campus Network Topology (Offices and Residential)

Approved Device Vendors

Core Layer Switches
1. Netgear Smart Managed Pro Series

Distribution Layer Switches
1. Netgear Smart Managed Pro Series

Access Layer Switches
1. Netgear Smart Managed Pro Series

Interim Measure

In the event of a switch failure on the Core, Distribution or Access Layer. An approved Unmanaged Gigabit Switch is to be installed as an interim measure to bring the network back up until the switch is replaced in-king by the BMS vendor per service contract.

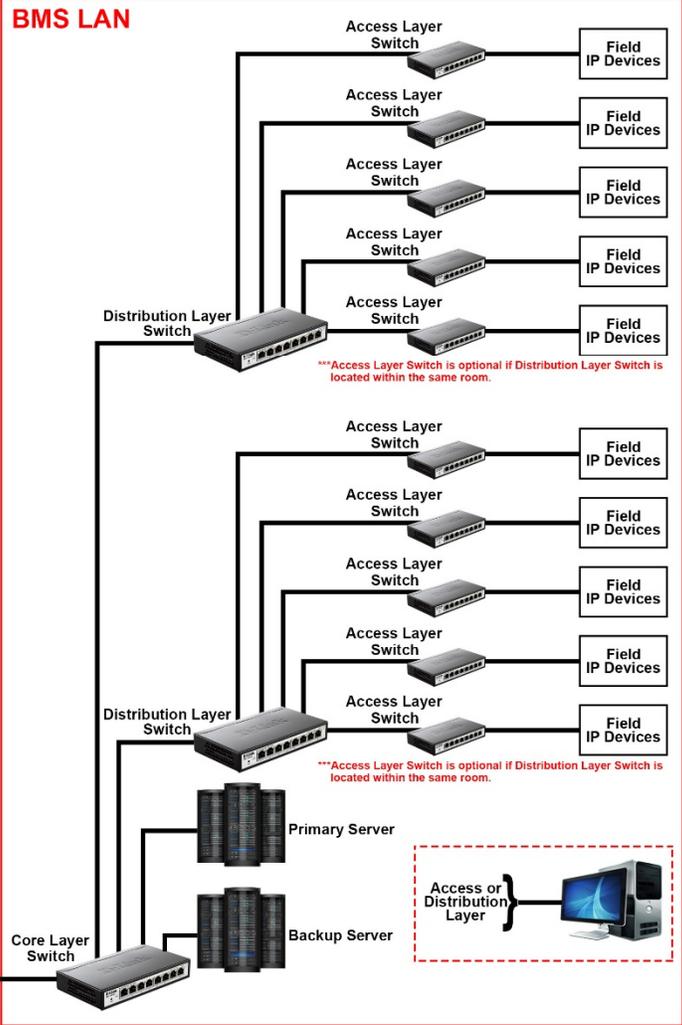
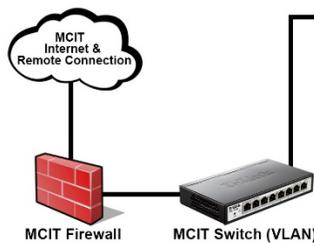
1. Netgear Unmanaged Gigabit Switch GS or JS Series
2. BlackBox Unmanaged Gigabit Switch LGB Series
3. Ethernet Direct Unmanaged Gigabit Switch HUG Series

Credentials

Contact Controls Specialist Team below to obtain credentials for controllers, switch and networking devices.
Gary.Chau@nyulangone.org
Chetram.Dasrat@nyulangone.org
Christopher.Alincastrate@nyulangone.org

Legend

— Ethernet (CAT6)



Network Requirements and Configurations

1. Distribution switch will be located on every 5th or 6th floor from the top of the building.
2. All switches shall have 25% of their ports unused at the completion of the project.
3. There shall be remote access to the BMS System from any NYU Langone issued PC
4. BMS Server must be connected to a Core Layered Switch.
5. BMS Workstation can only be connected back to the Access or Distribution Layer Switches and not the Core.

General Campus Network Topology (Office and Residential)

I. Communication Protocols

- I. Communication protocol between servers, workstations, DDC and unitary controllers shall utilize ASHRAE Standard 135 BACnet. No manufacturer variations to ASHRAE Standard 135 BACnet published communication protocol standards and rules will be accepted. Each BACnet communication alarm and subscription services shall be configured as Confirmed service or Unicast transmission.

- II. For ~~twisted pair bacnet~~MS/TP communication efficiency, the following requirement must be adhere to:
 - a) All Devices must have a unique MAC ID and Device Instance.
 - b) All Software device instance are unique on the entire network.
 - c) Baud Rate must be the same of all device including repeaters for given MS/TP trunk.
 - d) COV (Change of Value) Increment shall be set on ALL Analog Input and Value parameters with a number no less than 1 or 1% of maximum range whichever is higher.
 - e) Max Master on ALL Global Controllers shall be set according to Highest Node on MS/TP network trunk + 3.
 - f) EOL (End of Line) terminators shall be places on each end of a MS/TP trunk. Terminators resistance shall be determined by the BMS vendor recommended standard. No intermediate device shall have an EOL.
 - f)g) Refer to section VII. Conduit and Wiring/b. Wire Type and Color/2) ARC156/MSTP/Modbus Communication Cable, for cable specification.
 - g)h) Voltage Polarity of RS-485 communication cable shall confirmed before adding additional controllers/devices.
 - ~~h) MS/TP total length of twisted pair communication cable shall be less than 4000 ft. with 18 AWG, less than 2000 ft. with 22 AWG~~
 - i) MS/TP communication cable shall NOT be run in the same conduit as 24 VAC power
 - j) MS/TP communication cable shall NOT be run in the same conduit as conductors driven by Binary Outputs.
 - k) MS/TP communication cable shall NOT be run near electrical motors and only inside VFD plastic enclosures

J. System Security

- I. The BMS shall support SSL certificates communication between clients and BMS servers and applications shall be encrypted using minimum Secure Socket Layer (SSL 1.0, 2.0, 3.0 and TLS 1.0).
- II. The BMS shall be capable of communicating with standard industry control system protocols as follows:
 - a) HTTP/HTTPS
 - b) DHCP/DNS
 - c) Native Modbus – TCP/IP and RTU RS485
 - d) OPC (Open Platform Communication)
 - e) XML/SOAP Web Services
 - f) RESET Web Services
 - g) SMTP
 - h) SNMP v3
 - i) NTP

K. Network Security

- I. BMS Network Security standards shall be coordinated with the NYULH facility management team.
- II. Preliminary network design meetings shall be scheduled between design engineers, contractors, MCIT and NYULH facility management prior to construction.
- III. Network design drawings and specifications shall be reviewed and approved by NYULH facility management.

L. User Access Levels and Passwords

I. User Access Levels

There shall be ten (10) standard access levels. Assignment of an access level to a user shall be determined by the NYULH facility management team. Coordinate with the NYULH facility management team for access level assignments. Any variations to access level functionality shall be brought to the attention of the NYULH facility management team for verification.

- a) Access Level No. 1: Account Login with No Privileges (Note: This access level opens BACnet communication port for third-party companies, such as Utilivisor, to be continuously logged in for data extraction and collection).
- b) Access Level No. 2: View only (e.g., nurses are allowed to view space conditions).
- c) Access Level No. 3: Access Level No. 2 and trend and alarm viewing.
- d) Access Level No. 4: Access Level No. 3, trend/alarm creation and modifications of set points, start/stop commands, etc.

- e) Access Level No. 5: Access Level No. 4 and edit/create display privileges (i.e., graphics).
- f) Access Level No. 6: Access Level No. 5 and device manager viewing.
- g) Access Level No. 7: Access Level No. 6 and DDC software program read-only privilege.
- h) Access Level No. 8: Access Level No. 7 and priority array point override privilege (Note: This requires highest security level privilege set, but does not necessarily grant all privileges.)
- i) Access Level No. 9: Access Level No. 8 and complete privilege set (e.g., ability to modify device manager table [add/remove controllers], modify/upload DDC software programs, trend/alarm handler creation).
- j) Access Level No. 10: Access Level No. 9 and user account modifications/creations.

II. Username and Password

Each user should be assigned a specific username and password for the purposes of activity tracking. In order to gain access into the building automation system, each individual user is required to have a unique login ID and password. The user's password is to be kept confidential and MUST NOT be shared with any third party including management and supervisory employees. All users must comply with the following rules regarding the creation and maintenance of passwords where technically feasible:

a) Password must not be found in any English or foreign dictionary.

b) Passwords should not be posted on or near computer terminals or otherwise be readily accessible in the area of the terminal.

c) Passwords must contain a minimum of eight (e) characters.

d) The password must contain characters from at least three of the following four (4) categories:

- English uppercase characters (A - Z)
- English lowercase characters (a - z)
- Base 10 digits (0 - 9)
- One special character Ex: !@#

M. Power Requirements

I. Emergency/Standby Power Requirement

Regardless whether the equipment (e.g., air handling unit, chiller, etc.) served by the controller is powered by normal power or emergency/standby power, the controller shall be powered by emergency/standby power. For projects where emergency/standby power is not available, notify the NYULH facility management team that emergency/standby power is not available for controller use. NYULH will provide direction.

N. Product Standards

I. Management and Automation Devices

a. Rack Mount Servers

~~Furnish and install a server to meet Specification requirements:~~

- ~~● PC-based rack mounted server~~
- ~~● Quad Core Intel Xeon E5-4655 microprocessor operating at 3.0 GHz, 4MB Cache and 1333 MHz FSB~~
- ~~● 16 GB DD4 (2x8GB) Single Rank DIMMS~~
- ~~● 1 TB (minimum) internal hard disk drive (10,000 RPM) with Data Burst Cache (provide three hard disk drives per server)~~
- ~~● One 48 by 28 by 48 IDE CD-RW drive with 700 MB media data capacity~~
- ~~● ISA expansion bus with three spare expansion slots~~
- ~~● One 16X DVD Burner drive~~
- ~~● 4 USB 3.0 ports with additional 4 USB 2.0 ports~~
- ~~● Three (3) Integrated 10/1000 LAN (RJ-45) network interface ports~~
- ~~● Windows Server Standard~~

Furnish and install a server to meet the minimum specification requirements:

- 2U Rack mounted server
- Intel Xeon 5217 8 Core/16 Threads at 3.0 GHz or comparable
- 64 GB DDR4 (4x16GB) Dual Rank RDIMMs @ 2666MT/s
- 2 TB (minimum) of internal storage capacity in RAID 1 Configuration (SAS Drive)
- One DVD+/-RW
- Intel X550 Quad Port 10GbE BASE-T or comparable
- Redundant Power Supply
- Windows Server 2016 Standard or newer
- Microsoft SQL Server 2016 or newer
- Windows Office Suite
- iDRAC9 Enterprise or comparable
- ESET Anti-Virus

b. Tower Server

Furnish and install a server to meet the minimum specification requirements:

- Intel Xeon 5217 8 Core/16 Threads at 3.0 GHz or comparable
- 64 GB DDR4 (4x16GB) Dual Rank RDIMMs @ 2666MT/s
- 2 TB (minimum) of internal storage capacity in RAID 1 Configuration (SAS Drive)
- One DVD+/-RW
- Dual Port 1GbE BASE-T or comparable
- Redundant Power Supply
- Windows Server 2016 Standard or newer
- Microsoft SQL Server 2016 or newer
- Windows Office Suite
- iDRAC9 Enterprise or comparable
- ESET Anti-Virus

c. Micro Form Factor Server – Requires Approval

Furnish and install a server to meet the minimum specification requirements:

- Intel Core i7-10700T 8 Core/16 Threads or comparable
- 32 GB DDR4 (2x16GB)
- 1 TB (minimum) of internal storage capacity (Solid State Drive)
- Minimum of 4 USB Ports
- One integrated 1GbE BASE-T network port
- Windows 10 Professional 64 bit
- Windows Office Suite
- ESET Anti-Virus

b.d. Operator Workstation

Each operator workstation shall function as the primary means of overall system control and monitoring. The computer equipment shall be arranged to present an efficient and organized appearance. The following components shall be located with the workstation:

- PC-based computer
- LED type Full HD graphic monitor (minimum 24 in) with ~~additional~~-HDMI, ~~DVI and VGA port and Displayport~~ connections
- USB 104- key keyboard
- USB two button optical mouse and scroll wheel

Furnish and install a workstation to meet Specification requirements:

- ~~Quad Core Intel i5 or i7 microprocessor operating at 3.0 GHz with TurboBoost Technology~~
- ~~8 GB DDR4 (2x4GB) Single Rank DIMMS~~
- ~~1 TB (minimum) internal hard disk drive (10,000 RPM) with Data Burst Cache~~
- ~~One 48 by 28 by 48 IDE CD-RW drive with 700 MB media data capacity~~

- ~~• ISA expansion bus with three spare expansion slots~~
- ~~• 2 USB 3.0 ports with additional 2 USB 2.0 ports~~
- ~~• Support for minimum three (3) monitors via DisplayPort~~
- ~~• One (3) Integrated 10/1000 LAN (RJ-45) network interface ports~~
- ~~• Windows 7 Professional 64 bit~~
- Intel Core i5-10500T or comparable
- 16 GB DDR4 (1x16GB)
- 256GB of internal storage capacity (Solid State Drive)
- Minimum of 4 USB Ports
- Support for minimum two (2) monitors via DisplayPort
- One integrated 1GbE BASE-T network port
- Windows 10 Professional 64 bit Version 1903
- Windows Office Suite
- PDF Reader
- ESET Anti-Virus

e.e. Portable Operators Terminal Laptop

A portable operator's terminal shall consist of a laptop computer furnished with all required operating system and dynamic software package to provide all functionality and access all graphics and data available at a typical workstation:

- ~~• Quad Core Intel i5 or i7 microprocessor operating at 3.0 GHz with TurboBoost Technology~~
- ~~• 8 GB DDR4 (2x4GB) Single Rank DIMMS~~
- ~~• 1 TB (minimum) internal hard disk drive (10,000 RPM) with Data Burst Cache~~
- ~~• Integrated ATI Radeon Xpress card with HyperMemory~~
- ~~• One 48 by 28 by 48 IDE CD-RW drive with 700 MB media data capacity~~
- ~~• One DVD/CD-RW combo drive~~
- ~~• 2 USB 3.0 ports with additional 2 USB 2.0 ports~~
- ~~• One (3) Integrated 10/1000 LAN (RJ-45) network interface ports~~
- ~~• Wireless Interface Card – 802.11n~~
- ~~• Windows 7 Professional 64 bit~~
- ~~• Carrying case with additional wireless mouse~~
- 15 inch display
- Intel Core i5-10400H or comparable
- 16 GB DDR4 (1x16GB)
- 256GB of internal storage capacity (Solid State Drive)
- Minimum of 4 USB Ports
- One integrated 1GbE BASE-T network port
- Wireless Interface Card – Wi-Fi 6 802.11ax
- Windows 10 Professional 64 bit Version 1903
- Windows Office Suite
- PDF Reader
- ESET Anti-Virus
- Carrying case with additional wireless mouse

d.f. Direct Digital Controller (DDC)

- Stand-alone microprocessor board with ROM and full custom programmable RAM, EPROM, and/or EEPROM memory, integral interface equipment and power surge protection. DDC controller shall be connected directly to sensors, controlled devices, and the communication network
- All DDC controllers shall use the latest version of ANSI/ASHRAE Standard 135 BACnet standard for communications, have passed BTL certification as available and be listed as compliant with UL916 Standard for Energy Management Equipment. DDC controllers used in smoke control applications must also be listed as compliant with UL864 Standard for Control Units and Accessories for Fire Alarm Systems.
- DDC controllers shall be listed by BACnet Testing Laboratories (BTL) as conforming to the required standard device profile and support all of the minimum required BACnet Interoperability Building Blocks (BIBBs) associated with this device profile.
- Each DDC controller shall support firmware upgrades with the need to change hardware.
- Each DDC controller shall continuously perform self-diagnostics, communication diagnosis, and diagnosis of all panel components. The DDC controller shall provide local and remote annunciation of all detected component failures, low battery conditions or repeated failure to establish communication for any system.
- DDC controller types shall be one of three types, a Building Controller (BC), an Advanced Application Specific Controller (AAC) or an Application Specific Controllers (ASC).
 - Building Controllers (BC) shall be used for all major mechanical equipment and/or systems (i.e. chilled water, heating hot water, AHU's, etc.).
 - Advanced Application Specific Controllers (AAC) shall be used, as an extension of a B-BC's performance & capacity, for control of all medium and small mechanical systems and/or terminal equipment.
 - Application Specific Controller (ASC) shall only be allowed to be used on terminal equipment including VAV boxes, FCU's, etc.

e.g. Building Supervisory Controller (BSC)

- Provide controllers conforming to the latest version of ANSI/ASHRAE 135 Building controllers standard device profile and support all of the minimum required BACnet Interoperability Building Blocks (BIBBs) associated with this device profile.
- Controllers shall support Internet Protocol (IP) for communication to other BCs, the BMS front-end and MS/TP communication to AACs and ASCs.
- Controllers shall have a 32 bit microprocessor with an EEPROM, flash driven operating system. They shall be multi-tasking, multi-user, real-time digital control processors and permit I/O expansion for additional control/monitoring points.

- Controllers shall have sufficient on-board storage to fully meet the requirements of this specification. Controllers shall be fully programmable while supporting standard energy management system functions, including by not limited to:
 - Alarm Detection and reporting
 - Scheduler based: Calendar based, Holiday or Event
 - Close Loop PID control
 - Duty Cycling
 - Equipment Scheduling, Optimization and sequencing
 - Event Scheduling
 - Historical Trend Collection
 - Logical Programming
 - Reset Schedules
 - Night setback control
 - Peak Demand Limiting (PDL)
 - Start-Stop Time Optimization (SSTO)
 - Temperature-compensated duty cycling
 - Temporary schedule override
- Provide controller with integral power switch with separate dedicated transformer and switch within each enclosure for each controller present.
- The operator shall have the ability to manually override automatic or centrally executed commands at the Building Controller via local, point discrete, hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points. These override switches shall be operable whether the panel processor is operable or not.
- Controllers shall provide local LED status indication for power, communications, status and each digital output for constant, up-to-date verification.
- All points associated with a given mechanical system (i.e. air handling unit) will be controlled from a single Building Controller or point expansion panel(s) from the respective master. All expansion modules shall be located in the building controller enclosure or an attached enclosure. No points from a given mechanical system may be distributed among multiple panels – points must be run back to a single Building Controller dedicated to that mechanical system. Multiple mechanical systems shall be allowed on a single control. Closed-Loop control must never depend upon network communications. All inputs, program sequences, and outputs for any single DDC control loop shall reside in the same Building Controller.
- Historical data collection utilities shall be provided for manual or automatic sampling, storing and displaying system point data.
- Controllers shall also provide high resolution sampling capability for verification of control loop performance. Operator-initiated automatic and manual loop tuning algorithms shall be provided for operator-selected PID control. Provide capability to view or print trend and tuning reports.

- Loop tuning shall be capable of being initiated either locally at the Building Controller or from a network workstation. For all loop tuning functions, access shall be limited to authorized personnel through password protection
- Upon full system power recovery (e.g. emergency power backup), controller's clock shall be automatically synchronized and all controlled equipment shall be automatically re-started based on correct clock time and sequence of operation.
- Provide additional controllers or I/O modules if necessary in each DDC panel so that each panel has at least 20% spare universal I/O capacity for connection of future points. Provide all processors, power supplies, and communication controllers so that the implementation of adding a point to the spare point location only requires the addition of the appropriate expansion modules, sensors/actuators and/or field wiring/tubing.
- Controllers shall provide at least one data communication port for operation of operator I/O devices such as portable laptop operator's terminals. Controllers shall allow temporary use of portable devices without interrupting the normal operation of permanently connected printers or terminals.
- Field bus adaptors may be used, as an extension of the BC, to facilitate communication between BC and remote field devices (sensors, actuators). Adaptors shall be microprocessor based and utilize advanced diagnostics and configuration. Adaptor shall be securely housed in BMS panel.

f.h. Advanced Application Specific Controller (AAC)

- Provide controllers conforming to the latest version of ANSI/ASHRAE 135 BACnet Advanced Application Specific Controllers (AAC) standard device profile and support all of the minimum required BACnet Interoperability Building Blocks (BIBBs) associated with this device profile.
- Controllers shall support MS/TP (Master Slave Token Passing) communication to BCs and other AACs and ASCs. Also acceptable are AAC controllers that support Internet Protocol (IP) for communications to other BCs/AACs and the BMS front-end and MS/TP communication to AACs/ASCs.
- Controllers shall be a microprocessor-based, 32 bit, multi-tasking, real-time digital control processor capable of stand-alone operation for medium sized mechanical systems and/or control of roof-top units, VAV terminal units, CAV terminal units, dual-duct terminal units, fan-coil units, heat pump units.
- If the hardware point requirements of any medium-sized should exceed the I/O configuration of available AAC offerings then a BC must be used. Control of one piece of mechanical equipment may not be performed by more than one controller.
- Controllers shall be peer-to-peer devices with hand/off/auto switches for each digital output. Switch position shall be supervised in order to inform the system that automatic control has been overridden. Switches will only be required for non-terminal applications (not required for VAVs, CAVs, and other above terminal devices). All inputs and outputs shall be universal type allowing for additional system flexibility.

- Controllers shall support its own real-time operating system. Controllers without real-time clock functionality will only be permitted for use on terminal and unitary equipment such as VAVs and CAVs boxes and fan coil units.
- Controllers shall have sufficient memory to accommodate point databases, operating programs and graphical files. All databases and programs shall be stored in non-volatile EEPROM. The controllers shall be able to return to full normal operation without user intervention after a power failure.
- Controllers must be fully programmable. All programs shall be field-customized to meet the user's exact control operation requirements. Controllers utilizing pre-packaged or canned programs shall not be acceptable.
- All points used for a single mechanical system shall be connected to the same AAC. Following points are exempt from this requirement:
 - Control Loops reset based on outside air or space/zone temperature
 - Remote Differential pressure sensors on slow acting control loops
- Provide spare additional I/O such that future use of spare capacity shall require providing only the field device, field wiring, point database definition and operational sequence programming changes as required. Additional point modules may be required to implement use of these spare points.
 - Provide at least 15% spare capacity universal I/O of the total capacity of each AAC
 - If AAC is not universal then provide at least one (1) spare analog input, one (1) spare digital input, one (1) spare analog output and one (1) spare digital output with 15% additional spare I/O capacity.

g.i. Application Specific Controller (ASC)

- Provide controllers conforming to the latest version of ANSI/ASHRAE 135 BACnet Advanced Application Specific Controllers (AAC) standard device profile and support all of the minimum required BACnet Interoperability Building Blocks (BIBBs) associated with this device profile.
- Controllers shall support MS/TP (Master Slave Token Passing) communication to BCs and other AACs and ASCs.
- Controllers shall be a microprocessor-based, 32 bit, multi-tasking, real-time digital control processor capable of stand-alone operation for medium sized mechanical systems and/or control of roof-top units, VAV terminal units, CAV terminal units, dual-duct terminal units, fan-coil units, heat pump units and rooftop units.
- Each controller shall be capable of sharing point information with other BC, AAC or ASC on a peer to peer basis via the BACnet network.
- Controllers shall include all point inputs and outputs necessary to perform the specific control sequences. All inputs and outputs shall be of the universal type (outputs may be utilized either as modulating or two-state). Analog outputs shall be industry standard signals such as 24V floating control and 0-10 VDC allowing for interface to a variety of modulating actuators.

- Controllers shall have sufficient memory to accommodate point databases, operating programs and graphical files. All databases and programs shall be stored in non-volatile EEPROM. The controllers shall be able to return to full normal operation without user intervention after a power failure
- Each controller shall perform its primary control function independent of other DDC controller communications, or if communication is interrupted. Reversion to fail-safe mode of operation during network interruption is not acceptable. Controller shall receive its real-time data from the Building Controller time clock to insure network continuity.
- Each controller shall include algorithms incorporating proportional, integral and derivative (PID) values for all applications. All PID values and biases shall be field-adjustable by the user.
- Controllers shall provide diagnostic LEDs for power, communications and processor status. The controller shall continually check the status of its processor and memory circuits.
- All points used for a single mechanical system shall be connected to the same AAC.
- Controllers shall perform and manage historical data collections. Minimum sampling time shall be configurable with a sample rate of once per second. Controller shall store point history files for all analog and binary I/O's

Equipment	Alerton	Automated Logic Corporation
Air Handling Unit and Return/Spill Fan	V LX A CM and expanders	OFB BC/ OF 1628 with Expanders (Always routers) ME line with expanders. Include an AMR or ME-LGR if integration to VFD's is required.
Variable Air Volume Terminal Unit, Constant Volume Terminal Unit, Fan-Powered Variable Air Volume Terminal Units	V LC-853 V IP with separate DP sensor and actuator	OF 683T-2E or equivalent (IP Controllers) ZN 253 with separate DP sensor and actuator, or ZN 341v+ if separate sensors are not required, or SE line controller if fan-powered
Heating and Ventilation Units	V LX A CM with expanders	OFB BC/ OF 1628 with Expanders (Always routers) SE 6166- include AMR or switch to ME-LGR/expanders if integration to VFD's is required.
Exhaust Fans	V IP/ A CM with Expanders V LC-550 (constant speed) V LX (if analog output to VFD is required)	OF 1628 or SE equivalent for OF line. ZN 551- include AMR if integration to VFD's is required.

Equipment	Alerton	Automated Logic Corporation
Packaged Air Conditioning Units	VLC-550 or VLC-853 depending on scope VIP	OF683T-2E or equivalent (IP Controllers) ZN551 or ZN253.
Primary Chilled and Condenser Water System	ACM and expanders VLX and expanders depending on final point count	OFBBC/OF1628 with Expanders (Always routers)ME-LGR and expanders.
Hot Water Systems	ACM and expanders VLX and expanders, depending on final point count	OFBBC/OF1628 with Expanders (Always routers)SE6166 (lower point count) or ME-LGR and expanders (higher point count or integration to VFD's).
Secondary Water Systems	ACM and expanders VLX and expanders, depending on final point count	OFBBC/OF1628 with Expanders (Always routers)SE6166 (lower point count) or ME-LGR and expanders (higher point count or integration to VFD's).

h.j. Controllers used for Air Terminal Units (VAVs, CAVs, dual duct mixing boxes)

- Controllers shall perform and manage historical data collections. Minimum sampling time shall be configurable with a sample rate of once per second. Controller shall store point history files for all analog and binary I/O's
- Controller shall have an internal differential pressure transducer(s) capable of utilizing the total and static pressure signals from the air terminal unit's velocity sensor. Transducer shall be capable of 10% accuracy throughout its range.
- Each controller shall have electronic outputs compatible with the electronically operated air terminal units reheat coil and/or perimeter radiation control valve, where applicable.
- Provide a discharge air sensor, mounted on the discharge of the terminal box reheat coil interfaced with the controller.
- DDC terminal controller used in the following critical pressurized rooms shall **not** be permitted to modulate the terminal unit damper as part of a regular calibration cycle:
 - Operating Rooms/ Procedure Rooms/ Delivery Rooms
 - Cardiac Cath./ Angiography/ Interventional Radiology Rooms
 - Airborne Infection Isolation Rooms
 - Laboratory and Pharmacies
 - Central Sterile Processing/Instrument Processing
 - Biosafety Laboratory (BSL) and Vivarium
- Controllers shall be furnished in metal enclosure, complete with conduit knockouts.

i.k. BACnet IP Routers

- BACnet router between MS/TP and B/IP (BACnet over IP) as well as a BBMD (BACnet Broadcast Management Device) for transportation of BACnet broadcasts over an IP network with several subnets.
- Routers shall comply with the latest version of ASHRAE Standard 135 for communications.
- Routers shall be UL864 listed when connected to BACnet MS/TP network segments that contain UL864 listed devices being used in a smoke control application.
- Device shall be capable of routing BACnet packets over Layer 3 IP network and shall support both the router and BBMD networking options. BBMD shall support registration of Foreign Devices.
- Devices shall be password protected with additional security settings.

j.l. Controller Power Supplies

- Power to controllers and associated controlled devices shall be 24 VAC. Power source (i.e. normal vs. emergency power) shall match that of the equipment and/or system being controlled.
- Systems (AHU's, Chillers, etc.) that are fed from emergency power sources shall have their associated DDC controllers and DDC devices fed from the same emergency source.
- Each DDC panel shall be furnished with a line filter, surge suppressor, electrical breakers, control fuse and control transformer.
- Provide insulated, clamp style terminal blocks for the termination of all fields wiring in control enclosures. Field wiring to equipment with integral terminals and/or unitary equipment (i.e. VAVs, CAVs, etc.) shall not be required to have terminal blocks.

II. Field Devicesa. General

All field devices must be labeled with tag matching "as-built" document. Label shall be adhesive type, 12 mm width with black lettering on white background.

Wall-mounted devices (i.e., temperature, humidity and CO2 sensors) must be sealed at point of connection to wall such that no air from wall cavity will enter sensor enclosure. Sensors shall be installed in vaporproof enclosure. Seal conduit with duct seal putty as manufactured by Rainbow Technology. Wire jacket/insulation shall be compatible with duct seal putty.

All Air Handler mounted controls shall be located on the outside of the unit.

All safety devices and relays shall be wired such that on a failure of the safety device or relay the system shall stop.

Manufacturers listed below are preapproved by NYULH facility management team. Any deviations to the approved manufacturers must be approved by NYULH facility management team.

Control devices that are capable of manual reset shall be in an easily accessible location to allow for user access with use of a ladder.

b. Temperature Transmitters

Duct-mounted averaging-type sensors shall consist of a 1,000 ohm platinum RTD averaging element, transmitter and weather-resistant electrical box for wiring connections. RTD accuracy shall be $\pm 0.5^{\circ}\text{F}$. Transmitter shall provide 2-wire, 4 - 20 mA DC output linear over specified temperature range, with an accuracy of 0.2% over the calibrated span. Probe length shall be 1 linear foot per 1 square foot of duct area. If sensing probe is of insufficient length to fully cover coil area, provide multiple sensors. Coil-mounted averaging sensors must be mounted as per manufacturer's recommendations. Capillary shall be fastened utilizing capillary holder mounting clip (similar to Johnson Controls TE-6001-8 mounting bracket) to prevent damage to sensor and ensure appropriate radius bend where sensor changes direction. Installer must coordinate the mounting hardware radius with the averaging sensor minimum radius required. Capillaries must be installed such that the capillary or averaging sensor can be replaced without removing multiple devices. Transmitter shall be as manufactured by ACI Model A/1K Series (RTD) and Kele Model T85 transmitter.

Duct-mounted non-averaging-type sensors shall consist of a 1,000 ohm platinum RTD mounted on an 18 inch probe, transmitter and NEMA 3R electrical box for wiring connections. RTD accuracy shall be $\pm 0.5^{\circ}\text{F}$. Transmitter shall provide a 2-wire, 4 - 20 mA DC output linear over specified temperature range with an accuracy of $\pm 0.2\%$ over the calibrated span. Probe length shall be half the length of the duct. Transmitter shall be as manufactured by ACI Model A/1K-2W-D-8-GD (RTD) and Kele Model T85 transmitter.

Liquid insertion-type sensors shall consist of a 1,000 ohm platinum RTD, transmitter and electrical box for wiring connections. RTD accuracy shall be $\pm 0.50^{\circ}\text{F}$ at 32°F . Transmitter shall provide a 2-wire, 4 - 20 mA DC output linear over specified temperature range with an accuracy of $\pm 0.2\%$ over the calibrated span. Transmitter shall be as manufactured by ACI Model A/1K (RTD) and Kele Model T85 transmitter, with sensor mounted in a thermowell.

Sensors for duct locations shall not be affected by vibrations encountered in normal duct systems.

Space sensors shall be designed for wall-mounting in a decorative ventilated enclosure and consist of a 1,000 ohm platinum RTD element, transmitter and electrical box for wiring connections. Sensor accuracy shall be $\pm 0.5^{\circ}\text{F}$. Transmitter shall provide 2-wire, 4 - 20 mA DC output linear over temperature range of 0 to 100°F , with an accuracy of $\pm 0.2\%$ over the calibrated span.

Transmitter shall be as manufactured by ACI Model A/1K (RTD) and transmitter shall be as manufactured by Kele Model T85 transmitter.

All space temperature sensors/thermostats located in occupied areas shall be indicating and adjustable type. Set point adjustment shall be software-limited (minimum and maximum set points) via manual command at operator workstation. Space temperature sensors/thermostats located in transient areas such as corridors shall be non-indicating and non-adjustable.

Temperature sensors used in preheat coil low-limit applications shall be installed to cover the entire coil area. Refer to probe length vs. coil area requirements of duct-mounted averaging-type sensors listed above. Multiple sensors shall be provided as required by coil areas. Each individual coil section shall be provided with individual temperature sensors. Where multiple sensors are required for a single coil section, a DDC software program shall “average” the multiple sensors.

Transmitter maximum spans shall be (normal operating point at mid-scale):

- Room temperature: 50°F.
- Chilled water: 50°F.
- Condenser water: 50°F.
- Hot water: 100°F.
- Duct Air Temperature
 - Heating: 100°F or as required by maximum duct temperature.
 - Cooling: 50°F.
- Outside air temperature: 150°F (-30°F to 120°F).

c. Thermistors

Manufacturer’s standard thermistor temperature-sensing elements are only acceptable for use serving space temperature monitoring of VAV terminal units.

The use of thermistors shall not be acceptable for other air and water applications.

All space temperature sensors/thermostats located in occupied areas shall be indicating and adjustable type. Set point adjustment shall be software-limited (minimum and maximum set points) via manual command at operator workstation. Space temperature sensors/thermostats located in transient areas such as corridors shall be non-indicating and non-adjustable.

d. Static Pressure Transmitters

Duct static pressure transmitters shall consist of static pressure probe, transmitter and electrical box for wiring connections. The static pressure probe shall extend across the width of the duct. Duct wall pressure taps shall be acceptable. Reference pressure-sensing connections to duct static pressure transmitters shall be made through an ambient pressure probe or chamber that shall minimize effects of air disturbances and maintain a steady, uniform

reference pressure. Transmitter shall provide 2-wire, 4 - 20 mA DC output linear over a specified pressure range, with an accuracy of $\pm 0.4\%$ of span. Transmitter range shall be selected to ensure that the normal set point is in the center of the device range. Device shall be capable of withstanding the maximum pressure that could occur at the location. Transmitter shall be Setra Model 264. Probe shall be A-300-K series as manufactured by Kele.

e. Protective Thermostats and Detectors

Electric low-temperature (freeze protection) thermostats shall have 20 foot capillary (not averaging type) installed to cover the entire length of coil vertically and horizontally, leaving 6 inches from each edge of coil. The maximum vertical distance between each pass of thermostat capillary shall be no more than 8 inches. Switch actuation shall occur if any 12 inch length of capillary senses a temperature below set point. Capillary length shall be 1 linear foot per 1 square foot of coil area. If capillary is of insufficient length to fully cover coil area, provide multiple sensors. If multiple thermostats are provided, each thermostat shall only cover its percentage of coil. For example, if there are two (2) thermostats, each covers 50%. If there are four (4) thermostats, each covers 25%. Capillaries must be mounted as per manufacturer's recommendations. Capillary shall be fastened utilizing capillary holder mounting clip (similar to Johnson Controls TE-6001-8 mounting bracket) to prevent damage to capillary and ensure appropriate radius bend where capillary changes direction. Installer must coordinate the mounting hardware radius with the capillary minimum radius required. Capillaries must be installed such that the capillary can be replaced without removing multiple devices. If one (1) thermostat is not sufficient to provide adequate coverage of coil, furnish and install additional thermostats to provide sufficient coverage. Sufficient coil coverage shall be field-verified by the Engineer. These thermostats shall be 2-position automatic-reset type. The elements shall be suspended at least 6 to 8 inches downstream of the preheat coils. Thermostats shall be automatic-reset type. Furnish a hardwired time-delay relay to delay fan shutdown and alarming at the workstation for 180 seconds (adjustable), unless otherwise stated. For all low-temperature thermostat capillaries, provide manufacturer-specific capillary supports to prevent unnecessary capillary crimping.

f. Relative Humidity Transmitters

Duct-mounted relative humidity transmitter shall provide 4 - 20 mA linear DC output corresponding to a range of 0 to 95% RH. Calibrated end-to-end accuracy shall be ± 3.0 RH over the range of 0 - 90% RH at 20°C. Transmitter shall be manufactured by Vaisala HMD 60 Series.

Space relative humidity transmitter shall provide a 4 - 20 mA linear DC output corresponding to the range of 0 - 95% RH. Calibrated end-to-end accuracy shall be $\pm 3.0\%$ RH over the range of 0 - 90% RH at 20°C. Transmitter shall be manufactured by Vaisala HMD/60U Series.

g. Thermowells

Thermowells shall be Type 304 stainless steel, tapered pattern, 3/4 inch NPT external process connection, 1/2 inch NPT internal thread, with lagging extension, equal to insulation thickness where installed in insulated piping. Thermowells shall have an insertion length of at least 1/3 of pipe diameter but in no case shall wells be less than 4-1/2 inch insertion length. Maximum immersion length shall be 6 inches or 3/4 of pipe diameter, whichever is smaller. Thermowells shall be rated for maximum system operating pressure, temperature and fluid velocity.

Internal bore of thermowells shall be sized to exactly fit the diameter of the sensing element to be installed. Well shall be provided thermal conductive grease/paste to improve conductivity.

Thermowells to be provided with thermal grease to improve thermal conductivity.

h. Differential Pressure Transmitter (Serving Flow-Tracking Supply, General Exhaust and Fume Hood Exhaust Terminal Units)

Electronic differential pressure transmitter capable of transmitting a 0 - 10 or 0 - 5 VDC output signal. Transmitter accuracy shall be $\pm 0.4\%$ of full scale. Span shall be matched for a specific cfm range, plus ten percent (10%) overpressure. Transmitter zero and span shall be field-adjustable. Transmitter shall be Ashcroft CLXdp.

i. Differential Pressure Transmitter (for Air Conditioning Systems with Piezo Rings Only)

Electronic differential pressure transmitter capable of transmitting a 4 to 20 mA DC output signal. Transmitter accuracy shall be $\pm 0.5\%$ of span, including non-linearity, hysteresis and repeatability. Span shall be matched for a specific cfm range, plus ten percent (10%). Transmitter shall be Dwyer Model 603A, Air Monitor Veltron DPT 2500 Ultra. The inlet conditions to the box must contain a minimum of 3 diameters of unobstructed straight duct.

j. Airflow-Measuring Stations (Differential Pressure Type)

1) Fan Inlet Type

Airflow-measuring stations shall be Air Monitor Corporation, Volu-Probe FI Airflow Traverse Probe or Tek-Air Systems VT-5000. Airflow measurement accuracy shall be $\pm 2\%$ of actual flow. The maximum allowable unrecovered pressure drop caused by the station shall not exceed 0.085 in. w.c. at 2,000 fpm or 0.30 in. w.c. at 4,000 fpm.

Each airflow-measuring station shall be furnished with an electronic differential pressure transmitter capable of transmitting a 4 - 20 mA DC output signal. Transmitter accuracy shall be $\pm 0.5\%$ of span, including linearity, hysteresis and repeatability. Repeatability shall be $\pm 0.5\%$ of span. The transmitter shall be capable of being field-recalibrated for a different span within its range limits. Span shall be matched for a specific cfm range,

plus ten percent (10%) transmitter zero, and shall be field-adjustable. Transmitter shall be Air Monitor Veltron Series 2500 Ultra.

2) Outdoor Airflow-Measuring Stations

Outdoor airflow-measuring stations shall consist of probe(s), transducer and monitor. The outdoor airflow-measuring stations' accuracy shall be $\pm 5\%$ of actual flow over a range of 200 to 1,000 fpm. The probe installation shall not produce any static barrier (resistance to airflow).

The probe(s) and the transducer shall be able to operate in a temperature range between -40°F to 120°F . The transducer and monitor shall be enclosed in a NEMA-4 enclosure.

The power supply voltage to the monitor shall be 24 VAC. The outdoor airflow-measuring station shall be capable of transmitting a 4 - 20 mA DC output signal. Outdoor airflow-measuring station shall be manufactured by Tek-Air Systems, Inc., Model IAQ-Tek or Air Monitor Corporation Model VOLU-flo / OAM.

k. Resistance Temperature Detectors (RTD)

For monitoring of temperature, use of an RTD as a direct signal input into the direct digital system is an acceptable alternate to a temperature transmitter, provided the accuracy is equal to that of the substituted transmitters. Hydronic Temperature measurement devices to be 3 or 4 wire 1/10 DIN RTD.

RTD's shall be manufactured by ACI or BAPI.

l. Differential Pressure Transmitters (Water)

Differential pressure transmitters shall be variable capacitance type arranged for 2-wire, 4 - 20 mA control signal output. Transmitter shall be enclosed in a gasketed, dust-free and watertight housing. All body cavities open to the process fluid shall be provided with drain ports at the cavity bottom and vent ports at the top of the cavity. Both drain and vent ports shall be a minimum 1/4 inch - 18 NPT. The transmitter shall have continuously adjustable (externally) zero and span.

The differential pressure range span shall be adjustable to permit maximum zero elevation of 600% of calibrated span and a maximum zero suppression of 500% of calibrated span. These adjustments shall be made within the transmitter housing without a change of parts. The transmitter shall be capable of sustaining differential pressures in either direction up to the body rating without damage to the instrument or a loss of accuracy or zero shift.

The transmitter shall be fully compensated for both process and ambient temperature variations and a calibrated accuracy of $\pm 0.25\%$ of calibrated span.

Transmitter shall be furnished complete with factory-mounted 3-valve manifold, manufactured by Anderson Greenwood & Co. Model MDP. Transmitter shall be Rosemount Model 2051C.

m. Current-Sensing Relays

Relay shall be field-adjustable for detecting AC current levels in equipment served. For belt-driven equipment, relay shall be adjusted to detect a belt break. Relay shall be non-latching and shall have no time delay. Nominal input voltage and current-sensing range shall be selected based on electrical characteristics of equipment served. Relay shall be installed on one (1) lead of the load side of motor feed. Relay contacts shall be Form C-rated for 5A at 120 VAC.

n. Differential Pressure Switch (Air)

Differential pressure switch diaphragm and calibration spring shall be housed in a plated enclosure with removable metal guard protecting the set point screw and snap-action switch terminations. Switch shall be provided with SPST NC contacts. Contact rating shall be 15A, 125 - 277VAC.

High- and low-sensing ports shall be ferrule-and-nut compression for 1/4 in. o.d. tubing. Provide angle tips for duct insertion.

Switch shall be automatic-reset type.

Switch shall be Cleveland Controls Model AFS Series.

o. Zone-Type Leak Detector

Leak detector shall provide zone detection of leaks utilizing cable installed in a perimeter or serpentine configuration. Sensing cable shall lie flat and be installed with hold-down clips. Cable shall be plenum-rated and UL 916-listed. Cable shall be available in lengths of 20, 25, 30, 35 and 45 feet. Power requirements shall be 24 VAC, 120 mA. Enclosure shall be NEMA 1. Output relays shall be 2 Form C, 3A rating at 24 VAC. Detector shall be manufactured by Liebert Model LT-460.

p. Point Type Leak Detector

Leak detector shall provide single-point detection of leaks. Sensing probe shall be gold-plated to prevent corrosion. Sensor shall be provided with adjustable mounting brackets to allow for height and leveling adjustment. Sensing probes shall be adjusted to 1/8 in. of floor. Power requirements shall be 24 VAC, 100 mA. Enclosure shall be NEMA 1. Output relays shall be 2 Form C, 3A rating at 24 VAC. Detector shall be manufactured by Liebert Model LT-410.

q. Carbon Dioxide Transmitter

The CO2 sensor/transmitter shall be capable of detecting carbon dioxide (CO2) in the range of 0 - 2,000 ppm.

The sensor/transmitter shall consist of a single wall-mounted assembly designed for direct wall-mounting or mounting on a standard junction box.

The transmitter shall be operated on 24 VAC, 50/60 Hz, 2W. The unit shall provide a 4 - 20 mA output-based CO2 signal.

Accuracy, including repeatability, non-linearity and calibration uncertainty shall be $\leq \pm 2.0\%$ of range.

Long-term stability shall be $\pm 5\%$ of range/5 years.

The response time of the CO2 sensor/transmitter shall be 60 seconds.

The CO2 sensor/transmitter sensor shall not need sample pumps or other flow devices.

Provide a calibration kit to the NYULH facility management.

Wall-mounted CO2 transmitter shall be mounted between 3 feet and 6 feet above the finished floor.

Transmitter shall be as manufactured by Vaisala Model GMD20 (duct-mounting) or GMW20 (wall-mounting).

r. Electromagnetic Meter (In-Line Flanged Type)

Provide an in-line flanged electromagnetic flow meter complete with integral or remote electronics module. The electronics module shall include a backlit graphic display and external keypad. The principle of operation shall be based of Faraday's Law of Electromagnetic Induction.

The flow meter shall be installed in accordance with the manufacturer's installation guide, including meter orientation and straight pipe recommendations. Connections to the piping shall be ANSI Class 150 flanges (ANSI Class 300 where required).

The flow tube shall be epoxy-coated steel; the sensing electrodes shall be 316SS; the liner shall be polypropylene or ebonite for low-temperature service, PTFE for hot water service (266°F maximum).

Each flow meter shall be individually wet-calibrated and accurate to within $\pm 0.2\%$ of reading from 1.6 to 33 feet per second velocity. A certificate of calibration shall be provided with each flow meter.

Output signals shall be 4 - 20 mA and programmable pulse. The flow meter shall be capable of measuring bi-directional flow. Each flow meter shall be factory-programmed for its specific application, and shall be reprogrammable using the integral keypad on the electronics module (no special interface device or computer required).

Each flow meter shall be capable of generating a 4 - 20 mA signal to the DDC system and provide a local display.

Each flow meter shall be covered by the manufacturer's two-year warranty.

Refer to Mechanical subsection for approved manufacturers.

s. Energy Btu Measurement System

Flow meters shall only be required on systems that have impacts on energy calculations or indirect cost recovery.

The entire energy Btu measurement system shall be built and calibrated by a single manufacturer and shall consist of a flow meter, two (2) temperature sensors, a Btu meter, temperature thermowells and all required mechanical installation hardware. The Btu meter and associated sensors and flow meter shall be installed in accordance with the manufacturer's installation guide.

The Btu meter shall provide the following points both at the integral LCD and as outputs to the direct digital control system: energy total, energy rate, flow rate, supply temperature and return temperature. Output signals shall be via protocol conforming to BACnet MS/TP.

Each Btu meter shall be factory-programmed and -tagged for its specific application, and shall be reprogrammable using the front panel keypad (no special interface device or computer required).

Temperature sensors shall be loop-powered current-based (mA) sensors and shall be bath-calibrated and matched (NIST-traceable) for the specific temperature range for each application. The calculated differential temperature used in the energy calculation shall be accurate to within + 0.15°F (including the error from individual temperature sensors, sensor matching, input offsets and calculations).

A certificate of NIST-traceable calibration shall be provided with each system.

Flow meter shall be in accordance with "In-Line Flanged Electromagnetic Flow Meters" as specified herein.

Btu meter shall a remote local display unit indicating flowrate.

All equipment shall be covered by the manufacturer's two (2)-year warranty.

Refer to Mechanical subsection for approved manufacturers

t. Steam Metering

Steam meter shall be insertion type vortex flowmeter or inline variable area or steam condensate meter depending on application. Steam condensate meters shall only be allowed when steam is not used for humidification. Meter shall be installed through a 2 inch isolation valve and furnished with a retraction tool for insertion and removal without process shutdown.

Meter pressure rating shall be up to 900 psi based on ANSI flange rating. Temperature range shall be -40 to 500°F. Meter shall be of all stainless steel construction. Meter mounting shall be 2 inch raised face ANSI rated flanges.

Meter installation shall be in accordance with manufacturer's requirements for straight run, orientation and alignment.

Meter electronics hardware shall be factory configured for each specific application. Electronics shall be integral mounted for meters installed which floor standing access. For all other applications electronics shall be remote mounting allowing for floor standing access. Meter electronics shall be grounded to earth ground via ground strap. Meter shall be powered by 24 VAC power supply.

Meter output shall be both 4 - 20 mA and pulse output.

Meter shall be provided with temperature and pressure transmitters for mass flow calculations.

Meter accuracy shall be $\pm 1.0\%$ of flowrate. Isolation valve shall be 2 inch double flanged raised-face full port gate valve.

Meter shall be supplied with Modbus/BACnet MS/TP or IP, three 4-20mA outputs, 1 pulse output.

Steam mass flow measurement devices must be specified based on steam pressure and expected steam flow range

Refer to Mechanical subsection for approved manufacturers

u. Room Pressure Monitors

Room pressure monitor shall include a bidirectional pressure sensor and wall-mounted digital interface module. Room pressure monitoring shall utilize differential pressure-sensing technology to display the respective room's differential pressure with reference to the entrance corridor. Differential pressure transmitter accuracy shall be $\pm 10\%$ of reading (± 0.00001 in. H₂O) and shall be bidirectional.

Room pressure monitor shall be designed to provide room pressure operating and alarm status, alarm indication and acknowledgment functions. Alarm set points and time delays, prior to alarming, shall be programmable. Once the alarm condition ceases to exist, the alarm and mute functions are reset automatically.

Status indicators shall be green for normal and red for alarm. Room pressure monitoring shall include audible alarm.

Monitor shall be provided with a silence pushbutton to deactivate the alarm horn during an alarm condition.

Room pressure monitor shall be located outside of room served at entrance door.

Room pressure monitor shall interface to a dry contact input from door position contact. Provide a door position switch for each door serving the room. Switches shall be wired in series and provide an input to the room pressure monitor. In addition, provide a local alarm light, horn and silence switch located within the room served. Horn and light shall be activated if a door is maintained in the open position for a continuous 3 minute time period. Silence switch shall allow the user to silence the horn; however, the light shall remain energized until the door is closed.

Room pressure monitors shall be TSI RPM-10/20 or the LCS pressure display with Ashcroft. If project has multiple rooms requiring pressure monitoring, monitoring shall be capable from one monitor. Multiple room monitoring only applies to auxiliary rooms not separate rooms or Operating Rooms/OR support spaces.

v. Oxygen-Monitoring System Serving MRI Equipment Rooms and MRI Rooms

Oxygen-monitoring system shall be a sample draw monitoring system that alerts and alarms when oxygen levels fall below safe limits for human health. The oxygen-monitoring system shall consist of a zirconium oxide sensor that has a 10-year service life. The sensor shall not require a reference gas for calibration and shall operate in nitrogen environments of up to 100%.

Sensor shall not be affected by temperature or pressure drift. Monitoring system shall contain built-in flow sample pump and on-board CPU with back-lit display and built-in adjustable alarm relays.

Flow pump shall continuously sample air drawn from end points up to a maximum of 100 feet from the pump. Sample tube shall be made of transparent polyurethane 1/4 in. (7 mm) in diameter. Tube end shall be positioned near the ceiling of the space being monitored.

Oxygen-monitoring system shall be provided with polycarbonate case with wall-mounted accessory. System to include a 4 - 20 mA analog output and two (2) alarm levels, user-selectable relay contacts and a fault relay for interface with direct digital control system. Oxygen-monitoring system shall be CE-, UL- and CUL-listed.

Accuracy shall be $\pm 1.0\%$ of full scale. Range shall be 0 to 25%. Repeatability shall be 2% of reading. Response time shall be within 2 seconds of any change in oxygen. System shall be provided with a 24 VDC power supply.

Oxygen-monitoring system shall be Model OMS as manufactured by ETS-Lindgren.

III. Field Equipment Panels and Enclosures

a. General

- 1) The following shall be submitted by the controls contractor for approval by the design engineer & NYULH facilities management team:
 - i. Floor plan with proposed panel locations
 - ii. Panel control layout drawings – inclusive of all associated devices such as controllers, power supplies, relays, & terminal blocks.
- 2) The enclosure shall be made of steel or extruded aluminum with proper bracing for rigid wall or floor mounting. The enclosure shall not be attached to any piece of building equipment. All associated controller equipment shall be mounted in this enclosure such as controllers, power supplies, relays, switches, etc.
- 3) Hinged door shall contain a key-operated lock. Lock shall be a cam style, in order for all the cores to be accessed via a master key.
- 4) Each control device mounted within enclosure shall be marked with an engraved nameplate cross-referencing it to the control diagram.
- 5) Provide a nameplate for each enclosure, mounted on the face of the door, indicating the controller tag, device instance, system served and branch circuit number and electrical panel tag from which the enclosure is fed.
- 6) All control enclosures/panel have to be labeled with equipment tags that have controllers inside that enclosure.
- 7) Interconnections between internal devices and field wiring shall be neatly installed at terminal strips. Wiring shall be within plastic troughs. Wiring shall have identification sleeves at each termination at the terminal strip individually identified per control/interlock drawings, with adequate clearance for field wiring.
- 8) Enclosures shall be provided with space for future addition of instruments. Fully loaded enclosures shall not be acceptable. Enclosures shall be oversized by twenty-five percent (25%).
- 9) Separate terminal blocks shall be installed for 120 volt AC wiring and for low-level signal wiring within enclosures. Terminal blocks for line voltage wiring shall be separated from low-level signal wiring terminal blocks by a barrier partition.
- 10) Terminal blocks shall be 300 volt rated, medium-duty, channel-mounted, with numbered marking strips.

- 11) Each enclosure shall be provided with a plastic sleeve located on the inside of the door, which shall be used to contain “as-built” control diagrams serving the respective system. Plastic sleeve to contain controller directory indicating all input and output points labeled as per “as-built” drawings. Model: Hammond PKT99
 - 12) Field equipment panels located within building and not subject to outdoor environmental conditions shall be NEMA 12. Field equipment panels subject to outdoor environmental conditions shall be NEMA 4X with thermostatically controlled ventilation fan and electric heater.
 - 13) Enclosures shall be provided with all required transformers and fused disconnect ON/OFF power switches. Disconnect shall be used to disconnect all power serving the enclosure.
 - 14) All transformers shall be mounted within an enclosure. Transformers will not be permitted to be installed out of enclosures.
 - 15) Provide a 120 volt, 60 hertz duplex convenience outlet within each enclosure. Convenience outlet shall be provided with dedicated disconnect switch and fuse.
 - 16) All labeling of control devices, controllers, transformers, relays, wire tags, etc., shall match labeling on approved “as-built” drawings.
 - 17) Panel enclosures shall have a removable perforated backplane where all devices, din rail and Panduit shall be secured and mounted.
 - 18) Accepted manufacturers/Models:
 - a) Unity
 - b) Hoffman
 - c) Hammond
- b. Installation
- 1) Each control device (IE. Relays, fuses, etc.) mounted within enclosure shall be marked with an engraved nameplate cross-referencing it to the control diagram.
 - 2) Provide high quality sticker labels for each enclosure, mounted on the face of the door, indicating the controller tag, device instance, system served and branch circuit number and electrical panel tag from which the enclosure is fed.
 - 3) Interconnections between internal devices and field wiring shall be neatly installed at terminal strips. All wiring shall be within plastic panduits. Wiring shall have identification sleeves at each termination at the terminal strip individually identified per control/interlock drawings, with adequate clearance for field wiring

- 4) Separate terminal blocks shall be installed for 120 volt AC wiring and for low-level signal wiring within enclosures. Terminal blocks for line voltage wiring shall be separated from low-level signal wiring terminal blocks by plastic barrier partitions.
- 5) All transformers shall be mounted within panel/enclosure. Transformers will not be permitted to be installed outside of enclosures.
- 6) Enclosures shall be provided with space for future addition of controllers, relays, transformers, etc. Fully loaded enclosures shall not be acceptable.
- 7) All labeling of control devices, controllers, transformers, relays, wire tags, etc., shall match labeling on approved “as-built” drawings.
- 8) Provide a 120 volt, 60 hertz convenience outlet within each enclosure. Convenience outlet shall be provided with dedicated disconnect switch and fuse.
- 9) All conduit penetrations to enclosures shall be sealed by utilizing duct seal putty as manufactured by Rainbow Technology.
- 10) All conduit penetrations to enclosures shall be from the bottom or sides to prevent any liquids from draining into the pane. Conduit penetrations shall be sealed by utilizing duct seal putty as manufactured by Rainbow Technology. Wire jacket/insulation must be compatible with duct seal putty.
- 11) Each safety device serving a fan system (i.e., pressure switch and low-temperature thermostat) shall be wired to a 2-pole relay located in the controller enclosure. One (1) pole normally open of the relay shall be wired as a digital input to the controller serving the fan system identifying the specific alarm. The second pole, normally closed, shall be wired in series with the second pole of the relays serving other safety devices. The DDC controller shall provide a dedicated digital output, wired in series with all of the relay contacts, to stop the fan regardless of whether the fan is operating in the hand or auto position of a starter or hand, auto, inverter or bypass position of a variable frequency drive.
 - i. For pressure switch alarms, provide a manual reset pushbutton switch with indicating light, mounted on the face of the enclosure door. Pushbutton shall allow an operator to reset a pressure alarm. The system shall remain off until manually reset via the pushbutton.
 - ii. Low-temperature thermostat shutdowns shall be manually reset via operator command from a workstation.

IV. Miscellaneous Panel-Mounted Electrical Devices

a. Transformers

Transformer shall be 100 VA rated, 50/60 Hz with either foot or single thread hub mounting. Transformer shall be provided with circuit breaker for overcurrent protection. Operating temperature shall be -30 to 140°F. Mean time between failures shall be 100,000 hours at 77°F. Transformer shall be Class 2 UL 5085-3 listed.

Transformer shall be sized using following formula for optimal performance and overheat issues.

- 1) Control Panels: Total VA of all controllers in the panel on the same power loop x 1.5 = Transformer Size
- 2) Controllers with actuator: Total VA of all controllers and actuators on the same power loop x2 or x3 based on total devices = Transformer Size

b. Relays

General-purpose relays shall be rated for 10A switching capacity. Relays shall be configured with SPDT, DPDT, #PDT or 4PDT contact configurations based on application. Relays shall be provided with blade terminals for socket mounting. Maximum continuous applied voltage shall be 110% of rated voltage. Dropout voltage shall be thirty percent (30%) or more of rated voltage. Contact material shall be silver cadmium oxide. Contact resistance shall be a maximum of 50M ohms. Operating and release times shall be a maximum of 25 ms. Relays shall be manufactured by Idec Model RH series.

Time delay relays shall be provided with either on-delay, interval or off-delay timing functions. Adjustable timing ranges shall be from 0.1 second to 10 hours. Coils shall be rated for 24 or 120VAC, based on application. Relay type shall be DPDT. Input pulse time shall be 50 ms. Contact material shall be silver alloy. Mechanical life shall be 10 million operations at full load. Repeatability shall be 0.2%. Relay shall be Magnecraft Model TDR series.

c. Disconnect Switch

20 amp disconnect switch with duplex receptacle. Include indicating light and 10 amp fuse and 4 x 4 box with cover. Disconnect switch to be independently fused such that a blown fuse will not interrupt controller power.

V. Valves

a. Automatic Control Valves Serving Air Handling Unit and Heating and Ventilation Unit Heating and Cooling Coils

Automatic control valves shall be single-seated globe valves and shall have equal percentage flow characteristics unless specified otherwise. Control valves 2 inches and smaller shall have bronze bodies and stainless steel trim and stem. End connections shall be threaded. Control valves 2-1/2 in. and larger in a service where pressure does not exceed 125 psig at 350°F, or where steam pressure does not exceed 100 psig, shall have 125 pound cast iron bodies. Trim and stem shall

be stainless steel. End connections shall be flanged. Valves 2-1/2 in. and larger in a service where pressure does not exceed 250 psig at 400°F shall have 250 pound cast iron bodies. Trim and stem shall be stainless steel. End connections shall be flanged. Valves shall have sufficient stuffing box protection to ensure against leakage at hydrostatic head involved.

Single-seated valves shall meet ANSI Class IV leakage (0.01% of Cv).

b. Automatic Control Valves Serving Terminal Unit Reheat Coils, 2- and 4-Pipe Fan Coil Units, Perimeter Radiation, Chilled Beams and Radiant Panels

Valve shall be suitable for chilled and hot water service. Flow characteristic shall be equal percentage. Body shall be forged brass. Ball and stem shall be chrome-plated brass. Seat shall be fiberglass-reinforced Teflon PTFE. Valve shall be provided with characterized disk. Pressure rating shall be 600 psi for 1 in. valve and below, 400 psi for all others. Media temperature range shall be 0°F to 250°F. Leakage shall be ANSI Class IV. Valve actuator shall be spring-return type with 24 VAC power supply, 2 -10 VDC control signal and manual override.

1) General

Ball-type valves shall not be used for steam service.

Control valve operators shall be sized to close against a differential pressure equal to the design pump head plus ten percent (10%).

Valves shall be quiet in operation and fail-safe in either normally open or normally closed position in the event of power failure. All valves shall be capable of operating at varying rates of speed to correspond to the exact dictates of the controllers and variable load requirements. The valves shall be capable of operating in sequence with other valves and/or dampers when required by the sequence of operation. All control valves shall be sized by the control manufacturer and shall be guaranteed to meet the heating and cooling loads as scheduled. All control valves shall be suitable for the pressure conditions and shall close against the differential pressures involved. All valve operators shall be spring-return electrically actuated type. Body pressure rating and connection-type construction shall conform to fitting and valve schedules, as per the Heating, Ventilating and Air Conditioning subsection of the specifications.

Chilled water and hot water control valves shall have equal percentage flow characteristics. Steam control valves shall be single-seated type with linear flow characteristics. Preheater valves shall be normally open type and water heater valves shall be normally closed type. Whenever the steam flow rate is such as to require a single valve larger than 2-1/2 inches, provide two (2) valves in parallel, arranged to operate in sequence. Low-pressure (15 psig) steam valves shall provide tight closure at a pressure at least 10 psig higher than the normal maximum operating pressure.

Control valve shall be provided with a travel indicator (pointer) attached to the stem and a travel indicator scale attached to the yoke to indicate valve travel.

Control valves serving reheat coils shall be provided with normally closed spring-return actuators.

Preheat valves shall be normally open spring-return type. Chilled water and reheat valves shall be normally closed spring-return type. Steam valves serving steam-to-hot-water heat exchangers shall be normally closed spring-return type.

- 2) Control valves shall be sized using the following basic formulas:

Where:

Sub-Critical Flow

$$\text{Liquid: } CV = Q \sqrt{\frac{GF}{\Delta P}}$$

$$\text{Steam: } CV = \frac{W}{2.1 \sqrt{\Delta P(P1 + P2)}}$$

Critical Flow For Steam: ($\Delta P > P1/2$)

$$CV = \frac{W}{1.65 P1}$$

- CV = Valve flow coefficient
- GF = Specific gravity at flowing temperature (water = 1 @ 60°F)
- P1 = Upstream pressure, psia
- P2 = Downstream pressure, psia
- ΔP = Actual pressure drop P1 - P2
- Q = Liquid flow rate, US gpm
- W = Steam flow rate, pounds per hour

All chilled water valves that are subject to pressure conditions of the primary chilled water service (i.e., campus chilled water loop) shall be rated for 300 psig working pressure. Where a pressure break is provided (i.e., plate-and-frame heat exchanger) between primary and secondary chilled water systems, valves located in the secondary chilled water system shall be rated for the working pressure of the secondary chilled water system.

Control valves shall be manufactured by Belimo or Siemens.

Valves used in chilled water minimum flow and chiller modulating condenser water bypass and inline valve applications shall be ball-type control valves. Ball-type valves shall be carbon steel body with 316 stainless steel ball, shaft, pins and bearings. Seat material shall be Teflon. Stem shall be stainless steel, blowout-proof. Maximum leakage shall be 1/100 of Class IV ANSI/FCI 70-2. Valves shall be furnished with electric fail-in-place actuator, with manually operated handwheel for overriding the valve in both emergency and normal position. Actuators shall be provided with digital valve controllers with position feedback for monitoring at the DSC system. Ball valve shall be DeZurik V-Port Ball, Jamesbury Corp. R21/23 Segmented Vee Ball, Flowtech or Fisher Vee Ball.

3) Butterfly Valves

Motorized butterfly valves shall be high-performance type with lug ends. Valve body shall be carbon steel with 316 stainless disc, 17-4 pH one-piece stainless shaft. Seat and seal materials shall be Teflon. Valves shall be provided with internal travel stop designed to prevent overtravel of disc to minimize possible seat damage. Valves shall be full-bodied, full-lug type only (wafer-type or semi-lugged valves shall not be permitted). Valves shall be bolted from both ends of the flanges. Valves shall be capable of bubble-tight double dead-end closure with either upstream or downstream flange removed through the valves' full-rated pressure. Body pressure rating and connection-type construction shall conform to fitting and valve schedules. All such valves shall be provided under this subsection. Valve shall be Jamesbury Corp., Bray, Keystone K-LOK Figures 362 or 372.

4) Actuators

Actuator shall be sized based on valve operating torque values and safety factors stated by the valve manufacturer as well as the maximum torque developed during the stroke of the valve when operating under maximum working conditions. Actuators shall be of sufficient torque to smoothly position valve disk to maintain specified leakage classification.

All two-position actuators shall be provided with open and closed limit switches for remote monitoring at the BMS.

Actuator shall be factory-mounted to valve body and factory-tested to ensure proper operation.

Valves shall be provided with manually operated declutchable handwheels for overriding the actuator in both emergency and normal operation.

Actuator shall be provided with an external position indicator.

Tandem-mounted actuators are not acceptable.

Actuators, limit switches, manual override handwheels, position indicators, etc., that are located outdoors shall be constructed for outdoor use. All electrical devices shall be weatherproof and NEMA 4-rated. All exposed valve components (i.e., stem, shaft, gear operators, handwheel, etc.) shall be constructed of non-rusting metal or factory-coated with rust-inhibiting paint.

Actuators shall be manufactured by Bray, Limitorque or EIM.

VI. Damper Actuators Serving Automatic Louvered Dampers

All automatic louvered damper actuators in two-position (open/closed) service shall be 120 VAC electrically actuated spring-return type. Spring-return running time shall not exceed 20 seconds.

All automatic louvered damper actuators in modulating service shall be either 120 VAC or 24 VAC electrically actuated spring-return type, and shall be fully proportioning, unless otherwise specified. Spring-return running time shall not exceed 20 seconds.

Automatic louvered damper actuators shall be provided with manual override and external direction of rotation switch.

Actuator mounting arrangement shall be outside the airstream.

Wherever possible, actuators shall be direct-coupled type, which require no crank arm and linkage, and shall be capable of direct-mounting to a jackshaft. In applications where it is not feasible to direct-mount couple actuators to damper shaft or jackshaft, provide a substantial (strong) linkage between the actuator and damper.

Actuator linkage arrangement shall be such as to permit normally open or normally closed positions of the dampers as required.

Ambient temperature operation shall be -22°F to 122°F. Storage temperature operation shall be -40°F to 176°F. Housing shall be NEMA 2.

Actuators shall be UL-listed.

Tandem-mounted actuators shall not be provided.

Actuators located outdoors shall be equipped with O-ring gaskets designed to make motors weatherproof, an internal heater to permit normal operation at minus 22°F and a weatherproof enclosure to protect against rain and snow.

Actuators shall be manufactured by Belimo.

VII. Conduit and Wiring

a. General Requirements

- 1) Wiring and conduit installation shall be in accordance with the latest editions of all local and national electrical codes.
- 2) Abandoned control wiring, pneumatic tubing, control enclosures, conduit, sensing devices, controllers and raceway shall be removed to their source.
- 3) Safety devices (i.e., low temperature detectors, high pressure switches, low pressure switches, life safety shutdown relay contacts) shall be wired to starters and/or VFD's such that equipment will stop regardless if operating in hand, automatic, manual, or bypass.
- 4) All safeties serving a variable frequency drive or starter (i.e., low temperature thermostat, fire shutdown contact, pressure switch, end switch, etc.,) must be wired to a terminal strip outside of the VFD/starter, in a standard, labeled enclosure where voltage readings can be taken to facilitate troubleshooting. Each safety should be wired to an individual pair of terminals and labeled as to what safety it is. In addition, all safeties must have individual auxiliary contact wired to the BMS for alarm monitoring. In lieu of a separate enclosure, it is acceptable to utilize the DDC field equipment panel.
- 5) All systems requiring interlock wiring shall be hardwired interlocked and shall not rely on the BMS to operate. Interlock wiring shall be run in separate conduits from BMS associated wiring. Examples:
 - i. Emergency generator to fuel oil pump interlock, emergency generator damper interlock, etc.
 - ii. Motorized damper interlock to fan starter.
- 6) Use of tie wraps for supporting wire, cable, etc., shall not be permitted.
- 7) 120 VAC circuits used for control and instrumentation shall be dedicated to the control system and shall not be used for any other purposes.
- 8) Perform continuity testing for all wiring installed.
- 9) Conveniently located terminal junction boxes shall be used for the transition from the single-pair local signal cables to the multi-pair home-run cable. These boxes shall have terminal schedules attached to the inside of their covers displaying the terminals and the service tags of the cables terminated there.

b. Wire Type and Color

All wiring to be in accordance with manufacturer requirements and latest NYC Building Code.

1) Single Conductor (120 VAC)

Type THHN 12 AWG stranded copper with 600 volt insulation color-coded red for hot leg, white for neutral, black for all others, for use in conduit, EMT or IMC only. Larger-gauge cables shall be provided where necessary to limit the voltage drop to 3% or 3.6 volts.

2) ARC156/MSTP/Modbus Communication Cable

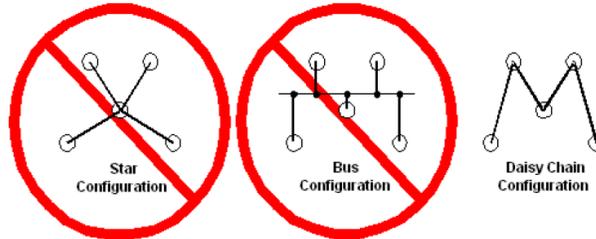
- 1-pair, 22 AWG Tinned Copper Shielded RS-232, RS-422 Low-Capacitance Communication, Instrumentation and Special Application Plenum Cable.
- Color Code: Black/White
- Shield: Aluminum Mylar Foil
- Drain Wire: 24 AWG Stranded Tinned Copper
- Jacket: Plenum-Rated PVC
 - i. Color must be kept consistent for same network loop.
 - ii. If multiple protocols (IE. MS/TP, ARC156, or Modbus) are required to be run in the same area, a unique color shall be utilized for each. As built documents shall include colors and wiring installed.
- Capacitance: 12.5 pF/ft. nominal
- Impedance: 100 ohms nominal
- Agency Approval: UL Subject 444 and NEC Article 800 Type CMP Communication Cable
- Manufacturer and Part Number: Windy City Wire Inc., 043006AL-S
- ARC156/MSTP/Modbus Communication Cable run must not exceed 1,000 ft.

3) Ethernet CAT 6 Cable

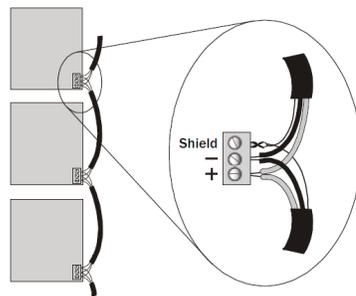
- 23 AWG Category 6 Unshielded Twisted Pair (UTP) Cable for Data Transmissions up to 250 MHz.
- Color Code: White-Blue/Blue, White-Orange/Orange, White-Green/Green, White-Brown/Brown
- Jacket: Flame-Retardant PVC
- Maximum Mutual Capacitance: 4.95 nF/100m @ 1KHz nominal
- Characteristic Impedance: 100 ±15 Ohms (1-250 MHz)
- Agency Approval: UL-Listed Type CMP, ANSI/TIA/EIA 568B.2.1
- Manufacturer and Part Number: Windy City Wire Inc., 556600
- Two (2)-Pair - Two (2)-Conductor Shielded - RNET
- 18 AWG 2-pair Bare Copper, Individually Shielded Plenum, UL Subject 444, Type CMP, C(UL)
- Color Code: Black/Red and White/Green
- Shield: Each Pair Aluminum Polyester Foil - 100% Coverage
- Drain Wire: 24 AWG 7 Stranded Tinned Copper
- Jacket: White Low-Smoke PVC

- Capacitance: 59 pF/ft. nominal
 - Agency Approval: NEC Article 800; 725, UL CMP C(UL)
 - Manufacturer and Part Number: Windy City Wire Inc., 160100
 - All CAT 6 cable shall not exceed 100 meters.
- 4) Three (3)-Conductor Shielded - Input/Output Points
- 18 AWG 3-Conductor Bare Copper, Shielded Plenum, UL Subject 444, Type CMP, C(UL)
 - Color Code: Black/White/Red
 - Shield: Overall Aluminum Polyester Foil - 100% Coverage
 - Drain Wire: 24 AWG 7 Stranded Tinned Copper
 - Jacket: Purple Low-Smoke PVC
 - Capacitance: 57 pF/ft. nominal
 - Impedance: 36 ohms/Mft.
 - Agency Approval: NEC Article 800; 725, UL CMP C(UL)
 - Manufacturer and Part Number: Windy City Wire Inc., 23350
- 5) Two (2)-Conductor Shielded - Input/Output Points
- 18 AWG 2 Conductor Bare Copper, Shielded Plenum, UL Subject 444, Type CMP, C(UL)
 - Color Code: Black/White
 - Shield: Overall Aluminum Polyester Foil - 100% Coverage
 - Drain Wire: 24 AWG 7 Stranded Tinned Copper
 - Jacket: Purple Low-Smoke PVC
 - Capacitance: 57 pF/ft. nominal
 - Impedance: 36 ohms/Mft.
 - Agency Approval: NEC Article 800; 725, UL CMP C(UL)
 - Manufacturer and Part Number: Windy City Wire Inc., 23350
- c. Wiring Installation Requirements
- 1) Cables for 120/24 VAC wiring, communications wiring and low-level signal wiring (i.e., 4-20ma, 0-10v) shall always be run in separate raceways.
- 2) All wiring in Mechanical Equipment Rooms, communications or electrical closets shall be in approved raceway (conduit, EMT, etc.). Open wiring strung above accessible ceilings shall be plenum-rated cable, bundled together and protected from mechanical damage. Wiring within inaccessible ceilings shall be installed in conduit. Wiring within drywall cavities or enclosure or beneath raised floor construction shall be in conduit. Wiring shall be independently supported from the building structure with bridal rings and clips. The supporting of wiring from other equipment, mechanical ductwork or piping shall not be acceptable. Provide individual supports for conduit.

- 3) No 300 volt insulated wiring shall terminate within or occupy any enclosure containing conductors operating at a voltage greater than 300 volts. This particularly applies to any analog or digital I/O wiring entering 460 volt motor starter enclosures or motor control centers.
- 4) Communication loops shall always be daisy chained and shall not be T-tapped or spliced in anyway



Example:



- 5) Communications loops must comply with the following requirements:
 - I. Unique MAC address for each controller on the network.
 - II. A repeater after every 31 devices or after 2000 feet (whichever is reached first), and at each brand of a hybrid network.
 - III. Wired in a daisy chain configuration.
 - IV. Have one of the following in order to prevent signal distortions due to echoing and add bias:
 - i. A BT485 at each end (unless the segment is less than 10 feet long)
 - ii. A ½ watt, 120 ohm terminator at each end.
 - iii. Terminating resistors as per manufacturers recommended installation instructions.
- d. Conduit installation requirements:
 - 1) Conduit associated with control system must be a blue color along with junction box covers. Conduit in finished spaces may be painted the color of the surroundings.

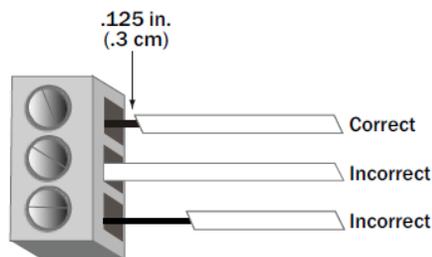
- 2) Conduits shall be run exposed in mechanical spaces, concealed in occupied spaces, and parallel or perpendicular to structural members or architectural features.
- 3) Conduit entering a cabinet, box, trough, etc., shall be secured with a locknut on the outside and on the inside, such that the conduit system is electrically continuous throughout. A bushing shall also be provided on the inside. Bushings shall be metal with insulated throats. Locknuts shall be the type designed to bite into the metal, or on the inside of the enclosure and shall have a grounding wedge lug under the locknut.
- 4) Conduit shall be installed such that any condensation in the conduit cannot run into control panels. Where necessary, conduit shall enter enclosures from the bottom or shall be sloped up to the enclosure.
- 5) Conduit runs that extend from the interior to the exterior of a building shall be sealed to prevent the circulation of air. This shall be accomplished by the installation of sealing fittings.
- 6) Use liquid-tight flexible metal conduit for making connections at instruments and devices mounted on piping or vessels or on equipment subject to vibration.
- 7) Junction and pull boxes shall be securely fastened to the conduit and be accessible where required by code or where necessary to facilitate the pulling of cables.
- 8) Percent fill of conduit, EMT or IMC shall not exceed code maximum, regardless of service.
- 9) Exterior locations shall be installed in rigid conduit.
- 10) Interior, exposed locations shall be installed in EMT conduit. Flexible conduit shall be allowable for short distances for termination to field devices and shall be Seal tight-type conduit.
- 11) Final raceway to damper actuators and duct mounted instruments may be either liquid-tight flexible metal conduit or MC-type cable (with a ground). Maximum Length shall not exceed 3 feet. A junction box should be located within 3 feet of the damper and a flexible connection may be MC with a ground, FMC with a ground or LFMC with a ground. The flex connection must be supported within 1 foot of the junction box. Raceway must be secured within 1 foot of junction box. The use of MC-type cable shall not be acceptable in any other service or location.
- 12) Control raceways shall not be hung from electrical raceways or attached to ceiling grid hanger wires.

e. Termination installation requirements

- 1) All wires terminating at each field device, terminal box, field equipment cabinet, DDC control unit or any other terminals shall be identified using Brady clip sleeve-type non-metallic wire markers or equivalent. The identification shall be consistent with the tagging indicated on the approved shop drawings. The same identification code shall be carried through from the field device to the final termination point. After identification is complete, the wire markers shall be anchored using a single layer of non-yellowing clear Mylar tape.
- 2) All control panels shall be provided with a terminal strip for field wiring. All control wiring internal to the panel shall be wired from the I/O of the controller to the terminal strip. Under no circumstance will field wiring be terminated from inputs or outputs directly to the controllers.
- 3) Terminations shall be mechanically and electrically secure. Twist-type wire nuts shall not be acceptable. Insulated tinned copper lugs shall be provided.
- 4) All communication wiring shall be tagged with the previous and post devices on the network.
- 5) Perform continuity and point to point testing for all wiring installed.
- 6) Wire stripping and terminations shall follow the correct installation procedure as shown below:

CAUTIONS

- o Do not allow more than .125 inch (.3 cm) bare communication wire to protrude.



- o If bare communication wire contacts the cable's foil shield, shield wire, or a metal surface other than the terminal block, communications may fail.

VIII. Network Hardware

a. General Requirements

Label all network hardware, switches and routers.

All network hardware components shall be powered by emergency/standby power.

All network hardware shall be provided with uninterruptible power via a local panel-mounted uninterruptible power supply as manufactured by:

- -Allen Bradley Model 1609-D-1000N with AB 1609HBat (battery) and AB1609-ENET Smart Card.
- APC Panel Mount UPS with high temp battery – Model SUA500PDRI-H

The UPS shall be monitored at the nearest network switch via Cat 5e wire in conduit.

b. Ethernet Switches

Switch shall be hardened industrial grade managed, gigabit and 10 gigabit Ethernet switch designed for harsh environments. Quantity of 10 gigabit ports, 10/100/100Base-T RF-45 ports and SFP connectors shall be based on the application. Provide redundant hot swappable power supplies. Indicators shall include per-port LED's, system LED's and primary and redundant power supply status LED's. Switch shall be Alcatel-Lucent Omniswitch 6855 series (no substitution allowed).

IX. Instrument Air Piping

- a. Number-coded tubing shall be used throughout, with coding readily identifiable at points of control and equipment. Coding of each line to a controller or equipment shall be different and shall match coding indicated on control shop drawings.
- b. Tubing shall be installed so that it can be removed without damage or alterations to the building structure.
- c. Care should be exercised in the installation of pipe, tubing and fittings to see that no dirt or foreign matter is present in the system.
- d. Connections shall be made without springing the tubing. Tubing is to be installed in such a manner that overlapping and crossovers are kept to a minimum. Where necessary, this should be done in an accessible place. Connections to instruments shall be made so that disconnect and removal of each individual instrument can be made without distortion of tubing. Instrument tubing and piping shall be arranged and supported so as to minimize the transmission of strain and vibration to the instruments to which they are connected. Instrument piping and tubing shall have the shortest possible runs and the least number of fittings required as is consistent with good design and installation practice. Instrument piping and tubing shall be installed so that there is sufficient space around the equipment for servicing and adjustment. Instrument lines shall be installed so they do not interfere with the maintenance of equipment such as the removal of tube bundles, pump casings, etc. Cap piping during installation to prevent entrance of dirt.

- e. Normally operated manual valves or other items associated with instruments that require manipulation shall be readily accessible either from the ground or from some convenient operating level.
- f. Care should be taken in the arrangement of the piping fittings, racks and brackets so as not to produce unsafe working conditions. Special care should be taken to eliminate protruding objects that might injure personnel.
- g. Branch air lines from high-pressure air headers shall be valved at the point of connection to the air header.
- h. Plastic air tubing shall be supported as follows:
 - 1) Polyethylene tubing bundles shall be installed in covered aluminum raceways or shall be supported on galvanized steel hangers not more than 4 feet 0 inches on center. At each support point at a hanger or trapeze, the tube bundle shall be protected by a 180 degree by 8 inch long galvanized steel shield.
 - 2) Individual plastic tubing shall be run in thin wall electric conduit or Wiremold raceway and supported by galvanized hangers on 4 foot 0 inch centers.
 - 3) Conduit or raceway shall not exceed 50 percent fill.
- i. Copper tubing shall be fastened and rigidly supported at regular intervals to prevent sagging, using straps, trapezes and pipe hangers as approved.
- j. No air lines shall be concealed under or within insulation or acoustic lining. The use of wire or tape to support air piping will not be permitted.
- k. Air piping shall be run horizontally level and vertically plumb and parallel to building lines.
- l. Install valved drip pocket at low points of mains and risers.
- m. Only tool-made bends in copper tubing will be acceptable.
- n. Raceway shall be terminated not more than 12 inches from terminal devices and this last section may be made with non-metallic tubing run exposed.
- o. Non-metallic tubing, except terminal ends, shall be installed with a minimum clearance of 1 foot to any surface that may exceed 120°F.
- p. Test metallic air piping at 150 psig air pressure, and non-metallic air tubing at 40 psig air pressure, sustained for 4 hours. If pressure loss exceeds five percent (5%) during the test period, repair or replace defective tubing and fittings and retest until the pressure loss is less than five percent (5%).
- q. All impulse tubing related to chilled water service must be insulated to prevent condensation.

O. System Equipment Standards and Sequence of Operations

I. General

The following system standards identify minimum hardware, software and sequence of operation requirements for basic mechanical systems installed at NYULH. They do not address each possible system type and variation. Additional hardware and software may be required for specific applications.

Any deviations to the standards listed below must be approved by NYULH facility management team.

Every VAV box shall have a “k factor” based on the box size and an adjustment factor for balancing.

Spaces requiring pressurization compliance shall also have the following installed for monitoring:

- Room Pressure Monitor
- Door contact sensors at all entrances and exits
- Critical Room Controller (Applicable for Operating Rooms)

All VAVs, CAVs and FPBs shall have the following:

- Graphics shall include Minimum and Maximum CFM Setpoints
- Box Sizes shall be available on submittals along with manufacture’s KFactors
- All boxes must contain a KFactor in the software depending on box size according to manufacture as well as a calibration factor. Formula: $\text{Sqrt}(\text{Velocity Pressure}) * (\text{Box Size KFactor}) * (\text{Balancer’s Reading/BMS Reading})$

II. Constant and Variable Air Volume Terminal Units (Non-Flow-Tracking Applications)

a. Hardware

Pressure-independent unitary controller utilizing differential pressure sensing.

Damper actuator shall be fail-in-place type.

For terminal units with reheat coils, provide discharge temperature transmitter.

Reheat coil control valves shall be spring-return fail-closed.

Space temperature sensor located in occupied areas shall be indicating and adjustable with a limit of $\pm 3^{\circ}\text{F}$ (adjustable). Cooling and heating set points should adjust up and down and maintain a built-in bias of 2°F (adjustable). Where multiple sensors are installed in a room served by multiple terminal units, only one (1) sensor shall be indicating and adjustable type. Set point adjustment shall be common for all terminal units serving a room.

Space temperature sensors located in unoccupied or transient areas such as corridors are to be non-indicating and non-adjustable.

Power to terminal unit controls shall be 120 VAC with enclosure-mounted 24 VAC step-down transformer, fuse and disconnect switch.

Transformer, damper actuator, unitary controller with differential pressure transmitter and fuse shall be mounted in a NEMA 1 steel enclosure with removable screw cover. Disconnect switch to be mounted external to panel. Switch activation shall not require removal of enclosure panel.

b. Software Functions

- Occupancy sensors to enable setback functions.
- Alarms.
- Demand Response: Global software function (per building and per floor) to adjust heating and cooling set points based on operator-initiated function.
- Air quality system interface for air change rate adjustment.
- Controller Reboot or Return from Power Failure or Controller Reboot: On controller reboot or return from power failure or controller reboot, all control loop outputs shall be commanded to their position prior to reboot or power failure and all control loop integrals shall be zeroed, thus eliminating reset windup.

c. Sequence of Operations

1) Constant Volume Terminal Units

Constant volume terminals with normally open dampers shall be controlled from a reverse-acting, 3-mode pressure-independent (PID) software program located at the unitary controller serving the terminal unit.

For units with reheat coils, provide a space temperature sensor, which shall provide an input to a software controller that shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller, which shall modulate the reheat valve to maintain supply air set point.

Whenever the air handling system serving the terminal unit is off, the terminal unit damper shall fully open.

A space temperature transmitter shall be furnished for each terminal unit that contains a reheat coil. Space temperature transmitters shall not be provided for terminal units that do not contain reheat coils.

Each terminal unit's unitary controller shall be capable of remote reset of all set points and damper position automatically or manually through the operator workstation.

In applications where multiple terminal units serve a common room, a software program shall calculate the average space temperature of the room by monitoring all of the space temperature transmitters. The average space

temperature shall be used to calculate the terminal unit air flow set point for each terminal unit serving the room. Furthermore all terminal units shall be at minimum air flow rate prior to operating any reheat coil or perimeter radiation control valve.

Minimum data points available at the operator workstation shall be as follows:

- Terminal unit airflow reading.
- Terminal unit airflow set point.
- Discharge temperature (for units with reheat coils only).
- Discharge temperature set point (for units with reheat coils only).
- Reheat coil valve command (for units with reheat coils only).
- Space temperature (for units with reheat coils only).
- Space temperature set points (for units with reheat coils only).
- Damper position.
- Occupancy mode.
- Include six (6) additional software points to be defined by NYULH.

2) Variable Air Volume Terminal Units

Variable air volume terminals with normally open dampers shall be controlled from a reverse-acting, 3-mode pressure-independent (PID) software program located at the unitary controller serving the terminal unit.

When the space temperature rises, as sensed by an electronic space temperature transmitter, the software controller shall modulate the terminal unit damper open.

As the space temperature decreases, the terminal unit damper shall modulate to a minimum position. For units furnished with reheat coils, on a continued decrease in temperature the space temperature sensor shall provide an input to a software controller that shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller, which shall modulate the reheat valve to maintain supply air set point.

Whenever the primary fan for the terminal unit is off, the terminal unit damper shall fully open.

A space temperature transmitter shall be furnished for each terminal unit.

Each terminal unit's unitary controller shall be capable of remote reset of all set points and damper position automatically or manually through the operator workstation.

Perimeter Radiation Valve Control for Multiple Rooms, Each Served by an Individual Supply Air Terminal Unit and a Common Perimeter Radiation Control Valve: (Note: Example described below is for an application where one [1] perimeter radiation valve serves common fin-tube elements serving two [2] rooms. Similar software logic shall be applied to instances where more than two [2] rooms are served by a single perimeter radiation valve.)

- The space temperature of each room shall be maintained by the supply air terminal unit and reheat coil serving the room. The perimeter radiation valve shall be used to satisfy the room that requires the greater amount of heating. A DDC software program, resident in the terminal unit controller, which is wired to the perimeter radiation valve, shall monitor the space temperature set point of each room, each room's actual space temperature, each terminal unit's current operating mode (heating, dead band, cooling) and calculate the difference between actual space temperature and set point.
- If either room requires heating, that room's terminal unit controller shall modulate its reheat coil control valve to maintain space temperature set point. The perimeter radiation control valve shall be allowed to operate in parallel with the reheat coil control valve until either room's space temperature is within 1°F below its cooling set point, at which time the perimeter radiation valve shall modulate closed regardless of the heating demand of the other room. If either room's space temperature drops 1°F below its cooling set point, the perimeter radiation valve shall modulate open with the reheat valve position.

In applications where multiple terminal units serve a common room, a software program shall calculate the average space temperature of the room by monitoring all of the space temperature transmitters. The average space temperature shall be used to calculate the terminal unit air flow set point for each terminal unit serving the room. Furthermore all terminal units shall be at minimum air flow rate prior to operating any reheat coil or perimeter radiation control valve.

Minimum data points available at the operator workstation shall be as follows:

- Terminal unit airflow reading.
- Terminal unit minimum airflow set point.
- Terminal unit maximum airflow set point.
- Discharge temperature (for units with reheat coils only).
- Discharge temperature set point (for units with reheat coils only).
- Reheat coil valve command (for units with reheat coils only).
- Space temperature.
- Space temperature set points.
- Perimeter radiation valve command (for units with reheat coils only).

- Damper position.
- Occupancy mode.
- Occupied cool/heat set point.
- Unoccupied cool/heat set point.
- Space temperature high-limit alarm.
- Space temperature low-limit alarm.
- Include six (6) additional software points to be defined by NYULH.

d. Demand Control Ventilation Control

1) Applicable to elevator lobby spaces and non-critical areas served by CAVs, VAVs, and FCUs. (IE. conference rooms, etc.)

a) Control logic shall be implemented to maintain the Co2 levels within the space. If Co2 levels within space exceed 800ppm (adj.) the VAV supply damper shall modulate open to increase the amount of flow introduced into the space. Once Co2 levels have returned to an acceptable value, the VAV supply air damper control shall return back to temperature control modulation.

d-e. VAV Balancing Procedure

1) Definitions:

- Supply or Exhaust Velocity Pressure = Analog Input into Controller from Field
- K-Factor = Value from Box Manufacturer's Design Table
- Calibration Factor = Number calculated during balancing

2) Calculating CFM from Velocity Pressure Equation:

- $CFM = \sqrt{\text{Velocity Pressure}} \times K\text{Factor} \times \text{Calibration Factor}$

3) Balancing Procedure

- Initial Parameters:
 - Calibration Factor to 1.00
 - Set K-Factor according to Box Manufacturer based off Box Size:

Titus AeroCross		Amenostat EZT & XAFT	
Inlet Size	K-Factor	Inlet Size	K-Factor
5	273	5	287
6	469	6	469
7	612	7	612
8	867	8	867
9	1098	9	1098
10	1353	10	1353
12	1802	12	1802
14	2469	14	2469
16	3366	16	3366
24X16	6358	24X16	6358

Note: K-Factors shown are for 1.0 ΔP

4) Testing Box at Maximum & Minimum Design CFM:

- Set Box to Maximum Design CFM
- Balancer will obtain a CFM hood reading
- BMS Vendor will calculate new Calibration by using this equation

$$\text{New Calibration Factor} = (\text{Balancer CFM Reading}) / (\text{BMS CFM Reading})$$
- BMS Vendor will enter new calibration factor in replace of the initialized calibration factor
- Balancer final CFM hood reading shall not exceed 10% of BMS final CFM reading at maximum design setpoint
- Set Box to Minimum Design CFM
- Balancer will obtain a CFM hood reading

- Balancer final CFM hood reading shall not exceed 10% of BMS final CFM reading at minimum design setpoint

III. Fan-Powered Variable Air Volume Terminal Units

a. Hardware

- Pressure-independent unitary controller utilizing differential pressure sensing.
- Damper actuator shall be fail-in-place type.
- Provide discharge temperature transmitter if terminal unit is furnished with reheat coil.
- Reheat coil control valves shall be spring-return fail-closed.
- Space temperature transmitters located in occupied areas shall be indicating and adjustable with a limit of $\pm 3^{\circ}\text{F}$ (adjustable). Cooling and heating set points should adjust up and down and maintain a built-in bias of 2°F (adjustable). Where multiple sensors are installed in a room served by multiple terminal units, only one (1) sensor shall be indicating and adjustable type. Set point adjustment shall be common for all terminal units serving a room.
- Space temperature transmitters located in unoccupied or transient areas such as corridors to be non-indicating and non-adjustable.
- Power shall be via enclosure-mounted 24 VAC step-down transformer and fused disconnect switch.
- Provide run status monitoring of fan via current-sensing relay.
- Transformer, damper actuator, unitary controller with differential pressure transmitter, fuse, control relay and current-sensing relay shall be mounted in a NEMA 1 steel enclosure with removable screw cover.

b. Software Functions

- Occupancy sensors to enable setback functions.
- Alarms.
- Demand Response: Global software function (per building and per floor) to adjust heating and cooling set points based on operator-initiated function.
- Air quality system interface for air change rate adjustment.
- Controller Reboot or Return from Power Failure: On controller reboot or return from power failure, all control loop outputs shall be commanded to their position prior to reboot or power failure and all control loop integrals shall be zeroed thus eliminating reset windup.

c. Sequence of Operations

Fan-Powered Variable Volume Terminal Units with Reheat and Perimeter Radiation

Fan-Powered terminals with fail-in-place dampers shall be controlled from a reverse-acting, 3-mode pressure-independent (PID) software program located at the unitary controller serving the terminal unit.

A software interlock shall start the terminal unit fan when the primary air fan serving the terminal unit starts. Fan starting shall be time-delayed to allow the primary air damper to fully close prior to starting fan. When the fan starts, the damper shall modulate open. This shall prevent backward rotation of fan on start-up.

When the space temperature rises, as sensed by an electronic space temperature transmitter, the software controller shall modulate the terminal unit damper open.

As the space temperature decreases, the terminal unit damper shall modulate to a minimum position. On a continued decrease in temperature, the space temperature sensor shall provide an input to a software controller, which shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller, which shall modulate the normally closed reheat coil control valve in parallel with the normally open perimeter radiation control valve to maintain supply air temperature set point.

Whenever the primary fan for the terminal unit is off, the terminal unit damper shall be positioned fully open.

Each terminal unit's direct digital control unit shall be capable of remote reset of all set points and damper position automatically or manually through the operator workstation.

On actuation of a life safety alarm in the area served by the terminal unit, the unit fan shall stop and the primary air damper shall fully open.

All required control and communication wiring for the terminal units shall be furnished and installed by this subsection.

The operator, via the workstation, shall be capable of commanding all terminal units serving the same floor to a common set point via one (1) global set point command at the workstation.

Night Setback: Whenever the terminal unit fan is off, the system shall operate in the unoccupied mode. During this mode, a DDC software program shall monitor the space temperature associated with a terminal unit. On sensing a drop in space temperature to 55°F (adjustable), the controller shall start the terminal unit fan and maintain space temperature set point by modulating the reheat coil control valve and perimeter radiation control valve. On achieving space temperature set point, the terminal unit fan shall stop, if still operating in the unoccupied mode, or continue to run switched to occupied mode.

Minimum data points available at the operator workstation shall be as follows:

- Fan start/stop.
- Fan run status.
- Terminal unit airflow reading.
- Terminal unit minimum airflow set point.
- Terminal unit maximum airflow set point.
- Discharge temperature (for units with reheat coils only).
- Discharge temperature set point (for units with reheat coils only).
- Reheat coil valve command (for units with reheat coils only).
- Space temperature.
- Space temperature set points.
- Perimeter radiation valve command (for units with reheat coils only).
- Damper position.
- Occupancy mode.
- Occupied cool/heat set point.
- Unoccupied cool/heat set point.
- Space temperature high-limit alarm.
- Space temperature low-limit alarm.
- Include six (6) additional software points to be defined by NYULH.

Perimeter Radiation Valve Control for Multiple Rooms, Each Served by an Individual Fan-Powered Terminal Unit and a Common Perimeter Radiation Control Valve: (Note: Example described below is for an application where one [1] perimeter radiation valve serves common fin-tube elements serving two [2] rooms. Similar software logic shall be applied to instances where more than two [2] rooms are served by a single perimeter radiation valve.)

- The space temperature of each room shall be maintained by the supply air terminal unit and reheat coil serving the room. The perimeter radiation valve shall be used to satisfy the room that requires the greater amount of heating. A DDC software program, resident in the terminal unit controller, which is wired to the perimeter radiation valve, shall monitor the space temperature set point of each room, each room's actual space temperature, each terminal unit's current operating mode (heating, dead band, cooling) and calculate the difference between actual space temperature and set point.
- If either room requires heating, that room's terminal unit controller shall modulate its reheat coil control valve to maintain space temperature set point. The perimeter radiation control valve shall be allowed to operate in parallel with the reheat coil control valve until either room's space temperature is within 1°F below its cooling set point, at which time the perimeter radiation valve shall modulate closed regardless of the heating demand of the other room. If either room's space temperature drops 1°F below its cooling set point, the perimeter radiation valve shall modulate open with the reheat valve position.

In applications where multiple terminal units serve a common room, a software program shall calculate the average space temperature of the room by monitoring all of the space temperature transmitters. The average space temperature shall be used to calculate the terminal unit air flow set point for each terminal unit serving the room. Furthermore all terminal units shall be at minimum air flow rate prior to operating any reheat coil or perimeter radiation control valve.

IV. Flow-Tracking Applications

a. Hardware

- Pressure independent unitary controllers utilizing differential pressure sensing.
- Damper actuator shall be spring return type.
- For terminal units with reheat coils, provide discharge temperature transmitter.
- Reheat coil control valves shall be spring return fail closed.
- Space temperature sensor located in occupied areas shall be indicating and adjustable with a limit of $\pm 3^{\circ}\text{F}$ (adjustable). Cooling and heating set points should adjust up and down and maintain a built in bias of 2°F (adjustable). Where multiple sensors are installed in a room served by multiple terminal units, only one (1) sensor shall be indicating and adjustable type. Set point adjustment shall be common for all terminal units serving a room.
- Space temperature sensors located in unoccupied or transient areas such as corridors to be non-indicating and non-adjustable.
- Power to terminal unit controls shall be 120 VAC with enclosure mounted 24 VAC step down transformer, fuse and disconnect switch.
- Transformer, damper actuator, unitary controller with differential pressure transmitter and fuse shall be mounted in a NEMA 1 steel enclosure with removable screw cover. Disconnect switch to be mounted external to panel. Switch activation shall not require removal of enclosure panel.
- Refer to subsection titled “Flow Tracking System” for additional information.

1) Transmitters and Actuators

Provide a control panel for each tracking pair that shall contain the control unit, supply terminal unit differential pressure transmitter and control transformer. The supply terminal unit shall contain a unit-mounted electric spring-return actuator, flow cross airflow sensor, and supply air temperature transmitter (located downstream of the reheat coil). The exhaust terminal unit shall contain a unit-mounted electric spring-return actuator, exhaust terminal unit differential pressure transmitter and flow cross airflow sensor.

Minimum airflow sensor measurement accuracy shall be $\pm 5\%$ of actual airflow and shall have a repeatability within $\pm 0.15\%$ over the entire airflow range of each air terminal.

Flow-Tracking Terminal Units Associated with Fume Hoods: Damper actuators for supply, general exhaust and fume hood terminal units shall have an electric spring return actuator (4 - 20 mA input signal) factory-mounted to each terminal unit. Loss of electric power or control signal shall cause the exhaust damper to fail open to the maximum scheduled design flow, and the supply damper to fail closed to the minimum scheduled design flow. Electric actuator stroke time shall not exceed 1.0 second for flow change from minimum flow to ninety percent (90%) at nominal load. Actuator shall be maintenance-free high-speed type with manual override and shall meet NEC Class 2 requirements.

Flow-Tracking Terminal Units without Fume Hoods: Damper actuators for supply and general exhaust terminal units shall have an electric spring return actuator (0 - 10 VDC or 2 - 10 VDC input signal) factory-mounted to each terminal unit. Electric actuator stroke time shall not exceed 90 seconds. Actuator shall be maintenance-free high-speed type with manual override and shall meet UL Class 2 requirements. Actuator shall be either 120 VAC or 24 VAC.

- For positive or neutral pressurization areas, loss of electric power or control signal shall cause the supply damper to fail open to the maximum scheduled design flow and the exhaust damper to fail closed to the minimum scheduled design flow.
- For negative pressurization areas, loss of electric power or control signal shall cause the exhaust damper to fail open to the maximum scheduled design flow and the supply damper to fail closed to the minimum scheduled design flow.

Spider-type multiple-probe airflow-sensing tubes of the automatic averaging type shall be 316 or 304 stainless steel. Accuracy of the sensing tubes shall be $\pm 2.0\%$ with a repeatability of 0.3% over a range of 0 - 3,000 ft./min. at 1 duct diameter upstream straight run duct. The flow signal shall also be used as the input to the BMS and also for balancing and field-measurement of air volume.

2) Pushbutton

Provide a mushroom-type pushbutton and local audible annunciation (i.e., horn) located at the exit door of each area that contains a fume hood. The switch shall, on annunciation, drive the fume hood to maximum airflow. On activation of the pushbutton switch, the audible alarm shall be activated. Switch and audible alarm shall be provided with a label for user operation as per NYULH Health and Safety requirements. Labels shall state instructional operation and required actions that need to be performed, if needed. Switch shall be manually reset type furnished with protective cover to allow the switch to be viewable without tampering or accidental activation. Refer to

System Standards “Laboratory Flow-Tracking Applications” for additional information.

3) Electronic Face Velocity Monitor for Variable Air Volume Fume Hoods

A UL 916-listed individual fume hood monitor shall be provided for each fume hood, which shall measure the average face velocity at the set point independently of the sash position. Also, provide sash sensors on each fume hood to indicate the position of all fume hood sashes to the respective fume hood controller. Sash sensors shall provide an input signal to the fume hood controller that is linearly proportional to within one-half inch of the actual sash position. All sash sensors shall be highly corrosion-resistant and allow easy removal of a fume hood’s sashes for cleaning. Sash sensor operational life shall allow a minimum of one million full sash travel cycles. Multiple sash sensors shall be utilized for combination vertical/horizontal sashes.

The fume hood controller shall also interface to the hood interface module at the designated measurement location on the front of the fume hood. The hood interface module shall provide a continuous digital display of average fume hood face velocity, which shall be the true average face velocity as calculated by the fume hood controller based upon actual measured fume hood exhaust airflow and the total fume hood open area.

The hood interface module shall also sound an audible alarm device in response to face velocity alarm conditions and the hood interface module digital display shall change to “LOW FACE VELOCITY” or “HIGH FACE VELOCITY” appropriate to the alarm condition. A “SILENCE” pushbutton on the hood interface module shall allow the user to silence the audible alarm, which shall then remain silent until a subsequent face velocity alarm occurs.

The hood interface module shall also provide an “EMERGENCY PURGE” pushbutton that shall enable a user to increase fume hood exhaust airflow to the maximum amount for a designated period of time as required by Laboratory safety standards. After the designated time has expired, the fume hood exhaust shall automatically reset to a lower level to prevent excessive demand on the exhaust system. The emergency purge mode of operation shall also be able to be canceled at any time by depressing the emergency purge button a second time. The hood interface module shall sound its audible alarm device whenever the emergency purge mode of operation is activated. The silence pushbutton on the hood interface module shall also allow the user to silence the audible alarm, which shall then remain silent until either the emergency purge operational mode is again activated or a face velocity alarm occurs.

The hood interface module shall also provide an audible sash-open alert feature that shall caution users whenever the fume hood sash opening exceeds a predetermined amount. The audible alert shall consist of one-minute repeating cycle of a series of quick “chirps” that continues until the

sash opening is reduced to an allowable amount. In addition, failure of a fume hood sash sensor shall also be indicated as an alarm condition on the hood interface module.

All fume hood control and display module and operational parameters shall be established and be changeable only by authorized personnel using a portable operator's terminal. These operational parameters shall include:

- Fume hood average face velocity set point.
- Fume hood minimum and maximum exhaust airflow set points.
- Face velocity high and low alarm limits and associated alarm time delay to avoid transient alarms.
- Face velocity high and low warning limits.
- Emergency purge time periods and exhaust levels.
- Allowable maximum sash opening associated with the sash alert feature.

The portable operator's terminal shall plug into the hood interface module as well as into the flow-tracking room controller. In addition, all Laboratory fume hood and flow-tracking room control parameters, along with all other facility control and monitoring functions, shall be accessible to authorized personnel from designated terminals on the DDC control and monitoring network.

Momentary or extended losses of power shall not change or affect any VAV fume hood control set points, operational parameters or stored data. Upon resumption of power after a power failure, fume hood monitor shall resume full normal operation exactly as before the power failure and without any need for manual intervention. Upon a power failure or operational failure within the fume hood controller, the fume hood exhaust air terminal shall be automatically positioned to the fully open (fail-safe) position as required by Laboratory safety standards.

4) Hood Interface Module

The hood interface module shall provide emergency override, high-flow alarm, low-flow alarm, hood status lights and programmable audible alarm. Audible alarm shall be no more than 85 dB at 1 meter. Module shall be designed to fit in a 2 inch by 4 inch (single-gang) electric box and mounted on the face of the fume hood. Connection using phone jack termination. All alarm set points shall be fully field-programmable as well as the time delay interval prior to alarming. Module shall also allow high/low sash alarms and limits. All points shall be monitored at the flow-tracking control unit. Alarm and mute functions shall automatically reset when the alarm condition ceases to exist. Alarm annunciation shall be as follows:

- Normal Condition: Green LED lighted.
- Alarm Condition: Red LED lighted, indicating either:

- Low face velocity.
- High face velocity.
- Emergency override.
- Caution or Control Transition: Green and red LED's flash alternately.
- Buzzer: Energized in any alarm or override condition.
- Pushbutton Functions
 - Override: Push once.
 - Reset to Normal Operation: Push once.
 - Alarm Acknowledgment (Audible Mute): Push twice (LED remains lighted while alarm condition exists).

In addition, all system set points shall be adjustable via the keypad.

5) Constant Volume Fume Hood Interface Module

The constant volume fume hood interface module shall provide emergency override, high-flow alarm, low-flow alarm, hood status lights and programmable audible alarm (95 dB at 1 meter). Module shall be designed to fit in a 2 inch by 4 inch (single-gang) electric box and mounted on the face of the fume hood. Connection using phone jack termination. All alarm set points shall be fully field-programmable as well as the time delay interval prior to alarming. All points shall be monitored at the flow-tracking control unit. Alarm and mute functions shall automatically reset when the alarm condition ceases to exist. Alarm annunciation shall be as follows:

- Normal Condition: Green LED lighted.
- Alarm Condition: Red LED lighted, indicating either:
 - Low hood airflow.
 - High hood airflow.
 - Emergency override.
- Caution or Control Transition: Green and red LED's flash alternately.
- Buzzer: Energized in any alarm or override condition.
- Pushbutton Functions
 - Override: Push once.
 - Reset to Normal Operation: Push once.
 - Alarm Acknowledgment (Audible Mute): Push twice (LED remains lighted while alarm condition exists).

In addition, all system set points shall be adjustable via the keypad.

The fume hood interface module shall interface with the fume hood exhaust terminal unit for monitoring of exhaust air flow rate. The hood interface module shall provide a continuous digital display of fume hood exhaust air flow rate.

The hood interface module shall also sound an audible alarm device in response to airflow alarm conditions and the hood interface module digital display shall change to "LOW HOOD AIRFLOW" or "HIGH HOOD AIRFLOW"

appropriate to the alarm condition. A “SILENCE” pushbutton on the hood interface module shall allow the user to silence the audible alarm, which shall then remain silent until a subsequent alarm occurs.

The hood interface module shall also provide an “EMERGENCY PURGE” pushbutton that shall enable a user to increase fume hood exhaust airflow to the maximum amount for a designated period of time as required by Laboratory safety standards. After the designated time has expired, the fume hood exhaust shall automatically reset to a lower level to prevent excessive demand on the exhaust system. The emergency purge mode of operation shall also be able to be canceled at any time by depressing the emergency purge button a second time. The hood interface module shall sound its audible alarm device whenever the emergency purge mode of operation is activated. The silence pushbutton on the hood interface module shall also allow the user to silence the audible alarm, which shall then remain silent until either the emergency purge operational mode is again activated or an airflow alarm occurs.

- Momentary or extended losses of power shall not change or affect any fume hood control set points, operational parameters or stored data. Upon resumption of power after a power failure, fume hood monitor shall resume full normal operation exactly as before the power failure and without any need for manual intervention. Upon a power failure, the fume hood exhaust air terminal shall be automatically positioned to the fully open (fail-safe) position as required by Laboratory safety standards

b. Software Functions

- Occupancy sensors to enable set back functions.
- Alarms.
- Demand Response: Global software function (per building and per floor) to adjust heating and cooling set points based on operator initiated function.
- Air quality system interface for air change rate adjustment.
- Controller Reboot or Return from Power Failure: On controller reboot or return from power failure, all control loop outputs shall be commanded to their position prior to reboot or power failure and all control loop integrals shall be zeroed, thus eliminating reset windup.

c. Sequence of Operations

1) Variable Air Volume Flow-Tracking System Without Fume Hood

A typical system consists of a supply variable air volume terminal unit and exhaust variable air volume terminal unit. In all flow-tracking applications, pressurization control shall take priority over temperature control.

A flow-tracking system microprocessor-based direct digital control unit shall be provided for each room to control the supply and exhaust variable air

volume terminal units. Each supply air terminal unit shall be furnished with a hot water reheat coil.

The direct digital control unit shall monitor the velocity pressure of each terminal unit and calculate terminal unit airflow, the reheat coil discharge temperature via a duct-mounted electronic temperature transmitter, and space temperature via a wall-mounted electronic temperature transmitter. The direct digital control unit shall provide individual outputs to the exhaust terminal unit damper, the supply terminal unit damper and the normally closed hot water reheat coil control valve.

The flow control system shall interface with the BMS to enable simultaneous two-way communications between the two (2) systems by utilizing ASHRAE standard BACnet protocol. This functionality shall allow an operator to remotely monitor and adjust all variables and set points associated with the flow control system via the BMS workstation.

The flow control system shall respond and maintain specific airflow ($\pm 5\%$ of signal) and stability ($< 5\%$ over/undershoot) within 1 second of a change in duct static pressure, irrespective of the magnitude of pressure and/or flow change or quantity of airflow controllers.

The flow control system shall use volumetric offset control to maintain room pressurization. The system shall respond and maintain room pressurization (negative or positive) within 1 second of a change in room/system condition.

The flow control system shall employ highly accurate microprocessor controllers with a minimum 8 to 1 (8:1) turndown to ensure accurate pressurization at low airflows and guarantee the maximum system diversity and energy efficiency. The end-to-end accuracy of the installed system shall be five percent (5%) over the entire range of the measurement.

For rooms which are designated as "positive" pressurization, the supply terminal unit shall be the master and the exhaust shall track the supply. The supply air terminal unit damper shall be normally open. The exhaust terminal unit damper shall be normally closed.

For rooms which are designated as "negative" pressurization, the exhaust terminal unit shall be the master and the supply shall track the exhaust. The supply air terminal unit damper shall be normally closed. The exhaust terminal unit damper shall be normally open.

For rooms which are designated as "neutral" pressurization, the exhaust terminal unit shall be the master and the supply shall track the exhaust. The supply air terminal unit damper shall be normally open. The exhaust terminal unit damper shall be normally open.

Negative Pressurization Rooms: The space temperature transmitter shall provide an input to a software controller. The output of the controller shall control the exhaust terminal unit between its maximum and minimum flow set points to maintain the temperature set point in the room. The supply terminal unit shall track the exhaust terminal unit to maintain a fixed air volume differential between the supply and room exhaust. In addition, the direct digital control unit shall monitor each terminal unit's velocity pressure and modulate the terminal unit dampers to maintain pressure-independent control. On a continued drop in space temperature, when the exhaust air terminal unit is at its minimum flow set point, the space temperature sensor shall provide an input to a software controller which shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller which shall modulate the normally closed reheat coil control valve to maintain supply air temperature set point. For units serving perimeter areas, the normally open perimeter radiation valve shall modulate in parallel with the reheat valve.

Positive Pressurization Rooms: The space temperature transmitter shall provide an input to a software controller. The output of the controller shall control the supply terminal unit between its maximum and minimum flow set points to maintain the temperature set point in the room. The exhaust terminal unit shall track the supply terminal unit to maintain a fixed air volume differential between the supply and room exhaust. In addition, the direct digital control unit shall monitor each terminal unit's velocity pressure and modulate the terminal unit dampers to maintain pressure-independent control. On a continued drop in space temperature, the space temperature sensor shall provide an input to a software controller which shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller which shall modulate the normally closed reheat coil control valve to maintain supply air temperature set point. For units serving perimeter areas, the normally open perimeter radiation valve shall modulate in parallel with the reheat valve.

Neutral Pressurization Rooms: The space temperature transmitter shall provide an input to a software controller. The output of the controller shall control the exhaust terminal unit between its maximum and minimum flow set points to maintain the temperature set point in the room. The supply terminal unit shall track the exhaust terminal unit with no differential between the supply and room exhaust. In addition, the direct digital control unit shall monitor each terminal unit's velocity pressure and modulate the terminal unit dampers to maintain pressure-independent control. On a continued drop in space temperature, when the exhaust air terminal unit is at its minimum flow set point, the space temperature sensor shall provide an input to a software controller which shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller which shall modulate the normally closed reheat coil

control valve to maintain supply air temperature set point. For units serving perimeter areas, the normally open perimeter radiation valve shall modulate in parallel with the reheat valve.

System variations consist of multiple supply and exhaust terminal units. The direct digital control unit shall total the exhaust and supply air to be used in the above sequencing.

In applications where multiple tracking pairs serve a common room, a software program shall calculate the average space temperature of the room by monitoring all of the space temperature transmitters. The average space temperature shall be used to calculate the master terminal unit (supply or exhaust) air flow set point. Furthermore all terminal units shall be at minimum air flow rate prior to operating any reheat coil or perimeter radiation control valve.

Perimeter Radiation Valve Control for Multiple Rooms Each Served by an Individual Supply Air Terminal Unit and a Common Perimeter Radiation Control Valve: (Note: Example described below is for an application where one (1) perimeter radiation valve serves common fin tube elements serving two (2) rooms. Similar software logic shall be applied to instances where more than two rooms are served by a single perimeter radiation valve.)

- The space temperature of each room shall be maintained by the supply air terminal unit and reheat coil serving the room. The perimeter radiation valve shall be used to satisfy the room which requires the greater amount of heating. A DDC software program, resident in the terminal unit controller, which is wired to the perimeter radiation valve, shall monitor the space temperature set point of each room, each room's actual space temperature, each terminal unit's current operating mode (heating, dead band, cooling) and calculate the difference between actual space temperature and set point.
- If either room requires heating, that room's terminal unit controller shall modulate its reheat coil control valve to maintain space temperature set point. The perimeter radiation control valve shall be allowed to operate in parallel with the reheat coil control valve until either room's space temperature is within 1°F below its cooling set point, at which time, the perimeter radiation valve shall modulate closed regardless of the heating demand of the other room. If either room's space temperature drops 1°F below its cooling set point, the perimeter radiation valve shall modulate open with the reheat valve position.

2) Flow –Tracking Control Unit

Flow-tracking control unit shall control the airflow balance of the room served. At a minimum, provide one (1) complete, stand-alone control unit per tracking pair.

The control unit shall be of DDC design with analog signal inputs and outputs. The inputs shall accept signals proportional to fume hood, exhaust and supply flows and space and supply air temperatures. The output signals shall control supply terminal units, reheat coil valves and general exhaust/return terminal units where applicable.

At a minimum, the following signals (points) shall be available to the BMS:

- Fume hood exhaust flow.
- Fume hood exhaust low-flow alarm.
- Supply/makeup airflow.
- General exhaust flow.
- Total exhaust flow.
- Total supply flow.
- Room offset.
- Space temperature.
- Supply air discharge air temperature.
- Terminal device position.

The control unit shall also accept direct-input global commands from the BMS. At a minimum, the following inputs shall be available:

- Room offset adjustment.
- Temperature override.
- Occupied/unoccupied setback of air change rates.

All points shall be stored in the BMS for trending, archiving, graphics, alarm notification and status reports.

3) Variable Air Volume Flow-Tracking System with Fume Hood

A typical system consists of a supply variable air volume terminal unit and exhaust variable air volume terminal unit and a fume hood exhaust valve. In some areas, there are multiple supply and/or general exhaust terminal units. In all flow-tracking applications, pressurization control shall take priority over temperature control.

In a room served by a fume hood, there shall be a wall-mounted emergency override pushbutton and local alarm light and horn. On activation of the pushbutton, the fume hood exhaust valve shall be positioned to maximum airflow and the general exhaust terminal units shall track accordingly. The alarm horn and light shall be activated. When the pushbutton is reset, the alarm light and horn shall be de-energized and the fume hood shall resume normal operation.

Control of a Laboratory with a fume hood exhaust valve shall be similar to a Laboratory without a fume hood, with the following exception:

- The fume hood exhaust valve airflow, as sensed via inputs to the DDC system, shall be summed to the general exhaust airflow. The supply terminal unit shall flow-track the general exhaust terminal unit and fume hood exhaust valve.

A DDC software program shall monitor the supply air temperature, space temperature, supply airflow and exhaust airflow, and calculate the space heat content by comparing the flow and differential temperature of the supply and return air. Any upset in the room flow shall cause the system to track the change in flow, calculate the required supply air temperature based on the new flow to meet the existing content, and feed forward a signal to the reheat coil control valve to assume the correct position in an anticipator arrangement.

On an increase in fume hood exhaust airflow, the exhaust terminal unit airflow shall be reduced to maintain the room's constant exhaust flow rate.

Space temperature control of the area shall be similar to the sequence titled "Variable Air Volume Flow-Tracking System Without Fume Hoods".

4) Electronic Face Velocity Controller for Variable Air Volume Fume Hoods

The electronic face velocity controller shall be a microprocessor-based controller, which shall control and maintain a constant face velocity (adjustable) into the hood by measuring the fume hood sash position and the fume hood exhaust flow and modulating the fume hood exhaust damper to maintain face velocity set point.

The face velocity controller shall be designed for fail-safe operation. It shall operate in an occupied/unoccupied mode via a signal from the building automatic temperature control system to operate the hoods at a lower velocity set point (when it is safe).

The fume hood face velocity controller shall maintain the average fume hood face velocity at the desired set point using a proportional, integral and derivative (PID) closed-loop control algorithm. The fume hood face velocity control process shall be as follows:

- The fume hood controller shall continually determine the fume hood's total open area by monitoring the fume hood sash position(s) by the sash sensor(s) as well as by taking account of any fume hood fixed open areas and the bypass opening(s).
- The fume hood controller shall calculate the required fume hood exhaust airflow necessary to maintain the average face velocity set point over the total open area.

- The fume hood controller shall control the fume hood exhaust airflow at the rate necessary to maintain the average face velocity set point. The fume hood controller shall ensure that the fume hood exhaust required to maintain the average face velocity set point is always maintained independently of any variations in exhaust system static pressure or any Laboratory room conditions such as the ventilation airflow or room static pressure that could otherwise affect the fume hood exhaust airflow.

5) Constant Air Volume Flow-Tracking System

A typical system consists of a supply variable air volume terminal unit and exhaust variable air volume terminal unit. In all flow-tracking applications, pressurization control shall take priority over temperature control.

A flow-tracking system microprocessor-based direct digital control unit shall be provided for each tracking pair to control the supply and exhaust variable air volume terminal units. Each supply air terminal unit shall be furnished with a hot water reheat coil.

The direct digital control unit shall monitor the velocity pressure of each terminal unit and calculate terminal unit airflow, the reheat coil discharge temperature via a duct-mounted electronic temperature transmitter, and space temperature via a wall-mounted electronic temperature transmitter. The direct digital control unit shall provide individual outputs to the exhaust terminal unit damper, the supply terminal unit damper and the normally closed hot water reheat coil control valve.

The space temperature transmitter shall provide an input to a software controller which shall reset the supply temperature set point. A supply air temperature transmitter shall provide an input to a DDC software controller which shall modulate the normally closed reheat coil control valve to maintain supply air temperature set point. For units serving perimeter areas, the normally open perimeter radiation valve shall modulate in parallel with the reheat valve.

Flow-Tracking Control: The exhaust air terminal unit shall operate at a constant air flow set point. The supply terminal unit shall track the exhaust terminal unit with a differential between the supply and room exhaust. In addition, the direct digital control unit shall monitor each terminal unit's velocity pressure and modulate the terminal unit dampers to maintain pressure-independent control.

System variations consist of multiple supply and exhaust terminal units. The direct digital control unit shall total the exhaust and supply air to be used in the above sequencing.

In applications where multiple tracking pairs serve a common room, a software program shall calculate the average space temperature of the room

by monitoring all of the space temperature transmitters. The average space temperature shall be used to control all reheat coil and/or perimeter radiation control valves in parallel at the same position.

Minimum data points available at the operator workstation shall be as follows:

- Terminal unit air flow reading.
- Terminal unit minimum air flow set point.
- Terminal unit maximum air flow set point.
- Discharge temperature (for units with reheat coils only).
- Discharge temperature set point (for units with reheat coils only).
- Reheat coil valve command (for units with reheat coils only).
- Space temperature.
- Space temperature set points.
- Perimeter radiation valve command (for units with reheat coils only).
- Damper position.
- Occupancy mode.
- Occupied cool/heat set point.
- Unoccupied cool/heat set point.
- Space temperature high-limit alarm.
- Space temperature low-limit alarm.
- Include six (6) additional software points to be defined by NYULH.

6) Approved Manufacturers

Flow-Tracking system shall be manufactured by Laboratory Control Systems – Envirotrak IV.

V. Air Handling Units

a. Hardware

- BACnet IP-based direct digital control unit per air handling unit.
- Provide BACnet or Modbus communication interface with variable frequency drive.
- Chilled water return temperature transmitter.
- Mixed-air temperature transmitter.
- Utilize latching relays for air handling units serving critical areas (i.e., OR's, Laboratories, Vivarium, patient areas)
- Humidifier valve control signal to be wired in series with fan run status contact. If fan is off, humidifier valve hardwired to close.
- Damper actuators (outdoor, return, spill) must have spring-return actuators with manual override.
- Each preheat coil section to have individual temperature control valve with dedicated temperature sensor for low-limit control.

- Cooling coil to have one (1) control valve for entire coil section with individual manual balancing valves on individual coil sections.
- VFD's must be programmed to skip resonance frequencies.

b. Software Functions

- Occupied/Unoccupied
- Preheat Coil Low-Limit Control
- Normal Operation - Summer Mode
- Normal Operation - Winter Mode
- Normal Operation Auto Mode
- Humidification Control
- Dehumidification Control
- Return Air Reset
- Supply Fan Static Pressure Control
- Flow Control
- Minimum Outdoor Airflow Quantity Control
- Indoor Air Quality Control
- Safeties
- Floor/Area Isolation Dampers (Combination Fire/Smoke Dampers)
- Fan Shutdown Mode
- Controller Reboot or Return from Power Failure or Controller Reboot: On controller reboot or return from power failure or controller reboot, all control loop outputs shall be commanded to their position prior to reboot or power failure and all control loop integrals shall be zeroed, thus eliminating reset windup.

c. Sequence of Operations

General Description

The air handling unit is an outdoor air economizer variable air volume air handling unit that operates in conjunction with a variable volume return/spill fan. The supply and return/spill air fans shall be provided with variable frequency drives, one (1) drive per fan. There shall be one (1) supply fan and one (1) return/spill air fan.

Occupied/Unoccupied Mode

The air handling unit shall operate based on a 7-day programmable schedule resident within the DDC controller serving the unit and adjustable at the operator workstation. The operator shall have the ability to override a starting or stopping of air handling unit and return/spill fan from the operator workstation or the DDC control unit.

Unoccupied Mode

During unoccupied mode, the air handling unit shall not be in operation. The normally closed minimum outdoor air, variable outdoor air, return air, spill air and fan discharge dampers shall be closed. The return/spill fan shall be off. No control signal shall be transmitted to the variable frequency drive of each fan. The normally closed chilled water coil valve shall be closed. Steam humidifier valve shall be closed.

Preheat Coil Low-Limit Control: The normally open steam preheat coil control valves, one (1) per coil, shall be under control of DDC software low-limit controllers to maintain a minimum air temperature of 45°F leaving the preheat coils, signal as sensed by temperature transmitters on the leaving air side of each coil section. The low-limit set point shall be reset by the BMS based on outside air temperature. As outside air temperature drops, the low-limit set point shall be raised.

When the air handling unit is off, all combination fire/smoke dampers located in supply and return ducts shall be closed.

Occupied Mode

Prior to starting the air handling unit, all combination fire/smoke dampers located in supply and return air ducts shall open.

When the air handling unit start-up is initiated, its temperature control system shall be in operation. When the air handling unit is called to start, its supply fan discharge and return air dampers shall open. A hardwired time delay shall prevent fan operation, allowing sufficient time for the dampers to open. When the supply fan and return fan are started, they shall both run at the minimum speed required to maintain rotation. Minimum speed set point shall be coordinated with the variable frequency drive manufacturer. The start of each fan shall be time-delayed to avoid simultaneous starting of fans. After the fan has achieved minimum speed, the DDC controller shall ramp up the speed of the supply fan to maintain its operating set point.

Normal Operation

1) Economizer Control

Economizer control will be enabled based on the following conditions:

- Global outside air enthalpy is enabled (i.e., outdoor air enthalpy is greater than 25 BTUs per pound of dry air) or outside air temperature plus an outside air temperature trigger deadband (adjustable) is less than the air handling unit return air temperature.
- Supply fan status is proven on.
- System is not operating in Warm-Up/Cool-Down Mode and Heating is off.

When enabled, the outside air damper, spill air damper and return air damper will modulate to maintain a mixed air temperature control set point (adjustable). The mixed air control set point will be adjusted based on the supply air temperature error set point. The supply air temperature error set point is based on how far off the supply air temperature is from the supply air temperature set point. For example, if the supply air temperature is 53°F and the supply air temperature set point is 55°F then the supply air temperature error set point is -2°F. A mixed air temperature error set point of 0 °F (adjustable) will control to the supply air temperature error set point and output a mixed air temperature heat gain set point. The mixed air temperature heat gain set point will range from a minimum mixed air temperature heat gain set point of -4°F (adjustable) to a maximum mixed air temperature heat gain set point of 5°F (adjustable). The supply air temperature set point minus the mixed air temperature heat gain set point will determine the mixed air temperature control set point. As the mixed air temperature increases above mixed air temperature control set point, the outside air damper and spill air damper will modulate open and the return air damper will close proportionately. The reverse will occur on a decrease below the mixed air temperature control set point. The outside air damper will maintain a minimum outside air flow set point (adjustable based upon the “Minimum Outdoor Air Flow Quantity Control” sequence below).

2) Supply Air Temperature Control

Supply air temperature control will be enabled based on the following condition:

- Supply fan status is proven on and
- System is not operating in Warm-Up/Cool-Down Mode.

When enabled the cooling valve will modulate to maintain a supply air temperature control set point as sensed by a duct mounted supply air temperature sensor. The supply air temperature control set point (adjustable) will be reset based on the worst case deviation from space temperature to the space temperature set point (adjustable) or space humidity to the humidification set point (adjustable) for all spaces being served by the air handling system. The supply air temperature control set point will range from a minimum supply air temperature set point of 45°F (adjustable) to a maximum supply air temperature set point of 65°F (adjustable). As the supply air temperature increases above supply air temperature control set point the cooling coil valve will modulate open. The reverse will occur on a decrease below the supply air temperature control set point.

The heating coil control valve will modulate to maintain a preheat supply air temperature control set point (adjustable). The preheat supply air temperature control set point will be adjusted based on the supply air temperature error set point as described in “Economizer Control”. A preheat

supply air temperature error set point of 2°F (adjustable) will control to the supply air temperature error set point and output a preheat supply air temperature heat gain set point. The reheat supply air temperature heat gain set point will range from a minimum preheat supply air temperature heat gain set point of -4°F (adjustable) to a maximum preheat supply air temperature heat gain set point of 5°F (adjustable). The supply air temperature set point minus the preheat supply air temperature heat gain set point will determine the preheat supply air temperature control set point. As the preheat air temperature decreases below preheat supply air temperature control set point, the steam heating coil valve will modulate open. The reverse will occur on an increase above the preheat supply air temperature control set point. Preheat air temperature low limit control shall be operational in this mode as described above.

3) Humidification Control

Humidification control will be enabled based on the following conditions:

- Supply fan status is proven on (Refer to Humidifier Valve Lockout below).

A supply air dew point control loop will modulate the normally closed humidifier valve to maintain a supply air dew point set point as sensed by a duct mounted supply air humidity sensor and the supply air temperature sensor.

The supply air dew point set point (adjustable) will be reset based on the worst case deviation from space humidity to the humidification set point for all spaces being served by the air handling system. The supply air dew point set point will range from a minimum supply air dew point set point of 30°F (adjustable) to a maximum supply air dew point set point of 65°F (adjustable).

The operator at the workstation shall have the ability to override the supply air dew point set point (adjustable) within the minimum supply air dew point set point and maximum supply air dew point set point.

Humidification control will be overridden and the humidifier valve will modulate closed if the supply air humidity increases above a high limit humidity set point of 90% RH (adjustable) as sensed by the supply air humidity sensor.

4) Humidifier Valve Lockout

The humidifier valve shall be prevented from opening via a hardwired interlock with a current sensing relay used to monitor fan run status.

The current sensing relay shall be wired to a double-pole, double throw relay. One normally open pole shall be wired as an input to the DDC unit for fan run status. The other normally open pole shall be wired in series with the control

signal to the humidifier valve such that when the fan is off, the humidifier valve shall be “hardwired” closed.

Upon a fan trip, the humidifier valves shall immediately fail in the closed position.

5) Dehumidification Control

Refer to Supply Air Temperature Control

6) Return Air Reset Program

The BMS shall contain a software program that shall reset the supply air temperature set point based on return air temperature. Supply air reset limits shall be operator-adjustable.

7) Supply Fan Static Pressure Control

A static pressure transmitter shall be located in the supply air duct, upstream of the furthest terminal unit served by the air handling unit.

A reverse-acting 2-mode (proportional-plus-integral) DDC software controller resident in the unit’s DDC controller shall monitor its static pressure transmitter. The output of this controller shall modulate the respective air handling unit supply fan to maintain supply static pressure set point.

As duct static pressure decreases, the controller output shall increase, to increase fan speed. On an increase in duct static pressure, the output of the controller shall decrease, to decrease fan speed. A software auto/manual switch function shall enable the operator to override the output of the static pressure controller and adjust fan speed from the operator workstation or DDC controller.

A static pressure transmitter in the supply fan discharge duct shall provide a signal proportional to fan discharge static pressure to a software-based 2-mode pressure controller with reverse action, acting as a high limit. If fan discharge static pressure exceeds its set point, the high-limit controller shall, through a software low selector, override the output of the system static pressure controller to proportionally reduce the speed of its respective supply fan to maintain fan discharge pressure high-limit set point. The controller set point shall be reset such that no terminal unit shall operate at its fully open position to maintain airflow set point.

Static pressure controls shall control system operation during all cycles of operation.

A DDC static pressure software program shall monitor the position of variable air volume terminal unit damper and shall calculate the quantity of dampers that are less than eighty percent (80%) open. If the majority of terminal units are less than eighty percent (80%) open, the DDC software controller shall reset the supply fan static pressure set point downward in 0.1 inch w.c.

(adjustable) increments every 5 minutes until the majority of the dampers are at 80% open. If the majority of the dampers are more than ninety percent (90%) open, the program shall reset the set point upwards in 0.1 inch w.c. (adjustable) increments every 5 minutes until the majority of the dampers are at eighty percent (80%) open.

During system start-up, the static pressure control algorithm, integral control mode, shall be suppressed until the control point is within the proportional band of the controller to avoid reset windup.

8) Flow Control

The unit's DDC controller shall contain a software-based flow control program. The software controller shall receive input signals from airflow-measuring stations installed in the inlet of its respective supply and return fan, and totalize, linearize and scale them. The flow control program shall match the return fan with the supply fan and maintain the volumetric balance between return and supply airflow by varying return fan speed to maintain a constant differential between supply and return airflow. A software bias shall be provided to compensate the return flow for an outside air minimum reset, constant toilet exhaust and constant general exhaust at all operating loads. The operator shall be able to manually override the flow control program and manually control each supply and return fan.

9) Minimum Outdoor Airflow Quantity Control

An airflow-measuring station installed upstream of the minimum outside air damper shall measure minimum airflow and transmit this information to the BMS. Should outside airflow be below set point, the return air damper shall be modulated closed and the spill damper open until the minimum outside airflow is at set point. Should outside air flow be above set point, the return air damper shall be modulated open and the spill damper closed until the minimum outside air flow is at set point. If the outside air flow continues to be above set point, the minimum outdoor air damper shall modulate to a preset minimum value. This program shall be overridden whenever the variable outdoor air damper is open during the economizer mode of operation. Minimum outdoor air damper shall be modulating type.

10) Mixed Air Low Limit Temperature Control

A mixed air temperature low limit control loop will override "Economizer Control". When the mixed air temperature sensor decreases below a mixed air low limit set point of 39°F (adjustable), the outside air damper and spill air damper will modulate closed and the return air damper will modulate open.

11) Indoor Air Quality Control

Multiple combination CO2 transmitters shall be installed in the space served by the air handling system and monitored via the BMS. In addition, a CO2 transmitter shall be installed in the unit's main return air duct and supply air duct. The output of the installed return and space CO2 transmitters shall be

monitored by the BMS and compared to the master outdoor air CO2 transmitter. The BMS shall activate an alarm if any CO2 transmitter reading is 530 ppm (adjustable) above the outdoor air system transmitter reading. A DDC software program shall continuously monitor the return and space CO2 transmitters, select the transmitter with the highest reading and calculate a supply air CO2 set point, which shall be used to vary the minimum outdoor airflow set point to maintain a maximum of 530 ppm above the outdoor air system transmitter reading for all return and space CO2 transmitters. Minimum and maximum airflow set points shall be operator-adjustable via the workstation. The operator shall be capable of enabling/disabling the automatic reset at any time from the workstation.

12) Safeties

High-Discharge Pressure Switches and Low-Suction Pressure Switches: Pressure differential switches installed in the discharge of each supply and return fan, which sense discharge pressure, shall stop the fan and transmit an alarm to the operator workstation if the pressure set point of the switch is exceeded. A separate pressure switch installed in the inlet of each supply and return fan shall also stop the fan and transmit the alarm if fan suction pressure is below its set point. Pressure switches shall be automatic-reset type. The fan shutdown shall be operative whether the variable frequency drive Hand-Off-Inverter-Bypass switch is in the Inverter, Bypass or Hand position. Individual alarms (high and low) will be activated at the workstation.

Low-Temperature Switches: Low-temperature switches (freezestats), one (1) for each cooling coil section, shall follow the following sequence:

- **Pre-time delay timeout:** Any freezestat installed on the inlet of the cooling coil shall initiate a safety shutdown sequence upon sensing a temperature below the low limit setting of 35°F, locally adjustable at each freezestat. Each normally closed freezestat shall have a unique input and identifier. Any freezestat trip shall activate a time delay relay. Upon activation of the freezestat switch status input, the following shall occur (before time delay timeout):
 - The unique freezestat switch status input will be ON.
 - The time delay relay will initiate the elapsed time countdown
 - A pre-alarm condition indicator shall activate at the BMS graphics containing the unique freezestat identifier
 - Preheat low limit setpoint will raise 10°F
 - CHW control valve will open to at least 25% (if it isn't already greater than 25% open)
- **Post-time delay timeout:** Upon activation of any freezestat switch status input for a continuous elapsed time of 30 seconds via the adjustable time delay relay, the following shall occur:

- The supply fan VFD(s) shall shut off via hardwired interlock to the VFD safety shutdown circuit.
- The return fan VFD(s) shall shut off via hardwired interlock to the VFD safety shutdown circuit.
- The chilled water valve shall open to 100%
- The preheat valves shall control to a preheat discharge temperature setpoint of 95°F
- A five star alarm must be generated each time a freezestat time delay relay activates.
- Each time delay relay shall have an independent five star alarm.
- After the freezestat switch status turns off, the five star critical alarm can be manually set to OFF via the BMS. Once the alarm is off and the unit can be manually restarted via the BMS.
- The outside air intake damper(s) shall close
- The supply fan discharge damper(s) shall close

13) Floor/Area Isolation Dampers (Combination Fire/Smoke Dampers)

Supply floor/area isolation dampers shall open when the supply fan serving the damper is started, and shall close when the fan serving the damper are stopped. All supply dampers on a floor shall be controlled in a group via a hardwired connection to the fan's variable frequency drive. Dampers shall be positioned open prior to fan starting regardless if fan is started from BMS, manual command from VFD, bypass function of VFD or fan start from fire alarm system.

Return floor/area isolation dampers shall open when the return fan serving the damper is started and shall close when the fan serving the damper is off. All return dampers shall be controlled in a group via a hardwired connection to the fan's variable frequency drive. Dampers shall be positioned open prior to fan starting regardless if fan is started from BMS, manual command from VFD, bypass function of VFD or fan start from fire alarm system.

14) Fan Shutdown Mode

On a command to stop a fan, the fan shall ramp down to its minimum speed and the fan shall stop. The fan discharge damper shall close slowly and shall not be fully closed until fan speed has decreased to approximately ten percent (10%). The outdoor, return and spill air dampers shall close. Refer to Unoccupied Mode.

15) Fire Alarm Reset

After a fire alarm shutdown, the AHU shall automatically restart as long as no safety interlocks require a manual reset. Unit shall resume operation to maintain last known setpoints prior to fire alarm shutdown.

VI. Packaged Air Conditioning Units

a. Hardware

- Unitary controller.
- Utilize latching relays for air conditioning units serving critical areas.
- Leak detector.
- Current-sensing relay (fan run status).
- Space temperature sensor.

b. Software Functions

- Fan failure alarm.
- Leak alarm.
- Start/stop/status.
- High space temperature alarm.

c. Sequence

Packaged air conditioning unit shall be chilled water-cooled type. The unit shall be furnished with a factory-installed microprocessor controller and chilled water valve.

The unit shall be started locally and run continuously. The BMS shall be capable of starting and stopping the unit.

A point-type leak detector in the unit's drip pan shall be installed and wired to the BMS for alarm monitoring only. On activation of a leak detector, the respective unit shall continue to run and an alarm shall be activated at the operator workstations.

The BMS shall monitor a common alarm from the unit originating from a dry-contact closure at the unit's microprocessor.

Unit run status shall be monitored at the BMS via a current-sensing relay. On failure of a unit to operate, a fan failure alarm shall be activated at the operator workstation.

A space temperature transmitter shall be monitored at the BMS and shall announce a high and low temperature alarm at the operator workstation on sensing a temperature above or below set point (adjustable).

When the unit is in operation, its factory-installed controller shall modulate its normally closed chilled water valve to maintain space temperature set point.

VII. Fan Coil Units

a. Hardware

- Unitary Controller. Note: Unitary controller is to be powered by a transformer that is energized on its primary side from the line side of the power feed to fan coil unit. This is to prevent a communication loss to the controller when the fan coil unit is shut down for maintenance.
- Utilize latching relays for fan coil units serving critical areas.
- Leak detector.
- Current-sensing relay (fan run status).
- Space temperature sensor.
- Spring-return normally closed modulating control valve for cooling.
- Spring-return normally closed modulating control valve for heating, unless fan coil unit has ducted unconditioned outdoor air. If so, provide normally open valve for heating.

b. Software Functions

- Fan failure alarm.
- Leak alarm.
- Start/stop/status.
- High space temperature alarm.
- Controller Reboot or Return from Power Failure or Controller Reboot: On controller reboot or return from power failure or controller reboot, all control loop outputs shall be commanded to their position prior to reboot or power failure and all control loop integrals shall be zeroed, thus eliminating reset windup.

c. Sequence of Operations

Fan coil unit shall be started and stopped through the BMS. Fan run status shall be monitored at the BMS via a current-sensing relay. On failure of the unit to operate, a fan failure alarm shall be activated at the workstation.

When the fan is off, its chilled and hot water control valves shall be closed.

When the fan coil unit is in operation a DDC software program shall modulate the electrically operated, normally closed chilled and hot water valves in sequence to maintain space air temperature set point. On an increase in space air temperature above set point, the software controller shall modulate the hot water valve closed and chilled water valve open. As the temperature decreases, the reverse shall occur.

A point-type leak detector in the unit's drip pan shall be installed and wired to the BMS for alarm monitoring only. On activation of a leak detector, the respective unit shall continue to run and an alarm shall be activated at the operator workstation.

On sensing a space temperature 5°F above set point, an alarm shall be activated at the workstation. On a decrease in space temperature to within $\pm 2^\circ\text{F}$ of set point, the alarm shall be reset.

VIII. Exhaust Fans

a. Hardware

- Unitary controller.
- Low suction and discharge pressure switches.
- Space temperature (as required).
- Provide BACnet or Modbus communication interface with variable frequency drive (as applicable).

b. Software Functions

- Fan failure alarm.
- Start/stop/status.
- High space temperature alarm.
- Pressure switch alarms.

c. Sequence

When a fan is off, its intake and discharge dampers shall be closed. All combination fire/smoke dampers located in associated ductwork shall be closed.

When the fan starts, a time delay relay shall prevent the fan from starting until its intake, discharge and combination fire/smoke dampers are fully open.

For fans that operate continuously, each fan shall be started by a manual command at the operator workstation. For fans that function to maintain space temperature, fan shall be started via a software program that monitors space temperature. On sensing a space temperature above set point, the exhaust fan shall start. On sensing a decrease in space temperature to 5°F below set point, the exhaust fan shall stop.

Fan run status shall be monitored at the BMS via a current-sensing relay. On failure of the fan to operate, an alarm shall be activated at the workstation.

High-Discharge Pressure Switches and Low-Suction Pressure Switches: Pressure differential switches installed in the inlet and discharge of the exhaust fan shall stop the fan and transmit an alarm to the workstation by means of a digital input to the system DDC controller, if the pressure set point of the switch is exceeded. The fan shutdown shall be operative whether the variable frequency drive Hand-Off-Inverter-Bypass switch is in the Inverter, Bypass or Hand position. Individual high- and low-pressure alarms shall be activated at the workstation.

All exhaust fan combination fire/smoke dampers shall be hardwired interlocked with the operation of the exhaust fan.

IX. Chillers

a. Hardware

- BACnet IP-based direct digital control unit to serve fifty percent (50%) of chilled water plant equipment (e.g., chillers, pumps, cooling towers). Provide two (2) control units per chiller plant.
- Provide BACnet communication interface with factory-provided chiller control panel.
- Provide hardwired output points for:
 - Enable/disable.
 - Common alarm monitoring.
- Utilize latching relays for enable/disable.
- Provide field devices for chilled water supply temperature and condenser water return temperature.

b. Software Functions

- Enable/disable control and status monitoring.

c. Sequence

- Prior to enabling chiller operation, respective chilled and condenser water pumps shall operate and chiller's condenser and evaporator isolation valves shall be open.
- When chiller is in operation, its factory-furnished controller shall stage compressors to maintain leaving water temperature set point.

X. Pumps

a. Hardware

- Hardwired points to include start/stop, status and speed control.
- Provide BACnet or Modbus communication interface with variable frequency drive.
- Utilize latching relays for start/stop.
- Differential pressure transmitters used for pump speed control shall be hardwired directly to the controller containing the analog output for pump speed control regardless of the transmitter location.

b. Software Functions

- Start/stop control and status monitoring.
- Runtime software calculation indicating total runtime of each pump.
- Speed control (as required).
- The following input points shall be monitored and/or alarmed via the DDC system:
 - Speed feedback.
 - Output frequency.
 - Current (amps).
 - % torque.

- Power (kW).
- Kilowatt hours.
- Operating hours.
- Drive temperature.
- All diagnostic warning and fault information.
- Remote fault reset.
- Keypad “Hand” or “Auto” selected.
- Bypass selected.
- Motor running in bypass mode.
- Motor running in inverter mode.

c. Sequence

- The DDC system shall monitor pump status via current-sensing relays furnished and installed by this subsection. Should a pump fail to start, the DDC system, through a 0 - 30 second (adjustable) time delay relay, shall send an alarm to the network computer and alarm printer and start the lag pump. An audible signal shall also alert the operator to the alarmed condition.
- A DDC software program shall rotate lead and standby pumps to equalize runtime.
- Variable Speed Pump Control: A DDC software differential pressure controller, through an input signal from an electronic differential pressure transmitter located upstream of the furthest load served by the pump, shall control the online variable speed pump to maintain set point. On decreasing differential pressure below set point, the DDC software controller output to the variable speed drive shall increase to drive the pump to full speed. On an increase in differential pressure above set point, the DDC software controller output to the variable speed drive shall decrease to drive the pump to reduce speed. On a continued increase in differential pressure, the pump minimum speed shall be limited to 30% (adjustable) of its design flow rate. On a further increase in pressure, the software controller shall modulate the differential pressure valve open to maintain system differential pressure.

XI. Cooling Towers

a. Hardware

- Control to be incorporated within chiller BACnet IP controller or dedicated controller based on location of cooling tower with respect to chillers.
- Monitor vibration alarm.
- Monitor basin water temperature.
- Monitor basin level.
- Utilize latching relays for start/stop.

b. Software Functions

- Condenser water set point reset based on outdoor air wet bulb and tower approach.
- Controller Reboot or Return from Power Failure or Controller Reboot: On controller reboot or return from power failure or controller reboot, all control loop outputs shall be commanded to their position prior to reboot or power failure and all control loop integrals shall be zeroed, thus eliminating reset windup.
- The following input points shall be monitored and/or alarmed via the DDC system:
 - Speed feedback.
 - Output frequency.
 - Current (amps).
 - % torque.
 - Power (kW).
 - Kilowatt hours.
 - Operating hours.
 - Drive temperature.
 - All diagnostic warning and fault information.
 - Remote fault reset.
 - Keypad “Hand” or “Auto” selected.
 - Bypass selected.
 - Motor running in bypass mode.
 - Motor running in inverter mode.
- The following alarms shall be annunciated at the operator workstation:
 - Cooling tower vibration alarm.
 - Basin low water temperature alarm.
 - Basin high water level alarm.
 - Basin low water level alarm.
 - Cooling tower fan excessive runtime alarm.

c. Sequence

- The DDC system shall be capable of starting and stopping each cooling tower fan and it shall contain a runtime software calculation indicating total runtime of each pump.
- A DDC software program shall allow an operator to select the lead-lag rotation of the cooling towers. In addition, an operator shall be capable of selecting an automatic mode, which shall allow the DDC software program to select lead-lag rotation based on runtime.
- The speed of each enabled cooling tower cell fan shall be selected by a DDC three-mode software program, based upon condenser supply water temperature, as measured by electronic temperature transmitter. The software controller shall modulate the fan speed to maintain supply water set point. Condenser water set point shall be calculated by the DDC system based on the outdoor air wet bulb temperature and the tower approach

temperature. There shall be software-adjustable minimum and maximum limits. The operator shall select the initial run sequence of the towers. The DDC system shall control the speeds of the active cooling tower fans in parallel from off to minimum speed, and modulate from minimum to maximum speed, to maintain supply water temperature set point as well as the reverse, until all fans are off. On a continued decrease in condenser water temperature, the condenser water bypass valve shall modulate open to maintain temperature set point. All cooling tower fans shall be off before the valve modulates open.

- All active fans shall operate at minimum speed prior to modulating from minimum to maximum speed.
- The condenser water supply temperature set point shall be automatically reset by the DDC system controller based on the instantaneous outdoor air wet bulb temperature plus the design tower approach (adjustable).

XII. Shell-and-Tube Heat Exchangers

a. Hardware

- BACnet IP-based direct digital control unit to serve water system, including pumps and heat exchangers.
- For systems with multiple heat exchangers, provide a supply water temperature sensor per heat exchanger.
- Monitor common supply water temperature.
- Monitor common return water temperature.

b. Software Functions

- The following alarms shall be annunciated at the operator workstation:
 - High supply water temperature alarm.
 - Low supply water temperature alarm.

c. Sequence

- If system includes lead/lag heat exchangers, the following modes shall be programmed:
 - Lead/Lag mode
 - Parallel mode

XIII. Plate-and-Frame Heat Exchangers

a. Hardware

- BACnet IP-based direct digital control unit to serve water system, including pumps and heat exchangers.
- For systems with multiple heat exchangers, provide a supply water temperature sensor per heat exchanger.
- Monitor common supply water temperature.
- Monitor common return water temperature.

b. Software Functions

- The following alarms shall be annunciated at the operator workstation:
 - High supply water temperature alarm.
 - Low supply water temperature alarm.

c. Sequence

- If system includes lead/lag heat exchangers, the following modes shall be programmed:
 - Lead/Lag mode
 - Parallel mode

XIV. Expansion Tanks

a. Hardware

- Pressure transmitter

b. Software Functions

- High and low pressure alarms

c. Sequence

- Provide software high and low pressure alarms. Alarm set points shall be 5 psi above and below actual operating pressure. The DDC system shall activate a high and low pressure alarm at the DDC system.

XV. Smart Comfort Program

a. General

- Design engineer shall analyze each individual space and consider its use to develop a strategic energy saving sequence during unoccupied periods. These areas shall also have a means of placing the system back into an occupied mode
- Strategies shall be reviewed by the NYULH Facilities Management Team and provide feedback as required.

b. Energy Saving Strategies

- Strategies that shall be considered but not limited to are:
 - Flow Setbacks
 - Temperature setbacks
 - Lighting control

P. OEM Equipment Interface

I. General Requirements

Equipment identified below shall be provided with communication interface option. Preferred communication network protocol is Modbus TCP/IP or BACnet MS/TP; however, if any of those are not available then Modbus RTU or Bacnet MS/TP are also

~~acceptable, the BMS is capable of communicating via other industry-standard protocols such as Modbus.~~ If a field server or gateway is required to communicate between the BMS and the equipment, it must be approved in writing by the NYULH facility management team prior to implementation.

Equipment provider will be responsible for equipment start-up and to verify that communication to BMS is established and functional. The BATC Contractor must participate with the start-up to ensure proper communications.

On completion of the interface, the interface shall be demonstrated to the NYULH facility management team and issues identified after start-up demonstration will require corrective action by the responsible party.

II. Equipment

At a minimum, the following equipment shall be interfaced with the BMS:

- ~~Electric m~~Meters (Electric, Flow, BTU, etc.).
- Variable frequency drives.
- Packaged air conditioning units.
- Chillers.
- Room pressure monitors/Critical Room Controllers.
- RO System
- Lighting System
- Boiler System
- Medical Gas System (Monitored points shall be hardwired to BMS Controller)
- Plumbing system tanks and pumps
- Fuel Oil Systems
- Electrical Systems

III. Metering

Metering shall be provided at the service entrance of each utility to each building and shall include at a minimum:

- Steam - Refer to Subsection 7.M.II.
- Condenser Water - Refer to Subsection 7.M.II.
- Chilled Water - Refer to Subsection 7.M.II.
- Electric – [To be included in a future document version.]

IV. Variable Frequency Drive Interface

a. General Requirements

Furnish and install a communication interface between each fan and pump variable frequency drive and the direct digital control system. Preferred communication protocol shall be BACnet. BATC Contractor shall be responsible for coordinating with the VFD manufacturer for communication protocol requirements per equipment per project. Interface shall allow for simultaneous two-way communications between the VFD and BMS. This functionality shall

allow an operator to remotely monitor and adjust all variables via the BMS operator workstation.

b. Hardwired Interface

- Fans (Air Handling Systems, Heating and Ventilation Units, Exhaust Fans and Cooling Tower Fans)
 - Start/stop.
 - Speed control.
 - Safety shutdown (i.e., pressure switch and low temperature thermostat).
 - Common malfunction alarm.
 - Drive not in Automatic.

Note: Fan run status shall be monitored via current-sensing relay, provided and installed by BATC Contractor.

- Pumps
 - Start/stop.
 - Speed control.
 - Common malfunction alarm.
 - Drive not in Automatic.

c. Communication Interface: The following input points shall be monitored via the BMS:

- Speed feedback.
- Output frequency.
- Current (amps).
- % torque.
- Power (kW).
- Kilowatt hours.
- Operating hours.
- Drive temperature.
- All diagnostic warning and fault information.
- Remote fault reset.
- Keypad “Hand” or “Auto” selected.
- Bypass selected.
- Motor running in bypass mode.
- Motor running in inverter mode.

A DDC software program shall monitor the Auto position of the VFD serving the fan via the communication interface specified herein. On receiving indication that the fan is not operating in “Auto”, an alarm shall be activated at the workstation.

V. Packaged Air Conditioning Units

Packaged air conditioning units to be provided with communication interface option. Preferred communication protocol is Modbus TCP/IP or BACnet ~~MS/TIP~~. BATC Contractor is responsible for verifying the protocol provided with the units. If a field

server or gateway is required to communicate between the BMS and the unit, it must be approved in writing by the NYULH facility management team prior to implementation.

VI. Chillers

Chillers to be provided with communication interface option. Preferred communication protocol is Modbus TCP/IP or BACnet MS/TP. BATC Contractor is responsible for verifying the protocol provided with the chiller. If a field server or gateway is required to communicate between the BMS and the chiller, it must be approved in writing by the NYULH facility management team prior to implementation.

VII. Room Pressure Monitors

Room pressure monitors to be provided with BACnet MS/TP communication interface option.

VIII. Lighting System

The lighting control system shall be provided with BACnet or Modbus communication interface connection capability.

The lighting control server and controllers shall be on their own independent network. A single point of connection shall tie the lighting control system to the BMS via IP or mstp.

Q. Graphics Standards

I. General Requirements

Dynamic graphics shall be created for each system interfaced with the building management system. Systems include, but are not limited to, air handling units, air conditioning units, heating and ventilation units, exhaust fans, pumps, chillers, heat exchangers, plumbing systems, electrical systems, etc.

Summary graphics shall be created for systems as described herein. Summary graphics shall be updated, on a per-project basis, as modifications are made to each respective system. The summary graphics are intended to be live documents that continue to evolve as various systems are added, removed and/or modified.

Where air handling or water systems serve areas other than Mechanical Equipment Rooms, provide dynamic color floor plan displays indicating the area served. The displays shall include all physical and virtual points associated with the respective system.

The graphical interface shall allow users to access system schematics, floor plans, summary graphics, “as-built” documentation, operation and maintenance manuals via a hierarchal graphical penetration scheme and menu selection.

Colors shall be used to indicate the status of points (e.g., RED = alarm, GREEN = normal) and these colors shall change as the status of the equipment changes. Provide a software program that shall notify the operator that a point has been placed in operator override. Notification shall be identified on the respective system graphic.

Dynamic temperature values, humidity values, flow values and status indication shall automatically update to represent current conditions without operator intervention and without predefined screen refresh rates.

All values displayed on the graphics shall include appropriate engineering units.

Values/icons for points which are placed in an override or locked state by an operator command shall clearly be identified and displayed in a manner that the operator can identify these locked points.

Performance overviews shall be provided for each building totaling its actual energy usage with a detailed comparison to its expected usage, on a month by month basis, as well as an annual basis.

BMS system graphics shall be developed based on NYU standard graphic symbols, colors, and design. All BMS system graphics shall be coordinated with NYULH. The contractors shall submit copies of proposed graphics in the shop drawings for review and approval by the following authorities:

- a) NYULH Facilities Team
- b) Consulting Design Engineers

II. Sitewide Main Page

Main page shall contain the following:

- Site map with links to each individual building.
- Link to each campus summary graphic.
- Common Critical Data
 - Outdoor air temperature.
 - Outdoor air humidity.
 - Outdoor air CO2.
 - Outdoor air enthalpy.
 - Outdoor air dewpoint.

III. Individual Building Main Page

Graphics should be organized by building and floor with links to all the equipment that serves that floor on the graphics link.

a. Building Operator Links

- Tisch Hospital
 - Ancillary
 - Millhauser
- Alumni Hall
- Medical Science Building - Berg
- Coles Student Laboratory
- Schwartz Lecture Hall
- Skirball Institute
- Smilow Research Center

- Schwartz Health Care Center (HCC)
- 660 First Avenue
- Energy Building
- Greenberg Hall
- Kimmel Pavilion
- Science Building

Each building shall be presented with an individual main page. The main page shall consist of the following:

- Link to the sitewide main page.
- Link to each respective floor plan of the building.
- Link to building summary graphics for each of the following systems:
 - Condenser water system and all connected equipment (i.e., packaged air conditioning units, Cold Rooms, freezers, etc.), regardless of whether the equipment is interfaced with the BMS or not (single-line format).
 - Chilled water system and all connected equipment (i.e., air handling units, packaged air conditioning units, Cold Rooms, freezers, etc.), regardless of whether the equipment is interfaced with the BMS or not (single-line format).
 - Air handling unit relevant data such as run status, supply temperature, static pressure, and active alarm (tabular format).
 - Supply, return and exhaust duct distribution and all connected equipment (single-line format).
 - VAV box relevant data such as temperature set point, actual temperature and list of rooms served. (Tabular Format).
 - Electrical distribution system, inclusive of all electrical status, alarm and metering points (single-line format).
 - Environmental boxes, refrigerators and freezers (tabular format).
 - Instrument air systems pressure readings, interconnections, risers, branch piping, isolation valves.
 - Communication network indicating all controllers, wiring configurations, controller addresses, controller location. Note: This is not a dynamic graphic. Intent is for a static graphic indicating “as-built” for BMS communication network.

Wherever possible, summary graphics shall include links to systems illustrated on the respective summary graphic as well as other systems associated with the system depicted. For example, VAV summary graphic should contain the AHU and reheat water system links.

- Links to each system group. Groups are defined as follows:
 - Air handling units.
 - Air conditioning units.
 - Exhaust fans.
 - Chilled water system.

- Condenser water system.
- Hot water system.
- Secondary water systems.
- Process cooling systems.
- Domestic water.
- Medical air systems.
- Operating Rooms.
- Environmental boxes.
- Generators.
- UPS systems.
- Automatic transfer systems.
- Double-ended substations.
- Individual links to each piece of equipment and/or system within each group. All graphics must show the name of the system and its service area. All systems that serve the system illustrated on the graphic, must be identified and linked to. For example, if a fan system provides the outside air delivered to a fan coil unit, the fan system tag must be identified at the outdoor air intake on the graphic. If a system serves VAV boxes, this must be indicated on the system graphic with a link to the VAV boxes provided.
- Refer to Appendix A for sample graphic indicating a typical floor plan.

IV. Campus Summary Graphics

Summary graphics include the following:

- Steam system (displayed in a single-line format).
- Chilled water system (displayed in a single-line format).
- Electric distribution systems (displayed in a single-line format).
- Pneumatic air systems (displayed in a single-line format).
- Domestic water system single-line riser diagram showing domestic water meter POE, pumping system, water tower, domestic hot water systems and other water users.
- Medical air system per building.
- Operating Rooms (tabular format).
- Energy metering (tabular format).
- Air handlers/exhaust fans by building and floor location
- Reheat/perimeter/secondary water by system by building and floor location (displayed in a "single line" format)
- Generators by building (tabular format)
- FCU's by building and floor (tabular format)
- Walk-in boxes, environmental boxes, hot rooms (tabular format)
- ATS (tabular format)
- UPS (tabular format)
- Sump/ejector pumps (tabular format)
- Critical Labs (Berg/Smilow ABSL-3 temps, pressures)
- Refrigeration cooling towers (displayed in a "single line" format)

- Control air plants (displayed in a "single line" format)
- Steam PRV's and perimeter steam control valves (tabular format)
- Sump/ejector/condensate pump (tabular format)
- Animal holding rooms (tabular format)
- Fire systems, preactions (tabular format)
- Decontamination showers (tabular format)
- Room pressure monitoring (tabular format)
- Domestic water, water heaters, booster pumps, house tanks (tabular format)
- Riser Diagrams – Airside (AHU, FCU, etc.); Waterside (Pumps, towers, chillers, etc.). Refer to riser diagram examples.
- Communication network indicating workstations, servers, network switches and primary controllers with respective locations and wiring configurations. Note: This is not a dynamic graphic. Intent is for a static graphic indicating "as-built" for BMS communication network.

Wherever possible, summary graphics shall include links to systems illustrated on the respective summary graphic as well as other systems associated with the system depicted. For example, chilled water system summary graphic should contain links to each chilled water system.

Campus summary graphics shall be a compiled building system overviews. The campus single lines will be the summation of the building single line drawings. All systems should be grouped together with similar systems in a building. If there are no other similar systems in the building a new overview shall be started for that system with LED alarm bringing you to that page in the event of a critical alarm. NO GRAPHICS SHALL BE GROUPED OR LABELED "miscellaneous".

Summary graphics shall be updated as the systems they represent are modified.

V. Floor Plans

Floor plans shall display air and piping distribution systems in single-line format.

Floor plans shall indicate location of all equipment located on the floor (i.e., exhaust fans, air conditioning units, VAV boxes, environmental boxes, etc.) as well as links to respective individual equipment graphics. Equipment locations shall be as-installed locations.

Floor plans shall indicate location of all equipment that is not located on the floor, but serves the floor (i.e., air handling units, exhaust fans and water systems) as well as links to respective individual equipment graphics. Equipment locations shall be as-installed locations.

Floor plans shall show dynamic variable monitoring space conditions (i.e., temperature, humidity, CO₂, room pressures, etc.) in actual field-installed location of sensing device.

Floor plans to indicate latest room numbers.

VI. Equipment

Each individual equipment graphic shall include the following links:

- Sitewide main page.
- Individual building main page.
- Each floor served by the equipment.
- Summary graphic associated with the system

For example: Air handling unit graphic is to include links to the following summary graphics:

- Chilled water system.
- Steam or hot water system.
- VAV box summary system.
- Network communications.

At the top of each graphic, indicate the equipment tag, location and what it serves (e.g., AHU-TH-2-1, 2nd Floor MER, Floors 3 - 7)

Individual equipment graphics shall indicate all input/outputs points associated with the system. Points shall be shown in the appropriate locations.

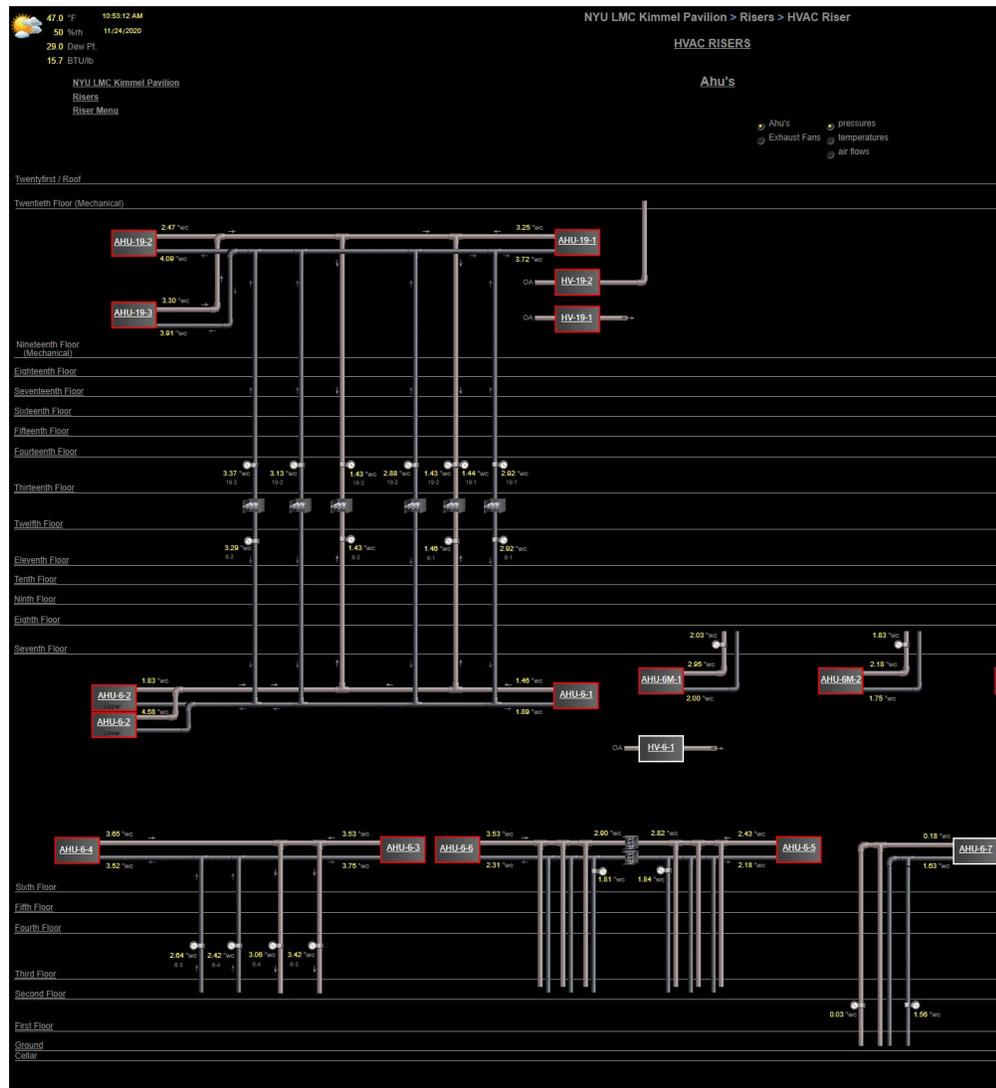
Set point increments shall be defaulted as follows. Any modifications must be approved by NYULH facility management team.

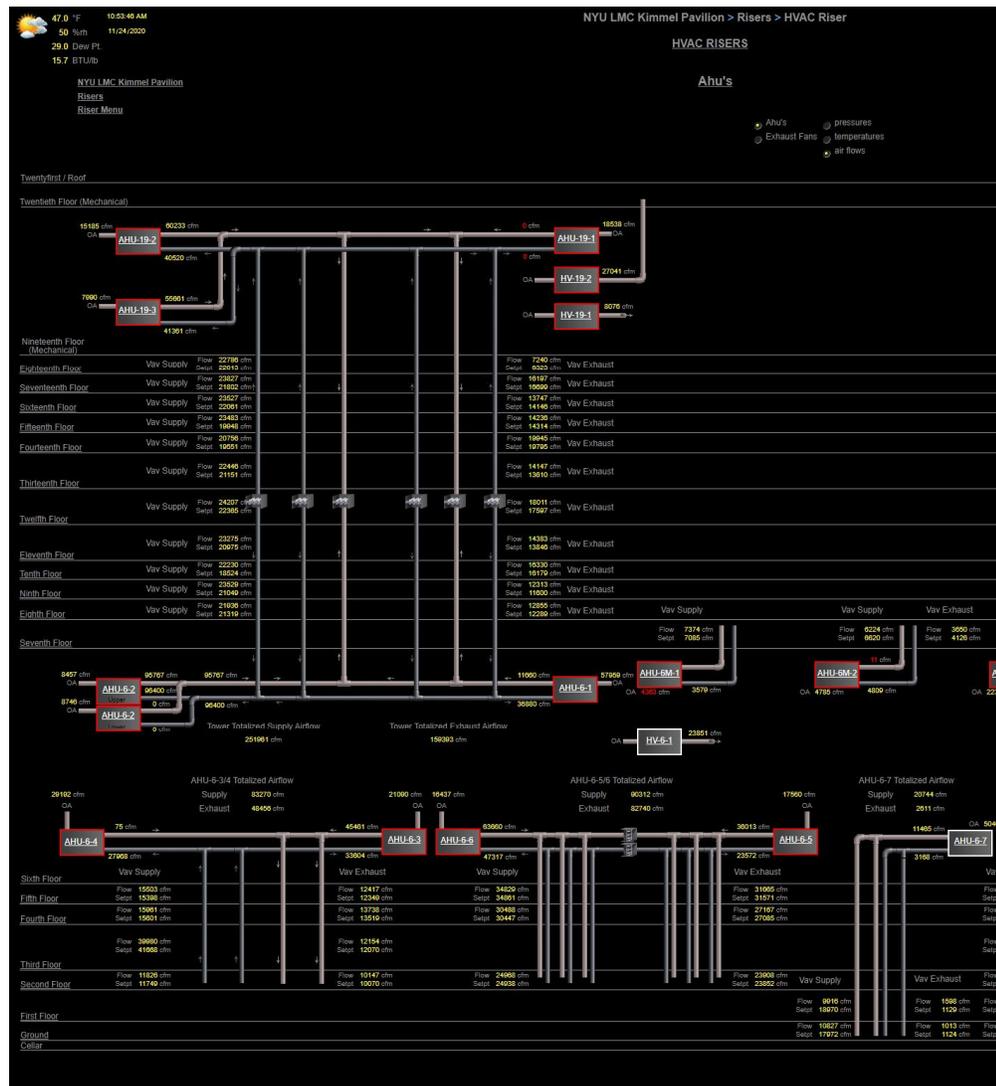
- Temperature: 1°F.
- Humidity: 1% RH.
- Static Pressure: 0.1 in w.c.
- Airflow: 100 cfm.
- Water flow: 50 gpm.
- Water differential pressure: 2 psig.

Individual equipment graphics shall include links to graphic page of all points monitored via third-party equipment interface. For example, provide link for display page of all data points associated with variable frequency drive.

Graphics shall clearly indicate the fail state positions for all BMS controlled devices.

Riser Diagram Examples:





R. BMS I/O Point, Addressing and Naming Standards

I. General Requirements

- a. All point naming conventions shall be reviewed and accepted by the NYULH facilities management team prior to being implemented.
- b. Each point name shall consist of the following components:
 - 1. First two or three letter prefix = building identification. (Controls contractor shall confirm with the facilities management team that the building prefix is unique and the convention does not already exist.),
 - 2. The next two or three letter or numerals = Equipment Identification,

3. The last two or three letters = Device identification

- i. Example: KP_HX1_SWT or KPHX1SWT = Kimmel Pavillion_Heat Exchanger
1_Supply Water Temperature

II. BMS Controller/Device Addressing and Naming Convention Requirements:

- a. All IP addresses are to be provided by NYULH facilities management personnel once the necessary IT infrastructure is in place.

- 1. In the event of new building construction this infrastructure will not be in place until the building is near completion.

- b. BACnet network and device addressing is to be managed by the controls contractor and should be as followed for all BACnet devices: within the vendor's assigned address range as follows:

~~1. Alerton:~~

- ~~i. 500-999~~

- ~~ii. 100000-199999~~

- 1. Network number: BB = Building Code (00 – 40 Range), FF = Floor (00 – 99 Range), N = Network number in the floor (0-9 Range). IE, Network Number 30182 (30= Kimmel Pavilion, 18th Floor, 2nd Network in the floor). Please keep in mind that this only works for buildings with less than 100 floors and less than 10 networks per floor. If any of these conditions are exceeded a custom configuration needs to be evaluated and documented for the project.

~~2. DEVICE ID: Network number + Mac Address Automated Logic:~~

- ~~3. 300000-399999~~

- c. NYULH facilities management personnel are to provide BACnet device addresses for devices outside of the assigned vendor address ranges.

- d. NYULH facilities management personnel must be provided with any necessary tools and software to change the BACnet device address on any devices installed.

III. Network Point Transfer Requirements

- a. The purpose of this subsection is to minimize network traffic and promote network health.
- b. All direct mapping of networked points shall be through a main control router/global controller. Examples:
 1. ~~LG~~Optiplex Routers (ALC)
 2. ASP (Schneider)
 3. ~~VLX/BCMACM~~ (Alerton)
- c. Direct point mapping from controller to controller shall only be accepted if:
 1. Controllers are on the same network bus.
 2. No control router is present between controllers.
- d. Outside Air point mapping: The outside air network points shall be pushed out (broadcast out) to all controllers with programming referencing these points.

S. Alarms

I. General Requirements

All digital input points shall be alarmed on change of state from normal state. Include a 60 second time delay for deadband.

All analog input points shall be alarmed. Provide adjustable deadband to prevent nuisance alarms.

All alarms should be furnish with both delay on break (DOB) and delay on make (DOM) timers to prevent future alarm chattering.

Nuisance alarms (i.e., repeating alarms) will be corrected during warranty period. Nuisance alarms are considered alarms that repeat due to poorly configured alarms or if smart alarms are not installed and cause unnecessary lower tier alarms.

All systems that are capable of automatic restart after a shutdown/alarm condition shall be able to have remote alarm clearing and acknowledgement ability through the BMS. Local clearing of alarms shall only be necessary with systems that can only be reset locally.

II. Email Alarm Alerts:

Email alarming shall be setup and tested prior to turnover of the BMS system. Email alerts shall be configured through the NYULH SMTP Relay:

- Username: bmsffsites@nyulangone.org
- Smtplib.nyumc.org; Port 25
- No Password, No Certificates.

4.3.3. Smart Alarming

Smart alarming feature shall be implemented when an equipment failure will trigger multiple secondary alarms causing unnecessary data transmission and operator alarm acknowledgement. Smart alarming shall be utilized to prevent unnecessary alarming of points.

Smart alarms shall be implemented for the following systems:

- Air handling units.
- Chilled, condenser and hot water systems.
- Secondary water systems.
- Rooms that are monitored via door contacts and room pressure monitors.

The following are some examples:

Air Handling Unit Run Failure

On failure of an air handling unit to operate when commanded on or air handling unit shut down due to a safety device, or if an air handling unit is off, provide a software program which shall disable all alarming capability of each temperature, pressure and humidity sensor associated with the air handling unit.

On failure of an air handling unit to operate when commanded on, an alarm should trigger for the fan status loss, but no pressure sensor alarm or supply air temperature alarm or normal room temperature alarms.

All safety devices (pressure switches and freezestats) shall remain active and capable of alarming.

In general, space temperature alarms in areas served by the air handling unit shall be disabled. However, extreme room temperatures or freezing preheat temperatures should annunciate (Note: There may be critical rooms such as cold rooms which will continue to be monitored for alarm.)

All space pressurization alarms in areas served by the air handling unit shall continue to be monitored for alarm.

Upon a smart alarm activation, the alarm message must read that this is a smart alarm and some alarms have been suppressed.

Note: Alarms associated with critical areas shall not be included within smart alarming programs. Alarms include Cold Rooms, Animal Holding Rooms, Patient Isolation Rooms, etc. Verify all smart alarming functions with NYULH facility management prior to implementation.

Secondary Water System Failure

On failure of all pumps associated with a secondary water system, provide a software program that shall disable all alarming capability of each temperature, pressure and flow sensor associated with the water system.

All alarms associated with equipment that is disabled (i.e., off) shall be inhibited from operating.

When a piece of equipment is off, all alarms associated with the equipment, as well as alarms associated with areas served by the equipment or secondary equipment served, shall be disabled.

Note: Alarms associated with critical areas shall not be included within smart alarming programs. Alarms include Cold Rooms, Animal Holding Rooms, Patient Isolation Rooms, etc. Verify all smart alarming functions with NYULH facility management prior to implementation.

Filter Alarm

All filters shall be provided with a differential pressure transmitter that shall be monitored at the BMS. Dirty filter alarms shall be generated when the differential pressure across the filter has exceeded setpoint (adj.). Filter alarms based off runtime are not acceptable.

III-IV. Alarm Syntax

- a. Alarm syntax shall be structured as follows:
 - Priority Designation, Critical, Building, Floor, System, Alarm, Contact Shop
 - Example: **** Critical Tisch 18th Floor AHU-4 Supply Fan Failure Alarm
Contact Energy Shop
- b. Return to Normal syntax shall be structured as follows:
 - Return to Normal (Priority Designation, Critical, Building, Floor, System, Alarm)
 - Example: Return to Normal (**** Critical Tisch 18th Floor AHU-4 Supply Fan Failure Alarm)
- c. Priority Designation
 - ***** 5 Star Alarms
 - Animal Facility/Vivarium-Related Alarms
 - Animal Facility/Vivarium Fan failures, Reheat Systems, Steam Systems.
 - Critical Labs - ABSL-3 Fan Failures, Space Temp/Humidity, Reheat Systems, Steam Systems
 - Critical Fan Failures Affecting Operating Room, Isolation Rooms, Protective Environment Rooms (Fans include air handling unit supply, return, and exhaust fans)

- Emergency Power-Related Alarms
 - Medical Air System Alarms
 - Compressed Air Systems
 - Procedure Rooms Alarms
 - Data Center Alarms
 - **** 4 Star Alarms
 - OR Temperature and Humidity Alarms
 - OR Fan System Failures
 - OR Reheat System Alarms
 - Sump Pit Overflow Alarms
 - Ejector Pit Overflow Alarms
 - *** 3 Star Alarms
 - Vacuum System Alarms
 - General Reheat and Perimeter Space Alarms
 - General Lab Fan Failure Alarms
 - Sump Pit Alarms
 - Ejector Pit Alarms
 - Walk-In Box Alarms
 - ** 2 Star Alarms
 - Office Fan Failure Alarms
 - General Lab Temperature and Humidity Alarms
 - General Lab Airflow Alarm
 - Non-Critical Alarms
 - Office Temperature and Humidity Alarms
- d. Critical vs. Non-Critical
 The designation “Critical” shall be included in the alarm syntax only for 2, 3, 4, and 5 star alarms. For all other alarms not listed above, the designation “Non-Critical” shall be used.
- e. Buildings
- Alumni Hall - ALH
 - Berg - BRG
 - Coles Student Laboratory - Coles
 - Energy Building - EB
 - Greenberg Hall - GBH
 - Medical Science Building - MSB
 - Millhauser - Mil
 - Tisch Hospital - TH
 - Schwartz Health Care Center - HCC
 - Science Building - SB

- Skirball Institute - Skirball
 - Smilow Research Center - SRC
 - Kimmel Pavilion – KP
- f. Floor
Identify floor where alarm is active (e.g., 2nd Floor, Lobby, roof).
- g. System
Utilize equipment tag or designation (e.g., AC3-7, AHU-TH-18-1, Walk-In Box Room 225, Filtration Water Holding Tank).
- h. Alarm
Identify actual device in alarm (e.g., Cooling Tower Trip Alarm, Fan Failure Alarm, Common Alarm, High Humidity Alarm).
- i. Contact Shop
- Energy Shop
 - All BMS-Related Communication Alarms and Outages
 - All BMS AHU, VAV, HW System Alarms (Energy to Reassign Post-Control Signal Confirmation/Verification)
 - All BMS AHU Humidity Alarms (Dual Assignment - HVAC Shop)
 - All Room Pressure-Related Alarms (Dual Assignment - HVAC Shop)
 - HVAC Shop
 - All CHW FCU-Related Alarms.
 - All Pneumatic-Related Alarms
 - All HVAC (AHU, FCU) Filter-Related Alarms
 - All Room Pressure-Related Alarms (Dual Assignment - Energy Shop)
 - All Low and Medium Steam Pressure Alarms, including HW System DP Alarms
 - All AHU-Related Humidity Alarms (Dual Assignment - Energy Shop)
 - Building Engineers
 - All CHW Plant-Related Alarms - Building to reassign these alarms when applicable
 - All Fire System Alarms
 - All Fuel Oil System Alarms (Dual Assignment - House Electricians)
 - All High Steam Pressure Alarms
 - All Generator-Related Alarms (Dual Assignment - House Electricians)
 - All Sump Pit-Related Alarms (Dual Assignment - Plumbing Shop is Primary)

- Plumbing Shop
 - All Sump Pit-Related Alarms (Dual Assignment - Building Engineers: Secondary)
 - All Pump-Related Alarms (Dual Assignment - Building Engineers: Secondary)
 - All Medical Air System Alarms
- House Electricians
 - All Generator-Related Alarms (Dual Assignment - Building Engineers)
 - All Fuel Oil System Alarms (Dual Assignment - Building Engineers)
 - All Power-Related Alarms
- Refrigeration Shop
 - All DX AC/AHU-related Alarms, including DX FCU's
 - All Walk-In Box Alarms
 - Refrigeration system cooling towers

Note: The term “dual assignment” means two (2) “shops” are assigned to these alarms.

IV-V. Infection Prevention and Control (IPC) and Nursing

The BMS shall automatically generate alarms, via e-mail to IPC and Nursing based on operating room humidity levels and pressurization level. E-mail addresses shall be provided by NYULH facility management team.

a. Operating Room Humidity Alarms (Typical per Operating Room)

On sensing a humidity level either below 30% RH or above 60% RH, the system shall annunciate an alarm at the operator workstation.

If the humidity level continues to remain either below 30% RH or above 60% RH for an additional 30 minutes (i.e., a total of 60 minutes from original alarm), an e-mail alarm shall be automatically sent to IPC and Nursing.

b. Operating Room Pressurization Alarms (Typical per Operating Room)

On sensing a neutral or negative pressurization level, the system shall annunciate an alarm at the operator workstation. Note: Entrance door must be closed for a minimum of 2 minutes prior to issuing alarm. Alarm to be disabled if door is open.

If the pressurization level continues to remain neutral or negative for an additional 30 minutes (i.e., a total of 60 minutes from original alarm), an e-mail alarm shall be automatically sent to IPC and Nursing.

c. Protective Environment Room Pressurization Alarms (Typical per Isolation Room, Central Sterilizer, Bone Marrow, Air Locks, Vestibules, BSL3 Labs, etc.)

On sensing a neutral or negative pressurization level, the system shall annunciate an alarm at the operator workstation. The respective NYULH shop will be required to respond within 30 minutes. Note: Each door serving the room must

be closed for a minimum of 2 minutes prior to issuing alarm. Alarm to be disabled if door is open.

If the pressurization level continues to remain neutral or negative for an additional 30 minutes (i.e., a total of 60 minutes from original alarm), an e-mail alarm shall be automatically sent to IPC and Nursing.

T. Trend & Historian

I. General Requirements

Trends shall be established for each hardwired and software-generated point associated with a system. For each project, trends shall be identified as critical or non-critical trends by the NYULH facility management team.

II. Critical Trend Points

Critical trends are of the highest importance to the NYULH facility management team. Trend information is collected at the source and transmitted to the storage device.

Each critical trended point shall be supported by collection point hardware capable of storing a minimum of 9,984 trend samples for each critical point before any samples are overwritten. Where controllers do not have this capability due to the number of trended points, provide additional controllers to provide the required memory capabilities.

Transmission between the point of collection device (DDC controller) and the trend storage device is critical. Each trend shall have its buffer size (the value at which the controllers sends its stored trend data to the collection software) set to a value equal to the smaller of either four (4) times the trend rate (i.e., the amount of samples per hour) or 900 samples. Under no circumstances shall the buffer value be set to more than 900 samples.

Each time the buffer reaches its trip rate, the entire volume of software samples stored in the controllers shall be sent. The collection software shall review the data and eliminate duplicate values (i.e., previous values already sent which have successfully received at the collection software).

Critical trends shall have a software routine included (separate from the “standard” trending software) that regularly monitors the trend data and alerts the user when expected trend data has not been received. For each trend, provide a software routine that shall monitor the last received trend point’s time stamp and identify when it has “aged” sufficiently to generate an alarm. Aging limit shall be exceeded when the last data point in the trend has a time stamp which is greater than two (2) times the value of the buffer size divided by the trend rate. This software routine cannot reside in the DDC controller which is the collection device for this data set.

III. Non-Critical Trend Points

Each non-critical trended point shall be supported by collection point hardware capable of storing a minimum of 1,000 trend samples for each non-critical point before any samples are overwritten. Where controllers do not have this capability

due to the number of trended points, provide additional controllers to provide the required memory capabilities.

Proper transmission between the point of collection device (controller) and the trend storage device is important. Each trend shall have its buffer size (the value at which the controllers sends its stored trend data to the collection software) set to a value equal to the smaller of either four (4) times the trend rate (i.e., the amount of samples per hour) or 250 samples. Under no circumstances shall the buffer value be set to more than 250 samples.

Each time the buffer reaches its trip rate, the entire volume of software samples stored in the controllers shall be sent. The collection software shall review the data and eliminate duplicate values (i.e., previous values already sent which have been successfully received at the collection software).

IV. Analog Points

The following analog type points shall be trended based on an adjustable time interval.

- Space temperature (10 minutes as standard).
- Space differential pressure (60 seconds as standard).
- Air handling unit supply, return, mixed-air and preheat coil discharge air temperature (10 minutes as standard).
- Air handling unit supply and return air humidity (10 minutes as standard).
- Air handling unit supply, return and outdoor airflow rates (10 minutes as standard).
- Duct static pressures (3 minutes as standard).
- Water temperatures (5 minutes as standard).
- Water systems differential pressure (5 minutes as standard).
- Water flow rates (10 minutes as standard).
- Btu meters (10 minutes as standard).
- Set points, associated process variables and control signals (Note: sample rate based on variables listed above).
- UPS voltage per phase, current per phase, kW input and kW output.
- PDU voltage per phase, current per phase, kW input and kW output.
- Distribution board voltage per phase, current per phase, kW output.

V. Digital Points

The following digital-type points shall be trended based on an adjustable time interval.

- Run status (e.g., pump, fan, air conditioning unit, chiller, etc.) (10 minutes as standard).
- Safety device (e.g., pressure switch, freezestat, leak detector, etc.) (10 minutes as standard).
- Dry contact input from third-party equipment such as packaged air conditioning unit common alarm contact (10 minutes as standard).

- Door contact associated with room pressure monitors (10 minutes as standard).

VI. Controller Data

The following status/data points shall be trended based on change of state.

- Controller online/offline status.
- Controller reboot.

U. Reports

I. General Requirements

Reports shall be generated on demand or via a predefined schedule.

II. Predefined Reports

The following predefined reports shall be created and updated as modifications are made to the respective equipment and/or facility.

a. Controller Online/Offline Status (Campus-Wide)

- Report to include controller tag, location, online/offline status.
- Report generated automatically on a daily basis.

b. Controller Reboot Status (Campus-Wide):

- Report to include controller tag, location, quantity of reboots and time of occurrence.
- Report generated automatically on a daily basis.

c. Equipment Uptime (per Building)

- Report to include equipment tag, location, required uptime, actual uptime.
- Report generated automatically on a monthly basis.

d. Operating Room Humidity

- Report to include Operating Room tag, location, humidity level over 24-hour period (highest, average, lowest).
- Report generated automatically on a daily basis for a 24-hour period.

e. Operating Room Pressurization

- Report to include Operating Room tag, location, pressurization level over 24-hour period (positive, neutral, negative).
- Report generated automatically on a daily basis for a 24-hour period.

f. Domestic Hot Water Temperature (per Building)

- Report to include:
 - Common supply water temperature.
 - Monthly hours.
 - Hours in Compliance (98 - 117.5°F) - Identified by total hours and percentage.
 - Out of Compliance hours (117.5 - 120°F) - Identified by total hours and percentage.

- Out of Compliance hours (120 - 125°F) - Identified by total hours and percentage.
 - Out of Compliance hours (125 - 200°F) - Identified by total hours and percentage.
 - Out of Compliance hours (90 - 98°F) - Identified by total hours and percentage.
 - Out of Compliance hours (80 - 90°F) - Identified by total hours and percentage.
 - Out of Compliance hours (35 - 80°F) - Identified by total hours and percentage.
 - Report generated automatically on a daily basis for a 24-hour period.
- g. Room Pressurization (per Building - Not Including Operating Rooms)
- Report to include room tag, location, required pressurization mode, actual pressurization mode.
 - Report generated automatically on a daily basis for a 24 hour period.
- h. Chilled Water Supply and Return Temperature (Campus-Wide)
- Report to include chilled water temperature transmitter tag, location, actual temperature (highest, average and lowest). Note: Temperature data referenced in this report is only specific to each chiller plant's common chilled water supply and return temperature.
 - Report generated automatically on a daily basis for a 24 hour period.
- i. Chilled Water Differential Pressure (Campus-Wide)
- Report to include chilled water differential pressure transmitter tag, location, actual pressure (highest, average and lowest). Note: Differential pressure data referenced in this report is only specific to each transmitter located in the campus chilled water loop.
 - Report generated automatically on a daily basis for a 24-hour period.
- V. Project Closeout
- I. General Requirements
- The following items must be included within the "Project Closeout" section of the Contract Documents.
- Systems will not be added to the BMS network until they are fully commissioned, training has taken place, and operation and maintenance manuals have been provided to NYULH facility management team.
 - Training must be completed prior to occupancy and NYULH facility management team acceptance.
 - The BATC Contractor will provide onsite 24/7 coverage for all warranted systems until commissioning and training is complete and operations and maintenance manuals have been provided to NYULH facility management team.
 - New control systems shall not be added to the BMS Network until it was reviewed with the Energy Shop and the Facilities Management Team.

II. Testing and Calibrating

Commission and test the final installed system prior to acceptance by NYULH.

Furnish labor and test apparatus required to calibrate and prepare for service control components, instrumentation and field devices. This work includes: Zero, span and range calibration checks of instruments and accessories, both field- and panel-mounted. In addition, check actuators, control valves and dampers to ensure proper action. Stroke each valve and damper actuator and make necessary adjustments for stem and blade travel.

Furnish labor and test apparatus required to check the operation of control loops, set points and interlocks. Test every input/output point for proper performance through the entire system and maintain accurate test records for each point throughout the testing cycle and thereafter. NYULH facility management reserves the right to inspect those test records at any time and also to witness any of the point tests they deem appropriate.

Prepare and submit for approval checklists of testing procedures, including point-to-point wiring and sequence check.

All control loops shall be tuned by utilizing manufacturer specified automatic tuning software or by the use of a third-party software loop tuning program. Control loops shall be tuned to provide stable response while eliminating offset and hunting. All control loop parameters shall be recorded and maintained with the test record of each control point.

Provide trending data for 72-hour automatic system operation. Trending data to include all relevant hardwired and software data points associated with the system that shall indicate that the system is operating as per design intent.

All equipment used for testing and calibration shall be NIST (National Institute of Standards and Technology) traceable and calibrated within the preceding 12-month period. Certificates of calibration shall be available for NYULH facility management review.

III. Operation and Maintenance Documentation

On completion of installation, system commissioning and NYULH facility management acceptance provide operation and maintenance manuals. Manuals shall be updated each time changes are made to the system. Manual shall be furnished in a three-ring binder and on compact disc media. Provide three (3) printed copies as well as three (3) compact discs. Operation and maintenance manuals shall include the following:

- Table of contents.
- Record drawings which shall represent the “as-built” condition of the system and incorporate all information supplied with the approved submittals inclusive of:
 - Sequence of operation.
 - Bill of Material.

- Control diagrams depicting controlled system configuration indicating all field devices.
- Control panel wiring diagrams.
- Starter/VFD interface wiring diagrams.
- Updated control system network architecture.
- Point list for all hardwired input/output points.
- Point list for all input/output points derived via communication interface (i.e., BACnet, Modbus, etc.) with third-party equipment such as air conditioning units, variable frequency drives and chillers.
- Floor plans indicating exact location of all devices.
- Updated system architecture drawing as per modifications made during project construction indicating tie-in points, hardware, cabling distances, controllers, equipment served, etc.
- All items listed in Subsection F. Submittals.

Note: For projects where minor modifications are made to an existing control system, “as-built” documentation shall be inclusive of all existing control work associated with the system as well as the new work provided as part of the project. Existing work shall be identified as shadowed block areas or other means acceptable to NYULH facility management team. New work shall be bold. Intent is to have a comprehensive “as-built” shop drawing indicating all existing and new control work associated with the system.

- Programming manual containing
 - Documentation of all project-specific application and BMS programs.
 - All passwords and/or required access credentials.
 - Complete final point schedule including all hardware and software data points and documentation of calibration and configuration values for all inputs, outputs, variables and PID loops at the conclusion of system commissioning and functional testing.
 - System database as functional at the conclusion of system commissioning and functional testing, including all graphics and images used by and/or created on electronic format.
- Parts list containing supplier information (manufacturer name, address, telephone number and website address) with complete component model number and ordering information.

With each local control panel, provide a paper copy of the “as-built” control diagram, sequence of operation, bill of material and point list for the equipment served by the control panel. Documentation shall be placed in a plastic sleeve located on the inside of the door.

Operation and maintenance manual must be submitted to NYULH facility management team prior to occupancy. Systems will not be accepted by NYULH without submission of operation and maintenance manuals.

IV. “As-Built” Database

A composite “as-built” database shall be created and updated at completion of each project. The database shall contain all “as-built” documentation, project start and completion dates, warranty start and completion date, brief description of project scope, name all BATC Project Manager, field technician and software programmer and Subcontractor name and contact information. Software database shall be accessible via dynamic link on respective equipment graphics.

V. Warranty

Warranty direct digital control units, field devices, components, etc., to be free from defects in workmanship and material for a period of one (1) year from completion of final commissioning, which may occur beyond equipment acceptance and initial occupancy by NYULH. During this period, BATC Contractor shall furnish all labor to repair or replace all items or components that fail due to defects in workmanship or material. Failures on control systems, including all computer equipment, transmission equipment and all sensors and control devices during the warranty period, shall be adjusted, repaired or replaced at no additional cost or reduction in service to NYULH.

Provide necessary preventive maintenance on the system during the warranty period. Provide updates to operator workstation and server software, project-specific software, graphic software, database software and firmware that resolve software deficiencies at no charge during warranty period.

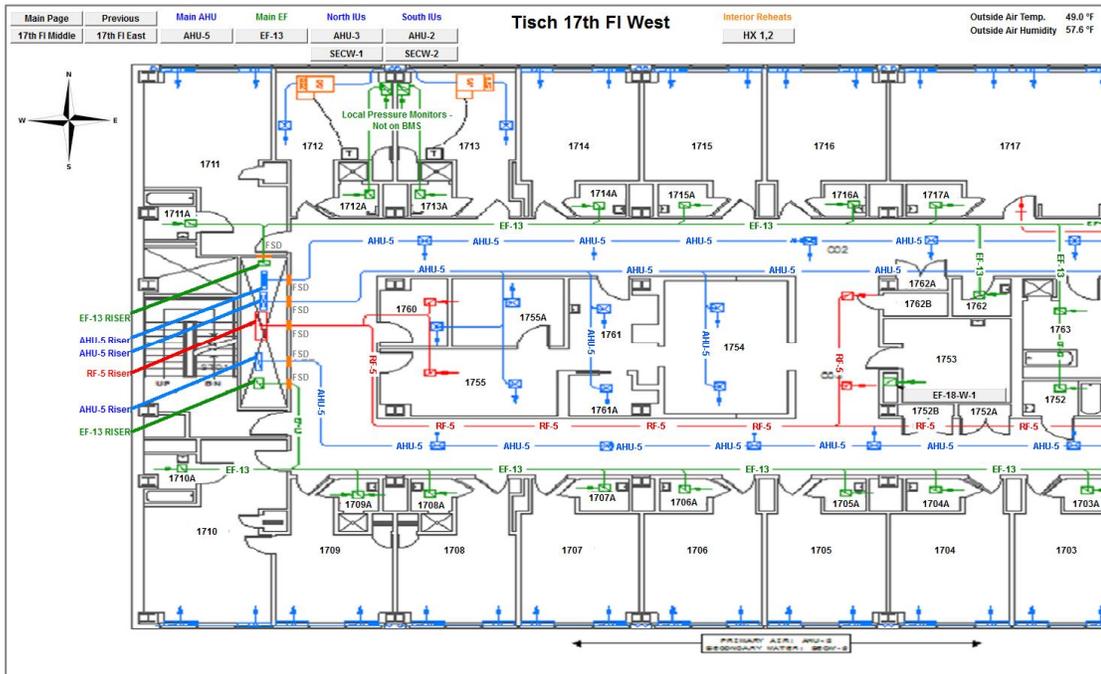
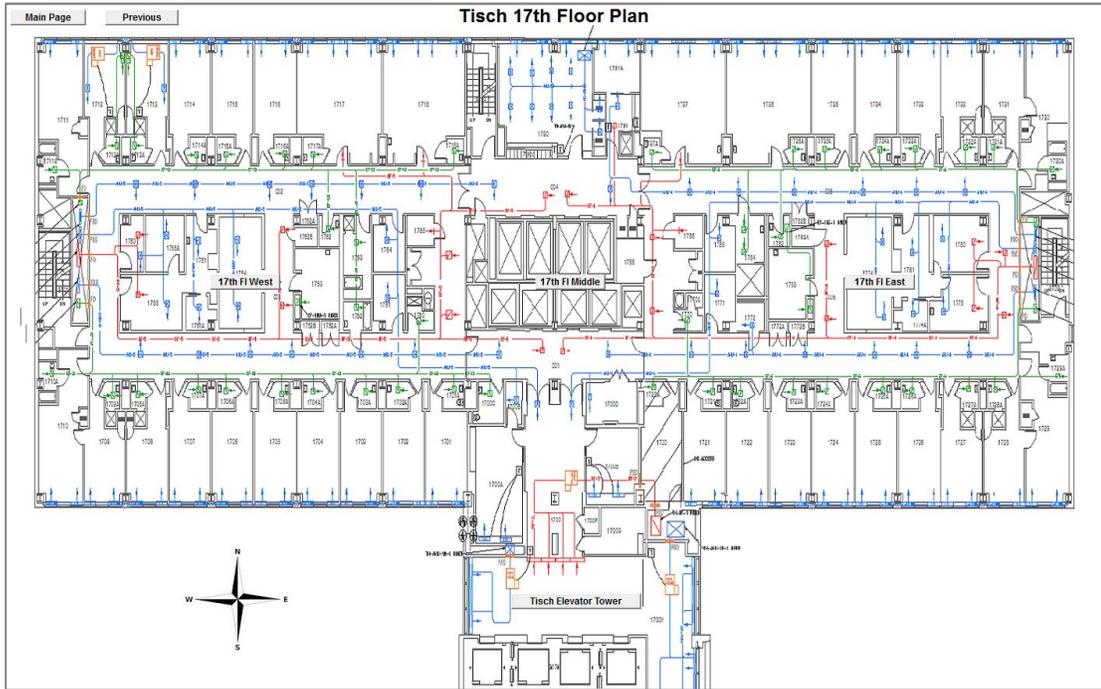
During the warranty period, BATC Contractor shall test the system under varying seasonal conditions to ensure that all operational sequences, as specified, are performed correctly. This shall include at least three (3) additional visits after initial NYULH facility management acceptance. Where necessary, BATC Contractor shall make programming adjustments and instrument calibrations at no expense to NYULH.

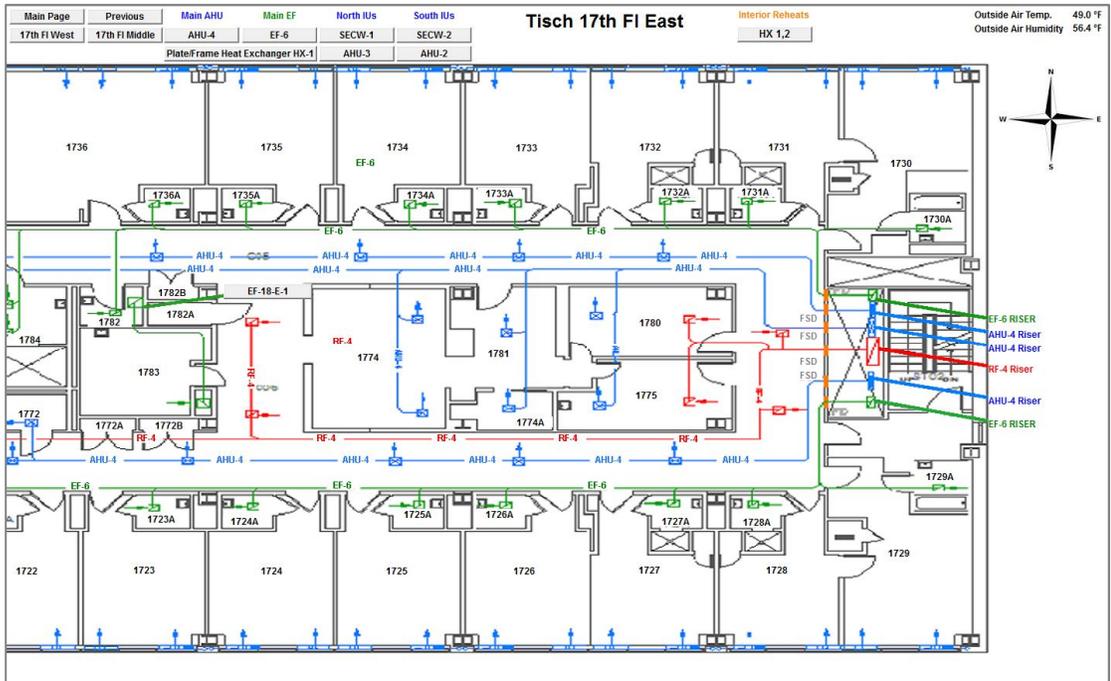
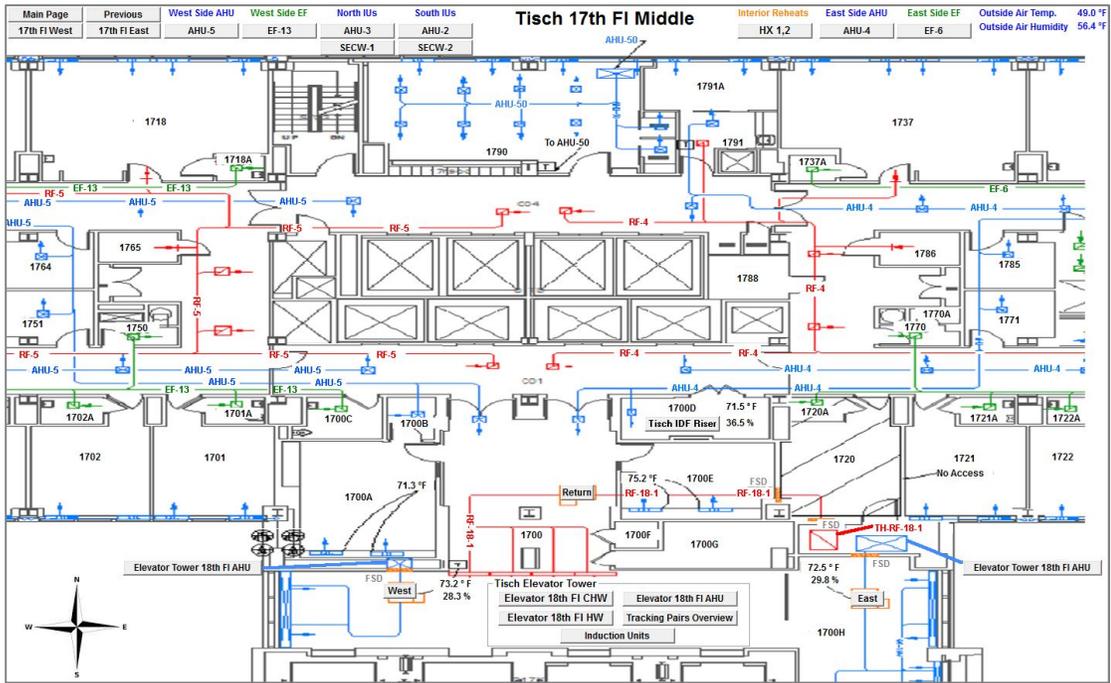
At the end of the warranty period update “as-built” documentation to reflect any modifications made during the warranty period.

VI. Uncompleted Work

At the end of the warranty period, a five (5)-year uncompleted work period shall begin. The uncompleted work period shall be used to determine if the BATC Contractor has completed the entire scope of work as required for the project. If work has been found to be incomplete or never installed, as determined by the NYULH facility management team, the BATC Contractor shall be responsible for completing the work at no additional cost to NYULH.

W. Appendix A - Sample Floor Plans





3. PROJECT CLOSE-OUT

CLOSE-OUT PACKAGE

At the end of a project, close-out packages are to be completed and submitted to RED+F per the Substantial Completion and Project Closeout Checklists shown below. The goal is to have all projects closed 120 days after the first user has moved in. The A/E Team shall request the latest version of these checklists from the RED+F PM at time of close-out.

SUBSTANTIAL COMPLETION CHECKLIST	
PROJECT NAME:	
LOCATION:	
ARCHITECT:	
ENGINEER:	
CONTRACTOR:	
RED+F PM:	

Legend
 A/E: Architect or Engineer
 C: Contractor (General Contractor or Construction Manager)
 RED+F: Project Manager

The following items must be completed for Substantial Completion to be declared for the above referenced project:

Item	Responsible Party	Date Received	Description
CONTRACTOR ITEMS REQUIRED FOR SUBSTANTIAL COMPLETION			
1	C		Work must be sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or use the Work for its intended purpose. Contractor completes all construction and other tasks necessary to achieve this. Substantial Completion includes DOB issuance of a Letter of Completion or TCO and for Article 28 projects, a DOH Letter of Approval.
2	C		Arranges all required special inspections, corrects non-compliant conditions and schedules re-inspections until Work is approved (to be done as construction progresses).
3	C		Coordinates filing of all required reports with DOB/FDNY to allow DOB/FDNY to close out permits as required.
4	C		Provides Medical Gas Certifications.
5	C		Provides copies of all approved test data (MEP,FA, FP).
6	C		Provides Electrical Panel Schedules and Keys (3 copies of each).
7	C		Provides valve tag charts with associated location plan.
8	C		Provides all As-Built Drawings maintained during construction.
9	C		Coordinates orientation with in-house staff for training and ongoing maintenance/engineering operations. Training shall be Tuesday - Thursday with two training sessions (730am and 330pm)
10	C		Provides equipment list of all major MEP/FP/FA equipment removed and installed in NYULH-approved Excel sheet. (Obtain from Facilities).
11	C		Provides equipment startup sheets.
12	C		Provides approved testing and balancing report (water and air).
13	C		Holds Facilities/Real Estate/Environmental Services pre-whiteout walkthrough prior to closing ceilings.
14	C		Resolves and documents pre-whiteout walkthrough issues for Facilities/Real Estate/Environmental Services signoff.
15	C		Provides Fire Smoke Damper and Fire Damper equipment list and location drawings.
16	C		Arranges for Functional Testing of MEP equipment with Commissioning Authority and fixes all life safety and equipment operational defects.
17	C		Provides Operations and Maintenance Manuals.

CONSULTANT AND RED+F ITEMS REQUIRED FOR SUBSTANTIAL COMPLETION

18	A/E		Conducts a site-inspection tour for NYULH team and consultants. Prepares a comprehensive list of items to be completed or corrected prior to final payment (the Punch List) for RED+F approval.
19	File Rep		Submits equipment verification to DOB and receives the permit.
20	Special Insp		Submits Special Inspection Reports.
21	File Rep		Submits reports to obtain Letter of Completion or TCO.
22	EOR		Verifies that equipment installed is what was specified.
23	A/E		For DOH projects, Completed Construction Certification Letter for Architects and Engineers.
24	RED+F		Copies of all AHJ-approved drawings (AHJs incl. DASNY, DOB, & FDNY) and letters (e.g., TCO, LOC, LOA, LOR) and forms must be archived in BuildFlow.
25	RED+F		Communicate project go-live to NYULMC: MRM update/Signage (elevators, etc.)/Occupancy date for Real Estate.

SIGNATURES

RED+F Project Manager + Date	_____
RED+F Program Director + Date	_____
RED+F Director, Regulatory Review + Date	_____
RED+F VP, Design & Construction + Date	_____
RED+F Asst Director, Commissioning + Date	_____
RED+F VP, Facilities Operations + Date	_____

PROJECT CLOSEOUT CHECKLIST	
PROJECT NAME: LOCATION: ARCHITECT: ENGINEER: CONTRACTOR: RED+F PM:	<div style="text-align: right; font-size: small;"> Legend A/E: Architect or Engineer C: Contractor (General Contractor or Construction Manager) RED+F: Project Manager </div>

The following items must be completed for Project closeout to be declared for the above referenced project:

Item	Responsible Party	Date Received	Description
CONTRACTOR ITEMS REQUIRED FOR PROJECT CLOSEOUT			
1	C		Obtains Equipment Use Permits
2	C		Resolves all items on commissioning issues log that are the Contractor's responsibility.
3	C		Provides all final approved equipment submittals.
4	C		Completes all punchlist work.
5	C		Final progress photos.
6	C		Provides all closeout material documentation in Buildflow, separated per approved NYULH closeout folder structure. Closeout material shall include all items listed on the Substantial Completion Checklist as well as all submittals of installed equipment.
7	C		Affidavit of Release of Liens (AIA G706A or as otherwise provided in the contract)
8	C		Affidavit of Payment of Debts and Claims

CONSULTANT AND RED+F ITEMS REQUIRED FOR PROJECT CLOSEOUT

9	CxA		Signs off commissioning issues log.
10	CxA		Provides final Commissioning Report
11	CxA		Provides Systems Manuals
12	RED+F		Latest revision of CD's in DWG format and PDF format documents received and forwarded to SPM to update Planon and Alchemy.
13	RED+F		Closed out ILSM forms, signed-off by EH&S.
14	RED+F		Closed out Penetration form, signed-off by Facilities Operations.
15	RED+F		Coordinate inspections conducted by the New York State Department of Health. Complete DOH binder and submit.
16	A/E		Certificate of Payment (AIA G702) certifying completion of all contract Work. *
17	A/E		Finish and Furniture Booklets as per Design Guidelines
18	RED+F		Certificate of Substantial Completion (AIA G704).
19	RED+F		Permanent Certificate of Occupancy, if applicable.
20	RED+F		Copy of Temporary Certificate of Occupancy or Letter of Completion (N/A if in receipt of PCO).
21	RED+F		Copy of DOH Pre-Occupancy Survey used at inspection.
22	RED+F		Facility Project Letter of Acceptance and Completion issued by the New York State Department of Health.

SIGNATURES

RED+F Project Manager + Date	
RED+F Program Director + Date	
RED+F Regulatory Review + Date	
RED+F VP, Design & Construction + Date	
RED+F Asst Director, Commissioning + Date	
RED+F VP, Facilities Operations + Date	

* Work includes all construction and services required by the Contract Documents.

PHOTOGRAPHY

The RED+F Project Manager shall engage a professional photographer pre-approved by the Design Studio to photograph the project after construction is complete and before move-in. The cost of this shall be included in the Project Budget. A professional photographer may also be engaged by the Architect to photograph the project. The Architect shall request pre-approval from NYU Langone Health of the photographer they wish to use.

The RED+F PM and GC/CM shall allocate sufficient time in the schedule to professionally photograph the project. The time shall be clearly shown on the project schedule. The length of time needed will be based on the size and scope of the project. At a minimum two days will be allocated for spaces up to 50,000 GSF. One more day shall be allocated for each additional 50,000 GSF. Final photography must be scheduled as follows:

- After construction is complete and no contractors are on the premises
- After final cleaning has occurred
- Before any move-in preparation has begun

All the major public spaces and architecturally important components shall be photographed sufficiently to show the scope of the project. Final high resolution files shall be provided to the Design Studio at RED+F via the RED+F PM without charge to NYU Langone. Below are a few examples:



Science Building - Rene Perez



Kimmel Pavilion - Jeff Goldberg/Esto



Tisch Cafe - Rene Perez



Tisch Gift Shop - Rene Perez



Fleck Courtyard - Rene Perez



Fleck Courtyard / Tisch Elevator - Rene Perez



Tisch Hospital Meditation Room - Rene Perez



Center for Men's Health - Rene Perez



Emergency Department - Rene Perez



Child Psychiatry - Rene Perez



Student Study Lounge - Rene Perez



Translational Research Building - Rene Perez

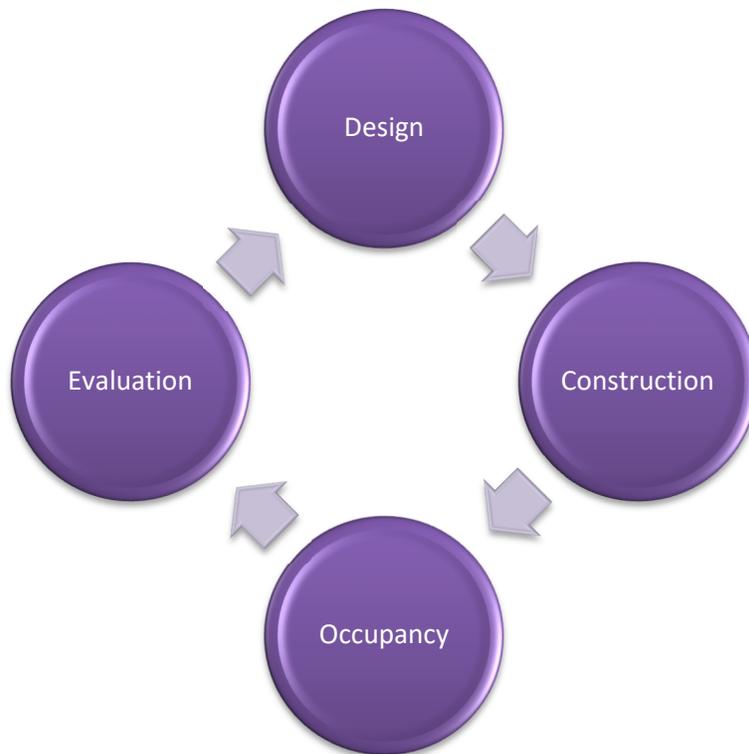
POST-OCCUPANCY EVALUATIONS

RED+F is continually seeking to improve the Design and Construction process of the built environment and has established a Built Environment Improvement Cycle. The cycle, which consists of Design-Construction-Occupancy-Evaluation and back to Design, allows for continual improvement of the built environment by establishing a Post-Occupancy Evaluation phase.

The Post-Occupancy Evaluation phase occurs after the users have moved in and utilized the space for a certain period of time, typically about a year. The intent of the Post-Occupancy Evaluation is to provide feedback on the design and general performance of materials and furniture over a period of time.

The RED+F Design Studio performs the Post-Occupancy Evaluation. It is important the same group perform the evaluation in order to maintain a consistent basis of analysis between projects. Results of Post-Occupancy Evaluations are then used to inform Project Teams and update the Design Guidelines. For example, materials and furniture that are not holding up well are removed from the Design Guidelines. Materials and furniture that are not part of the Design Guidelines but were approved for a particular project and have been holding up well are considered for inclusion in the Design Guidelines. This process reduces maintenance costs and streamlines the Design process.

Built Environment Improvement Cycle



POST-OCCUPANCY EVALUATION FORM

The intent of the Design Post Occupancy Evaluation Form is to provide feedback on the overall design and general performance of materials and furniture over a period of time. The information will be used to continually update the Design Guidelines.

PROJECT NAME: _____

PROJECT ADDRESS: _____

NAME OF ARCHITECT: _____

DATE OF OCCUPANCY: _____

DATE OF EVALUATION: _____

NAME OF EVALUATOR(S): _____

EVALUATION ITEMS	RATINGS (1-10)
1. Floor Finishes.....	#
2. Wall/Base Finishes.....	#
3. Doors/Hardware.....	#
4. Millwork/Casework.....	#
5. Ceilings.....	#
6. Lighting.....	#
7. Furniture.....	#
8. Signage/Wayfinding.....	#
9. Specialty (Reception Desk, Nurse Station, etc.).....	#
10. Other (Acoustics, Artwork, etc.)	#
	Total #

* Ratings: 1 = Needs Work, 3 = Fair, 5=Average, 7=Above Average, 9=Very Good, 10=Exceptional

