
MIT

Design Standards

Project Turnover Program

Thematic Folder

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I. INTRODUCTION

For the purpose of this standard, the term “Project Turnover” refers to the transfer of responsibility of a building’s operation, maintenance, troubleshooting and repair activities from the project team to MIT’s R&M group, as well as providing all contract required documentation. During a construction project, the responsibility of these activities belongs to the project team which consists of the Construction Manager or General Contractor (CM/GC) and the Campus Construction (CC) division of MIT. Once a project is complete, the responsibilities must be transferred to MIT’s R&M group who act as the facility owners and operators. This document will explain the program for the transfer of these responsibilities, including the planning and preparation activities required to improve the results.

II. GOVERNANCE

Standard Development Teams

Due to the multiple parties involved with the turnover process, it was imperative that teams be assembled that consisted of representatives from each. With the goal to apply the standard to all project types, the team included representatives who could provide guidance for each. Thus, this document was created through the collaboration of three specific teams who have participated in the review and approval process.

Team members were included from the following groups:

- Campus Construction (CC)
 - Project Management Division (PMD)
 - System Performance & Turnover (SPT)

- Infrastructure Business Operations
 - Facilities Engineering (FE)
 - Facility Information Services (FIS)
 - Repair and Maintenance (R&M)

- Environmental Health and Safety (EHS)

- Information Services and Technology (IS&T)

Standard Updating Plan

As the needs for project turnover change in the future, this standard shall continue to be reviewed on a regular basis to assess the effectiveness of the current process and amend as needed to accommodate those changes. Any errors or omissions found since the last update will also be accounted for. This review will be coordinated by the SPT Group and a new version will be created and distributed, as required.

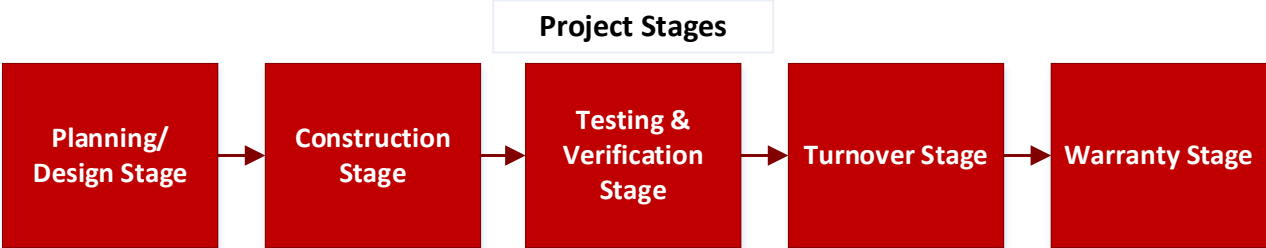
1. APPLICABLE PROJECT TYPES

MIT’S project turnover standard is to be utilized for all project types executed on the MIT Cambridge campus. These projects may be executed by any campus construction group, including Capital Projects, Capital Renewal, CRSP or Special Projects. It is understood that some of the steps and tasks outlined in this standard may not be applicable to all projects and that the process may require augmentation due to the scope and size, but the projects are still expected to follow the general rules and meet the requirements whenever possible.

2. PROJECT TURNOVER

During a construction project, the responsibility for activities related to the operation, maintenance, troubleshooting and repair of a building or space under construction belongs to the Construction Manager or General Contractor (CM/GC) and is facilitated by the Campus Construction division of MIT. Once a project is complete, the responsibilities must be transferred to MIT’s R&M division. This program will explain the transfer of these responsibilities, as well as the planning and preparation activities required to improve the execution.

From the perspective of turnover, there are five stages in any construction project:



This document will refer to all phases of a project, but only speak to the activities and requirements applicable to the Project Turnover Standard.

2.1 DATE OF BENEFICIAL OCCUPANCY

The Date of Beneficial Occupancy (DBO) is the date set by the construction team when the building users begin to occupy the facility. This day commonly coincides with the Certificate of Occupancy date, but may not coincide with the Substantial Completion date. Once a project has reached the DBO, the warranty for the building officially begins and all systems become the official responsibility of R&M. The PMD shall provide the DBO to SPT, FE, R&M and Customer Service no later than 90 days in advance of its arrival.

3. PROJECT TURNOVER STAGES

3.1 PLANNING & DESIGN STAGE TURNOVER ACTIVITIES

3.1.1 *Preparation for Turnover Stage*

Preparation for the turnover of a facility needs to begin during the planning and design stages of a project. This will allow requirements to be vetted with all involved parties and understood by the project team going forward. To accomplish this, there needs to be collaboration among the MIT facilities teams in setting clearly defined turnover goals.

3.1.1.1 *Project Team Representatives (PTRs)*

To accomplish the collaboration effort outlined for this program, an early designation of team members is required for clear understanding of communication lines. To this end, each group to be involved with a project shall select a Project Team Representative during the planning and design stage that shall be the point of contact for various activities referenced in this program. These PTRs will coordinate all activities, as well as disseminate all project information to the members of their respective team that will participate in the project. PTRs will be selected from the following groups at a minimum:

- Project Management Division (PMD) – (I.e. Project Manager)
- Systems Performance & Turnover (SPT)
- Facilities Engineering (FE)
- Repair and Maintenance (R&M)
- Environmental Health and Safety (EHS)
- Information Services and Technology (IS&T)

3.1.1.2 *Turnover Requirements*

During this first stage for the project, the guidelines for a proper project turnover need to be laid out and included in the project contract documents. The CC team shall coordinate a review of the items listed below with the PTRs before they are finalized. This includes the following:

- Requirements for the Interim and Final Turnover Packages
- Need for pre-training building tours
- Asset tagging requirements
 - *See Appendix E for example of Project Equipment List and Removed Equipment Submittal*
 - *See Appendix F for MIT ASSET ID TAGGING GUIDELINES*
- Requirements for Owner Training comprising of, but not limited to:
 - Disciplines included
 - Topics to be covered (system level and equipment level)
 - Deliverables

- Durations
- Location (classroom and/or field)
- Qualifications of the trainer
- Digital recording parameters
- Post-occupancy performance verification process (I.e. 10 month warranty visit vs. post-occupancy commissioning)
- Warranty Procedures

3.1.1.3 Turnover Related Design Stage Deliverables

During the design stage for the project, specific turnover related deliverables are required to lay the ground work for proper turnover packages at the end of the project. Those deliverables include:

- Project Equipment List – During the design stage, the template for this list is provided to the Engineer of Record by MIT and is to be populated with the full list of new, repaired and existing-to-remain pieces of equipment.
- Removed Equipment List – During the design stage, the template for this list is provided to the Engineer of Record by MIT and is to be populated with the full list of removed pieces of equipment.

3.2 CONSTRUCTION STAGE TURNOVER ACTIVITIES

3.2.1 Project Team Documentation Review

PMD shall include the various group members in the distribution of certain construction documents by sending them directly to the PTRs via email, eBuilder and/or through access to a project website where the documents are being kept. These documents include:

- Submittal Packages
- Coordination Drawings

The group members will have an opportunity to coordinate comments on these packages while under review by the project Architects and Engineers. Any comments from the various groups shall be consolidated by the PTR and provided to PMD, who then has the responsibility of eliciting responses from the design team. These responses shall be provided in writing to the PTRs.

3.2.2 Project Equipment List and Asset ID Tagging

During the construction stage for the project, the Contractor will finalize the populated information on the Project Equipment List and provide it to MIT's R&M Planning and Scheduling Group, who will review the information and create the physical asset ID tags for any new equipment.

These asset ID tags shall be placed on all new equipment according to MIT's Asset ID Tagging Guidelines, by the following team members:

- CRSP Projects - MIT's R&M Planning and Scheduling Group
- Capital Projects and Major Renovation Projects – Contractor

See Appendix F for Asset ID Tagging Guidelines.

3.2.3 Construction Progress Walk-Downs

During construction, the SPT Lead shall schedule periodic building walks that shall start at a time agreed upon by the project team and R&M. These walk-downs shall include representatives from all groups including the contractors, as applicable for the progress of construction. The PTRs shall designate representatives to participate in the construction progress walk-downs. This will be an opportunity for groups to track the construction of the building, better understand the facility and its systems and to raise any concerns about the building before the systems are transferred to their control.

- It will be the FE Lead's responsibility to lead the walkdowns, document and distribute questions or comments that arise from the walk-downs to the PMD.
- It will be the responsibility of the PTRs to take information gleaned from walk-downs and disseminate it amongst other members of their team, as well as bring to the attention of the CC team, questions or concerns from their team members related to that particular project.

3.3 TESTING & VERIFICATION STAGE TURNOVER ACTIVITIES

3.3.1 Component and System Testing

During the Testing & Verification Stage of the project, the construction team will do the following:

- The Architectural/Engineering team will assess the project and create a punch list of items to be resolved by the construction team.
- The Commissioning Provider, along with other 3rd party test agencies, will check and test the building components and systems for proper installation, functionality and performance. These checkouts and tests will produce a list of deficiencies to be corrected by the construction team.
- The project team will track alarms on the Building Automation System (BAS) and have them resolved by the appropriate contractor.

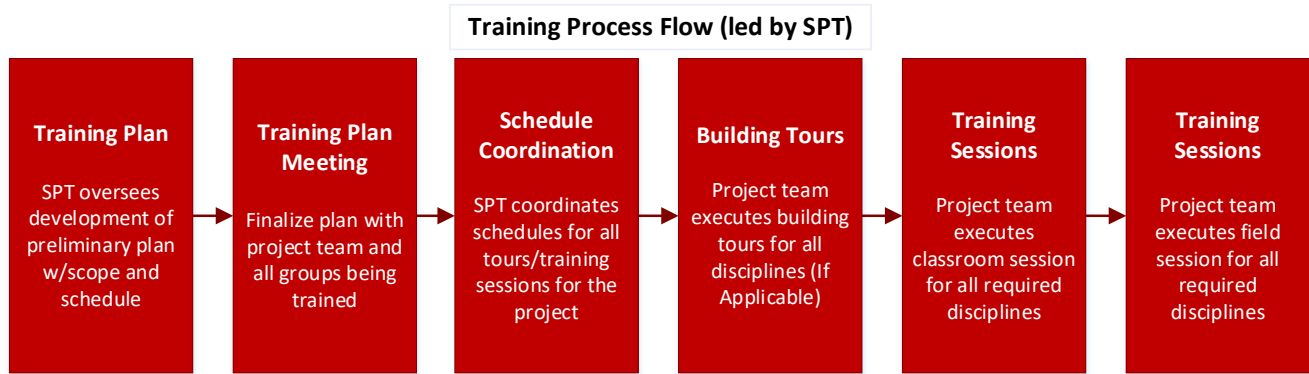
By the DBO, CC will make every effort to have all outstanding project related issues/ alarms resolved before systems are turned over. This includes any open work to complete items, punch list items, R&M inspection items, commissioning action list items or alarms on the BAS.

NOTE: Open items on any given system may not necessarily affect the ability to turn over that system. Each issue/alarm will be assessed as to its impact on the turnover process. See Section 1.1.1 for post-turnover issue/alarm closeout process.

3.4 TURNOVER STAGE ACTIVITIES

3.4.1 Training

No later than 90 days in advance of the DBO, the SPT team will begin the coordination of the training program for R&M, EHS, IS&T and Custodial personnel, as well as the building occupants as applicable on the building and the newly installed systems. The training program will include the following steps:



- **Preliminary Training Plan:** SPT, PMD, FE and the CM/GC will create a preliminary training plan including a training scope based on project specifications and a schedule. *(Sample Training Plan form is provided in Appendix A)*. Training and tours should be provided for:

 - HVAC/Mechanical Technicians/QAQC/Asset Mgmt
 - Electrical/Fire Alarm/Utilities Technicians
 - Plumbing Technicians / Pipe Fitters
 - Fire Protection Technicians
 - Building Control Instrument Technicians
- **Training Planning Meeting:** SPT, PMD and FE will hold a meeting with representatives from the groups requiring training to review the preliminary training plan. This meeting will review systems to be trained on, topics to be covered, duration of specified training per system and preliminary schedule of training dates. The meeting will also establish a training contact for each of the groups to be trained for coordination of the training program, if any of these people are to be different than the project PTR. There are two major goals of this meeting. First is to outline the program for the trainee groups giving them advance notice as to what will occur during the program. The second is to allow the trainee groups the opportunity to participate in the structure of the program and provide valuable information about where the training time should be focused to best benefit their team. Training agendas should be discussed as a part of the planning meeting. *(See Appendix B for sample training agenda forms)*
- **Training Schedule Coordination:** SPT shall coordinate scheduling of training with the trainee groups. Any scheduling or scheduling changes shall be discussed with the trainee groups to ensure availability of proper team members. It is the responsibility of the trainee group's training contact to make sure the trainees attend the training sessions and it is expected that the training contact and/or discipline supervisor be present at the beginning of each session to assist in coordination of their team. All attendees to the building tours or training sessions shall be required to sign in on a Training Record form. *(Sample Training Record form is provided in Appendix C)*
- **Building Tours:** Pre-training building tours are to be utilized when a project is either a new construction or consists of renovations comprehensive enough to warrant reintroduction to the space for the trainee groups. Although these tours will usually only be needed on capital projects, each project shall be assessed during design if building tours will be required for the project. The specifications shall indicate the requirement. If deemed appropriate for the project,

starting no later than 30 days in advance of the scheduled training, building tours will be given for each R&M discipline by PMD, SPT, FE and project contractor representatives. Similar to the training sessions, it is the responsibility of R&M's training contact to make sure the trainees attend the tour and it is expected that the training contact and/or discipline supervisor be present at the beginning of each tour to assist in coordination of their team.

NOTE: The number of tours required will depend on the size and complexity of the project. For example, large full building renovations may require up to 4 tours to accommodate all the R&M representatives that need to be included and they may be scheduled early (I.e. 7:30AM) in the day to accommodate 1st shift personnel and/or later in the day during 2nd shift (I.e. 3:30PM). However, small single space projects may not require a separate tour, if agreed upon by the stakeholders that a system overview walk down is sufficient for training. NOTE: If tours are implemented, 3rd shift personnel shall attend morning sessions, as applicable. The R&M PTR will coordinate their availability.

- **Training Session Requirements:** Although training requirements will be detailed in the project specifications, minimum expectations include:
 - **Classroom Session:** In addition to the traditional component level training offered by the contractors and vendors, each session shall also include a “systems” based training review. The design engineer and/or commissioning provider shall provide this system based training. At the beginning of each discipline classroom training session, there will be a presentation of the overall system design concept and a review of applicable system using simplified system schematics (single-line drawings) and floor plans. If the project is a renovation, discussion will include description of changes from previous configuration and operation.
 - **Field Session:** A field session including a walk-down of the system to show locations of equipment, components and devices relevant to the system, as well as detailed explanations of the equipment and procedures for operating, adjusting, maintaining, troubleshooting and repairing the system.
 - **Trainers:** Trainers must be well versed in the systems and equipment in which they are providing training, as well as be familiar with the installation and operation of those on that particular project. (I.e. If factory representatives are used for equipment training, but they did not install the equipment, the session shall be supplemented by a representative of the installing contractor.)
 - **Recording:** At least one session of each training course shall be digitally recorded for the Owner's use after the completion of the training program. Recordings shall be done by a professional videographer, hired by the CM/GC. Separate videos shall be provided for each discipline, or grouped as appropriate and agreed upon by the team developing the training plan for the project. Each video must be bookmarked to allow the viewer to jump directly to specific sections of interest which will be determined during the training planning process. At a minimum, bookmarking of videos shall allow immediate access to sessions/sections including, but not be limited to:
 - Beginning of the classroom training session
 - Beginning of the field walkdown training session
 - Start of each system review section during the classroom session

- Start of each equipment focused section during the field walkdown session

These training videos will be turned over with the O&M documents and uploaded onto eBuilder by the project team and subsequently to the Meridian document archive.

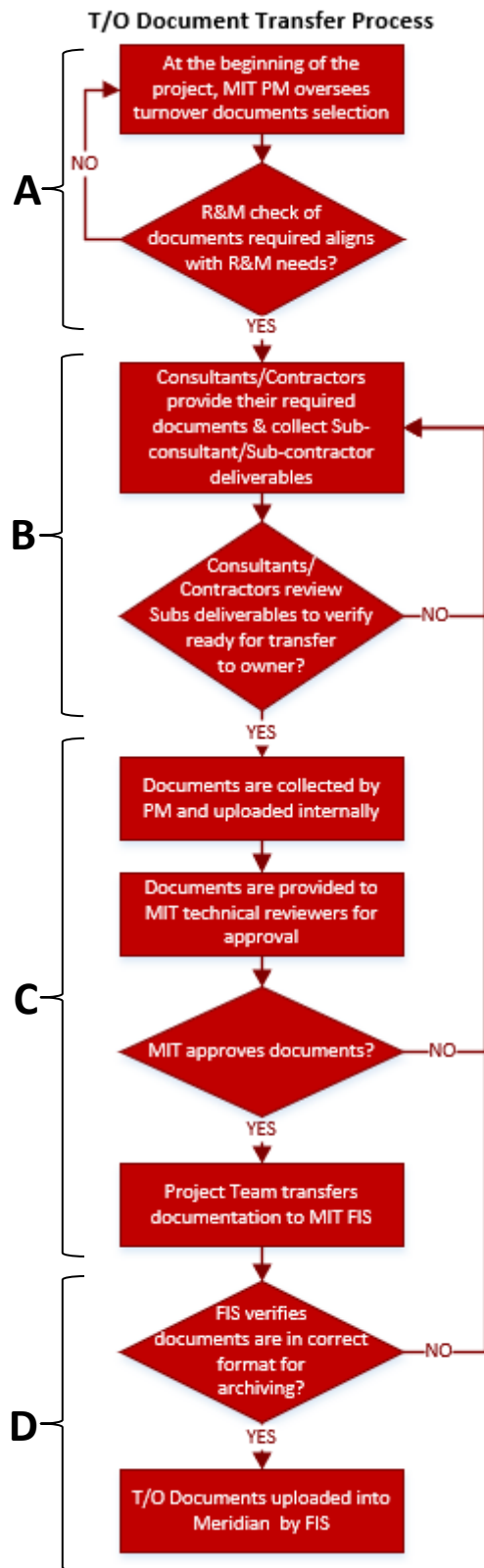
- **NOTE:** For small, minimally scoped projects, it may be appropriate to only conduct a small number of general training sessions where all disciplines are trained at once. This could be applicable for single room renovations or individual system upgrades. However, the potential for this type of training must be evaluated by the project team, including the trainee representatives. See Appendix B for sample agenda (Class II).

3.4.2 Pre-Interim Turnover Meeting

No later than 14 days in advance of the DBO, SPT shall schedule and conduct a meeting with the PTRs to discuss the status of the facility and how the interim turnover process will be implemented for the project. The PTRs shall invite any additional representatives from their respective groups they feel are necessary given the scope of work of the project. During this meeting, the following topics will be discussed:

- Review the DBO
- Review the systems included in the project scope
- Review of any open operational issues from construction (punch list, commissioning, inspection team list, etc.) and any current alarms on the system, to be corrected by the construction team
- CC will provide contractor contact list for R&M and Customer Service use
- Status of the interim turnover documentation package for the project
- Warranties and procedure for warranty item correction
- Status of the training program

3.4.3 Turnover Documentation Requirements



3.4.3.1 T/O Document Transfer Process

The transfer of turnover documentation shall adhere to the following steps. The purpose of these steps is to verify at various stages throughout the documentation transfer process that the correct documents are being provided and that they are of sufficient quality. This flow shall be applied to both the Interim Turnover Package and the Final Turnover Package. (See Section 3.4.3.2 for more information on these packages).

A: At the beginning of the project, the PM oversees the selection of requirements for the Interim and Final Turnover Packages (referenced in Section 3.1.1.2) with the project team. The R&M representative must participate in this selection and approve the list.

B: As the project progresses, it is up to the Consultants (A/E) and Contractors (CM/GC) to not only provide all of their own required documents, but also collect all the documents from their sub-consultants and sub-contractors. They will also be required to verify the accuracy and completeness of those documents provided by the sub-consultants and sub-contractors. If issues are identified during this review, the particular deliverable shall be corrected and verified as such before transferring to MIT as part of a turnover document package.

C: Once the PM has collected all of the project required turnover information, they will upload it to an internal location where they can be accessed by the MIT representatives responsible for their technical review and approval. Again, if issues are identified during this review, the particular deliverable will be sent back to the party responsible for providing it for correction. Only after the documents are approved by MIT’s internal review, can they be passed on to the FIS group for final upload into MIT’s archiving platform Meridian.

D: MIT’s FIS group will perform one more review of the files provided with a focus on the formatting accessibility for future use. This review will verify that the turnover package is compliant with MIT’s “CAD&DIGITAL_FILE_GUIDELINES” and “ARCHIVING_GUIDELINES”. Deviations will be called out and will require correction by the party responsible for providing the document.

3.4.3.2 T/O Document Packages

The turnover documentation requirements are broken into two packages:

- Interim Turnover Package – This package is required to be completed at the Interim Turnover stage of the project. All documents listed for this package have been deemed as the necessary minimum by R&M to run the facility. See Section 3.4.4 below for more detail.
- Final Turnover Package – This set of documents is required at the Final Turnover stage of the project and MIT has accepted the space. It is comprised of the overall project file set, including specific pertinent testing records and verifications pulled out for easy access. See Section 3.4.6 below for more detail.

The complete list includes items that may or may not be applicable to a particular project. The PM is required to review the list with SPT to develop the final requirements. See Appendix D for the full document listing and descriptions of each.

NOTE: Although there are other documents to be completed, submitted and archived at the completion of a project, (Ex. financial closeout documentation) they are not required for the turnover process and therefore not included in this standard.

3.4.4 Interim Turnover

At MIT, the turnover of a project is broken into two steps.

The first step is the “Interim Turnover”, which occurs on the DBO. It refers to the transfer of responsibility of a building’s operation, maintenance, troubleshooting and repair activities from the project team to the owner of a facility and providing a specific set of deliverables required to properly operate the facility or space. On the DBO, SPT shall submit the Interim Turnover Package to R&M, EHS and IS&T notifying that the building responsibilities have been transferred to MIT.

The Interim Turnover Package is designed to inform the groups of MIT responsible for operating the facility as to the current construction status, open issues within the facility related to the project and assemble the minimum essential information required for proper facility operation as MIT awaits the completion of all work and documents expected per the contract as part of the final building turnover. The package itself is a summary of information with references to the location of pertinent turned over documents. Included in this package will be:

- A letter stating the interim turnover of the space and signifying the transfer of operational responsibility to MIT.
- Pre-interim turnover meeting agenda and sign-in sheet
- Listing of the interim turnover documents and their status
- Training schedule as implemented
- Listing of any outstanding issues or alarms to be corrected by the construction team
- A list of all warranties associated with the project including effective dates and duration of warranty
- Warranty item correction procedure
- Contact list from the project for warranty repair service.

3.4.5 Project Related Issue/Alarm Closeout

As previously mentioned, CC as well as the other members of the Project Team (PTRs), will make every effort to have all outstanding project related issues/ alarms resolved before the interim turnover to the R&M team. However, there will be situations where issues and alarms cannot be corrected before the DBO and the process below describes how to facilitate their resolution:

- Any issues that cannot be resolved before the DBO will remain the responsibility of the construction team.
- A master list of open items, including work to complete items, punch list items, R&M inspection items, commissioning action list items or alarms on the BAS is created to provide a basis of the resolution plan.
- CC will conduct regular meetings with SPT, FE, CM/GC and R&M to track and update all on the resolution progress
 - R&M should bring open Work Orders and Alarms to this meeting for discussion.
 - R&M should bring any items of contract work found to this meeting.
 - NOTE: These meetings shall continue until all items are corrected or when all parties agree that it is no longer beneficial to meet.
- The project team will continue to work to resolve these open items and final turnover will not occur until one of the following conditions has been met:
 - All project related issues/alarms identified at Interim Turnover have been resolved
 - All open project related issues/alarms are a result of extenuating circumstances and are undergoing a resolution process as agreed to by the CC and R&M
 - The final condition of the unresolved items are accepted by R&M

3.4.6 Final Turnover

The second step in the turnover process is the “Final Turnover”, which refers the verification that all issues/deficiencies/alarms that remained open at the Interim Turnover step have been resolved and that all remaining contract required documentation has been collected and provided to the R&M team. SPT shall submit a Final Turnover Package to R&M, EHS and IS&T at this point indicating that the final turnover of the facility to MIT has been completed.

The Final Turnover Package is designed to update the groups of MIT responsible for operating the facility that the building or space is ready for final turnover. The package itself is a summary of information with references to the location of pertinent turned over documents. Included in this package will be:

- A letter stating the final turnover of the building or space, signed by the infrastructure directors and Deputy Executive Vice President
- Listing of the turnover documents and their status
- Training schedule as implemented
- A list of all warranties associated with the project including effective dates and duration of warranty
- Warranty item correction procedure
- Contact list from the project for warranty repair service.

3.5 WARRANTY STAGE ACTIVITIES

3.5.1 Operation of Warrantied Systems Post Interim Turn Over

Once a system has undergone interim turn over to R&M, it is their responsibility to troubleshoot and repair any non-warranty issues and/or oversee the repair of any warranty issues related to that system.

3.5.1.1 System Preventative Maintenance

As of the DBO, with training complete and the interim turnover document package provided by the contractors, the preventative maintenance responsibilities become MITs. All preventative maintenance of any system is the responsibility of R&M regardless of the outstanding issues awaiting resolution.

3.5.1.2 Issue Resolution Process for Systems Under Warranty

The process for communicating and coordinating the correction of these issues during the warranty period will be as follows:

1. R&M will assess whether the issue is contract, warranty or non-warranty related item.
 - Contract Work
 - R&M will communicate the issue to PMD who will be responsible to coordinate contractor correction.
 - Warranty Related Work
 - R&M will contact the CM/GC and/or the responsible contractor directly to react and correct the issue.
 - If the CM/GC is contacted, the CM/GC will follow up with the appropriate contractor to review the issue and support the resolution.
 - The CM/GC/Contractors shall copy the R&M (via the Zone Supervisor), PMD PM, FE Lead Engineer and project file on all relevant correspondence.
 - Non-Contract/Non-Warranty Related Work
 - R&M is responsible to react and correct the issue.

R&M/Contractors (if still on site) should not delay the response to an emergency or critical situation. Any emergency or critical situation corrections should be implemented (be it temporary or permanent as necessary) and brought to FE's attention after the work is complete. In the event that R&M requires emergency service from the CM/GC/contractors, they shall follow the project protocols utilizing the CM/GC's emergency contact list.

3.5.2 Post-Occupancy System Assessments

After the DBO, the project team may have the obligation to execute some form of post-occupancy review on the building operation and performance. Depending on the scope of the project, this will take one of two formats.

3.5.2.1 Seasonal Testing and Building Warranty Review

In order to verify proper operation and performance of systems in all seasons, the project team (lead by the Commissioning Provider, will execute a “seasonal testing” process in the opposite season to the testing executed during construction. They will coordinate and observe the required seasonal testing (this may include shoulder season assessments as well) and provide the final testing documentation.

Also, approximately 10 months into the warranty period, the project SPT representative will schedule a building review with representatives from the PMD, FE, R&M, building owners/occupants, project engineers, CM/GC and commissioning provider. This review will include a meeting and a building walk-down to assess the following items:

- 1 Assessment of the current building operation (includes review of building work orders)
- 2 Resolution plans/status of any outstanding issues relating to the seasonal commissioning
- 3 An opportunity to introduce new warranty related issues that have arisen since occupancy

Deficiencies identified through this process that are deemed the responsibility of the project, will be corrected by the project team at no additional expense to the MIT.

3.5.2.2 Post-Occupancy Commissioning

Starting from the DBO, the Commissioning Provider shall oversee quarterly meetings with PMD, FE, R&M, project engineers and the CM/GC where the following will be reviewed:

- 1 Quarterly reports of findings from trend data via the building automation and MIT’s fault detection systems to discuss issues and resolutions.
- 2 Work orders from the R&M team

Deficiencies identified through this process that are deemed the responsibility of the project, will be corrected by the project team at no additional expense to the MIT.

APPENDICES

A.	<u>TRAINING PLAN SAMPLE</u>	<u>A-1</u>
B.	<u>TRAINING AGENDA SAMPLES</u>	<u>B-1</u>
C.	<u>TRAINING RECORD SAMPLE</u>	<u>C-1</u>
D.	<u>TURNOVER DOCUMENTATION PACKAGE</u>	<u>D-1</u>
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F.	<u>MIT ASSET ID TAGGING GUIDELINES</u>	<u>F-1</u>

B. TRAINING AGENDA SAMPLES

These sheets are to be filled out completely by the contractors and reviewed and approved by the PMD, SPT, FE and R&M prior to the beginning of training. The “MIT Training Agenda” and “MIT Class II Training Agenda” files can be accessed by contacting the SPT team at SPT@mit.edu.



TRAINING AGENDA

Project: _____

Date: _____

Equipment / System: _____

Spec Section: _____

Part 1: Training Scope

General objectives and scope of training: (check all that apply)

- A. Provide an overview of the purpose and operation of this equipment, including required interactions of trainees with the equipment.
- B. Provide technical information regarding the purpose, operation and maintenance of this equipment at an intermediate level, expecting that serious malfunctions will be addressed by factory reps.
- C. Provide technical information regarding the purpose, operation, troubleshooting and maintenance of this equipment at a very detailed level, expecting that almost all operation, service and repair will be provided by the trainees.

Part 2: Trainees

Intended audience type (enter number of staff): ___ facility manager, ___ facility engineer, ___ facility technician, ___ project manager, ___ tenant, ___ other: _____

Part 3: Instructors

ID	Trainer	Company	Position / Qualifications
1)	_____	_____	_____
2)	_____	_____	_____
3)	_____	_____	_____

Part 4: Agenda [The contractor’s trainers fill out this Part and submit to Owner and Commissioning Authority for review and approval prior to conducting training.]

Location: ___ site _____ Date _____
 ___ classroom (location) _____, Date _____

<u>Agenda of general subjects covered</u> (√ all that will be covered)	(√ when completed)	<u>Duration / Instructor / Completed</u> (min.) (ID) (√)
___ General purpose of this system or equipment (design intent)	_____	_____
___ Review of control drawings and schematics (have copies for attendees)	_____	_____
___ Startup, loading, normal operation, unloading, shutdown, unoccupied operation, seasonal changeover, etc., as applicable	_____	_____
___ Integral controls (packaged): programming, troubleshooting, alarms, manual operation	_____	_____
___ Building automation controls (BAS): programming, troubleshooting, alarms, manual operation, interface with integral controls	_____	_____
___ Interactions with other systems, operation during power outage and fire	_____	_____
___ Relevant health and safety issues and concerns and special safety features	_____	_____



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<input type="checkbox"/> Energy conserving operation and strategies	_____	_____	_____
<input type="checkbox"/> Any special issues to maintain warranty	_____	_____	_____
<input type="checkbox"/> Common troubleshooting issues and methods, control system warnings and error messages, including using the control system for diagnostics	_____	_____	_____
<input type="checkbox"/> Special requirements of tenants for this equipment's function	_____	_____	_____
<input type="checkbox"/> Service, maintenance, and preventative maintenance (sources, spare parts inventory, special tools, etc.)	_____	_____	_____
<input type="checkbox"/> Question and answer period	_____	_____	_____
<u>Other subjects covered, specific to the equipment:</u>	<u>Duration</u>	<u>Instructor</u>	<u>Completed</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Total duration of training: (hrs) ----->	<input type="text"/>	_____	_____
<u>Training methods that will be included (clarify as required):</u> (Trainer checks all that apply)			
<input checked="" type="checkbox"/> use of the O&M manuals, illustrating where the verbal training information is found in writing			
<input checked="" type="checkbox"/> each attendee will be provided: 1) the control drawing schematic and sequence of operations; 2) a copy of this agenda.			
<input type="checkbox"/> discussion/lecture at site	_____	_____	_____
<input type="checkbox"/> site demonstration of equipment operation	_____	_____	_____
<input type="checkbox"/> written handouts	_____	_____	_____
<input type="checkbox"/> manufacturer training manuals	_____	_____	_____
<input type="checkbox"/> classroom lecture	_____	_____	_____
<input type="checkbox"/> classroom hands-on equipment	_____	_____	_____
<input type="checkbox"/> video presentation	_____	_____	_____
<input checked="" type="checkbox"/> question and answer period	_____	_____	_____

Part 5: Approval

This Agenda has been reviewed by, the Owner and Commissioning Authority and may be used by the Trainer for use during training.

This signature is for approval of the Training Agenda outline by the following individuals, subject to the additions and clarifications noted in the left columns marked "add." (This is not an approval of training completion.)

Owner's Representative

Date

Commissioning Authority

Date

CLASS II TRAINING AGENDA

Project: _____

Date: _____

Building: _____

Equipment / System: _____

Training will consist of a walk-down of the newly completed spaces, systems and major equipment. During the walk down, the following topics shall be discussed:

Agenda of topics covered

1. General purpose of this system or equipment (design intent)
2. Startup, normal operation, shutdown, unoccupied operation, seasonal changeover, etc., as applicable
3. Integral controls (packaged): programming, troubleshooting, alarms, manual operation
4. Building Automation System (BAS): programming changes, troubleshooting, alarms, etc.
5. Interactions with other systems, operation during power outage and fire
6. Relevant health and safety issues and concerns and special safety features
7. Energy conserving operation and strategies
8. Any special issues to maintain warranty
9. Special requirements of tenants for this equipment's function
10. Service, maintenance, and preventative maintenance (sources, spare parts inventory, special tools, etc.)
11. Question and answer period

Unique Operational Considerations:

(add number to correspond with topic above and include a brief explanation of the unique information to be considered.)

____:
____:
____:
____:
____:
____:
____:
____:



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STAFF TRAINING AND ORIENTATION PLAN RECORD

Project Name: _____

System or Equipment: _____

Topics Covered:

Length of Training (hours) _____

Total Number of Training Sessions _____

Handout Attached (Y/N) _____

C. TRAINING RECORD SAMPLE

This cover sheet is to be filled out completely by the contractors prior to the training commencing. The "MIT Training Plan Record" file can be accessed by contacting the SPT team at SPT@mit.edu.

Cover Page – Fill out one cover sheet for each type of training



STAFF TRAINING AND ORIENTATION PLAN RECORD

Project Name: _____ **System or Equipment:** _____

Class Date _____ Class Time _____

<u>TRAINEE INFORMATION</u>			
<u>Printed Name</u>	<u>Department</u>	<u>Position</u>	<u>Signature</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____
13.	_____	_____	_____
14.	_____	_____	_____
15.	_____	_____	_____

<u>TRAINER INFORMATION</u>		
<u>Printed Name</u>	<u>Company</u>	<u>Position</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Signature _____

D. TURNOVER DOCUMENTATION PACKAGE

Listing of requirements is to be assessed on a project by project basis to determine which are applicable. The list is to be filled out by the PMD and SPT representatives from the project and turned over as part of the Interim Turnover Package and Final Turnover Package. The list shown here is a representative sample. The latest version of the list file can be found in the MIT PM Tool Kit in eBuilder accessed by the MIT's Project Manager or SPT representative for the project.

R&M Project Turnover Documents

Current Revision: 2.0

Current Template Location: E-Builder PM Toolkit

<https://app-us2.e-builder.net/da2/Documents>

Project Closeout Requirement	e-Builder Folder Location	Deliverable is Due:	Deliverable applicable to project? (Y/N)	Docs Provided By	Received Date	Received By	Team Responsible for Verification	Verification Date	Meridian Folder Location	Deliverable Format *See FIS Project Closeout Doc Outline V5.0 (Tab 3)
SPECIFICATIONS	09.00	Interim T/O					Project Mgmt		Operations/Specification	
CONTACT LIST	09.01	Interim T/O					SPT		Operations/Contact List	
PERMITS	09.02	Interim T/O							Operations/Permit	
Flammable Storage Permit	09.02.01	Interim T/O					EHS		Operations/Permit	
New MWRA Permits and/or Discharge Locations	09.02.02	Interim T/O					EHS		Operations/Permit	
Crane and Boom Operating Permit (AKA Cranes and Hoists)	09.02.03	Interim T/O					EHS		Operations/Permit	
Building Code and MAAB Variances	09.02.04	Interim T/O					Project Mgmt		Operations/Permit	
Air Quality	09.02.05	Interim T/O					EHS		Operations/Permit	
Stormwater Pollution and Prevention Plan (MS4)	09.02.06	Interim T/O					EHS		Operations/Permit	
Other	09.02.07	Interim T/O					Project Mgmt		Operations/Permit	
100% Construction Set Drawings	09.03	Interim T/O							(Discipline)/Construction Documents	
Architectural	09.03.01	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Audio-Visual	09.03.02	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Civil	09.03.03	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Electrical	09.03.04	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Fire Alarm	09.03.05	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Fire Protection - Sprinklers	09.03.06	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Landscape	09.03.07	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Mechanical	09.03.08	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Plumbing	09.03.09	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Security	09.03.10	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Structural	09.03.11	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Telecommunications	09.03.12	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Geotechnical	09.03.13	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
Utilities	09.03.14	Interim T/O					Project Mgmt / Utilities		(Discipline)/Construction Documents	
Controls	09.03.15	Interim T/O					Project Mgmt		(Discipline)/Construction Documents	
As Built - Coordination Drawings	09.04	Interim T/O & Final							(Discipline)/As-Built	
Architectural	09.04.01	Interim T/O & Final					FEG		(Discipline)/As-Built	
Audio-Visual	09.04.02	Interim T/O & Final					FEG		(Discipline)/As-Built	
Civil	09.04.03	Interim T/O & Final					FEG		(Discipline)/As-Built	
Electrical	09.04.04	Interim T/O & Final					FEG		(Discipline)/As-Built	
Fire Alarm	09.04.05	Interim T/O & Final					FEG		(Discipline)/As-Built	
Fire Protection - Sprinklers	09.04.06	Interim T/O & Final					FEG		(Discipline)/As-Built	
Landscape	09.04.07	Interim T/O & Final					FEG		(Discipline)/As-Built	
Mechanical	09.04.08	Interim T/O & Final					FEG		(Discipline)/As-Built	
Plumbing	09.04.09	Interim T/O & Final					FEG		(Discipline)/As-Built	
Security	09.04.10	Interim T/O & Final					FEG		(Discipline)/As-Built	
Structural	09.04.11	Interim T/O & Final					FEG		(Discipline)/As-Built	
Telecommunications	09.04.12	Interim T/O & Final					FEG		(Discipline)/As-Built	
Geotechnical	09.04.13	Interim T/O & Final					FEG		(Discipline)/As-Built	

Utilities	09.04.14	Interim T/O & Final				FEG / Utilities		(Discipline)/As-Built
Controls	09.04.15	Interim T/O & Final				FEG		(Discipline)/As-Built
Architect's Record Drawings	09.05	Final T/O						Architecture/Record Design Drawing
Architectural	09.05.01	Final T/O				FEG		Architecture/Record Design Drawing
Audio-Visual	09.05.02	Final T/O				FEG		Architecture/Record Design Drawing
Civil	09.05.03	Final T/O				FEG		Architecture/Record Design Drawing
Electrical	09.05.04	Final T/O				FEG		Architecture/Record Design Drawing
Fire Alarm	09.05.05	Final T/O				FEG		Architecture/Record Design Drawing
Fire Protection - Sprinklers	09.05.06	Final T/O				FEG		Architecture/Record Design Drawing
Landscape	09.05.07	Final T/O				FEG		Architecture/Record Design Drawing
Mechanical	09.05.08	Final T/O				FEG		Architecture/Record Design Drawing
Plumbing	09.05.09	Final T/O				FEG		Architecture/Record Design Drawing
Security	09.05.10	Final T/O				FEG		Architecture/Record Design Drawing
Structural	09.05.11	Final T/O				FEG		Architecture/Record Design Drawing
Telecommunications	09.05.12	Final T/O				FEG		Architecture/Record Design Drawing
Geotechnical	09.05.13	Final T/O				FEG		Architecture/Record Design Drawing
Utilities	09.05.14	Final T/O				FEG / Utilities		Architecture/Record Design Drawing
Controls	09.05.15	Final T/O				FEG		Architecture/Record Design Drawing
O&M MANUALS	09.06	14 (CRSP)-60 (Capital) days Prior to Interim Turnover						Operations/O&M Manuals
Building Envelope	09.06.01	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				PM / SPT		Operations/O&M Manuals
Mechanical (HVAC)	09.06.02	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Electrical	09.06.03	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Plumbing	09.06.04	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Fire Alarm	09.06.05	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Fire Protection - Sprinklers	09.06.06	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Controls	09.06.07	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Lighting	09.06.08	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
Other	09.06.09	14 (CRSP)-60 (Capital) days Prior to Interim Turnover				FEG		Operations/O&M Manuals
REPORTS	09.07	Interim & Final if Updated						Operations/Reports
Balancing Report	09.07.01	Interim & Final if Updated				FEG		Operations/Reports
Commissioning Final Report	09.07.02	Final T/O				SPT		Operations/Reports
Interim Turnover Letter (Incl: Cx, P/L, Inspection & Alarm lists)	09.07.03	Interim T/O				SPT		Operations/Turnover Summary
Final Turnover Letter	09.07.03	Final T/O				SPT		Operations/Turnover Summary
Asbestos Abatement Closeout Docs	09.07.04	Final T/O				EHS		Operations/Reports
Hazardous Materials Sample Analysis	09.07.05	Final T/O				EHS		Operations/Reports
MassDEP MCP-LSP Environmental	09.07.06	Final T/O				EHS		Operations/Reports
Pull Testing Anchorage	09.07.07	Final T/O				EHS		Operations/Reports
Vacated Space Decontamination	09.07.08	Final T/O				EHS		Operations/Reports
Window Washing Access Study	09.07.09	Final T/O				EHS		Operations/Reports
Nox Data	09.07.10	Final T/O				EHS		Operations/Reports
Confined Space, Bldg, Stairways, Signage	09.07.11	Final T/O				EHS		Operations/Reports

Light Fixture Access	09.07.12	Final T/O					EHS		Operations/Reports
Hazardous Waste	09.07.13	Final T/O					EHS		Operations/Reports
LEED	09.07.14	Final T/O					SPT		Operations/Reports
SURVEYS	09.08	Interim T/O							(Discipline)/Surveys
Site Survey	09.08.01	Interim T/O					Project Mgmt		(Discipline)/Surveys
Other	09.08.02	Interim T/O					Project Mgmt		(Discipline)/Surveys
CERTIFICATIONS ("Binder")	09.09	Interim T/O							Operations/Certificates
Certificate of Substantial Completion	09.09.01	Interim T/O					Project Mgmt		Operations/Certificates
Certificate of Inspection (assembly spaces)	09.09.02	Interim T/O					EHS		Operations/Certificates
Certificate of Use and Occupancy (or signed bldg card) / Beneficial Use	09.09.03	Interim T/O					Project Mgmt		Operations/Certificates
Eyewash and Safety Shower Acceptance Certificate	09.09.04	Interim T/O					EHS		Operations/Certificates
Fall Protection Tie-Point Certifications	09.09.05	Final T/O					EHS		Operations/Certificates
Exhaust Device Certifications (ASHRAE 110)	09.09.06	Interim T/O					EHS		Operations/Certificates
Elevator Certificate	09.09.07	Interim T/O					QAQC / O&M		Operations/Certificates
Sheet Metal Certificate	09.09.08	Interim T/O					Project Mgmt		Operations/Certificates
EQUIPMENT LIST with PM numbers (w/prefunctional checklists for Cx'd equipment)	09.10	Same time as O&M Manuals					SPT		Operations/Equipment list
TRAINING	09.11	Interim & Final if Updated							Operations/Training Record
Training Records	09.11.01	Interim & Final if Updated					SPT		Operations/Training Record
Training Videos	09.11.02	Interim & Final if Updated					SPT		Operations/Training Record
WARRANTIES (actual and list)	09.12	Interim & Final if Updated					SPT		Operations/Warranty
FIRE ALARM POINTS LIST	09.13	Interim & Final if Updated					FEG		Operations/Fire Alarm Points
VALVE TAG LIST	09.14	Interim & Final if Updated					FEG		Operations/Valve Tag Chart
CAMBRIDGE FIRE DEPT. BINDER	09.15	Interim T/O					FEG		Operations/Cambridge Fire Dept Binder
ARC FLASH / SHORT CIRCUIT STUDY	09.16	Interim & Final if Updated					FEG		Electrical/Arc Flash Study
VENDOR REPORT CARDS	09.17	Final T/O					Project Mgmt		N/A
SUBMITTALS	09.18	Interim & Final if Updated							Operations/Submittal
Existing Conditions	09.18.01	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Concrete	09.18.02	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Masonry	09.18.03	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Misc. Metals	09.18.04	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Structural Steel	09.18.05	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Millwork	09.18.06	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Thermal and Moisture Protection	09.18.07	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Openings	09.18.08	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Finishes	09.18.09	Interim & Final if Updated					Project Mgmt		Operations/Submittal
Mechanical (HVAC)	09.18.10	Interim & Final if Updated					FEG		Operations/Submittal
Electrical	09.18.11	Interim & Final if Updated					FEG		Operations/Submittal
Plumbing	09.18.12	Interim & Final if Updated					FEG		Operations/Submittal
Fire Alarm	09.18.13	Interim & Final if Updated					FEG		Operations/Submittal
Fire Protection - Sprinklers	09.18.14	Interim & Final if Updated					FEG		Operations/Submittal
Controls	09.18.15	Interim & Final if Updated					FEG		Operations/Submittal
Other	09.18.16	Interim & Final if Updated					Project Mgmt		Operations/Submittal
RECORD OF MATERIALS TRANSFERRED (Attic Stock)	09.19	Final T/O					Project Mgmt		Operations/Record of Materials Transfer
All Keys Returned	N/A	Final T/O					Locksmiths		N/A
All Access Cards Returned or Deactivated	N/A	Final T/O					IST physical Security		N/A

** All reports should be bookmarked & have text recognition enabled

TURNOVER DOCUMENTATION DESCRIPTIONS

1. Document Descriptions

Some items identified in the turnover document package are clear as to what is to be received (E.g. permits, test results, certificates, etc.). Others may require further definition as to what should be included. Below we clarify a number of the deliverables. For a complete list of Turnover Documents and the required formats, please refer to the R&M Project Turnover Document List above:

2. Certificate of Inspection (assembly spaces)

Required for any assembly space/room that has 50 or more people. For any building with an Assembly Space, a certificate of Assembly would also be required for the building.

The CI (certificate of Inspections) should be posted in an obvious location in a MIT Standard acrylic holder: (see MIT Signage Standard for specifics)

3. Architect Contract Drawings/ Specifications (PDF & DWG)

Contract drawings are prepared by the architect during the Construction Document (CD) phase of design. They are the drawings that form the basis of the construction. These drawings are to be provided during the Interim Turnover as a supplement to the draft as-built set and provide additional information to the R&M team while the final as-builts and record drawings are being completed.

4. Cambridge Fire Department Closeout Binder

The fire department closeout binder is important in achieving approval from the Cambridge Fire Department in order to obtain the certificate of occupancy. This binder should include the following (*as applicable to the project*):

- Certificate of completion
- Copy of Construction Project Fire Prevention Program Manager form per NFPA 241
- Sprinkler permits
- Material and test certificates for piping
- Fire pump acceptance test and curve
- Generator acceptance test
- Fire alarm record of completion
- Smoke control testing
- Radio signal testing
- Flammability certificates for interior finishes
- Engineer's affidavit
- Evacuation plan
- Place of assembly permit

5. As-Built (Conformed) Drawings

The as-built (conformed) drawings are prepared by the contractor showing typically in red ink, on-site changes to the original construction documents. This set of drawings depicts the actual conditions of the completed construction “as it was built”.

Due to the nature of as-built drawings, they cannot be completed and turned over by the DBO or Interim Turnover. Therefore, the project team is required to provide an interim set of drawings that consist of either an electronically scanned copy of the conformed drawing set or a draft electronic copy for use by R&M until the record set is complete. These drawings are to be included with the interim turnover document package. For final turnover, the contractors are required to provide a finalized electronic copy of these drawings.

6. Project Equipment List and Removed Equipment List

The Project Equipment List template is developed by MIT’s R&M Planning and Scheduling Group and the latest version is provided to the Engineer Of Record to be populated with the full list of new, repaired and existing-to-remain pieces of equipment during the design phase. During construction, the contractors will update the list information based on the as-built conditions and complete the population of specific installed equipment data unavailable during design (E.g. serial numbers)

The Removed Equipment List template is developed by MIT’s R&M Planning and Scheduling Group and the latest version is provided to the Engineer Of Record to be populated with the full list of removed pieces of equipment during the design phase.

See Appendix E for sample list templates.

7. Warranty and Contact List

Warranty List: The warranty information shall include the following:

- List of all warranty items including O&M references for proper maintenance so as to maintain the valid warranties, as well as unauthorized actions that may invalidate the warranty.
- Warranty start dates and durations of both the building warranty, as well as individual pieces of equipment.
- Name(s) of specific individuals from the CM/GC to administer the warranty period
- Administrative process for warranty item correction including instructions for reporting defects covered by warranty to the CM/GC or other appropriate contractor

Contact List: The purpose of the contractor contact list is to provide the R&M group with a list of people to contact in the event that they need support from the installing contractors to answer a question or resolve a problem. The contact lists shall include the following information for each contact at a minimum:

- Name of Company
- Name of Company Representative (specific person)
- Direct Phone Number to Representative
- Direct Email Address to Representative

- Hours of Business (Include afterhours/off-hours contact information if applicable)
- Systems applicable to the Company Listed

8. *Approved Testing, Adjusting and Balancing (TAB) Report*

At a minimum, a draft Testing, Adjusting and Balancing (TAB) report is to be included in the interim turnover package. This report shall be provided under a separate cover from the rest of the mechanical O&M documentation.

The final approved Testing, Adjusting and Balancing (TAB) report is to be included in the final turnover package. Again, this report shall be provided under a separate cover from the rest of the mechanical O&M documentation. The MIT shall not accept the HVAC systems without a completed TAB report approved by the engineer of record.

9. *Final Commissioning Report*

See MIT's Commissioning Standard for a definition of the Final Commissioning Report.

Interim (Draft) Commissioning Report

A draft final commissioning report shall be submitted to SPT for their review. Any comments on these packages will be sent back to the Commissioning Provider, through the SPT, for correction and resubmission.

Final Commissioning Report

The final version of the commissioning report shall be uploaded into MIT's Meridian document archive prior to the final turnover of the space. This shall be indicated in the Final Turnover package.

10. *Operation & Maintenance Manuals (O&Ms)*

Operational and Maintenance Manuals include equipment specifications and schedules, drawings and overall information needed to maintain installed equipment.

Interim (Draft) O&M Manuals

A draft set of O&M manuals shall be submitted to the FIS department for their review. (For FIS requirements regarding these turnover packages, see the current latest revision of the FIS "CAD&DIGITAL_FILE_GUIDELINES" and "ARCHIVING_GUIDELINES"). Any FIS comments on these packages will be sent back to the author, through the PMD, for correction and resubmission.

Final O&M Manuals

The final version of the O&M manuals is due before the first day of training. The O&M manuals shall be uploaded into MIT's Meridian document archive for R&M' use in operating the building once the DBO is reached. A copy shall be provided to the FIS department for record and document archiving in the Meridian document archive. This shall be indicated in the Final Turnover package.

11. *Training Documentation Package*

The training documentation shall be turned over as a part of the turnover package and shall include the following grouped and formatted per the executed training sessions:

- The Training Plan
- All approved training agendas
- All training handout materials
- The Training Record documents
- Training videos (*Only required at Final T/O*)

A copy of the training material and training videos shall be provided to the FIS department for record and document archiving in the Meridian document archive. This shall be indicated in the Final Turnover package.

12. Project Files

Project files refers to the folders of files collected during the project execution. These files are to be available in the eBuilder system for future access if required.

13. Architect's Record Drawings and Specifications

Record drawings are prepared by the architect and reflect on-site changes the contractor noted in the conformed set of drawings. They are often compiled as a set of on-site changes made for the owner per the owner-architect contract.

Due to the nature of record drawings, they cannot be completed and turned over by the DBO or Interim Turnover. Therefore, the project team is required to provide an interim set of drawings that consist of an electronically scanned copy of the conformed drawing set for use by R&M until the record set is complete. These drawings are to be included with the interim turnover document package.

Draft Record Drawing Set

A draft set of record drawings shall be submitted to the FIS department for their review. The project shall schedule all drawing reviews by the construction manager or general contractor, consultant engineers and architects as required verifying accuracy and completeness of drawing information, prior to submission to FIS. Any FIS comments on these packages will be sent back to the author, through the PMD, for correction and resubmission. (For FIS requirements regarding these turnover packages, see the current latest revision of the FIS "CAD&DIGITAL_FILE_GUIDELINES" and "ARCHIVING_GUIDELINES").

Final Record Drawing Set

Prior to Final Turnover, the final record drawing package shall be provided to the FIS department for upload into MIT's Meridian document archive. This shall be indicated in the Final Turnover package.

14. Coordination Drawings

Per ASHRAE, coordination drawings show the work of all trades to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances.

15. Submittals

Product data submittals, samples, and shop drawings are required primarily for the Architect and Engineer to verify that the correct products will be installed on the project. A shop drawing is a drawing or set of drawings produced by the contractor, supplier, manufacturer, subcontractor, or fabricator typically required for pre-fabricated components.

The turnover package shall include only the final approved submittals and shop drawings. Any marked "Approved as Noted" must have the accompanying notes from the designer of record.

16. Certificate of Occupancy Binder

The certificate of occupancy binder should include the following (*as applicable to the project*):

- Certificate of occupancy application
- A cost affidavit certifying the final cost of the project;
- Affidavits from the architect and/or engineer and the contractor certifying that the project was built in accordance with the approved plans and all applicable codes;
- A final inspection conducted by the following inspectors: fire, wiring, plumbing, zoning, and building;
- Written approval from the zoning inspector that any special permit requirements have been met.

E. PROJECT EQUIPMENT LIST AND REMOVED EQUIPMENT SUBMITTAL

Project Equipment List - Asset ID Upload Form

Date Filled Out:	
Version:	
Project/Work Order #:	
REQUIRED FIELDS:	
MIT TO ASSIGN:	

Instructions: See written guidelines in A/E and Contractor requirements. If not provided, then request requirements from the project manager.

	Asset ID Range (Start)
	Asset ID Range (End)

MIT		Required information prior to obtaining physical Asset ID Tags											As-built Information Required After Installation					Notes			
Parent Asset ID	MIT R&M Description	Status	Equipment Tag	Skid Tag	A/E Description	Building Number	Room Number	Location Info	Related Equipment	System	Area Served	Maintenance Owner	Project Number	Asset ID#	Manufacture Name	Model Number	Serial Number		Warranty Start	Warranty End	Approved Submittal Number
		NEW		LS-1-2	LIFT STATION	E37	310	NEAR SINK		PLUMBING DRAINAGE LAB WASTE	E37-310 ACID LAB	MIT R&M	12345	To be filled out after installation							
		NEW	P10	LS-1-2	WASTE WATER PUMP	E37	310	NEAR SINK	LS-1-2	PLUMBING DRAINAGE LAB WASTE	E37-310 ACID LAB	MIT R&M	12345								
		NEW		AC-1	AIR COMPRESSOR	E37	515	5TH FL MECH RM		HVAC COMPRESSED AIR	E37 ANIMAL QUARTERS	MIT R&M	12345								
		NEW	P1	AC-1	COMPRESSOR	E37	515	5TH FL MECH RM	AC-1	HVAC COMPRESSED AIR	E37 ANIMAL QUARTERS	MIT R&M	12345								
		NEW	P2	AC-1	COMPRESSOR	E37	515	5TH FL MECH RM	AC-1	HVAC COMPRESSED AIR	E37 ANIMAL QUARTERS	MIT R&M	12345								
		NEW		AC-1	AIR DRYER	E37	515	5TH FL MECH RM	AC-1	HVAC COMPRESSED AIR	E37 ANIMAL QUARTERS	MIT R&M	12345								
		NEW	T1	AC-1	COMPRESSED AIR TANK	E37	515	5TH FL MECH RM	AC-1	HVAC COMPRESSED AIR	E37 ANIMAL QUARTERS	MIT R&M	12345								
		NEW		SP-1	DUPLEX SUMP PUMP	E37	0030	BSMT MECH ROOM		PLUMBING DRAINAGE STORM DRN	E37	MIT R&M	12345								
		NEW	P1	SP-1		E37	0030	BSMT MECH ROOM	SP-1	PLUMBING DRAINAGE STORM DRN	E37	MIT R&M	12345								
		NEW	P2	SP-1		E37	0030	BSMT MECH ROOM	SP-1	PLUMBING DRAINAGE STORM DRN	E37	MIT R&M	12345								
		NEW		EP-1	DUPLEX SEWAGE EJECTOR	E37	0030	BSMT MECH ROOM		PLUMBING DRAINAGE SANITARY	E37	MIT R&M	12345								
		NEW	P1	EP-1	EJECTOR PUMP	E37	0030	BSMT MECH ROOM	EP-1	PLUMBING DRAINAGE SANITARY	E37	MIT R&M	12345								
		NEW	P2	EP-1	EJECTOR PUMP	E37	0030	BSMT MECH ROOM	EP-1	PLUMBING DRAINAGE SANITARY	E37	MIT R&M	12345								
		NEW		CWB-1	TRIPLEX BOOSTER PUMP SYSTEM	E37	515	5TH FL MECH RM		PLUMBING POTABLE WATER	E37	MIT R&M	12345								
		NEW	P1	CWB-1	DOMESTIC WATER BOOSTER PUMP	E37	515	5TH FL MECH RM	CWB-1	PLUMBING POTABLE WATER	E37	MIT R&M	12345								
		NEW	P2	CWB-1	DOMESTIC WATER BOOSTER PUMP	E37	515	5TH FL MECH RM	CWB-1	PLUMBING POTABLE WATER	E37	MIT R&M	12345								
		NEW	P3	CWB-1	DOMESTIC WATER BOOSTER PUMP	E37	515	5TH FL MECH RM	CWB-1	PLUMBING POTABLE WATER	E37	MIT R&M	12345								
		NEW		CAS-1	COMPRESSED AIR SYSTEM	E37	515	5TH FL MECH RM		FIRE PROTECTION SUPPRESSION	E37 FIRE SUPPRESSION	MIT R&M	12345								
		NEW	P1	CAS-1	AIR COMPRESSOR	E37	515	5TH FL MECH RM	CAS-1	FIRE PROTECTION SUPPRESSION	E37 FIRE SUPPRESSION	MIT R&M	12345								
		NEW	T1	CAS-1	AIR COMPRESSOR TANK	E37	515	5TH FL MECH RM	CAS-1	FIRE PROTECTION SUPPRESSION	E37 FIRE SUPPRESSION	MIT R&M	12345								
		NEW	EF-22		EXHAUST FAN	E37	ROOF	NORTH ROOF	FH-1	HVAC AIR HANDLING EXHAUST	LAB 3-345 SPRAY BOOTH	MIT R&M	12345								
		NEW	FH-1		FUME HOOD	E37	345		EF-22	HVAC AIR HANDLING EXHAUST	LAB 3-345 SPRAY BOOTH	Glass Lab	12345								
		NEW		AHU-1	AIR HANDLING UNIT	E37	515	5TH FL MECH RM		HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	S1	AHU-1		E37	515	INSIDE AHU-1	AHU-1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	S2	AHU-1		E37	515	INSIDE AHU-1	AHU-1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	S3	AHU-1		E37	515	INSIDE AHU-1	AHU-1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	S4	AHU-1	VARIABLE FREQUENCY DRIVE	E37	515	INSIDE AHU-1	AHU-1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	VFD-1	AHU-1	VARIABLE FREQUENCY DRIVE	E37	515	INSIDE AHU-1	AHU-1 S1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	VFD-2	AHU-1	VARIABLE FREQUENCY DRIVE	E37	515	INSIDE AHU-1	AHU-1 S2	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	VFD-3	AHU-1	VARIABLE FREQUENCY DRIVE	E37	515	INSIDE AHU-1	AHU-1 S3	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	VFD-4	AHU-1	VARIABLE FREQUENCY DRIVE	E37	515	INSIDE AHU-1	AHU-1 S4	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	HW-1	AHU-1	HEAT WHEEL	E37	515	INSIDE AHU-1	AHU-1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								
		NEW	FP-H1	AHU-1	PUMP FREEZE PROTECTION	E37	515	INSIDE AHU-1	AHU-1	HVAC AIR HANDLING CIRC.	FORUM - E37 1ST FLOOR	MIT R&M	12345								

- a) **Asset ID** - Unique 6 Digit number assigned and physically attached to each inventoried equipment. Used track to track maintenance history.
- b) **Status** - This is either New or Existing. Existing equipment includes two types; First, equipment that is altered in regards to area served, location or function, Second, existing equipment that is related to new equipment and tied together with the Parent Asset(see definition below).
- c) **A/E Description** - Description provided in project documents
- d) **Skid Tag** - The Skid or System Tag is shown in the P&ID or plans/schedules/risers or labeling on the skid. For example, a pump skid might have two pumps. The pumps are identified by the Equipment Tag (P1 and P2) and the associated Skid is identified by the Skid Tag (PMP-1). The logic follows for equipment that is part of AHU systems and other skids. Does not apply to all assets.
- e) **Equipment Tag** - The Equipment Tag is shown in the P&ID or plans/schedules/risers or labeling on the installed equipment. For example, a pump skid might have two pumps. The pumps are identified by the Equipment Tag (P1 and P2) and the associated Skid is identified by the Skid Tag (PMP-1). The logic follows for equipment that is part of AHU systems and other skids.
- f) **Area served** - Specific location information as applicable. Use room number(s) for dedicated equipment. Use floor or building for general infrastructure.
- g) **System/Function** - The best suited and most specific system available in the drop down list referenced from the System Index. The list is restricted to meet MIT reporting requirements. No modifications are accepted.
- h) **Related Equipment** - Provide Equipment Tag and Skid Tag or Asset ID for related equipment. Hood/Exhaust Fan, VFD/Pump, Evaporator/Condenser, etc. Parent Asset provides the link between related equipment. In some cases related equipment is existing. This equipment should be listed in the upload form with the "Existing Status".
- i) **Maintenance Owner** - The MIT department responsible for maintenance of the equipment. In most cases this is DoF. However, there may be some equipment special cases where equipment from other departments is inventoried.
- j) **Approved Submittal Number** - Reference to submittal(s) relating to each equipment listed in the project equipment list.

MIT		Required information prior to obtaining physical Asset ID Tags											As-built Information Required After Installation								
Parent Asset ID	MIT R&M Description	Status	Equipment Tag	Skid Tag	A/E Description	Building Number	Room Number	Location Info	Related Equipment	System	Area Served	Maintenance Owner	Project Number	Asset ID#	Manufacture Name	Model Number	Serial Number	Warranty Start	Warranty End	Approved Submittal Number	Notes
		NEW	VAV 1-1	AHU-1	VARIABLE AIR VOLUME	E37	100LA	FORUM 1ST FL LOBBY	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL LOBBY	MIT R&M	12345								
		NEW	VAV 1-2	AHU-1	VARIABLE AIR VOLUME	E37	100LA	FORUM 1ST FL LOBBY	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL LOBBY	MIT R&M	12345								
		NEW	VAV 1-3	AHU-1	VARIABLE AIR VOLUME	E37	100LA	FORUM 1ST FL LOBBY	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL LOBBY	MIT R&M	12345								
		NEW	VAV 1-4	AHU-1	VARIABLE AIR VOLUME	E37	192	FORUM 1ST FL RECEPTION	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL RECEPTION	MIT R&M	12345								
		NEW	VAV 1-5	AHU-1	VARIABLE AIR VOLUME	E37	192	FORUM 1ST FL RECEPTION	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL RECEPTION	MIT R&M	12345								
		NEW	VAV 1-6	AHU-1	VARIABLE AIR VOLUME	E37	162	FORUM 1ST FL FEM RESTROOM	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL FEM RESTROOM	MIT R&M	12345								
		NEW	VAV 1-7	AHU-1	VARIABLE AIR VOLUME	E37	162	FORUM 1ST FL FEM RESTROOM	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL FEM RESTROOM	MIT R&M	12345								
		NEW	VAV 1-8	AHU-1	VARIABLE AIR VOLUME	E37	162	FORUM 1ST FL FEM RESTROOM	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL FEM RESTROOM	MIT R&M	12345								
		NEW	VAV 1-9	AHU-1	VARIABLE AIR VOLUME	E37	162	FORUM 1ST FL FEM RESTROOM	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL FEM RESTROOM	MIT R&M	12345								
		NEW	VAV 1-16	AHU-1	VARIABLE AIR VOLUME	E37	100CB	FORUM 1ST FL NEAR ELEV G	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL NEAR ELEV G	MIT R&M	12345								
		NEW	VAV 1-17	AHU-1	VARIABLE AIR VOLUME	E37	136	FORUM 1ST FL MECH/PUMP RM	AHU-1	HVAC AIR HANDLING CIRC.	FORUM 1ST FL MECH/PUMP RM	MIT R&M	12345								
		NEW	FCU-3-1		FAN COIL UNIT	E37	310	ABOVE CEILING		HVAC AIR HANDLING CIRC.	E37-310 ACID LAB	MIT R&M	12345								
		NEW			FIRE EXTINGUISHER	E37	100CB	CORRIDOR		FIRE PROTECTION SUPPRESSION	CORRIDOR	MIT R&M	12345								
		NEW			COUPON RACK	E37	0030	BSMT MECH ROOM		HVAC HOT WATER	E37 HOT WATER FOR AHUs	MIT R&M	12345								
		NEW			MIXING VALVE	E37	0030	BSMT MECH ROOM		PLUMBING EMERGENCY WATER	E37 SAFETY SHOWERS AND EYE WASH	MIT R&M	12345								
		NEW			SAFETY SHOWER AND EYE WASH	E37	310	ACID LAB		PLUMBING EMERGENCY WATER	E37-310 ACID LAB	MIT R&M	12345								
		NEW		WNS-1	WASTE WATER NEUTRALIZATION STATION	E37	0030	BSMT MECH ROOM		PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	P10	WNS-1	WASE WATER PUMP	E37	0030	BSMT MECH ROOM	WSN-1	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	P20	WNS-1	WASTE WATER PUMP	E37	0030	BSMT MECH ROOM	WSN-1	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	CF10	WNS-1	CHEMICAL FEED	E37	0030	BSMT MECH ROOM	WSN-1	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	CF20	WNS-1	CHEMICAL FEED	E37	0030	BSMT MECH ROOM	WSN-1	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	TK10	WNS-1	DILLUTION TANK	E37	0030	BSMT MECH ROOM	WSN-1	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	VFDA	WNS-1	VARIABLE FREQUENCY DRIVE	E37	0030	BSMT MECH ROOM	WSN-1 P10	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								
		NEW	VFDB	WNS-1	VARIABLE FREQUENCY DRIVE	E37	0030	BSMT MECH ROOM	WSN-1 P20	PLUMBING DRAINAGE LAB WASTE	BLDG 3,7,10,E15, E18	MIT R&M	12345								

PROJECT EQUIPMENT LIST GLOSSARY

R&M Planning and Scheduling Equipment Glossary Narrative

Version: v5

Date Updated: 04/07/2021

NOTE: The following table takes all equipment listed in the DoF SAP equipment glossary and provides additional details regarding the equipment as well as any required parent/child (SAP). This is intended as a supporting tool to help MIT project managers, contractors A/E understand what categories of equipment are inventoried by the Office of R&M Planning and Scheduling.

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
AIR COMPRESSOR	Air compressor for laboratory or control air applications. Does not include Air Compressors maintained by DLC or CUP. Sub to air compressor SKID.	CHILD	Skid Air Compressor
AIR COMPRESSOR FIRE SUPPRESSION	Air compressors associated with dry pipe and pre-action type sprinkler systems.	SOMETIMES	Sometimes related to large AHU with dedicated sprinkler system.
AIR COMPRESSOR SKID	Air Compressor Skid. This includes all compressors that serve the same function and area. They are not always on the concrete pad or platform.	PARENT	Related equipment is usually shown on flow or riser diagram; Air Compressors, Tanks, Air Dryers.
AIR DRYER REFRIGERATED	Dries air by passing it through a refrigerated heat exchanger which cools the air and allows water vapor to condense and drain out, thereby preventing corrosion.	CHILD	Skid Air Compressor
AIR DRYER REGENERATIVE DESICCANT	Desiccant air dryers use solid adsorbents in granule form to reduce the moisture content of air in a compressed air system.	CHILD	Skid Air Compressor
AIR HANDLING UNIT	Described as such in mechanical drawings. Coils located within the unit are considered part of the AHU and are not inventoried with separate Asset ID's.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exhaust Air Handling Unit(EAHU), Supply and return Fans, VFDs, Freeze Pumps, VAVs, Heat Wheels, Re-heat coils.
AREA DRAINS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
BACKFLOW PREVENTER	Backflow preventer valve for hydronic systems.	NO	
BASIN STORM CATCH	Water collection basin for capturing sediment, debris and associated pollutants. Components typically include sump pump(s).	NO	
BATTERY BANK SWITCH GEAR	Battery systems for substations and switchgear. Components include batteries, battery racks, chargers, inverters, and battery test equipment.	CHILD	MEDIUM VOLTAGE BREAKER
BIORETENTION AREA	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
BREAKER DISTRIBUTION	Low voltage circuit breaker downstream of the main breaker. Feeds distribution panelboards, busduct, and major equipment (emergency generators, fire pumps, etc.). Sub (child) to SWITCH SF6.	CHILD	SWITCH SF6
BREAKER MAIN	Low voltage main circuit breaker. First breaker downstream of medium voltage transformer. Feeds distribution breakers. Sub (child) to SWITCH SF6.	CHILD	SWITCH SF6
BREAKER MEDIUM VOLTAGE	Medium voltage breaker switch installed as an intermediary disconnect between the SF-6 switch and medium voltage transformer. Sub (child) to SWITCH SF6.	CHILD	SWITCH SF6
BREAKER TIE	Medium voltage breaker which functions as an intermediary disconnect between two independent medium voltage transformers.	CHILD	SWITCH SF6
CABINET BIOLOGICAL SAFETY	Enclosed, ventilated laboratory containment device with a defined biosafety level, hard ducted to lab exhaust system.	CHILD	Fan Exhaust Hood Lab

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
CHILLER	A system's primary source of chilled water used for cooling air and or process chilled water, which removes heat from a liquid via a vapor-compression or absorption refrigeration cycle. Does not include point of chilled water at air conditioners, drinking fountains, refrigerators, freezers, etc.	PARENT	Related equipment is usually shown on flow or riser diagram. Cooling tower, pumps, exchangers, filters, coupon rack, water treatment, etc.
COIL CHILLED WATER	Chilled water coil which is independent of supply fans or packaged units.	NO	
COIL PREHEAT	Preheat coil which is part of air handling units or packaged units.	CHILD	AHU
COIL REHEAT	Electric or hydronic heat transfer element used to reheat conditioned air before it enters a particular space. Typically used in laboratory, clean room, medical, and high ventilation applications.	CHILD	AHU
COMPACTOR TRASH	Hydraulically powered trash compactor used to reduce the size of waste or biomass material.	NO	
CONDENSER	Condenser, condensing unit, or heat pump/condensing unit combination used to provide heating or cooling. Superior (parent) to corresponding evaporators.	PARENT	Evaporator
CONDENSER ENVIRONMENTAL ROOM	Condensing unit used as the source of cooling for laboratory environmental cold rooms. Superior (parent) to cold room.	PARENT	Environmental Room
COOLING TOWER	Heat rejection device used to cool condenser water from a chiller that provides cold water for a chilled water system.	CHILD	CHILLER
COOLING TOWER SAND FILTER	Filter using sand media to remove suspended solids and reduce associated corrosion, scaling, and micro-biological growth from a condenser water system.	CHILD	COOLING TOWER
COUPON RACK	Corrosion coupons are pre-weighed and measured metal strips which are mounted in a special pipe system called a coupon rack. They are used to estimate the rate of metal corrosion.	CHILD	HEAT EXCHANGER SKID, COOLING TOWER, HEAT EXCHANGER
DEEP SUMP AND HOODED CATCH BASINS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
DEHUMIDIFIER	Device for removing humidity from air within a space or from ducted air in an HVAC system.	CHILD	AHU
DETENTION BASINS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
DOOR ELEVATOR MACHINE ROOM	Hinged swing door enclosing elevator machine rooms.	NO	
DOOR EXTERIOR	Exterior manual or motorized hinged swing door or revolving door.	NO	
DOOR FIRE	Fire rated hinged swing door or motorized overhead door used for fire & smoke containment between adjoining buildings and/or along egress routes.	NO	
DOOR ROLLUP EXTERIOR	Manual or motorized overhead rollup door.	NO	
DOOR ROLLUP INTERIOR	Manual or motorized overhead rollup door.	NO	
DOOR ROOF	Hinged swing door or hatch door at rooftop access points.	NO	
DRY WELLS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
EJECTOR KITCHEN	Pump located in an ejector pit used to remove effluent water from a kitchen drainage system or pump used to lift kitchen waste when plumbing fixtures or storage tank is below the level of the main sewer or septic line.	CHILD	Ejector Pit
EJECTOR PIT	Sewer Ejector Pit. Pit is a confined space, usually containing a duplex pump system.	PARENT	Ejector Sanitary

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
EJECTOR SANITARY	Pump for removal of sewage waste when plumbing fixtures or storage tank is below the level of the main sewer or septic line.	CHILD	Ejector Pit
ELEVATOR DUMB WAITER	Dumb waiter carriage, identified by state ID.	NO	
ELEVATOR FREIGHT	Freight elevator carriage, identified by state ID. Asset ID = State ID.	NO	
ELEVATOR PASSENGER	Passenger elevator carriage, identified by state ID. Asset ID = State ID.	NO	
ELEVATOR WHEELCHAIR	Single story wheelchair lift, identified by state ID. Asset ID = State ID.	NO	
EMERGENCY BATTERY UNIT EXIT LIGHT	Emergency battery backup for an illuminated exit sign fed by only normal power.	NO	
EMERGENCY BATTERY UNIT LIGHT FIXTURE	Emergency battery backup for Wall- or ceiling-mounted emergency light fixture.	NO	
EMERGENCY GENERATOR	Interior, exterior, or enclosed emergency generator.	PARENT	Radiator, fuel tank, transfer switch, fuel oil pumps
EMERGENCY GENERATOR RADIATOR	Heat rejection radiators associated with emergency generators.	CHILD	Emergency Generator
EMERGENCY SAFETY EYE WASH	Laboratory emergency eye wash stations fed from tempered potable water system.	NO	
EMERGENCY SAFETY SHOWER	Laboratory emergency shower stations fed from tempered potable water system.	NO	
EMERGENCY SAFETY SHOWER & EYE WASH	Laboratory emergency shower and eyewash combination stations fed from tempered potable water system.	NO	
ENERGY RECOVERY UNIT	Described as such in mechanical drawings. Coils located within the unit are considered part of the ERU or HRU and are not inventoried with separate Asset ID's.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Supply and return Fans, VFDs, Freeze Pumps, VAVs, Heat Wheels, Re-heat coils.
ENGINE FIRE PUMP	Diesel engine that serves as a power source for the fire pump.	CHILD	Pump Fire
ENGINE NATURAL GAS	Natural gas engine used to power other inventoried equipment. Not a building wide emergency generator.	CHILD	Fan, Pump or other inventoried equipment
ENVIRONMENTAL ROOM	Enclosed laboratory room capable of being controlled to a specific temperature. Cooled by condenser environmental room.	CHILD	Condenser Environmental Room
EVAPORATOR	Split system evaporator coil associated with condensing unit.	CHILD	Condenser
EXCHANGER CHILLED WATER	Chilled water or chilled process water fluid heat exchanger.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Cooling Tower, Exchanger Skid, Exchanger, Pump, Water Treatment, Expansion Tank, Filter
EXCHANGER DOMESTIC HOT WATER	Fluid heat exchanger used on potable domestic hot water systems. Also includes instantaneous water heaters and electric water heaters.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchanger Skid, Exchanger, Pump, Expansion Tank
EXCHANGER DOMESTIC HOT WATER FUEL	Gas or fuel oil fired, or electric boiler or hot water generator used on potable domestic hot water systems. Includes point-of-use water heaters.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchanger Skid, Exchanger, Pump, Expansion Tank
EXCHANGER GLYCOL	Fluid to fluid heat exchanger where one or more fluid includes glycol.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Cooling Tower, Exchanger Skid, Exchanger, Pump, Water Treatment, Expansion Tank, Filter
EXCHANGER HEATING HOT WATER	Heat exchanger or hot water generator used in hot water heating system. Types include plate and frame or shell and tube.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchanger Skid, Exchanger, Pump, Water Treatment, Expansion Tank, coupon rack

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
EXCHANGER HEATING HOT WATER FUEL	Gas or fuel oil fired, or electric boiler dedicated to heating hot water systems. Types include hot water heaters and steam boilers.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchanger Skid, Exchanger, Pump, Water Treatment, Expansion Tank, coupon rack
EXCHANGER HVAC SKID	Mechanical System Heat Exchanger Skid with multiple exchangers serving the same function and area.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchanger, Pump, Water Treatment, Expansion Tank, Filter
EXCHANGER PLUMBING PROCESS WATER	Fluid-to-fluid heat exchanger dedicated to process water systems, i.e. systems that are not used for heating, domestic hot water, eyewash, or safety showers	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchanger Skid, Exchanger, Pump, Expansion Tank
EXCHANGER PLUMBING SKID	Plumbing System Heat Exchanger Skid with multiple exchangers serving the same function and area.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exchangers, Pumps, Expansion Tanks
EXCHANGER STEAM	Steam generator for laboratory or building systems. Steam to Steam OR water to steam.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Equipment maintained by lab is not inventoried.
EXCHANGER STEAM FUEL	Gas or fuel oil, or electric steam generator for laboratory or building systems.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Equipment maintained by lab is not inventoried.
EXCHANGER VALANCE	Valance heating and cooling units are simply hydronic coils mounted in an architectural enclosure. The units are mounted near the ceiling, usually along an outside wall, and provide draft-free, energy-efficient heating and cooling using natural convection.	NO	
EXHAUST AIR HANDING UNIT	Described as such in mechanical drawings, EAHU.	PARENT	Related equipment is usually shown on flow or riser diagram. Fan Exhaust, VFD, EAV
FAN EXHAUST GENERAL	Exhaust fan for stairwells, corridors, offices, classrooms, and/or common area exhaust.	SOMETIMES	AHU, VFD, SUPPLY FAN, MAK-UP AIR
FAN EXHAUST HOOD KITCHEN	Exhaust fan dedicated to kitchen hood exhaust. Related hood(s) are inventoried with separate asset ID.	PARENT	Hood Kitchen, VFD
FAN EXHAUST HOOD LAB	Exhaust fan dedicated to lab hoods, fume hood, slot hoods, biological safety cabinets, and snorkel drops. Related hood(s) and biological safety cabinets are inventoried with a separate asset ID. Snorkel drops do not receive a separate asset ID.	PARENT	Hood Lab, Hood Fume, Biological Safety Cabinet
FAN EXHAUST TOILET	Exhaust fan dedicated to toilet room exhaust.	NO	
FAN RETURN	Fan used to return air to Air Handlers and Packaged Units. Fans can be housed within or separate from an air handling unit.	PARENT	VFD
FAN SUPPLY	All supply fans except for FAN SUPPLY FUEL and FAN SUPPLY HOOD LAB, and self-contained packaged units. Considered part of the Air Handling Unit. VFDs or other equipment are sub (child) only if external to unit.	PARENT	VFD
FAN SUPPLY FUEL	Supply fan dedicated to fuel storage and emergency generator rooms.	PARENT	VFD
FAN SUPPLY HOOD LAB	Supply fan dedicated to laboratory spaces and lab hood make-up air.	PARENT	VFD
FIELD UNDERDRAIN	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
FIRE EXTINGUISHER	Handheld rechargeable dry chemical or CO2 type fire extinguisher.	NO	
FIRE HYDRANT	Pressurized above-ground connection that provides firefighters access to a water supply. Typically connected to city water mains.	NO	
FOUNTAIN DRINKING	Drinking water fountain. Components include water filter(s) and chiller.	NO	
GRAVEL WETLANDS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
HEAT TRACE DIWATER	Heat trace wire and heat trace control module dedicated to deionized water system piping.	NO	
HEAT TRACE EXTERIOR	Heat trace wire and heat trace control module dedicated to de-icing exterior rain gutters, drains and overhangs.	NO	
HEAT TRACE FIRE	Heat trace wire and heat trace control module dedicated to fire protection system piping.	NO	
HEAT WHEEL	As described in mechanical drawings	CHILD	ERU, HRU, RTU, AHU, MAU
HOOD FUME	Enclosed, ventilated exhaust hood for toxic fumes not specific to laboratory use. For hoods in labs, use HOOD LAB	CHILD	Fan Exhaust Hood Lab
HOOD KITCHEN	Open exhaust hood dedicated to kitchen exhaust.	CHILD	Fan Exhaust Hood Kitchen
HOOD LAB	Enclosed, ventilated laboratory exhaust hood or lateral slot exhaust hood.	CHILD	Fan Exhaust Hood Lab
HUMIDIFIER	Humidifiers used for general HVAC and/or laboratory purposes.	CHILD	ERU, HRU, RTU, AHU, MAU
ICE MACHINE	Ice machines located in public corridors.	NO	
INFILTRATION BASINS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
INSTRUMENTATION METER FLOW	Hydronic system flow meter.	NO	
LEVEL SPREADERS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are identified on site plans turned over by projects that install or modify them.	NO	
LIFT HYDRAULIC	Stationary loading dock lift, or portable scissor or boom type lift.	NO	
LIFT STATION LAB WASTE	Lift Station or Transfer station that stores and pumps untreated lab waste to another Lift Station or Central Neutralization Station(CNS) or Stand Alone Neutralization Station(SANS). Parent to Acid Waste Pumps.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Parent to Acid Waste Pumps. Reference Site Utility drawings for campus wide system map with CNS, SANS and major Lift Stations.
LIGHT UV	UV Light used for swimming pool sterilization.	NO	
MAKE UP AIR UNIT	Described as such in mechanical drawings, MAU. Coils located within the unit are considered part of the MAU and are not inventoried with separate Asset ID's.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exhaust Air Handling Unit(EAHU), Supply and return Fans, VFDs, Freeze Pumps, VAVs, Heat Wheels, Re-heat coils.
MANHOLE ELECTRIC	Sub-grade electrical manhole or vault, housing medium voltage electrical equipment, sump pump, or splices.	NO	
MANHOLE STEAM	Sub-grade steam manhole or vault, housing high and medium pressure steam equipment.	NO	
MANHOLE STORMWATER	Manhole or vault providing access to sub-grade storm water infrastructure. Filters may be a part of a storm water manhole.	NO	
METER CONDENSATE	Meter that measures condensate flow within a steam system.	NO	
METER ELECTRIC	Meter that measures energy flow and/or demand. Sub (child) to any upstream switch.	CHILD	SWITCH SF6

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
METER GAS	Meter used to measure fuel gas flow.	NO	
METER STEAM	Meter used to measure steam flow.	NO	
METER WATER	Meters used to measure water flow.	NO	
MOTOR CONTROL CENTER	Remote assembly comprised of multiple enclosed sections, each containing motor starters, fuses or circuit breakers, and a power disconnect. Each assembly typically fed via a single bus.	NO	
OIL WATER SEPERATORS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
OTHER	Equipment which does not fall under any of the existing equipment descriptions.	NO	
PACKAGE UNIT	Self-contained packaged unit with on-board compressors. Internal components may include internal VFDs, fans, coils, or heat wheels. VFDs or other equipment are sub (child) only if external to unit.	PARENT	VFD
PANEL ANNUNCIATOR FIRE	Fire alarm panel which indicates the zone and approximate location of the source of alarm. Operates in conjunction with the fire control panel, warning strobes, and audible warning devices.	CHILD	Related equipment is usually shown on flow or riser diagram. Panel in fire command is used to apply measurement points for water flow test for entire system. Annunciators and Nodes are child to the main control panel in commend center.
PANEL CONTROL DISTILLED REVERSE OSMOSIS	Separately mounted control panel on reverse osmosis system. This represents the RO system or site.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. RO Panel, RO Skids,pumps,tanks.
PANEL CONTROL FIRE	Fire alarm control unit which acts as the controlling component of the fire alarm system. Receives information from nodes, annunciators, smoke detectors, CO detectors, etc. Panel located in fire command center.	PARENT	Related equipment is usually shown on flow or riser diagram. Panel in fire command is used to apply measurement points for water flow test for entire system. Annunciators and Nodes are child to the main control panel in commend center.
PANEL NODE FIRE	Fire alarm panel or remote addressable device with direct communication with the fire alarm network.	CHILD	Related equipment is usually shown on flow or riser diagram. Panel in fire command is used to apply measurement points for water flow test for entire system. Annunciators and Nodes are child to the main control panel in commend center.
PANELBOARD BRANCH CIRCUIT	Branch circuit panelboard generally contains overcurrent protection devices up to 30 amps and neutral connected loads, overcurrent protection over 30 amps and not neutral connected make up not more than 10% of devices. Panelboard is used to distribute energy to outlets, appliances, and lighting.	NO	
PANELBOARD CONTROL LIGHTING	Programmable lighting control panel for use with occupancy sensors, photocell sensors, time clocks, and remote switches. Includes Lutron Panels(Asset ID goes on the control panel). Does not include dimmer racks or relay panels.	NO	
PANELBOARD DISTRIBUTION	Panelboard that generally contains overcurrent protection over 30 amps and may or may not have neutral connections which delivers power to branch circuit panelboards, as well as motors and equipment.	NO	
POROUS PAVEMENT	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
POWER CONDITIONER	Includes only Power Conditioners/Harmonic Filters that are part of general building infrastructure with maintenance owned by MIT R&M. Excludes Power Conditioners that are part of DLC owned equipment.	NO	

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
POWER FACTOR CORRECTION CAPACITOR BANK	Several power factor correction capacitors tied in series, used with systems having large inductive loads.	NO	
PUMP CHEMICAL FEED	Peristaltic or diaphragm pump specifically to add chemicals into a fluid system. Typically considered part of a WATER TREATMENT CONDENSER WATER system, and not inventoried separately.	CHILD	Waste Water System
PUMP CHILLED PROCESS WATER	Pump in a process chilled water system.	SOMETIMES	VFD
PUMP CHILLED WATER	Chilled water pump other than process chilled water. Pumps occasionally operate as dual function pumps, circulating heating or cooling water to the heating hot water or chilled water systems, in which case, system operation would be dependent upon the season and BMS controls sequence. Superior (parent) to any associated VFD.	SOMETIMES	VFD
PUMP DOMESTIC WATER	Pump in a domestic potable water system.	SOMETIMES	Duplex and triplex pump skids, expansion tank, exchange
PUMP DRAIN CONDENSATE	Pump that removes waste condensate from equipment involved in HVAC heating and cooling, refrigeration, condensing boilers, or steam systems.	CHILD	FCU, Evaporator, Air Conditioner, AHU
PUMP EMERGENCY WATER	Booster pump used to increase or maintain pressure in a tempered water system supplying emergency showers, eyewashes, and shower/eyewash combination stations.	PARENT	VFD
PUMP FIRE JOCKEY	Pump which works with the main fire pump as part of the fire protection system, used to maintain system pressure when system is not in use.	CHILD	FIRE PUMP
PUMP FIRE MAIN	Main fire pump on the fire protection system, typically powered via the emergency generator or a building's emergency power supply. Pump intake is connected to a static water source (tank) or the city water supply.	PARENT	JOCKEY PUMP, ENGINE
PUMP FUEL OIL	Pump used to provide fuel oil, typically to emergency generators.	CHILD	Emergency Generator
PUMP GLYCOL	Pump that is part of a glycol system.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Chiller, Cooling Tower, Exchanger Skid, Exchanger, Pump, Expansion Tank, Coupon Rack, Water Treatment, etc.
PUMP GRAYWATER	Pump that is part of a rainwater reclaim or run-off/overflow/gray water collection system, or skid which includes pumps.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Plumbing Pump Skid, Expansion Tank, Pumps, VFD.
PUMP HEATING WATER	Pump that is part of a heating hot water system. Pumps occasionally operate as dual function pumps, circulating heating or cooling water to the heating hot water or chilled water systems, in which case, system operation would be dependent upon the season and BMS controls sequence. Superior (parent) to any associated VFD.	SOMETIMES	VFD
PUMP HVAC SKID	Mechanical System Pump Skid serving the same function and area.	PARENT	Pump, VFD
PUMP NATURAL GAS	Booster pump used to elevate pressure in a natural gas system.	NO	
PUMP PLUMBING PROCESS WATER	Pump dedicated to domestic hot OR cold non-potable OR protected water systems.	SOMETIMES	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Plumbing Pump Skid, Expansion Tank, Pumps, VFD, Exchanger.
PUMP PLUMBING SKID	Plumbing System Pump Skid serving the same function and area. Triplex booster pump is an example.	PARENT	Pumps, expansion tank
PUMP RO/DI	Reverse osmosis water filtration pumps. Includes distribution, circulation, reject and RO Pumps.	CHILD	Reverse Osmosis Ski

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
PUMP STEAM CONDENSATE RETURN	Pump or duplex pumps that sit on top of the condensate receiver tank, used to return condensate back to a steam generator, boiler, or the CUP. Pumps ID'd individually.	CHILD	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. RO Panel, RO Skids,pumps,tanks.
PUMP STEAM CONDENSATE RETURN SKID	Steam Condensate Return Skid. Usually duplex pump system with receiver and sometimes a vacuum pump.	PARENT	Pump Steam Cond Ret, Vacuum Pump
PUMP STORM WATER	Ejector pump for storm water overflow tanks.	NO	
PUMP SUMP ACID	Submersible pump that is part of a laboratory waste water system, typically discharging to an acid neutralization tank. Pump for untreated lab waste; part of a lift station or transfer station.	CHILD	Lift Station
PUMP SUMP PIT	Stormwater Sump Pit. Pit is a confined Space. Parent to the sump pumps.	PARENT	Pump Sump Water
PUMP SUMP WATER	Submersible pump used to eject non-corrosive water into storm drain. Not part of lab waste system.	CHILD	Pit Sump
PUMP ULTRAVIOLET DISINFECTION	Pump that is part of an ultraviolet disinfection system, typically used on gray water retention and storage systems.	CHILD	N/A
PUMP VACUUM	Vacuum pump used in laboratory applications, or skid which includes vacuum pump(s).	CHILD	Skid Pump Vac
PUMP WASTE WATER	Pump located within wastewater treatment tanks on a buildings wastewater system. Pumps neutralized water.	CHILD	Waste Water System
PURIFIER GENERATOR FUEL	Stand alone fuel purification system for emergency generator.	CHILD	Generator
RADIANT PANEL	Electric or hydronic radiant heating panels used for perimeter and/or supplementary heating.	NO	
RAIN TANK	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
REVERSE OSMOSIS SKID	RO/DI System Skid. Parent to RP/DI Pumps. Parent to pumps.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. RO Panel, RO Skids,pumps,tanks.
ROOF TOP UNIT	Described as such in mechanical drawings, RTU. Coils located within the unit are considered part of the RTU and are not inventoried with separate Asset ID's.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Exhaust Air Handling Unit(EAHU), Supply and return Fans, VFDs, Freeze Pumps, VAVs, Heat Wheels, Re-heat coils.
SENSOR CO DUCT	Carbon monoxide sensor located within a supply or return duct.	CHILD	AHU, FAN
SENSOR CO FIRE	Carbon monoxide sensor located in areas with high potential for hazardous levels of CO, such as sub-grade parking structures. Sensor triggers the fire alarm when concentration of CO reaches hazardous levels.	CHILD	AHU, FAN
SENSOR CO HVAC	Carbon monoxide sensor located in areas with high potential for hazardous levels of CO, such as sub-grade parking structures. Sensor initiates sequence enabling garage exhaust fans once concentration of CO exceeds acceptable levels.	CHILD	EXHAUST FAN
SENSOR DIFFERENTIAL PRESSURE	Sensor that measures the difference in pressure between two or more ports on supply and return lines of a hydronic system.	NO	
SENSOR OXYGEN DEPLETION ALARM	Sensor located in laboratory spaces where oxygen depletion is a concern. Typically found in rooms with helium, some chemistry labs, or MRI rooms.	NO	
SENSOR SMOKE	Aspirating smoke detection device that provides early warning smoke detection through continuous air sampling.	NO	
SENSOR TEMPERATURE	HVAC temperature probe. Not commonly inventoried.	NO	

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
SENSOR WEATHERSTATION	Weather sensors that measure any combination of the following: solar irradiance, precipitation, barometric pressure, air temperature, humidity, dew point, wind speed, and wind direction. Typically located on rooftops.	NO	
SOLAR PHOTOVOLTAIC ARRAY	Rooftop solar panel or solar panel array.	CHILD	SOLAR POWER INVERTER
SOLAR POWER INVERTER	DC to AC power inverter specific to solar panel arrays.	PARENT	SOLAR PHOTOVOLTAIC ARRAY
SPRINKLER SYSTEM GLYCOL	Water-based fire sprinkler system with an antifreeze additive, glycerin or propylene glycol, for freeze protection.	NO	
STORMWATER OUTFALLS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
SWITCH ISOLATOR	Isolator or disconnect switch used in electrical distribution system.	NO	
SWITCH MEDIUM VOLTAGE	Medium voltage switch, typically an intermediary disconnect between the SWITCH SF-6 and medium voltage transformer. Sub (child) to SWITCH SF6.	CHILD	SWITCH SF6
SWITCH SF6	Medium voltage gas-filled switch, typically fed from adjacent buildings or CUP. Superior (parent) to switch medium voltage, breaker medium voltage, transformer medium voltage, meter electric, breaker main, and breaker distribution.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. SWITCH MEDIUM VOLTAGE, BREAKER MEDIUM VOLTAGE, TRANSFORMER MEDIUM VOLTAGE, METER ELECTRIC, BREAKER MAIN, BREAKER DISTRIBUTION
SWITCH TRANSFER	Automatic transfer switch. Automatically transfers electrical loads from normal power to emergency power upon power failure.	CHILD	GENERATOR, SF6 SWITCH
TANK COMPRESSED AIR	Compressed air storage tank associated with AIR COMPRESSOR.	CHILD	Air Compressor Skid, Vacuum Pump Skid
TANK CONTAINMENT	Laboratory waste or chemical spill containment tank.	CHILD	WASTE WATER SYSTEM
TANK DILUTION	Acid neutralization tanks used to dilute and neutralize lab waste water for discharge.	CHILD	Waste Water System
TANK DILUTION MANHOLE	Manhole or vault containing sub-grade acid neutralization tank.	CHILD	WASTE WATER SYSTEM
TANK EXPANSION	Hydronic expansion tank on a hydronic system including heating hot water systems, domestic hot water systems, or chilled water systems. Not a Flash Tank.	CHILD	EXCHANGER SKID, EXCHANGER, PUMP SKID
TANK FUEL OIL	Fuel oil storage tank for emergency generators.	CHILD	Emergency Generator
TANK STORAGE CHILLED WATER	Chilled water storage tank for use on chilled water systems.	SOMETIMES	CHILLER
TANK STORAGE RODI	Plastic storage tank for RO/DI water / RO/DI systems.	CHILD	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. RO Panel, RO Skids,pumps,tanks.
TERMINAL UNIT FAN COIL	2-pipe or 4-pipe fan coil unit used for heating and/or cooling.	PARENT	CONDENSATE PUMP
TERMINAL UNIT HEATER	Electric or hot water unit heater.	NO	
TERMINAL UNIT HEATER FUEL	Gas-fired unit heater.	NO	
TRANSFORMER	Electrical transformer other than medium voltage transformer.	NO	
TRANSFORMER MEDIUM VOLTAGE	13,800V (normal power) or 2,400V (emergency power) medium voltage transformer. Typically feeds distribution switchgear. Typically sub (child) to SWITCH SF6.	CHILD	SWITCH SF6
TRAP GAS	Trap used to prevent any sediment that may be found in gas supply lines from entering and damaging equipment. Used on boilers, water heaters, unit heaters, etc.	NO	
TRAP GREASE	Catch basin for oils, fats, and grease released into drains / drainage systems. Typically used in kitchen applications.	NO	
TRAP SAND	Catch basin used to filter particulate matter out of a water system.	NO	

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
TRAP STEAM	Various types separate steam from condensate in a steam system.	NO	
TREE BOX FILTERS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
TRENCH DRAIN	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
UNDERGROUND DETENTION SYSTEM	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
UPS	Uninterrupted power supply used to keep power/data systems online in the event of a power failure.	NO	
VACUUM PUMP SKID	Vacuum System Pump Skid. Duplex or Triplex Vacuum Pump Skid. Parent to Vacuum Pumps.	PARENT	Pump Vac, TANK
VACUUM RECEIVER		CHILD	VACCUM PUMP SKID
VALVE AIR EXHAUST	Pressure independent, flow metering, variable air or constant volume exhaust air venturi valves used to modulate and maintain proper pressurization of exhaust air flow as part of critical airflow systems.	CHILD	RETURN OR EXHAUST FAN
VALVE AIR SUPPLY	Pressure independent, flow metering, variable air or constant volume supply air venturi valves used to modulate and maintain proper pressurization of supply air flow as part of critical airflow systems.	CHILD	AHU OR SUPPLY FAN
VALVE MIXING	Thermostatic mixing valve used on domestic hot water systems to maintain temperature.	NO	
VALVE MIXING TEMPERED WATER	Thermostatic mixing valve used on potable water systems dedicated to emergency safety eyewash and shower stations.	NO	
VALVE STEAM PRESSURE REDUCING	Steam valve used to reduce incoming high pressure steam to low pressure steam for use in building systems.	NO	
VALVE STEAM SAFETY	Steam safety relief valve used to relieve steam pressure to avoid over pressurization of the system.	NO	
VARIABLE FREQUENCY DRIVE	Used to modulate the speed of a motor. Sub (child) to most fans and pumps.	CHILD	Inventoried Equipment w/ Motor
VEGETATED SWALES	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
WASTE WATER SYSTEM	Chemically treated laboratory wastewater treatment system. Components include wastewater treatment tanks, chemical feed pumps, and ejection pumps. Discharges neutralized water. Lift stations and acid pumps are inventoried under separate descriptions.	PARENT	Related equipment is usually shown on flow or riser diagram and or detailed parts breakdown. Parent to Lift Stations, chemical feed pumps, treatment tanks. Reference Site Utility drawings for campus wide system map with CNS, SANS and major Lift Stations.
WATER QUALITY UNITS	Long-Term Stormwater Pollution Prevention Plan And Stormwater Operation And Maintenance Plan - Locations are Identified on site plans turned over by projects that install or modify them.	NO	
WATER SYSTEM BUILDING FILTRATION	Filter or Strainer used as part of a building's plumbing, chilled water or grey water system through the use of filters and water softeners. This is intended to capture stand alone filters that serve a system and are not associated with a particular piece of equipment.	CHILD	EXCHANGER SKID, EXCHANGER, PUMP SKID, CHILLER

SAP/CMMS EQUIPMENT NAME	ADDITIONAL EQUIPMENT DETAILS	PARENT / CHILD?	RELATED EQUIPMENT
WATER TREATMENT CLOSED LOOP SYSTEM	Treatment system used to treat and/or filter system water; Corrosion coupon rack is a separate inventoried piece of equipment..	<i>PARENT</i>	Coupon Rack, Pump Chemical Feed
WATER TREATMENT CLOSED LOOP SYSTEM	Treatment system used to treat and/or filter system water; Corrosion coupon rack is a separate inventoried piece of equipment..	<i>PARENT</i>	Coupon Rack, Pump Chemical Feed
WATER TREATMENT CONDENSER WATER	Cooling tower water treatment system; may include blowdown, filters, and chemical injection.	<i>CHILD</i>	COOLING TOWER
WATER TREATMENT CONDENSER WATER	Cooling tower water treatment system; may include blowdown, filters, and chemical injection.	<i>CHILD</i>	COOLING TOWER

REMOVED EQUIPMENT SUBMITTAL SAMPLE

Itemized Removed Asset Tag Study (Only a sampling of photos is shown on the following pages. Information and photos of all removed equipment is required.)

Equipment	Description	Sort field	Room	Manufacturer	Model number	ManufSerialNo.	Location	Area Serviced by Equ	Function	Ma More Location Info
849084	PANELBOARD BRANCH CIRCUIT	GEN-ELC-PWR	000CA	WESTINGHOUSE			17	BUILDING 17		WEST SIDE OF ROOM
849087	PANELBOARD BRANCH CIRCUIT	GEN-ELC-PWR	104	WESTINGHOUSE	BS-24526		17	ROOM 104		EAST WALL OF ROOM
754481	WATER TEST WATERFLOW ALARM	GEN-FPR		NA	AUTOCALL EAST LOOP	TRANS NO -456	17	SPRINKLER SYSTEM		ITEM NOT PRESENT / FOUND
849082	PANEL CONTROL FIRE	GEN-FPR-CTL	000CA	NOTIFIER	XP SERIES		17	BUILDING 17		SOUTH SIDE OF ROOM
849077	FIRE EXTINGUISHER	GEN-FPR-SUP	004	BADGER	ADV-550	B01030528	17	RM 004		004 NORTH END
849079	FIRE EXTINGUISHER	GEN-FPR-SUP	004	BADGER	ADVE-550	B01030544	17	ROOM 004 SOUTH		SOUTHEAST CORNER
849081	FIRE EXTINGUISHER	GEN-FPR-SUP	000CA	AMEREX	VV-432498	B456	17	000CA		NEXT TO STAIRS
849085	FIRE EXTINGUISHER	GEN-FPR-SUP	1000SA	BADGER	ADV-550	B01030496	17	STAIRWELL		LANDING ON STAIRS
849086	FIRE EXTINGUISHER	GEN-FPR-SUP	104	BUCKEYE	10HI SA80 ABC	ZE-739308	17	104		EAST SIDE OF ROOM
849089	FIRE EXTINGUISHER	GEN-FPR-SUP	104	GENERAL	TGPA-10A	AP-110248	17	STAIRWELL		NEXT TO ENTRANCE TO 110
717419	TERMINAL UNIT HEATER		104	STURTEVANT			17	17-104	HEATING	OVERHEAD NORTH WEST CORNER
849088	TERMINAL UNIT HEATER	GEN-HVC-AIR-CIR	104A				17	RM104A TUNNEL SPACE		OVERHEAD - WIND TUNNEL
732088	PUMP STEAM CONDENSATE RETURN		004	HOFFMAN-WATERMAN	W60-12-208	160032	17	STEAM LINES	CONDENSATE RETURN	BSMT MECH RM - NORTH END
732089	PUMP STEAM CONDENSATE RETURN		004	HOFFMAN-WATCHMAN	WCD-12-208	160032	17	STEAM LINES	CONDENSATE RETURN	BSMT MECH RM - NORTH END
790088	WATER SYSTEM EXTERIOR DOMESTIC	GEN-PLM	UNKNOWN				17	GROUNDS		ITEM NOT PRESENT / FOUND
849080	PUMP SUMP WATER	GEN-PLM-DRN	004				17	004 STEAM CONDENSATE PUMPS		NORTH WEST END
702290	EXCHANGER DOMESTIC HOT WATER		004	RUUD	PE30-2	RU 0293104555	17	DOMESTIC HOT WATER		BSMT MECH RM - SOUTH END
716304	BACKFLOW PREVENTER	GEN-PLM-POT	004	WATTS	909	268711	17	EQUIPMENT LASER		ITEM NOT PRESENT / FOUND
849078	BACKFLOW PREVENTER	GEN-PLM-POT	004	WATTS	LF909M10TRP	007159	17	LAB EQUIPMENT		WEST WALL CENTER
849083	FOUNTAIN DRINKING	GEN-PLM-POT	000CA	HALSEY TAYLOR	S300_2EQ_1M	081022327	17	000CA		EAST SIDE OF ROOM



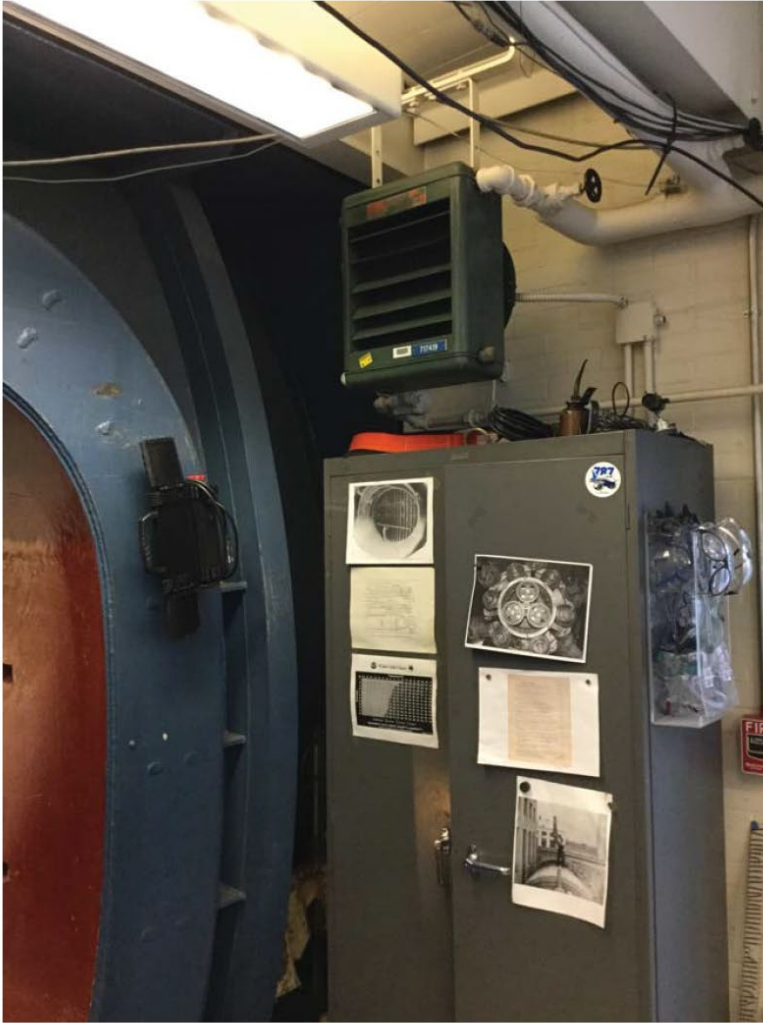
Equipment ID#: **849084** | Description: PANELBOARD BRANCH CIRCUIT



Equipment ID#: **849082** | Description: PANEL CONTROL FIRE



Equipment ID#: **849079** | Description: FIRE EXTINGUISHER



Equipment ID#: **717419** | Description: TERMINAL UNIT HEATER



Equipment ID#: **732088** | Description: PUMP STEAM CONDENSATE RETURN



Equipment ID#: **8490809** | Description: PUMP SUMP WATER



Equipment ID#: **702290** | Description: EXCHANGER DOMESTIC HOT WATER



Equipment ID#: **849078** | Description: BACKFLOW PREVENTER



Equipment ID#: **849083** | Description: FOUNTAIN DRINKING

F. MIT ASSET ID TAGGING: A/E & CONTRACTOR REQUIREMENTS

A/E Requirements – Asset ID Tags

A/E Requirements

Asset ID Tags (v4)

April 8, 2021

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A/E Requirements – Asset ID Tags

1 As-bid Project Equipment List

1.1 General

This section refers only to the A/E requirements for providing the As-bid Project Equipment List. If the template spreadsheet is not provided, request it from the MIT Project Manager.

MIT requires that all projects provide an As-bid Project Equipment List to clearly define the scope of inventory. The list contains all equipment inventoried by Repair and Maintenance (R&M). The list will be used to assign a range of MIT Asset ID numbers to the project, it will also be used as a baseline from which the contractor will provide an As-built Project Equipment List.

The guidelines in this section supplement the Equipment Asset ID Tagging Process and have been set forth to facilitate communication of inventory changes triggered by projects. The inventory is changed when equipment is moved, modified, removed or added. The Project Equipment List is ultimately uploaded to the MIT Computer Maintenance Management System (CMMS). The information is critical for preparing preventative maintenance plans, requesting shut downs, identifying asset locations, reporting and trouble shooting.

1.2 Inventoried Equipment

Inventoried equipment pertains to equipment listed in the Glossary, which is provided as a reference tab in the Project Equipment List template. The Glossary includes Commissioned and Non-Commissioned equipment. It is expected that the A/E reviews the Glossary to ensure all inventoried equipment is captured. The list is not the same for all projects.

1.3 Definitions

- a) **Project Equipment List** –An excel spreadsheet that has multiple tabs.
 - Upload Form to list all new equipment, modified existing equipment, related existing equipment.
 - Glossary – List of inventoried equipment types.
 - Existing Equipment – List of existing inventoried equipment provided upon request by R&M planning and scheduling. This used to identify removed, modified and related equipment.
 - System Index – List of system categories used by MIT repair and maintenance which is used to group equipment in a consistent manner for reporting and analysis purposes.
- b) **MIT Asset ID#** – Unique 6 Digit number assigned and physically attached to each inventoried equipment. Used to track maintenance history.
- c) **Status** – This is either New or Existing. Existing equipment includes two types; First, equipment that is altered in regards to area served, location or function, Second, existing equipment that is related to new equipment and tied together with the Parent Asset(see definition below).
- d) **A/E Description** – Description provided in project documents
- e) **Skid Tag** – The Skid or System Tag is shown in the P&ID or plans/schedules/risers or labeling on the skid. For example, a pump skid might have two pumps. The pumps are identified by the Equipment Tag (P1 and P2) and the associated Skid is identified by the Skid Tag (PMP-1). The logic follows for equipment that is part of AHU systems and other skids. Does not apply to all assets.

A/E Requirements – Asset ID Tags

- f) **Matching Drawing Equipment Tag** – The Equipment Tag is shown in the P&ID or plans/schedules/risers or labeling on the installed equipment. For example, a pump skid might have two pumps. The pumps are identified by the Equipment Tag (P1 and P2) and the associated Skid is identified by the Skid Tag (PMP-1). The logic follows for equipment that is part of AHU systems and other skids.
- g) **Area served** – Specific location information as applicable. Use room number(s) for dedicated equipment. Use floor or building for general infrastructure.
- h) **System/Function** – The best suited and most specific system available in the drop down list referenced from the System Index. The list is restricted to meet MIT reporting requirements. No modifications are accepted.
- i) **Related Equipment** – Provide Equipment Tag and Skid Tag or MIT Asset ID for related equipment. Hood/Exhaust Fan, VFD/Pump or Fan, Evaporator/Condenser, etc. Parent Asset provides the link between related equipment. In some cases related equipment is existing. This equipment should be listed in the upload form with the “Existing Status”.
- j) **Maintenance Owner** – The MIT department responsible for maintenance of the equipment. In most cases this is R&M. However, there may be some equipment special cases where equipment from other departments is inventoried.
- k) **Approved Submittal Number** – Reference to submittal(s) relating to each equipment listed in the project equipment list.

1.4 Project Equipment List Population

- a) Starting with the blank template, incorporate all changes to the inventory.
- b) A/E to fill out Upload Form Tab with new and related existing equipment information. See definitions in 1.3.
 - Status
 - A/E Description
 - Building Number
 - Room Number
 - Equipment Tag
 - Skid Tag
 - System
 - Related Equipment
 - Area Served
 - Location Info
 - Project Number
 - Maintenance Owner

1.5 Submit As-Bid project Equipment List

- c) After equipment list is complete, arrange a turn page meeting with R&M Planning and Scheduling. This can be combined with or tagged onto an FE review meeting when the CD’s are close to 100%. Incorporate changes based on the turn page and submit the As-bid Project Equipment list.

Contractor Requirements – Asset ID Tags

Contractor Requirements Asset ID Tags (v5)

April 8, 2021

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Contractor Requirements – Asset ID Tags

1 Part 1 - As-built Project Equipment List

1.1 General

If the project results in no change in room numbers and there is no inventoried equipment added, removed or otherwise modified, then this requirement is not applicable to the project.

MIT requires that all projects submit an As-built Project Equipment List after all equipment is installed. The list contains all equipment inventoried by Repair and Maintenance (R&M).

The guidelines in this section supplement the Equipment Asset ID Tagging Process and have been set forth to facilitate communication of inventory changes triggered by projects. The inventory is changed when equipment is moved, modified, removed or added. The Project Equipment List is ultimately uploaded to the MIT Computer Maintenance Management System (CMMS). The information is critical for preparing preventative maintenance plans, requesting shut downs, identifying asset locations, reporting and trouble shooting.

1.2 Inventoried Equipment

Inventoried equipment pertains to equipment listed in the Glossary, which is provided as a reference tab in the Project Equipment List template. The Glossary includes Commissioned and Non-Commissioned equipment. It is expected that contractor reviews the Glossary to ensure all inventoried equipment is captured. The list is not the same for all projects. The preliminary As-bid Project Equipment List is prepared by the A/E and provided in the Bid Documents. If there is no As-bid Project Equipment List, then see Item 1.4a below.

1.3 Definitions

- a) **Project Equipment List** –An excel spreadsheet that has multiple tabs.
 - Upload Form to list all new equipment, modified existing equipment, related existing equipment.
 - Glossary – List of inventoried equipment types.
 - Existing Equipment – List of existing inventoried equipment provided upon request by R&M planning and scheduling. This used to identify removed, modified and related equipment.
 - System Index – List of system categories used by MIT repair and maintenance which is used to group equipment in a consistent manner for reporting and analysis purposes.
- b) **MIT Asset ID** – Unique 6 Digit number assigned and physically attached to each inventoried equipment. Used to track maintenance history. Also referred to as PM Number and Asset ID.
- c) **Status** – This is either New or Existing. Existing equipment includes two types; First, equipment that is altered in regards to area served, location or function, Second, existing equipment that is related to new equipment and tied together with the Related Equipment(see definition below).
- d) **A/E Description** – Description provided in project documents

Contractor Requirements – Asset ID Tags

- e) **Skid Tag** – The Skid or System Tag is shown in the P&ID or plans/schedules/risers or labeling on the skid. For example, a pump skid might have two pumps. The pumps are identified by the Equipment Tag (P1 and P2) and the associated Skid is identified by the Skid Tag (PMP-1). The logic follows for equipment that is part of AHU systems and other skids. Does not apply to all assets.
- f) **Matching Drawing Equipment Tag** – The Equipment Tag is shown in the P&ID or plans/schedules/risers or labeling on the installed equipment. For example, a pump skid might have two pumps. The pumps are identified by the Equipment Tag (P1 and P2) and the associated Skid is identified by the Skid Tag (PMP-1). The logic follows for equipment that is part of AHU systems and other skids.
- g) **Area served** – Specific location information as applicable. Use room number(s) for dedicated equipment. Use floor or building for general infrastructure.
- h) **System/Function** – The best suited and most specific system available in the drop down list referenced from the System Index. The list is restricted to meet MIT reporting requirements. No modifications are accepted.
- i) **Related Equipment** – Provide Equipment Tag and Skid Tag or MIT Asset ID for related equipment. Hood/Exhaust Fan, VFD/Pump, Evaporator/Condenser, etc. Parent Asset provides the link between related equipment. In some cases related equipment is existing. This equipment should be listed in the upload form with the “Existing Status”.
- j) **Maintenance Owner** – The MIT department responsible for maintenance of the equipment. In most cases this is MIT DoF. However, there may be some equipment special cases where equipment from other departments is inventoried.
- k) **Approved Submittal Number** – Reference to submittal(s) relating to each equipment listed in the project equipment list.

1.4 Project Equipment List Population

- a) Starting with the As-Bid Project Equipment List, incorporate changes to the inventory. In the event of conflicting or missing information, RFIs should be directed to the A/E providing construction services. If there is no As-bid Project Equipment List, then the contractor is responsible for obtaining and reviewing the glossary of inventoried equipment types and preparing an initial list of inventoried equipment in order to request a range of MIT Asset ID tags referred to in the Requirements for Asset ID Tag Application.
- b) Fill out As-Built Project Equipment List Upload Form Tab with new equipment information.
 - MIT Asset ID – Range provided by MIT R&M Planning and scheduling.
 - Status
 - A/E Description
 - Manufacturer Name
 - Model Number
 - Serial Number

Contractor Requirements – Asset ID Tags

- Building Number
- Room Number
- Equipment Tag
- Skid Tag
- System
- Related Equipment
- Warranty Start
- Warranty End
- Area Served
- Location Info
- Project Number
- Maintenance Owner
- Approved Submittal Number

1.5 Submit As-built project Equipment List

- a. After equipment is installed, tagged and the Project Equipment list is complete, submit the As-Built Project Equipment List along with verification photos referenced in Part 3.

2 Part 2 – Removed Equipment Submittal

Prepare a submittal which lists all equipment removed and provide back-up photos showing the MIT Asset ID of each piece of equipment. This does not apply to projects where all the equipment is removed such as gut renovations.

3 Part 3 – MIT Asset ID tag Application

3.1 General

This section refers only to the Application of MIT Asset ID Tags and supplements the Equipment Asset ID Tagging Process.

Guidance in regards to filling out the related As-built Project Equipment List is provided in Part 1.

Guidance in regards to Equipment Nameplates, Valve Tags and other labeling is provided in other contract documents.

Contractor needs to confirm with MIT Project manager whether or not contractor is responsible for the application of the MIT Asset ID tags.

- For Capital Projects and Major Renovations, the contractor is responsible for the application of MIT Asset ID Tags and submission of the As-Built Project Equipment List.
- For CRSP Renovations and other partial renovations, MIT is responsible for the Application of the MIT Asset ID tags via WO submitted by the MIT Project Manager. The contractor is responsible for the completion of the As-built Project Equipment List in all projects.

3.2 Obtain MIT Asset ID Tags

After the count of new equipment is established. Request MIT Asset ID tags from the MIT Project Manager.

Contractor Requirements – Asset ID Tags

3.3 Application of MIT Asset ID Tags

- A. For each type of inventoried equipment, MIT Asset IDs are applied in a uniform location. When obstructions or other conditions prevent access to the normal location for that equipment type, good judgement is required with consideration towards the following:
 - a. Consistency ± Tags should be placed on equipment in a manner which is consistent throughout a building and campus.
 - b. Visibility ± Tags should be visible to R&M staff without having to open cabinet doors or equipment compartments. They should not be obstructed by existing ductwork or other equipment.
 - c. Durability ± Tags must be placed on surfaces which are properly cleaned and are unlikely to be refinished (eg. Painted)
 - d. For equipment which serves hot or cold systems, hang the tags with metal hangers. Holes are provided in the aluminum tags. Tags should never be applied directly to hot or cold piping, or piping insulation.
 - e. For equipment which will be located above hung ceilings, the ID should be applied directly to the equipment itself. The additional location information provided in the Project Equipment List and other labeling as described in Section 2.4 will indicate where the equipment is located.
- B. Verification photos are required for each inventoried piece of equipment.
 - a. Photos are saved in the e-builder folder 09.10 or other agreed upon location.
 - b. Create one folder or PDF Binder for each inventoried equipment using standard nomenclature for each folder or PDF Binder;
 - i. AAAAAA DDDDDDDDDDD SSSSSS
 - 1. A = MIT Asset ID
 - 2. D = Equipment Description
 - 3. S = Equipment Tag as Shown on Drawings
 - c. The photos shall clearly show the following as applicable;
 - i. MIT Asset ID
 - ii. Equipment Tag
 - iii. Equipment Nameplate(s)
 - iv. Motor Nameplate(s)
 - v. Installation location (distance shot showing whole equipment as installed).
 - d. Photos are used to verify MIT Asset ID, Equipment Tag and Nameplate information provided in the project equipment list and are attached to equipment records in the MIT CMMS.
- C. Record MIT Asset ID for each equipment in the As-built Project Equipment List. See Part 1.