



LABORATORY TURNOVER PROCESS GUIDE 2023



COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK



TABLE OF CONTENTS

01	INTRODUCTION
02	DEFINITIONS
03	TURNOVER MILESTONES
04	MEETING AGENDAS
05	EMERGENCY RESPONSE
06	PLANNED SHUTDOWNS

APPENDICES

Substantial Completion Prep Meeting
Substantial Completion Meeting
Conditional Commissioning Acceptance Meeting
Final Commissioning Acceptance Meeting
Operation and Maintenance of Lab Equipment
Equipment Maintenance Responsibility Diagram
CPM Closeout Checklist
Sample Substantial Completion Letter
Sample Turnover Package Table of Contents with Warranty Checklist
Sample Training Summary
Commissioning Checklist
Equipment Tagging Protocol
MEP Asset Data Sheet
Utility Usage Data Sheet
Custodial Data Sheet
Equipment Data Sheet
Regulatory Tracking Sheet
EH&S Laboratory Permit Checklist
EH&S Project Closeout Checklist

01 INTRODUCTION

This Laboratory Turnover Guide is a companion guide to the CU Lab Design Guideline. The Guide outlines the process for ensuring that all criteria have been met for the Lab Occupant and CUFO Operations to:

- 1) assume the safe and effective use of the Lab for scientific research and teaching,
- 2) have a full understanding of Base Building (Operations-owned) vs. Proprietary (Lab Occupant-owned) Equipment, and
- 3) accept responsibility for maintenance and repair of Proprietary Equipment (Lab Occupant) and Base Building (Operations) Equipment.

The turnover process is a collaborative effort led by CPM Project Managers (PMs) and involving a Lab Turnover Team consisting of the Lab Occupant, School / Department Coordinator, EH&S, Design and Compliance, Commissioning, Operations, and Architects and Engineers (A/Es).

02 DEFINITIONS

Base Building Equipment - Any equipment owned and maintained by Operations.

Conditional Commissioning Acceptance - All commissioning tasks relating to the current season are complete. Between 'Substantial Completion' & 'Final Commissioning Acceptance', for Critical Environment Spaces, a period of fine-tuning is expected as the occupant starts to inhabit the space.

Final Commissioning Acceptance - All commissioning activities are complete.

Lab Turnover Team - The team assembled at approximately 75% completion of construction to guide the closeout process. The team is led by the CPM PM, and includes the Lab Occupant, Department Representative, School / Department Coordinator, EH&S, Design and Compliance, Commissioning, Operations, and Architects and Engineers (A/Es).

Proprietary Equipment - Lab-specific equipment owned and maintained by the Lab Occupant, whether services and maintenance are self-performed or contracted to a vendor.

Substantial Completion - The stage in the progress of the work when the work or designated portion is sufficiently complete in accordance with the contract documents that the Lab Occupant can begin to set up the lab. Research is not to occur until the Substantial Completion Letter is signed by the PM.

Warranty Commencement Date - The date certified by the architect or engineer that the prime contract(s) has (have) been substantially completed in accordance with plans and specifications, or beneficially used by the owner, whichever first occurs.

03 TURNOVER MILESTONES

The Lab Turnover Process begins when construction is estimated to be 75% complete. There are four milestones in the process:

- 75% construction completion (Substantial Completion Prep begins)
- Substantial Completion
- Conditional Commissioning Acceptance
- Final Commissioning Acceptance

04 TURNOVER MEETING AGENDAS

The PM initiates the Lab Turnover Process by convening a series of meetings with the Lab Turnover Team beginning at 75% construction completion with the Substantial Completion Prep meeting. These meetings will track progress against the requirements for Substantial Completion to ensure that they can be met on the timeline intended for beneficial use of the lab.

Meetings are to continue at an appropriate interval, typically starting as a monthly meeting, increasing to biweekly when Substantial Completion is imminent. Meetings continue at a biweekly cadence until Conditional Commissioning Acceptance has been achieved. Meetings are then paused until the off-season commissioning can be performed.

When Final Commissioning Acceptance has been achieved, the FDNY Lab Permit is in place, and all Regulatory applications have been closed, the project is ready for financial closeout.

The following Meeting Agendas serve as a checklist of requirements. Refer to the provided templates in the Appendix section.

- Substantial Completion Prep Meeting
- Substantial Completion Meeting
- Conditional Commissioning Acceptance Meeting
- Final Commissioning Acceptance Meeting

05 EMERGENCY RESPONSE

In the event of Proprietary Equipment (Lab Occupant owned and maintained) malfunction endangering life safety or damage to the lab or its surrounding environment, Operations can assist with emergency shutdown of proprietary equipment. Once the equipment has been safely shut down, it is the responsibility of the Lab Occupant to contact the equipment vendor to facilitate repairs.

Operations is not responsible for damage to equipment or experiments in progress.

06 PLANNED SHUTDOWNS OF BASE BUILDING EQUIPMENT

The lab occupant is responsible for taking any measures to protect Proprietary equipment or experiments in progress. (See USI protocols for shutdowns).



MILESTONE: 75% CONSTRUCTION COMPLETION
(SUBSTANTIAL COMPLETION PREP)

Project:

Date:

Attendees:

CPM Project Representative
DAC Project Representative
Cx Project Representative
EH&S Project Representative
Maximo Administrator
Operations

School / Department Coordinator
Lab Occupant
Architect
Engineers
GC or CM
CUFO Client Services

MEETING AGENDA

Walkthrough Tour

Project Manager

- Identify warrantees
- Create record document package table of contents
- Establish criteria and target dates for 1) moving proprietary equipment into the lab, and 2) full operation of the lab

Commissioning

- Schedule Functional testing
- Identify training needs
- Review record document list
- Review and confirm Asset Data Sheet for Base Building Equipment installed as part of the project

Design & Compliance

- Review regulatory Inspections required
- Review record documentation required

Environment, Health & Safety

- Review and assign tasks from the Lab Permit Tasks Checklist
- Schedule Safety Equipment training

Operations

- Review and update Utility and Custodial Data sheets
- Review procedures and limitations to emergency response services available for Proprietary Equipment

Maximo Administrator

- Review and confirm Asset Data Sheet for Base Building Equipment installed as part of the project
- Review Maximo Base Building PM Schedule with Lab Occupant to make them aware of building shutdowns

Lab Occupant

- Identify and prepare Proprietary Equipment Preventive Maintenance contracts / CUFO Ops SLA's.
- Establish monitoring schedule for proprietary maintenance activities (Outlook Calendar reminders are recommended)

Architect and Engineers

- Create Punch List and track resolutions / corrections, including Cx findings

MILESTONE: SUBSTANTIAL COMPLETION

Project:

Date:

Attendees:

CPM Project Representative	School / Department Coordinator
DAC Project Representative	Lab Occupant
Cx Project Representative	Architect
EH&S Project Representative	Engineers
Maximo Administrator	GC or CM
Operations	CUFO Client Services

MEETING AGENDA

Project Manager

- Warranty effective date(s) established
- Record documents handed off to Cx
- Equipment tagging in progress
- Identify warranty contact information for proprietary equipment and ensure all vendors are entered in VMS

Commissioning

- Operations training in progress
- Current season Cx in progress
- Confirm Base Building Equipment and any misc. CUFO Ops-maintained equipment installed as part of the project has been entered into Maximo

Design & Compliance

- Regulatory agency inspections in progress
- Application closeouts in progress
- Record documentation requirements identified

Environment, Health & Safety

- Lab Permit submission to FDNY complete
- Assignments from the Lab Permit Tasks Checklist in progress or complete

Operations

- Base Building Preventive Maintenance schedule confirmed in Maximo

Lab Occupant

- Proprietary Equipment Maintenance contracts / SLA's and schedule in place

Architect and Engineers

- Punch List and Cx resolutions / corrections substantially complete

TEMPLATE

MILESTONE: CONDITIONAL COMMISSIONING ACCEPTANCE

Project:

Date:

Attendees:

CPM Project Representative	School / Department Coordinator
DAC Project Representative	Lab Occupant
Cx Project Representative	Architect
EH&S Project Representative	Engineers
Maximo Administrator	GC or CM
CUFO Client Services	

MEETING AGENDA

Project Manager

- Record Documents handed off to Lab Occupant

Commissioning

- Current season accepted
- Off-season pending - date set for reconvening the appropriate participants
- Training complete (Ops and Lab Occupant)
- Verification of Equipment tags

Design & Compliance

- Regulatory application closeouts complete
- Record documents received

Environment, Health and Safety

- Lab Permit in place or pending

Architect and Engineers

- Punch List and Cx current season resolutions / corrections substantially complete

MILESTONE: FINAL COMMISSIONING ACCEPTANCE

Project:

Date:

Attendees:

CPM Project Representative	School / Department Coordinator
DAC Project Representative	Lab Occupant
Cx Project Representative	Architect
EH&S Project Representative	Engineers
Maximo Administrator	GC or CM
CUFO Client Services	

MEETING AGENDA

Commissioning

- Off-season Cx accepted
- Warranty issues resolved

Lessons learned

Link: [Appendix11.10-OperationMaintenanceLabEquipment.pdf](#)

Base Building vs. Proprietary Equipment:
Operation and Maintenance Responsibility for Lab Equipment and Services

1.1 Base Building (Operations-owned) vs. Proprietary (Lab Occupant-owned) Equipment and Services

Base Building Systems and Infrastructure are the utilities and services provided in a building that directly serve most or all lab occupants. Listed below is the range of services that may be provided in CU buildings. These services are not available in all buildings, and as part of the planning process, the lab occupant's needs are evaluated against the services provided in various buildings. See Appendix 11.9 for a matrix of services by building.

Base Building Infrastructure

Year-round chilled water	Process chilled water
Plant Steam	Compressed air
Hot and cold water (Potable)	Vacuum
Lab water (Non-Potable)	Natural Gas
RO/Deionized water	Fume Hood Exhaust
Standby power	

CUFO Operations supports the operation and maintenance for base building equipment and infrastructure, limited to the building's equipment and building risers.

Proprietary Equipment and Services

- Heat exchangers
- Local chillers and associated water loops
- Booster pumps,
- Local chillers
- Environmental boxes
- Other compressed gases (tank)
- Step-up or step-down equipment that fulfills the need for delivery to an individual lab
- Any other equipment in or supporting labs.

Operation and maintenance for proprietary/lab equipment and non-supported services are the responsibility of the Lab Occupant. Responsibility will be assigned during the design process in Appendices 11.1 (Laboratory Requirements Data Sheet), 11.2 (Laboratory Equipment List) and 11.9 (Building Infrastructure).

1.2 Design Phase

During the design phase, the Design Consultant(s), Lab Occupant, and Project Manager are responsible for identifying all equipment, utilities, and services and identifying who is responsible for managing and funding routine maintenance and repairs for proprietary equipment. The Laboratory Requirements Data Sheet, Laboratory Equipment List, and Building Infrastructure Matrix are to be populated with O&M responsibility information and submitted to the CUFO Commissioning Representative and the O&M Committee for concurrence.

Any lab's utility demand that exceeds available infrastructure capacity will be supplied with lab-specific equipment that is considered proprietary equipment. This proprietary equipment is the responsibility of the Lab Occupant for operations and maintenance.

1.3 General Guidelines

Mechanical Rooms, Service Corridors and other shared and common utility spaces are under the purview of CUFO Operations, and are not part of any Lab.

Placement of proprietary or lab equipment that will not be supported by CUFO Operations is not to be located within a Base Building Mechanical/Electrical Room (MER) or new MER created as part of the project to support a new lab.

Proprietary equipment may be located outside the lab in a service corridor (if available) subject to review and approval by Operations and applicable regulations.

Repairs & routine preventive maintenance to proprietary/lab equipment are to be done with the Lab Occupant's equipment manufacturer and/or service vendor. This proprietary equipment is the Lab Occupant responsibility for operation and maintenance.

Equipment-related emergency response and division of duties between Operations and the Service Vendor are to be determined during the design phase.



Base Building Equipment
(CUFO Ops Owned)

Proprietary Equipment
(Lab Occupant Owned)

CUFO BASE BUILDING SERVICES
REFER TO:

APPENDIX 11.9 of the Lab Design Guideline [Infrastructure Matrix.pdf](#)

AND

APPENDIX 11.10 [Operation & Maintenance of Lab Equipment.pdf](#)

CUFO RESPONSIBILITY
REFER TO:

APPENDIX 11.10 [Operation & Maintenance of Lab Equipment.pdf](#)

RELATED TO SHUTDOWNS COORDINATED WITH DEPARTMENT REPRESENTATIVE ARTS & SCIENCE

LAB OCCUPANT RESPONSIBILITY
REFER TO:

APPENDIX 11.2 [Laboratory Equipment List.pdf](#)

APPENDIX 11.10 [Operation & Maintenance of Lab Equipment.pdf](#)

Year one repairs are covered under General Contractor's warranty

C.U.F.O

DEPARTMENT REPRESENTATIVE COORDINATES PREVENTIVE MAINTENANCE OF BASE BUILDING SYSTEMS TO BE SCHEDULED WITH LAB OCCUPANTS

LAB OCCUPANT'S RESPONSIBILITY

- CREATE AND MAINTAIN SERVICE CONTRACT
- SCHEDULE ROUTINE MAINTENANCE WITH VENDOR
- MANAGE INCIDENTAL SERVICE REQUESTS
- FACILITATE NEEDED REPAIRS



CPM CLOSEOUT CHECKLIST

PHASE	TASK
<p>SUBSTANTIAL COMPLETION PREP</p> <p>SUBSTANTIAL COMPLETION</p>	<p>Project Manager to lead Closeout and Turnover Process</p> <ul style="list-style-type: none"> Schedule Weekly working sessions Agendas as provided in the Turnover Guide Track punchlist progress Track long lead items <p>Determine the Substantial Completion Date and Warranty Effective dates</p> <ul style="list-style-type: none"> CM / GC to notify PM that Substantial Completion has been reached Sign off Substantial Completion letter (all AOR's) <p>Keying coordinated with Public Safety</p> <p>Notify Client</p> <p>Reconcile budget with Unifier / ARCS</p> <p>Reconcile budget with GC / CM</p> <p>identify Day 2 work</p> <p>Adjust retainage to 1%</p> <ul style="list-style-type: none"> Release retainage after 1 year Perform 11th month inspection <p>Establish Beneficial use date</p> <p>Update Project information in Unifier</p>
<p>CONDITIONAL AND FINAL ACCEPTANCE</p>	<p>PROVIDE RECORD DRAWINGS TO OWNER/CU IN CAD FORMAT AND PDF</p> <p>SEND CONSTRUCTION PLAN AND FURNITURE PLAN TO PLANNING FOR RECORD</p> <p>DRAWING SET TO BE THE "AS-BUILT" SET TO OWNER</p> <p>FORWARD THE "AS-BUILT SET" TO PLANNING GROUP</p> <p>COLLECT, REVIEW, AND FORWARD TO CUFO, CXA ALL WARRANTIES, OWNER'S MANUALS AND TRAINING SIGN-OFF AND VIDEOS</p> <p>--- MAKE SURE THERE IS A SIGNED TRANSMITTAL SHEET FROM CPM TO CUFO OR CXA ACCEPTING THE DOCS</p> <p>TURN OVER KEYS TO CLIENT, CUFO, OWNER</p>
<p>REGULATORY</p>	<p>SEE REGULATORY CLOSEOUT CHECKLIST</p>
<p>COMMISSIONING</p>	<p>SEE COMMISSIONING CLOSEOUT CHECKLIST</p>
<p>FINANCIAL</p>	<p>SEE CAPITAL FINANCE CLOSEOUT CHECKLIST</p>

[Date]

[Contractor]

REFERENCE: Columbia University

[Project #]

[Project name]

[Contractor]:

An inspection of the Project Work was conducted on [date]. Attendees were [names and roles].

Columbia University and [Consultant] confirm that you have attained Substantial Completion as of [date]. Substantial Completion is the stage in the progress of the work when the work or designated portion is sufficiently complete in accordance with the contract documents that the owner can occupy or use the work for its intended purpose. The Lab Occupant may begin to set up the lab at this time.

Substantial Completion is the also the date of commencement of applicable warranties, except as stated below:

- 1.
- 2.
- 3.
- 4.
- 5.

The following outstanding items remain to be completed or corrected by dates indicated:

1. Seasonal commissioning [date]
- 2.
- 3.
- 4.
- 5.

Please also note that the Owner has the right to decline approval of the final payment if specific work has not been completed.

Sincerely,

[Project Manager]

Columbia University Facilities - Capital Project Management

**SAMPLE TURNOVER PACKAGE TABLE OF
CONTENTS WITH WARRANTY CHECKLIST**

Columbia University
Halliday Lab Reno Clean Lab
Palisades, NY 10964

Columbia University – Halliday Lab Renovation Clean Laboratory
Table of Contents

- I) Project Contact List**

- II) Warranty Letters (Workmanship)**
 - A. Subcontractor**
 - i. Electrical
 - ii. Carpentry
 - iii. Mechanical Piping
 - iv. Balancing
 - v. Controls
 - vi. Finishes
 - vii. Fire Protection
 - B. Vendor**
 - i. Fume Hoods
 - 1. Labor & Material Warranty 1
 - 2. Labor & Material Warranty 2
 - ii. Humidifier
 - iii. Exhaust Valves
 - iv. Fire Alarm
 - v. VAV Boxes
 - vi. Doors
 - vii. HEPA FFU

- III) Material/Equipment Warranties**
 - A. Subcontractor**
 - i. Electrical
 - ii. Carpentry
 - iii. Mechanical Piping
 - iv. Balancing
 - v. Controls
 - vi. Finishes
 - vii. Fire Protection
 - B. Vendor**
 - i. Fume Hoods
 - 1. Labor & Material Warranty 1
 - 2. Labor & Material Warranty 2
 - ii. Humidifier
 - iii. Exhaust Valves
 - iv. Fire Alarm
 - v. VAV Boxes

**SAMPLE TURNOVER PACKAGE TABLE OF
CONTENTS WITH WARRANTY CHECKLIST**

Columbia University
Halliday Lab Reno Clean Lab
Palisades, NY 10964

- vi. Doors
- vii. HEPA FFU

IV) Submittals

- A. Division 06 – Carpentry**
 - i. FRP Channels and Accessories
- B. Division 08 – Doors & Windows**
 - i. Access Doors and Frames
- C. Division 09 – Finishes**
 - i. Paint Coatings
 - ii. Sanigrid Ceiling
 - iii. Static Control Resilient Flooring
- D. Stainless Steel Wire**
 - i. Stainless Steel Wiring
- E. Division 11 – Equipment**
 - i. Acid Hoods
 - ii. Laminar Flow Hood
- F. Division 12 – Furnishings**
 - i. Casework
- G. Division 15 – Mechanical & Plumbing**
 - a. HVAC**
 - i. Exhaust VAV's
 - ii. Supply VAV's
 - b. Plumbing & Piping**
 - i. Acid Waste Piping
 - ii. Mechanical Piping, Fittings, and Valves
- H. Division 21 – Fire Suppression**
 - i. Alternate Sprinkler Heads
 - ii. Fire Protection Product Data
 - iii. Fire Protection Shop Drawings
- I. Division 22 – Plumbing**
 - i. Acid Waste Piping
 - ii. Acid Waste Vent Fittings
 - iii. Backflow Preventer – Humidifier
 - iv. Control Valve Schedule
 - v. Duct Humidifier Wiring
 - vi. Fire Smoke Dampers and Access Doors
 - vii. HVAC Shop Drawings
 - viii. Laboratory Control Systems

**SAMPLE TURNOVER PACKAGE TABLE OF
CONTENTS WITH WARRANTY CHECKLIST**

Columbia University
Halliday Lab Reno Clean Lab
Palisades, NY 10964

- ix. Permashield Duct
- x. R.O. Piping and Hangers & Supports
- xi. Revised Duct Per Field Verification
- xii. Siemens P2P Check List
- J. Division 23 – HVAC**
 - i. Duct Test Port
 - ii. Fan Filter Unit Spec Sheets
 - iii. Fan Filter Units
 - iv. FFU Filters
 - v. Humidification Package
 - vi. Siemens Graphic Package
- K. Division 26 – Electrical**
 - i. (225A) Electrical Panel and (200A) Circuit Breaker
 - ii. Electrical Wiring Package
 - iii. Lighting Package
 - iv. Room Pressure Tap Plate
- L. Division 28 – Electronic Safety and Security**
 - i. Fire Alarm System
- V) As-Built**
 - A. Subcontractor**
 - i. XXXX (Electrical)
 - 1. Lamont-Mechanical
 - 2. Lamont-Plumbing
 - ii. Mechanical Piping
 - iii. Fire Protection
 - B. Vendor**
 - i. Fire Alarm
 - ii. Fume Hoods
 - 1. Base Cabinet
 - 2. Workstation
- VI) Installation, Operation, and Manuals**
 - A. Subcontractor**
 - i. XXXX (Electrical)
 - 1. Acuity Controls Sensor Switch
 - 2. LED Tri-Proof Light
 - 3. nLight Ceiling Mount
 - 4. nLight Communication Module

**SAMPLE TURNOVER PACKAGE TABLE OF
CONTENTS WITH WARRANTY CHECKLIST**

Columbia University
Halliday Lab Reno Clean Lab
Palisades, NY 10964

- 5. nLight Power Pack
 - 6. nLight Sensor
 - 7. Schneider - NQ Panelboard
 - 8. Water Guard LED
 - ii. XXXX (Mechanical Piping)
 - B. Vendor**
 - i. Fume Hoods
 - ii. Humidifier
 - iii. Fire Alarm
 - iv. VAV Boxes
 - v. HEPA FFU
- VII) Reports**
- A. Start-up report**
 - i. Fume Hoods
 - ii. Humidifier
 - B. Test Report**
 - i. Electrical
 - ii. HVAC
 - iii. Mechanical Piping
 - iv. Fire Protection
 - v. Fume Hoods
 - vi. Fire Alarm
 - vii. HEPA FFU

Training Items

Columbia – Milan Delor Lab Renovation

Havemeyer 117 – 3000 Broadway New York, NY

Facilities Training Items

Par Plumbing – 45mins

- Valve Locations
- Manifold
- Vacuum Pumps
- Emergency Shower and Eye wash

Matros Automated Electrical – 30mins

- Lighting Controls System Operation
- Panel Directory Review
- EPO and Laser Light Signage

M&J Mechanical – 90mins

- Access Panel Locations
- Valve Locations
- Heat Exchangers
- Chiller Pumps
- FCU1
- AC-1, 2 & 6
- VFD
- Humidifiers
- DX Package
- Duplex Condensate Pump
- PRV
- Exhaust Fans

Albireo – 60mins

- HVAC Controls for:
 - FCU
 - Chiller Pumps
 - Phoenix Valves
 - VAV Boxes Operation
 - Exhaust Fan Operation
 - VFD Unit Operation

Thermosystems – 45mins

- HVAC Controls
- AC-1 AND AC-2
- HMI
- Scada Training

COMMISSIONING CHECKLIST

Phase	Task	Team Members	Task Closed (Y/N)	Date Closed
Project Inception				
	COLUMBIA UNIVERSITY FACILITIES & OPERATIONS			
Design	Engage Operations team			
	Review project scope	CPM/CU Cx		
	Conduct baseline of existing services-Infrastructure	CPM/CU Operations		
	Feasibility Study			
	Review Owner's Project Requirements (OPR)	CPM/A/E		
	Review Feasibility Study	CU Cx/CU Operations		
	Schematic Design (SD)			
	OPR and SD's issued by A/E	CPM/A/E		
	Review Basis of Design (00 00 14)	CU Cx		
	Review SD documents	CU Cx		
	Review Process (timeline 2 weeks)	CU Cx/CU Operations		
	1. CU Operations comments			
	2. CU Cx comments			
	Design Documents (DD)			
	Drawings Issued by A/E	CPM/A/E		
	Review DD and specification documents	CU Cx		
	Review Process (timeline 2 weeks)	CU Cx/CU Operations		
	3. Back check SD comments	CU Cx		
	4. CU Operations comments on DD	CU Operations		
	5. CU Cx comments on DD	CU Cx		
	Engage 3rd Party CxA			
	Issue RFP and award	CPM/CU Cx		
	Issue Cx Plan	CxA		
	Issue Cx Specifications	CxA		
	Construction Documents (CD)			
	Drawings and Specifications Issued by A/E	CPM/A/E		
	Review CD specifications	CU Cx		
	Review Process (timeline 2 weeks)	CU Cx/CU Operations		
	1. CPM comments	CPM		
	2. CU Operations comments	CU Operations		
	4. CU Cx comments	CU Cx		
	5. 3 rd party CxA comments	CxA		
	Utility Data sheets submitted by A/E	CPM/A/E		
	Response to CU Team comments			
	Comment responses and request a confirmed set of drawings	CPM/A/E		
Pre-Construction	Bid Leveling			
		CPM		
	Submittal Process			
	Set up CxA in Unifier	CPM		
	Issue submittal registry for review and comment; revise	CPM/A/E		
	Review			
	1. Reviewed by A/E	A/E		
	2. Reviewed by CU Cx	CU Cx		
	3. Reviewed by CU Operations	CU Operations		

Phase	Task	Team Members	Task Closed (Y/N)	Date Closed
	4. Reviewed by CxA	CxA		
	Construction Schedule			
	Issue Construction Schedule	CPM/GC		
	Review Construction Schedule for Cx Milestones	CU Cx/CxA		
	Incorporate Cx Milestones In Construction Schedule	CPM/GC		
	Project Kick Off Meeting (KOM)			
	Review schedules	CPM/A/E/CU Cx/CxA/GC/Subs		
	Review shutdowns	CPM/A/E/CU Cx/CxA/GC/Subs		
	Set meeting schedules	CPM/A/E/CU Cx/CxA/GC/Subs		
	Pre-construction Coordination			
	Shutdowns coordination	CPM/GC/CU Operations		
	Review Construction schedule	CPM/GC		
Construction	Commissioning Kick Off Meeting (KOM)			
	Scope of commissioning	CPM/A/E/CU Cx/CxA/GC/Subs		
	Cx Process review	CPM/A/E/CU Cx/CxA/GC/Subs		
	Test requirements	CPM/A/E/CU Cx/CxA/GC/Subs		
	Review Cx Plan draft	CPM/A/E/CU Cx/CxA/GC/Subs		
Commissioning	Required testing per specification			
	Electrical	A/E/CU Cx/CxA/GC/Subs		
	Plumbing	A/E/CU Cx/CxA/GC/Subs		
	Mechanical	A/E/CU Cx/CxA/GC/Subs		
	Fire Protection	A/E/CU Cx/CxA/GC/Subs		
	Fire Alarm	A/E/CU Cx/CxA/GC/Subs		
	Technologies	CUIT		
Pre-Functional Checks	Prefunctional tests completed			
	Electrical	CPM/CU Cx/CxA/GC/Subs		
	Plumbing	CPM/CU Cx/CxA/GC/Subs		
	Mechanical	CPM/CU Cx/CxA/GC/Subs		
	Fire Protection	CPM/CU Cx/CxA/GC/Subs		
	Fire Alarm	CPM/CU Cx/CxA/GC/Subs		
	Start Up Reports	CPM/CU Cx/CxA/GC/Subs		
	Request training Syllabus	CPM/CU Cx/CxA/GC/Subs		
Balancing	TAB complete			
	Report submitted			
	A/E approval	A/E		
	CxA verification	CU Cx/CxA		
Functional Testing	Functional Performance Tests Complete			
	Electrical	CPM/CU Cx/CxA/GC/Subs		
	Plumbing	CPM/CU Cx/CxA/GC/Subs		
	Mechanical	CPM/CU Cx/CxA/GC/Subs		
	Fire Protection	CPM/CU Cx/CxA/GC/Subs		
	Fire Alarm	CPM/CU Cx/CxA/GC/Subs		
	Verify asset tagging - CMMS	CPM/CU Cx/CxA/GC/Subs		
	Technologies	CUIT		
Controls	Controls Integrated with campus BMS			

Phase	Task	Team Members	Task Closed (Y/N)	Date Closed
	Graphics accepted	CPM/CU Cx/CxA/GC/Subs		
	Communication	CPM/CU Cx/CxA/GC/Subs		
	IST	CPM/CU Cx/CxA/GC/Subs		
Punchlist	MEP Punchlist Walkthroughs			
	Engineer/Architect	A/ECPM/CU Cx/CxA/GC/Subs		
	Commissioning	CU Cx/CxA		
	Custodial	A/ECPM/GC/Subs		
	Grounds keeping	A/ECPM/GC/Subs		
	Locksmith	A/ECPM/GC/Subs		
Punchlist	MEP Punchlist Prepared and Submitted to Contractors			
	CPM	CPM		
	Engineer	A/E		
	CU Cx	CxA		
	Operations	CU Cx		
	Powerhouse	CU Operations		
Punchlist	MEP Punchlist Complete and Accepted			
	Electrical	CPM		
	Plumbing	GC		
	Mechanical	Subs		
	Fire Protection	A/E		
	Fire Alarm	CxA		
	Vertical Transportation	CU Cx		
	Powerhouse	CU Operations		
Closeout Docs	O&M Manuals Submitted, Reviewed, Revised, Accepted			
	Electrical	CPM/A/E/CU Cx/CxA/GC/Subs		
	Plumbing	CPM/A/E/CU Cx/CxA/GC/Subs		
	Mechanical	CPM/A/E/CU Cx/CxA/GC/Subs		
	Fire Protection	CPM/A/E/CU Cx/CxA/GC/Subs		
	Fire Alarm	CPM/A/E/CU Cx/CxA/GC/Subs		
	Vertical Transportation	CPM/A/E/CU Cx/CxA/GC/Subs		
Closeout Docs	Warranties Submitted, Reviewed, Revised, Accepted			
	Electrical	CPM/A/E/CU Cx/CxA/GC/Subs		
	Plumbing	CPM/A/E/CU Cx/CxA/GC/Subs		
	Mechanical	CPM/A/E/CU Cx/CxA/GC/Subs		
	Fire Protection	CPM/A/E/CU Cx/CxA/GC/Subs		
	Fire Alarm	CPM/A/E/CU Cx/CxA/GC/Subs		
	Vertical Transportation	CPM/A/E/CU Cx/CxA/GC/Subs		
	Architectural	CPM/A/E/CU Cx/CxA/GC/Subs		
Closeout Docs	As-built Drawings Submitted, Reviewed, Revised, Accepted			
	Electrical	CPM/A/E/CU Cx/CxA/GC/Subs		
	Plumbing	CPM/A/E/CU Cx/CxA/GC/Subs		
	Mechanical	CPM/A/E/CU Cx/CxA/GC/Subs		
	Fire Protection	CPM/A/E/CU Cx/CxA/GC/Subs		
	Fire Alarm	CPM/A/E/CU Cx/CxA/GC/Subs		
	Vertical Transportation	CPM/A/E/CU Cx/CxA/GC/Subs		

Base Building Asset Tag – Maximo



- Unique asset ID for all assets on the Morningside Campus
- Tied to preventive maintenance schedule in Maximo
- PM's are auto-generated

Proposed Equipment Tag for Proprietary Equipment

Asset Name
Asset Unique ID

Maintained by Lab Occupant

Vendor Name and contact
Date installed

Asset Information needed by Lab Occupant:

- Vendor
- Contact info
- Contract term
- Maintenance schedule

[PM notification to Lab occupant can be auto-generated if entered in Maximo]

Asset Maintenance coordination (between Lab Occupant and Ops):

- Shutdowns and shop support
- Chart String
- Lab occupant contact
- Building contact

Link: [GEN REQ SECTION 01 77 03F - MEP ASSET DATA SHEET.pdf](#)

Asset Data

Building	Building
Project Name	
Project Manager	
Funding Client	
Unifier Project Number	
Architect	
Engineer	
Current Primary Use	
Proposed Primary Use	
Project Size (SF)	
Date	

ASSETS REMOVED

Equipment ID	Equipment Description

ASSETS ADDED

Equipment ID (as shown on dwgs)	Equipment Description	Make / Model	Location	MSI (to be filled out by MA)	Barcode



Link: [SPECIAL SECTION 00 00 04F - UTILITY USAGE DATA SHEET.pdf](#)

Utility Usage Data

Building	Building
Project Name	
Project Manager	
Funding Client	
Unifier Project Number	
Architect	
Engineer	
Current Primary Use	
Proposed Primary Use	
Project size (SF)	
Date	

Utility	Load Type	Current Usage	Proposed Usage	Units
Campus Chilled Water	Peak Design Load			Tons
	Annual Consumption			Ton-Hours/Year
Campus Steam	Peak Design Load			MBH
	Annual Consumption			MBH/ Year
Municipal Cold Water	Peak Consumption			GPM
	Annual Consumption			Gal/Year
	Estimated Annual Consumption not diverted to Sewer System			Gal/Year
Electricity	Peak Design Demand			kW
	Annual Consumption			kWhr/year
Natural Gas	Peak Consumption			SCFM
	Annual Consumption			Cubic Feet

Comments / other systems requiring utility consumption (such as liquid fuel system):



Link: [Appendix11.8-Laboratory Permit Checklist.pdf](#)

Project: _____

Date: _____

FDNY Laboratory Permit Documents				
Laboratory Permit Documents	Document Source	Task	When?	Completed
Basis of Design Report: Provide a copy of the report indicating design air changes per hour.	Architect / Engineer	PM collects the required air change information.	Schematic Design approval	<input type="checkbox"/>
Architectural Floor Plans: Copy of DOB approved floor plans, with DOB barcode and stamp* indicating fire rating of walls, partitions and fire doors.	Architect / Expeditor	PM collects the required A/MEP/FP set.	Prior to start of construction.	<input type="checkbox"/>
Fire Protection Plans: Copy of DOB approved and stamped* fire suppression system (i.e., sprinkler) diagram.	Engineer / Expeditor			<input type="checkbox"/>
Mechanical Plans: Copy of DOB approved with barcode and stamp indicating fume hood duct systems.	Engineer / Expeditor			<input type="checkbox"/>
Compressed Gas Manifold: Evidence from manufacturer that manifold headers are capable of withstanding 3000 psig (e.g., manufacturer's specifications or product literature).	Contractor	PM collects manifold performance criteria	Construction Submittal Phase	<input type="checkbox"/>
Blackout and Laser Curtains: Flame Resistant (if installed): Documentation or affidavit from the manufacturer stating such curtains are Inherently Flame Resistant as per NFPA 701. Curtains must be tested, and documentation issued, by FDNY Certificate of Fitness holder (C-15). Notarized Affidavit must also state building and room numbers where curtains are installed.	Curtain Vendor (CU preferred vendor is G.M.I. Inc.)	PM collects document	Construction Submittal Phase	<input type="checkbox"/>
ASHRAE 110: test report for all chemical fume hoods stamped.	Cx / EH&S	1. PM includes test requirement in project spec. 2. Contractor issues report to A/E for review and approval, CxA for review and comment.	Project Closeout	<input type="checkbox"/>
Testing and Balancing Report: Copy of room air balance report stamped, showing the calculated Air Changes per Hour.	Cx	3. Cx provides a copy to PM		<input type="checkbox"/>

2023

1/2

Fume hood face velocity certification: after successful ASHRAE 110.	EH&S	PM collects certificate from EH&S	Project Closeout	<input type="checkbox"/>
Compressed Gas Distribution: Notarized affidavit/statement from NYC licensed plumber that piping from manifold header has been tested at 1 ½ times working pressure, but not less than 100 psi. No drop in pressure for 30 minutes. Must state building and room numbers on affidavit.	Cx	1. PM includes test requirement in project spec. 2. Contractor issues report A/E for review and approval, CxA for review and comment. 3. Cx provides a copy to PM.	Project Closeout	<input type="checkbox"/>

Chemical Waste Storage Room Permit (in addition to above)	Document Source	Task	When?	Complete
Fire Alarm Drawings: Copy of DOB and FDNY Tech Management barcode approved plans with copy of FDNY Tech. Mgmt. Approval Letter. Note: Chemical Storage Room plans must be submitted in triplicate, along with fee and TM-1 & PW-1 application (link below) to FDNY Tech Management prior to FDNY Inspection.	Expeditor	PM collects drawings and letter.	Prior to start of construction.	<input type="checkbox"/>
Electrical Approval: Notarized affidavit/statement from NYC licensed electrician on company letterhead that all electrical equipment has been installed in accordance with the NYC Electrical Code. Affidavit must include building and room number and statement "... were installed in compliance with 3RCNY 2706.01(C) (1) in accordance with NYC Electrical Code and complies with the requirements for Class 1, Group D, Division 2 locations."	Expeditor	PM collects letter	Project Closeout	<input type="checkbox"/>

NOTE – Effective 2020, for chemical storage rooms accessory to laboratories all required documents are to be submitted directly to the FDNY Laboratory Unit (and not via form TM-1 application to Technology Management Unit). Project Managers should prepare all requisite documentation in an electronic packet for delivery to EH&S and subsequent submission to FDNY

2023

2/2



Link: [EHS ProjectCloseoutChecklist.pdf](#)

EH&S Project Closeout Checklist				
Completion Date & Initials	Plumbed Eyewash/Deluge Hose ¹	Document Source	Task	Timeline
	All eyewash or deluge hose components tested and operational	PM / Cx	PM coordinates test with Plumbing contractor and Cx	Prior to occupancy
	Water pressure/temperature confirmed			
	Overhead Emergency Shower¹			
	Water pressure/temperature confirmed	PM / Cx	PM coordinates test with Contractor, Cx and an Operations representative	Prior to occupancy
	Check for inspection tag: Tested and dated on inspection tag (month, year, initials) after installation	PM / Cx	PM coordinates test with Contractor, Cx and an Operations representative	Prior to occupancy
	Fire Safety			
	Oxygen sensor for storage of over 60 US gallons of cryogenic gases or other oxygen depleting substances. ²	PM	PM confirms that as-built condition does / does not require a sensor. Lab occupant has maintenance and testing contract in place.	Prior to occupancy
	Fire extinguisher mounted (10 lb. ABC), with current inspection tag	PM / Operations	Confirm	Prior to occupancy
	Compressed Gas Cylinder restraints installed (e.g., inside cylinder closets)	PM	Confirm	Prior to occupancy
	Corridor doors <ul style="list-style-type: none"> Fire rating label is readable and as specified Glass lites (e.g., Firelite) are stamped (embossed) with the fire rating of the glass. Are self-closing Closer is set for positive latching 	PM	Confirm	Prior to occupancy

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1

Completion Date & Initials	Laboratory Signage - Perform walkthrough with PM and EH&S for all signage requirements.	Timeline	
	"No Smoking" Signage (outside rooms or areas where hazardous materials are stored or used)	PM / EH&S	
	Laboratory Placard template (inclusive of FDNY language requirements)		
	("LABORATORY - POTENTIALLY HAZARDOUS SUBSTANCES" posted at each laboratory entrance door to lab from corridor, or from interior hallways of space into laboratory area)		
	Placard Inserts with laboratory hazard pictograms and emergency contact information		
	Label storage areas and equipment (Flammables, Acids, Eyewash, Shower, No Flammables in Refrigerator, Compressed Gas, etc.)	EH&S	
	Eyewash location/testing signage		
	Overhead emergency shower testing signage installed on or near shower	EH&S	
	Posting and signage - "Caution Class IIIB Laser" or "Danger Class IV Laser" for areas containing Class IIIB or IV lasers		
	Provide RAM "Sign of Signs, as applicable" ³	Furnish and install	Prior to occupancy
	Baseline Radiation survey completed by Radiation Safety personnel, where applicable	Furnish and install	Prior to occupancy
	Hazardous waste, recycling guide, and SLs posted inside laboratories		
	Non-ionizing Radiation Safety Documents- MRI Unit		
	Shielding Evaluation upon installation - Magnetic fields	EH&S	Prior to occupancy
	Shielding Evaluation upon installation - Radiofrequency	EH&S	Prior to occupancy
	Acoustic evaluation/vibration analysis upon installation	EH&S	Prior to occupancy
	Laser Safety Documents and Equipment⁴		
	Interlocks installed and functional for Class IV lasers as necessary.	EH&S w/installer confirmation	Prior to occupancy

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2

	Chemical Dark Room⁵			
	Silver recovery unit installation. EH&S to coordinate vendor installation.	EH&S		Prior to installation
	Provide laboratory with chemical dark room procedures and log	EH&S		At time of installation
	Provide a labeled scrap film container in chemical dark room or in appropriate area	EH&S		At time of installation
	Additional Required Documents or Other			
	Biosafety Cabinet certification. Please visit https://research.columbia.edu/biological-safety-links-and-summaries-accessed-certification-biosafety-cabinets for a list of Columbia University approved vendors. ⁶	Lab Occupant / PM		For new cabinets, prior to occupancy. For relocated cabinets, prior to use.
	ATF Alcohol Storage Permit (if storing ethanol for laboratory distribution)	Lab Occupant / Operator		Project Closeout
	Fume Hood Face Velocity Certification: after successful ASHRAE 110 ⁸	EH&S	PM coordinates with laboratory following ASHRAE 110	Project Closeout
	Confirm vendor maintenance contract and appropriate response protocol is in place for proprietary equipment with alarm systems	Lab Occupant / Operator	PM discusses with client	Project Closeout
	EH&S Documents and Supplies			
	Radioactive Materials (RAM) License	EH&S		Prior to occupancy
	DEC Air Discharge Permit for RAM (if applicable)	EH&S		Prior to occupancy
	Regulated Medical Waste containers (as needed) ⁹	PM / Operations		Prior to occupancy
	Spill kit present in lab or corridor, if applicable	Laboratory / EH&S		Prior to occupancy
	DEA Controlled Substances - Lockbox installed prior to occupation of laboratory. ¹⁰	Laboratory / PM	Laboratory/PM to agree on type and location of box. Box procured by Laboratory or PM prior to installation.	Consult EH&S prior to installation.

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3

REFERENCES

1. Columbia University Guidelines for Laboratory Design - <https://research.columbia.edu/sites/default/files/content/EHS/ProjectManagers/LaboratoryDesignGuideline2023.pdf>
2. Oxygen Sensors in Research Laboratories - <https://research.columbia.edu/o2-sensor-information>
3. New York City Fire Code - <https://www.nyc.gov/site/nyc-codes/fire-code/page>
4. Radiation Safety Manual - <https://research.columbia.edu/sites/default/files/content/RIS/Manuals/RadiationSafetyManual.pdf>
5. Laser Safety Policy - <https://research.columbia.edu/sites/default/files/content/LIS/Manuals/LaserSafetyManual.pdf>
6. Silver Management for Wet Chemistry Photo Processing - <https://research.columbia.edu/system/files/EHS/Policy/WetManagementForWetChemistryPhotoProcessing.pdf>
7. Biological Safety Cabinet Policy - <https://research.columbia.edu/system/files/EHS/Policy/BiosafetyCabinets.pdf>
8. Chemical Fume Hood Use in Research Laboratories - https://research.columbia.edu/system/files/EHS/Policy/CFH_UseInResearchLabs.pdf
9. Regulated Medical Waste Policy - <https://research.columbia.edu/system/files/EHS/Policy/RMW.pdf>
10. Controlled Substances Policy - <https://research.columbia.edu/system/files/EHS/Policy/ControlledSubstances.pdf>

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4



