Carnegie Mellon University

Asbestos Management Program

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Environmental Health and Safety

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1. Purpose

This program has been developed to address maintenance and handling of asbestos materials, including asbestos containing materials (ACM), presumed asbestos containing materials (PACM), and trace asbestos containing materials (TACM).

2. Scope

This Asbestos Management Program has been developed in accordance with the following Occupational and Safety Health Administration (OSHA), Environmental Protection Agency (EPA), Allegheny County Health Department (ACHD), and Pennsylvania Department of Labor and Industry (PA DL&I) regulations:

- OSHA Asbestos Construction Standard (29 CFR 1926.1101)
- OSHA Asbestos General Industry Standard (29 CFR 1910.1001)
- OSHA Respiratory Protection Standard (29 CFR 1910.134)
- EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP) Standard for Asbestos (40 CFR Part 61, Subpart M)
- EPA Asbestos Hazards and Emergency Response Act (AHERA—also known as Asbestos in Schools Rule) (40 CFR 763)
- ACHD Air Pollution Control, Asbestos Abatement Edition (Title XXI)
- PA DL&I Asbestos Occupation Certification

Non-CMU employees, specifically asbestos contractors and other contractors, are included in this program in relation to CMUs expectations of their handling of asbestos materials in CMU-owned properties in addition to documentation, certification, and licensing requirements that CMU expects of them. All contractors are ultimately responsible for following their companies' protocols for handling asbestos materials, such as personal exposure monitoring and appropriate supply of personal protective equipment to employees, which must be compliant with all applicable local, state, and federal regulations in addition to any obligations identified in their contracts with CMU.

This program covers asbestos materials in CMU-owned buildings. CMU is not responsible for maintaining the good condition of asbestos materials in leased spaces, but may be responsible for properly abating asbestos materials if they will be impacted during renovation, maintenance, or other work activities that CMU performs in these spaces—this program covers the latter. Any questions related to occupant concerns of asbestos materials in leased spaces should be directed towards the space owner.

3. Definitions

a. **Approved asbestos contractors**: A contractor approved by EHS to perform a specific type of asbestos work (such as abatement, bulk sampling, air sampling, or sample analysis) by providing applicable documentation demonstrating competency in their trade. See Section 11.

b. **Approved trace asbestos containing material contractor**: A contractor approved by EHS to perform work on materials that contain greater-than zero percent (>0%) and less-than or equal-to one percent (≤1%) asbestos (see trace asbestos containing material definition) by providing applicable documentation demonstrating competence in their trade. See Section 11.
c. **Asbestos abatement**: Asbestos abatement includes any disturbance, repair, enclosure, encapsulation, or removal of asbestos materials and/or their debris.
d. **Asbestos assessment**: Review of EHS asbestos inventories and performance of asbestos bulk sampling.
e. **Asbestos containing material (ACM)**: Any material that contains greater than one percent (>1%) asbestos.
f. **Asbestos materials**: Any material that contains asbestos, including asbestos containing material (ACM), presumed asbestos containing material (PACM), and trace asbestos containing material (TACM). A listing of buildings where such materials are likely to be found is located in Appendix J "Red, Yellow, Green Building List."
g. **Building inspector**: A person licensed by the PA DL&I as an Asbestos Building Inspector and permitted to collect bulk samples of suspect asbestos materials and to assess condition of asbestos materials.
h. **Building material**: Any material make-up of a building, such as insulating materials, plaster, drywall, floor tiles, mastics/glues, ceiling tiles, window glazing, roof flashing, etc.
i. **Bulk polarized light microscopy (PLM)**: Method of analysis that provides a visual estimation of asbestos fibers present in a material. This method is less accurate and precise as compared to point counting (see point count definition).
j. **Bulk sampling**: Sampling for asbestos that is destructive in nature and involves collecting pieces of suspect asbestos materials for laboratory analysis.
k. **Class I asbestos work**: OSHA term for work that involves removal of thermal systems insulation and surfacing ACM and PACM.
l. **Class II asbestos work**: OSHA term for work that involves removal of ACM or PACM that is not thermal systems insulation or surfacing materials, such as asbestos containing floor tiling, mastics, roofing materials, etc.
m. **Class III asbestos work**: OSHA term for repair and maintenance activities that are likely to disturb ACM and PACM. Bulk sampling is considered class III work.
n. **Class IV asbestos work**: OSHA term for maintenance and custodial activities during which employees may contact but do not disturb ACM or PACM and activities to clean up dust, waste, and debris resulting from class I, III, and IIII activities.
o. **Clearance air sample**: Air sample(s) collected from inside of an abatement area after abatement activities have been completed, but before containment removal or re-occupancy occurs.
p. **Competent person**: A person trained to identify existing asbestos hazards in the workplace and choose the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate asbestos hazards and has completed 2-hour Asbestos Awareness training as outlined in this program.
q. **Demolition**: Activities such as razing a building, removal of a load-bearing structural

member(s), raising (lifting) a building, and intentional burning of a building.

r. **Fiber release**: Any uncontrolled or unintentional disturbance of asbestos materials resulting in visible generation of dust, debris, etc.

s. **Friable**: When a dry material can be crumbled, pulverized, or reduced to a powder by force of hand it is is friable—e.g. fireproofing and thermal systems insulation. Note that some non-friable materials may become friable after being damaged or otherwise impacted—e.g. plaster.

t. **Job Hazard Analysis (JHA)**: A technique that focuses on detailing the job tasks in a way that identifies associated hazards. It focuses on the relationship between the worker, task, tools, and work environment to identify hazards and ways they can be avoided to prevent accident and injury.

u. **Homogeneous area**: An area of surfacing material, thermal systems insulation, or miscellaneous material that is uniform in color, texture, and date of application.

v. **Management planner**: A person licensed by the PA DL&I as a Management Planner. A management planner determines how to handle identified areas of ACM and PACM.

w. **Miscellaneous materials**: One of three categories (also see surfacing materials and thermal systems insulation) into which suspect asbestos materials are separated for bulk sampling. Miscellaneous materials include any ACM that is not thermal systems insulation or surfacing materials—e.g. resilient floor tiling, mastic, window glazing, caulking, cementitious wall board (commonly referred to as Transite panels), and ceiling tiles.

x. **Non-friable**: When dry, a material that is not able to be crumbled, pulverized, or reduced to powder by hand pressure—e.g. resilient floor tiling.

y. **Operations and Maintenance (O&M) permit**: A permit obtained through ACHD by an asbestos abatement contractor to perform small (<160 square feet (sf) or 260 linear feet of ACM and/or PACM) asbestos abatement projects for the university.

z. **Permissible exposure limit (PEL)**: An 8-hour time-weighted average established by OSHA for which exposure to a particular contaminant cannot be exceeded. The PEL for asbestos is 0.1 fibers per cubic centimeter (f/cc).

aa. **Point count**: Method of quantitative analysis that provides an estimation of asbestos fibers present in a material. This method is more accurate and precise as compared to bulk PLM and is used to verify that certain materials contain ≤1% asbestos. Commonly utilized for plaster sample analysis.

bb. **Presumed asbestos containing material (PACM)**: Thermal systems insulation and surfacing materials found in buildings constructed on or before 1980 are presumed to be asbestos containing until appropriately sampled and proved otherwise.

cc. **Project monitor**: Project monitors observe abatement activities performed by contractors and generally serve as a representative to ensure that abatement work is completed according to specification and in compliance with all relevant regulations. Project monitors may also collect project monitoring air samples and clearance air samples.

dd. **Project monitoring air sample**: Air sample(s) collected from outside of an abatement area for the purpose of verifying no asbestos fibers are migrating from the abatement

area.

ee. **Regulated area**: An established and demarcated area where class I, II, and III asbestos work is conducted, including adjoining areas where waste and debris are accumulated and areas where the airborne fiber concentration may reasonably exceed the PEL.

ff. **Regulated material**: ACHD regulates all ACM and PACM (not including TACM), regardless of the material's friability, and must be handled in accordance with ACHD Title XXI.

gg. **Renovation**: The modification of any existing structure or any portion within an existing structure.

hh. **Supervisor**: Any CMU employee who is responsible for the oversight of one or more CMU employees.

ii. **Surfacing material**: One of three categories (see also miscellaneous materials and thermal systems insulation) into which suspect asbestos materials are separated into for bulk sampling. A surfacing material includes any material that is mixed onsite and is sprayed-on, troweled-on, or otherwise applied to surfaces—e.g. plaster, acoustical plaster, fireproofing, or other materials on surfaces for acoustical, fireproofing, and other purposes.

jj. **Thermal systems insulation (TSI)**: One of three categories (see also surfacing materials and miscellaneous) into which suspect asbestos materials are separated into for bulk sampling. TSI includes materials applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss, gain, or water condensation or for other purposes.

kk. **Trace asbestos containing material (TACM)**: Any material that contains >0% and ≤1% asbestos. The most commonly encountered TACM on CMU's Pittsburgh campus is plaster found in Baker and Porter Halls, Margaret Morrison and Carnegie Hall, Hamerschlag Hall, Doherty Hall, and the College of Fine Arts building. Note: some areas of plaster have been found to be ACM/>1%.

ll. **Work manager**: Any CMU employee who is responsible for overseeing or managing any portion of work for renovation, maintenance (both minor and major), or other construction work.

4. Responsible Parties

a. Work Managers and Supervisors

i. Comply with the contents of this Asbestos Management Program.

ii. Attend 2-hour Asbestos Awareness training and Asbestos Work Manager training as detailed in this program.

iii. Attend Asbestos Work Manager training as detailed in this program.

iv. Identify and report to EHS all projects that will disturb building materials in areas where suspect asbestos materials may be present—see **Appendix J** "Red, Yellow, Green Building List," for a listing of buildings grouped by likelihood of the presence of asbestos materials. Where this applies, ensure that an asbestos assessment is conducted prior to work commencing as it relates to the scope of work for the project.

v. Submit work notification to EHS as soon as possible in advance of project initiation or at the beginning of project planning, understanding that certain projects will require an approved third party to conduct the assessment. Certain exceptions apply for emergencies. See section **6** for more detail.
vi. For assessments that require a third party or specialty contractors, e.g. where sampling involves roofing materials, engage an appropriate contractor for sampling and/or repair work. See section **6**.
vii. Identify and ensure that all CMU personnel who you oversee are trained, as applicable, in accordance with this program.
viii. Engage approved contractors and manage their work, ensuring compliance with regulatory and EHS requirements as well as ensuring their training, certification, and licensing are valid at the time that work commences (valid training, certification, and licensing requirements are detailed in the contract language as well).
ix. Before work begins in an area with asbestos materials, notify all personnel of the presence, quantity, and location of asbestos materials that they will be working around to ensure no accidental disturbance occurs.
x. Be aware that all abatement projects involving ≥160sf or 260 linear feet of ACM and PACM require a 10-working-day waiting period, which begins once a permit application and fee are submitted to the Allegheny County Health Department (ACHD).
xi. In addition to complying with all standard city requirements for demolition, be aware that demolition projects require 10-working-day notification to ACHD and Environmental Protection Agency (EPA) even if no ACM is present at the building. See section **10.c.iv**.
xii. Ensure project monitoring and clearance air sampling is conducted as described within this program. See sections **10.d** and **10.f**.
xiii. Provide to EHS for signature all ACHD permit applications, ACHD Notification forms, and annual O&M applications. Work managers are not permitted to sign these.
xiv. Provide to EHS all contractor records of asbestos abatement, to include all information outlined in section **10.g**.
xv. Provide to EHS records of all third-party asbestos sampling events, to include all information outlined in section **6.f.I**.
xvi. Notify EHS of any reports of damaged asbestos materials in accordance with the Accidental Asbestos Fiber Release Procedure found in **Appendix G**.
xvii. Ensure contractors understand their responsibility to report to the CMU work manager all newly discovered suspect asbestos materials within two hours of discovery. See section **10.e**.
xviii. Notify EHS of reports of newly discovered asbestos materials. If multiple contractors are working on a project where such materials are found, the work manager must notify them all of the presence, location, and quantity of the newly found suspect materials within 24 hours of the discovery (this may be accomplished by utilizing the prime contractor for notifying all subcontractors). See section **10.e**.
xix. Ensure that all materials used, applied, installed, etc. as part of work performed in

CMU buildings contains no asbestos in any amount (this is detailed in the contract language as well).

xx. Consult with EHS as questions or concerns arise regarding implementation of this program.

b. EHS

i. Develop, implement, and maintain the Asbestos Management Program.
ii. Assist work managers with implementing aspects of this program.
iii. Develop, maintain, and conduct 2-hour Asbestos Awareness training for CMU employees and maintain associated training records.
iv. Develop, maintain, and conduct Asbestos Work Manager training for CMU work managers and maintain associated training records.
v. Field asbestos assessment requests from CMU work managers or due to personnel concern. EHS will provide historical information from existing records and either perform sampling or refer the work manager to engage an approved asbestos sampling contractor.
vi. Provide guidance to work managers and employees with needs arising from asbestos assessments, abatement activities, and other asbestos-related topics.
vii. Maintain an inventory of asbestos sampling records, repair and abatement work, and asbestos disturbance/exposure reports.
viii. Develop, implement, and conduct Operations and Maintenance (O&M) inspections of ACM as prescribed in this program. Maintain records of these activities indefinitely.
ix. Assess risk and recommend response actions for known locations of asbestos materials.

c. EHS and FMCS Asbestos Building Inspectors

i. Selected EHS Workplace Safety and FMCS personnel will maintain asbestos building inspector and management planner licenses.
ii. EHS to perform or oversee personal exposure monitoring for bulk sampling activities as identified in this program.
iii. EHS and FMCS to each provide their own building inspectors with personal protective equipment and sampling supplies as prescribed in this program.
iv. Follow all appropriate bulk sampling procedures as described in this program.
v. Perform asbestos assessments for work activities described in this program.
    1. FMCS building inspectors to only perform bulk sampling for FMCS emergencies, urgent priorities, and daily service work.
    2. EHS building inspectors to perform bulk sampling for work that is small in scope and/or simple in complexity.

d. FMCS and Employees Who Perform Maintenance and/or Renovation Activities

i. Comply with the contents of this program, including training requirements as outlined in section **13**.
ii. Refrain from performing work that may disturb or impact suspect or confirmed asbestos materials in any way, excepting personnel trained to perform work on TACM (see sections **12** and **13**) and licensed building inspectors.

iii. Notify your supervisor of any suspected or confirmed asbestos materials that are found in damaged condition or accidentally damaged during work, following the Accidental Fiber Release Procedure as applicable.
iv. Report any potential airborne asbestos fiber exposures to your supervisor as soon as possible after the exposure occurs, following the Accidental Fiber Release Procedure.
v. Inform your supervisor of all newly discovered asbestos materials identified in or near your work area within two hours of the discovery. See section **10.e** for additional information.
vi. For personnel trained to perform work on TACM, undergo personal exposure monitoring, as needed, and follow all appropriate work procedures as described in this program. See Section **12**.

e. Building Occupants

i. Review annual notification regarding asbestos hazards on campus and how they may apply to you.
ii. Review Asbestos Location Summary and Red, Yellow, Green Building Listing in **Appendix J** for information on asbestos materials that might be present in your space.
iii. Comply with relevant sections of this program, with specific attention to section **15**.
iv. Direct asbestos-related questions to EHS.

f. Contractors

i. For contractors performing any type of asbestos work, follow all local, state, and federal regulations as they relate to the asbestos work being performed.
ii. For contractors performing any type of asbestos work, have and maintain appropriate asbestos occupation certifications as established by ACHD, PA DL&I, OSHA, and any other local, state, and federal regulations.
iii. For all contractors not performing asbestos work—prior to commencing work on CMU property, have and maintain two-hour asbestos awareness training.
iv. Inform the CMU work manager of all newly discovered suspect asbestos materials identified within or near the work area within two hours of the discovery. It is crucial that vigilance is maintained during work to identify suspect asbestos materials that were not found or were inaccessible at the time of asbestos assessment.
v. For all contractors involved with asbestos work, provide to the CMU work manager the relevant documentation described in sections **6.f.I** and **10.g** in a timely manner after completion of work. The checklists found at the end of the Work Manager Quick Guide (**Appendix K**) also detail required documentation and should be completed and submitted along with the work documentation.
vi. Ensure that all materials used as part of work performed in or on CMU property contain no asbestos in any amount.
vii. For abatement contractors performing work under an O&M permit, submit quarterly notifications to ACHD of all such activities. A copy of all notifications must be forwarded to EHS.

5. Identification of Asbestos Materials

Asbestos materials can be found in many older buildings on CMUs Pittsburgh campus. No asbestos materials are used in the construction of new buildings, and these locations therefore can be considered asbestos free. For those older buildings, asbestos was used for various applications, from floor tiling to pipe insulation to plaster. A large portion of publicly accessible ACM has been removed. However, there are some exceptions, such as:

- 9"x9" floor tiling found throughout most of Hunt Library
- Acoustical plaster applied to the first-floor ceiling of Margaret Morrison and Carnegie Hall (MMCH)
- Trace and asbestos-containing plasters in Margaret Morrison and Carnegie Hall, College of Fine Arts building, Doherty Hall, Hamerschlag Hall, and Baker and Porter Halls.

Most other asbestos materials are located within mechanical spaces, underneath carpeting, behind walls, and above ceilings, which means they are generally inaccessible until renovation or maintenance work is performed.

Some materials must be presumed to be asbestos containing based on age of application and material make-up. Such materials are known as presumed asbestos containing materials (PACM) and include all surfacing materials and thermal systems insulation found in buildings constructed on or before 1980.

It is important to know that asbestos materials only present potential health concern when they are disturbed or become damaged and thereby release asbestos fibers into the air. See section **9** for additional information on the health effects of asbestos.

Contrary to popular belief, there was no hard-stop regulatory ban on production or use of all materials containing asbestos. However, it is prohibited for contractors or university personnel to use or apply materials containing any amount of asbestos for work in university-owned spaces.

a. Categories of ACM

ACM is typically separated into three categories for bulk sampling purposes: surfacing materials, thermal systems insulation, and miscellaneous materials. Definitions of these types of ACM can be found in section **3**. The following are examples[1] of each type:

i. Surfacing Materials

Asbestos can be found in the following surfacing materials:

1. Traditional, plaster walls and ceilings
2. Spray-on fireproofing generally found on structural building components
3. Acoustical plaster

ii. Thermal Systems Insulation

The material makeup of insulation varies, but asbestos-containing insulations are

[1] This is not an all-inclusive list and not all listed materials have been found at CMU. However, their presence is possible and are provided with the intent to increase awareness for materials commonly manufactured with asbestos.

typically comprised of cementitious or corrugated cardboard-type (e.g. aircell) materials. Fiberglass insulation is not considered to be a suspect asbestos material itself, but coverings of fiberglass insulation can contain asbestos as well as glues/tars that adhere the fiberglass to its substrate. Asbestos-containing insulation can be found on the following building components:

1. Pipes
2. Pipe fittings
3. Duct work (can be found on both the outside AND inside of the duct)
4. Boilers
5. Tanks

iii. Miscellaneous Materials

Asbestos can be found in the following miscellaneous materials:

1. Resilient flooring—sizes can vary, but asbestos is most often found in 9”x9” tiles
2. Ceiling tiles and panels
3. Mastic (glue) from associated carpeting and cove base
4. Cove base
5. Drywall
6. Drywall joint compound
7. Wire/cable coverings
8. Gaskets
9. Refractory brick
10. Laboratory benchtops
11. Transite (cementitious) panels commonly found in laboratory fume hoods
12. Window caulking
13. Window glazing
14. Roofing materials
15. Fire doors
16. Fire curtains
17. Expansion joints typically part of ductwork and mechanical systems

b. Inventory and Recordkeeping of Asbestos Materials

There has been no comprehensive assessment identifying all asbestos materials throughout CMU-owned buildings. With many suspect asbestos materials being located behind walls and underneath carpeting, it would be an invasive and destructive task to conduct sampling, which could also put space occupants at greater asbestos exposure risk than if the materials were left in place, undisturbed, and in good condition.

Most buildings have been at least partially surveyed as a required part of ongoing renovation and maintenance work. In turn, this provides a good indication of what asbestos materials might be present and where they are located within a building.

The campus community and other affected parties may contact EHS for asbestos records requests by using the Asbestos Records Inquiry and Assessment Request webform.

c. Asbestos Activity Database

EHS indefinitely maintains inspection and laboratory reports for all asbestos sampling activities—both in-house and those completed by third parties. Results of these inspections are summarized in the "Asbestos Activity Database," which identifies the date of the inspection, type of materials sampled, location of the material(s) sampled, laboratory results, and additional notes such as plans for abatement and need for inclusion in the Operations and Maintenance program—see section **8**.

For work managers overseeing inspections performed by approved consultants, results and corresponding reports must be submitted to EHS upon their receipt for review and inclusion in the Asbestos Activity Database as well as the Asbestos Location Summary. See section **6.f.I** or **Appendix K** for minimum requirements for asbestos summary reporting.

d. Asbestos Location Summary

The Asbestos Location Summary is a high-level spreadsheet detailing the types of asbestos materials in a building, their general locations, and any corresponding abatement history. This summary spreadsheet is maintained indefinitely by EHS.

6. Work Notification and Asbestos Assessment

Confirmation of the presence or absence of asbestos materials is required prior to most renovation, maintenance, demolition, and other work activity that will disturb suspect asbestos building materials. If there isn't adequate documentation confirming the presence or absence of asbestos materials at a given location, as determined by EHS or approved asbestos building inspector, and the work is occurring in a "yellow" or "red" building (see **Appendix J**), an asbestos assessment must be performed. The assessment must be based on the planned scope of work, including areas such as underneath carpeting and above drop-panel ceilings if these areas will be impacted. Attempts should be made to determine if asbestos materials are behind immoveable barriers, such as walls, when necessary.

In order to prevent delays to schedules, notification must be submitted to EHS as soon as possible in advance of work initiation or at the beginning of work planning, whichever is sooner. It is highly suggested to send notification as early as possible to allow ample time for scheduling subsequent bulk sampling by either EHS, FMCS, or an approved third-party contractor[2]. Notification should be made using the Asbestos Records Inquiry and Asbestos Assessment Request webform found on the EHS website. Certain exceptions for emergencies may apply, see section **6.a**.

Upon notification, EHS will review the supplied information and communicate all relevant historical records from the Asbestos Activity Database and Asbestos Location Summary (see section **5.b**) to the work manager and identify asbestos assessment needs.

[2] Regardless if EHS will be performing the asbestos bulk sampling or not, notification of work must still be submitted to EHS. This ensures adequate completion of record review, adequate completion of third-party assessment, and EHS awareness of work activity.

For work activity checklists and flowcharts that provide a holistic view of asbestos-project work flows from start to completion, see the following appendices:

- Appendix K: Work Manager Quick Guide
- Appendix L: Computing Services Work Flowchart
- Appendix M: FMCS Daily Service and Preventive Maintenance Work Flowchart
- Appendix N: FMCS Emergency and Urgent Priority Work Flowchart

a. Emergency Notification

For work that is emergency[3] in nature, notification must be made to EHS by calling the **EHS Emergency Hotline at 412-268-8182**.

For FMCS work only, licensed asbestos building inspectors within FMCS may also be contacted for asbestos assessments of emergency and urgent priority work; however, EHS must be notified via the EHS Emergency Hotline or the Asbestos Records Inquiry and Asbestos Assessment Request webform as soon as practical. If needed, EHS will follow up with the work manager to obtain relevant information outlined in the Asbestos Records Inquiry and Asbestos Assessment Request webform.

Emergencies may be a result of flooding, newly found materials after work initiation, accidental disturbance of suspect asbestos materials (see **Appendix G** for the Accidental Fiber Release Procedure), etc. where a lack of immediate attention would negatively impact a building or its occupants. Failure to adequately plan or notify EHS of asbestos assessment needs ahead of work initiation does not constitute an emergency.

During emergency events that require immediate attention and are occurring in buildings identified as yellow or red (see **Appendix J**), impacted material considered PACM or suspect ACM or TACM, must be assumed to be ACM unless the situation allows time for appropriate bulk sampling activities.

EHS will make a concerted effort to assist with emergency asbestos sampling requests, but may not have the availability to do so within the requested timeframe. In the event that EHS personnel are unavailable, an approved asbestos bulk sampling contractor will need to be contacted by the work manager to conduct sampling.

b. Asbestos Assessment/Bulk Sampling

If bulk sampling is required following record review by EHS, EHS will notify the work manager to coordinate bulk sampling or to advise that an approved, third-party contractor must conduct the assessment. *For FMCS work only*, see **Appendix I** for additional guidance on EHS and FMCS personnel bulk sampling capabilities based on work category.

[3] Work that requires asbestos assessment results within 24-48 hours.

EHS is generally only able to conduct assessments for maintenance and renovation work that is small in size and scope or simple in complexity[4]. Work that is mid-to-large in size and scope or is complex will typically require assessment by an approved third-party asbestos building inspector. EHS will determine on a case-by-case basis when third-party assessment is necessary, which will be based on EHS availability to sample and the work's overall size, scope, and complexity. Exceptions for emergencies (see section **6.a**) may apply.

The asbestos assessment must be based on the planned scope of work and consider all materials to be impacted by the proposed work, including underneath carpeting and above drop-panel ceilings if such areas will be impacted. If the scope-of-work changes after an asbestos assessment has already been conducted, additional assessment may be necessary before continuing with work—notify EHS if this occurs.

Please also be aware of the following:

i. For assessments that identify an amount of ACM that requires a permit application and fee to ACHD for removal, i.e. >160sf or 260 linear feet, there will be a 10 business-day wait time until abatement of the material(s) can begin—see section **10.c**.
ii. For assessments that identify ACM in quantities <160sf or 260 linear feet, there will be no waiting period before which abatement work may begin if an abatement contractor that holds and Operations and Maintenance (O&M) permit for the University is selected. If an abatement contractor is selected that does not hold an O&M permit, there will be a 10-business-day waiting period before abatement work may begin (no fee is required).
iii. EHS cannot guarantee availability for assessments or promptness of result received from the laboratory if the Asbestos Records Inquiry and Assessment Request is not submitted to EHS in a timely manner.
iv. Some sampling activities, such as the collection of bulk samples of roofing materials or high-temperature pipes, may require assistance by a contractor who is aptly trained in a specialized trade to prevent negative impact to a building or its occupants, maintain warranty of the item being sampled, etc. The trade-specific contractor with appropriate-level training must be contracted and coordinated by the work manager to complete the sampling under the oversight of the asbestos building inspector and/or make repairs to the sampled material(s). EHS shall notify the work manager of such instances where this may be required.
v. When third parties conduct asbestos assessment activities, a copy of the sample results and corresponding inspection reports must be forwarded to EHS for retention and inclusion in the asbestos database—see section **6.f** for report requirements.

[4] Work that is moderate in size, but simple in terms of complexity may be considered by EHS for bulk sampling. An example may include flooring replacement in four rooms where the flooring is the same in all four rooms.
Work that is small in size, but complex may not be considered by EHS for bulk sampling. An example may include work to repair water-damaged plaster inside an elevator shaft or at elevated heights where scaffolding or fall protection would be needed.

vi. It is not the responsibility of the work manager to identify suspect asbestos materials that require bulk sampling within a work area. The work manager must provide the asbestos building inspector, whether in-house or third-party, with a description of the entire scope of work and project specifications so that they can make the determination of what materials require bulk sampling. Historical records provided by EHS should also be provided to any third-party building inspectors to aid in their inspection. Providing such information will ensure lesser-known asbestos materials, such as caulking, joint compound, roofing materials, etc., are not overlooked and historical records are not misinterpreted by the work manager.

vii. Asbestos bulk sampling does not typically include materials located behind immovable structures, e.g. walls; however, consideration should be made for the benefits of such sampling to the proposed work, particularly where wall and ceiling removal will occur. Access to such areas may require cutting larger holes in walls and should be completed by the asbestos building inspector in conjunction with a general contractor, as arranged by the CMU work manager. Repairs may be needed after completion of the asbestos assessment and should be coordinated by the work manager.

viii. Even though certain areas may have previously undergone renovation and abatement, e.g. flooring replacement that required asbestos abatement, please consider the possibility that additional asbestos materials may be located behind walls, above ceilings, etc. if the previous scope of work did not include this kind of activity. Additionally, in areas where TACM/ACM plaster is present, it is likely that all of the TACM/ACM plaster was not completely removed.

ix. All plaster samples collected at the university must be point counted when there is a positive result from the PLM bulk analysis (**see section 6.e**). Positive, plaster samples are most likely to be found in the following buildings: Baker and Porter Halls, Doherty Hall, College of Fine Arts building, Hamerschlag Hall, and Margaret Morrison and Carnegie Hall. Positive plaster samples that are not point counted must be assumed to be ACM even if the PLM bulk result was ≤1%.

c. Payment for Assessment

The cost of asbestos assessment and bulk sampling will be covered by EHS and/or FMCS in the following situations:

i. Sampling activities that are conducted by EHS or FMCS.
ii. Small work activities, such as hanging a shelf or photo.
iii. Small-to-moderate sized renovations overseen by FMCS, such as floor replacement.
iv. Small-to-moderate sized cabling installation as overseen by Computing Services.
v. Emergency bulk sampling due to damaged materials or newly found materials.
vi. Bulk sampling requested by space occupants due to a reported concern.

The customer for which work is being completed will be responsible for the cost of bulk sampling in the following situations:

- Bulk sampling performed by a third party for moderate-to-large sized or complex renovations, whether overseen by FMCS, Housing, CDFD, etc.

The above-listed situations do not cover the cost of asbestos abatement, which will come at the cost of the customer.

d. In-House Bulk Asbestos Sampling Requirements

All CMU personnel collecting bulk asbestos samples must be licensed by the PA DL&I as an asbestos building inspector.

Bulk material samples shall be collected in accordance with 29 CFR 1926.1101 and 40 CFR Part 763.86 to determine the presence or absence of asbestos. The samples shall be randomly collected using wet methods and in an overall manner that minimizes dust creation. Where thermal systems insulation or surfacing materials are sampled, impermeable drop cloths must be utilized and the material isolated to additionally prevent release of airborne asbestos fibers. The use of compressed air to remove asbestos materials and employee rotation to reduce asbestos exposure is prohibited.

i. Regulated Area Demarcation and Requirements

Sampling areas must be demarcated as a regulated area using applicable signage provided in **Appendix C**. Demarcation should be placed in a manner that prevents those outside of the area from exposure to airborne asbestos and at such a distance that authorized personnel can properly protect themselves before entering the regulated area—only trained and licensed asbestos building inspectors and those with 2-hour Asbestos Awareness training or greater are authorized to enter the regulated area.

Inspections of the worksite must be completed by a competent person at intervals sufficient to assess if conditions have changed that would warrant altering the regulated area demarcations or those permitted within the regulated area.
No eating, drinking, smoking, tobacco use, chewing gum use, or application of cosmetics is permitted within the regulated area.

ii. Cleanup, Handling, and Disposal of Sampling Waste

Waste generation during sampling must be minimized to the greatest extent possible. All subsequent asbestos-containing or asbestos-contaminated waste, including PPE, equipment, scraps, and debris generated by sampling must be promptly cleaned up after completion of the sampling event. No dry-sweeping of debris, or other means of dry-cleaning, is permitted. If more extensive cleanup is required, the inspector will notify the work manager who will engage an approved abatement contractor to perform prompt and appropriate cleanup, such as utilizing a vacuum equipped with HEPA (high-efficiency particulate air) filtration—CMU bulk sampling personnel must notify the work manager as soon as possible and follow the Accidental Fiber Release Procedure as needed.

All waste must be fully wetted before being double-bagged and sealed so that it is

leak-tight. Asbestos waste must be clearly labeled as "non-hazardous asbestos-containing debris" and tagged using the documents provided in **Appendix D**, then promptly submitted to the EHS waste program for disposal using.

iii. Repair of Sampled Materials

An attempt must be made to cover damaged portions of friable materials (including materials that became friable during sampling) to the best of the building inspector's ability. For example, holes in plaster and pipe insulation should be filled with an appropriate patching compound or otherwise covered in order to prevent further degradation and release of asbestos fibers until more permanent repairs can be made, as applicable, based on the safety of the space's occupants and future work plans. Because these activities are short duration or small scale in nature, additional training is not required; this repair activity is defined by OSHA as a class III activity.

Note that some repairs may need specialized trades to maintain integrity of building assets and warranties in addition to protection of building occupants and the building inspector—e.g. roofer for roofing repairs. If special trades are required, the building inspector should notify the work manager in advance for coordination.

If at any point the sampled material becomes significantly damaged after bulk sampling, do not attempt repairs and follow the procedures in **Appendix G Accidental Fiber Release Procedure**.

iv. Personal Exposure Monitoring

Personal breathing-zone air samples representing the 8-hour time-weighted average and 30-minute short-term exposures of CMU sampling personnel will be collected at least annually in accordance with 29 CFR 1926.1101(f) to ensure that exposure to airborne asbestos fibers remains below 0.1 fibers per cubic centimeter (f/cc) and 1.0 f/cc, respectively. Additional exposure monitoring will be conducted in situations where work practices have significantly changed or the suspected exposure to airborne asbestos fibers has changed.

Personal exposure monitoring will be conducted in accordance with the procedure provided in **Appendix E** with all documentation being recorded on the form in **Appendix F.**

Record of all personal exposure monitoring will be retained by EHS for at least 30 years.

v. Respiratory Protection

Respiratory protection is required to be worn when bulk sampling will disturb thermal systems insulation or surfacing ACM or PACM. All personnel wearing respiratory protection must also be approved and trained through the CMU Respiratory

Protection Program prior to engaging in these activities. All associated costs with enrollment into the Respiratory Protection Program will be the responsibility of the department making the request—such costs may include medical evaluation and purchase and maintenance of the respirators and associated supplies.

Respirators must either be a tight-fitting half-face (not including disposable filtering face pieces) or full-face and utilize HEPA/P-100 filters.

vi. Medical Monitoring

A medical evaluation in accordance with 29 CFR 1926.1101(m)(2)-(m)(4) must be provided for any person conducting bulk asbestos sampling for 30 or more days per year (one day is constituted by one hour or more of sampling activities). The evaluation must be conducted within 10 working days following the 30th day of sampling and must be conducted annually thereafter. Each building inspector must keep a log of their hours using the "Asbestos Building Inspector Sampling Hours" spreadsheet within the shared EHS Box folder.

All records of medical monitoring will be kept by EHS for the duration of the employee's employment plus 30 years.

e. Bulk-Asbestos Sample Analysis

Bulk asbestos samples will be sent to an accredited third-party laboratory to be analyzed by bulk polarized light microscopy (PLM) in accordance with the "EPA Method for the Determination of Asbestos in Bulk Building Materials" (600/R-93/116). Laboratories analyzing asbestos samples must be approved by EHS—see section **11.b** for approval requirements.

It is a requirement for materials that have a bulk PLM result of 10% or less asbestos (including ≤1% results, but not including non-detect results) to be re-submitted for analysis by point count[5], where applicable, or otherwise be assumed to be ACM. Point counting is most often used to verify that a material is TACM and does not meet the regulatory definition of ACM, i.e. >1% asbestos. Where point counting is conducted, this result overrides the PLM bulk result.

Considerations for analyzing applicable bulk samples by point count should be addressed with the building inspector prior to sampling if a project is likely to impact materials with trace amounts of asbestos—this will most often be the case with plaster. All plaster samples collected at the university must be point counted when there is a positive result from the PLM bulk analysis or otherwise assumed to be ACM.

[5] Point counting can typically only be performed on friable or non-tightly-bound materials, such as plaster, joint compound, and insulating materials. Non-friable materials, such as floor tiles, are generally not suitable to be analyzed by point count due to the way in which the components of the material are tightly bound.

f. Summary Reporting

Maintaining thorough documentation for all asbestos assessment and sampling activities is crucial for utilizing, and confidently relying upon, such information for future needs—see section **5.b** for EHS Inventory and Recordkeeping. Without thorough documentation, most sampling information would be unusable and assessments may need to be repeated resulting in loss of time and funds. For sampling map requirements, floorplans available through the Property Accounting Services webpage should be utilized.

i. Summary Reporting for Third-Party Assessments

For all assessments (see exception below for small assessments) that are completed, the following information should be provided to EHS, where applicable:

1. Summary of the assessment, e.g. scope of assessment work, building information, and inspection and sampling methodology
2. Photographs of any uncommon materials—all photos should be labeled with a description
3. Summary of samples and associated laboratory results. Summary must include, at a minimum, a description of each homogeneous area (estimated quantity and material description), sample IDs associated with each homogeneous area, sample results, a listing of any materials assumed to be asbestos containing, listing of locations that were inaccessible or not able to be sampled, and maps of sampling locations.
4. Copies of lab reports, chains of custody, and sample log forms/onsite notes.
5. Recommendations based on results.

Exception to the reporting requirements may be made for certain small work activities where only 2-3 homogeneous areas of materials are assessed—e.g. one section of pipe insulation that needs sampled for pipe repair, floor tiling and mastic that needs sampled in a small closet, or one plaster wall that needs sampled due to water damage. For such assessment work, the third party[6] must supply the following to the work manager:

- Copies of lab reports, chains of custody, and any sample log forms/onsite notes
- Summary of samples and associated laboratory results. Summary must minimally include:
  - A description of each homogeneous area (estimated quantity and material description) and sample IDs associated with each homogeneous area
  - Map of sample locations

ii. Summary Reporting for In-House Assessments

Sampling information from in-house assessments must be uploaded by the asbestos building inspector or provided to EHS via safety@andrew.cmu.edu for inclusion in the

[6] The work manager may assist with supplying the last two bullet-point items, but must be present during assessment to ensure accuracy.

Bulk Testing Results Box folder and Asbestos Activity Database. See **Appendix O** for requirements of both the Box folder and database.

7. Assessment of Risk and Determination of Response Actions

Assessing the risk associated with ACM and determining the appropriate response actions, i.e. repair, encapsulation, enclosure, or removal, are based on the condition, type, and accessibility of the material as well as its potential for disturbance or to cause exposure. As a best practice, these factors should be assessed by a certified and licensed asbestos Management Planner. All response actions recommended by EHS/Management Planner must be, first and foremost, protective of human health and the environment. At the discretion of the Management Planner and/or EHS, a more stringent response action may be chosen.

8. Operations and Maintenance of ACM

An Operations and Maintenance (O&M) Program is a process by which friable ACM not suitable for removal is managed in-place and in good condition. This management is designed to protect the health and safety of people in areas where such ACM is present by monitoring its condition, minimizing and controlling disturbance, and ensuring prompt control and cleanup if disturbed. O&M activities will be performed by appropriately qualified personnel, either in-house or via a third-party, depending on the level of work and the timeliness required.

Included in the O&M Program is periodic inspection and surveillance of friable, easily accessible, known areas of ACM—a listing of these areas is provided in Appendix **A**. This process consists of visually inspecting the areas of friable ACM and identifying damage, change in condition or friability from the previous assessment, change in the material's potential to become damaged, and bulk sampling where necessary. Records of this activity will be retained indefinitely by EHS using the form found in Appendix **B**.

If the inspection and assessment identifies areas of damage or potential fiber release, corrective actions must be initiated to address these conditions, following the guidance in section **7** and the Accidental Fiber Release Procedure located in **Appendix G**, as needed. EHS will coordinate through FMCS, or other appropriate party, of any abatement or repair needs.

9. Exposure to Airborne Asbestos Fibers

a. General

Asbestos is a group of six naturally occurring, fibrous minerals that have been used historically in a variety of building materials for their strength, heat resistance, and insulation properties. Examples of suspect asbestos materials are included in section **5**.

Asbestos materials do not present health hazards in their intact forms; they do, however, present potential health hazards once they are physically disturbed thereby allowing asbestos fibers to be released into the air. The potential for asbestos materials to release breathable fibers largely depends on their degree of friability—meaning that the more

easily a material can be crumbled by hand pressure, the more likely it is to emit fibers. Fireproofing and insulation are examples of materials that are typically considered friable.

By breathing airborne asbestos fibers, a person increases their risk of developing respiratory diseases, such as asbestosis and cancers, such as lung cancer and mesothelioma. Disease onset is slow and symptoms can take upwards of 20 years or more to appear after initial exposure. The risk of developing lung disease or cancer from asbestos fiber exposure is related to the frequency, duration, and airborne concentration of fibers. Smoking additionally exacerbates disease development.

b. Workplace Exposure to Airborne Asbestos Fibers

Occupational exposure to airborne asbestos fibers is regulated by OSHA. Specialized training, certification, licensing, personal exposure monitoring, medical evaluation, personal protective equipment, and tools are required for personnel who perform work that will disturb asbestos materials, including clean-up of associated debris. No CMU employees, except for those personnel who are appropriately licensed asbestos building inspectors and those trained to work on TACM, are permitted to disturb asbestos materials in any way or for any reason and, therefore, should not be occupationally exposed to asbestos. Personal exposure monitoring requirements for CMU asbestos building inspectors are described in section **6.d.iv** and for TACM workers in section **12**.

c. Accidental Damage to Asbestos Materials and Exposure to Airborne Asbestos Fibers

Despite periodic inspections and employee training, asbestos materials may be accidentally disturbed during routine maintenance, renovation, or by other daily activities. It may also deteriorate through water damage, air erosion, vibrations, or by other physical means. If such damage occurs, it is crucial to be familiar with the Accidental Fiber Release Procedure provided in **Appendix G** so that exposure to students, faculty, staff and visitors is reduced to the greatest extent possible. The steps in this guideline should be followed as soon as it has been identified that asbestos materials have been disturbed or are found in damaged condition.

d. Airborne Asbestos Fiber Exposure Records

There are currently no medical evaluations that can be administered after a person was accidentally exposed to asbestos fibers to confirm if they were over-exposed or if they will experience future health effects. As such, it is crucial that detailed records are maintained with regard to the exposure as identified in the Accidental Fiber Release Procedure.

Employees who were potentially exposed to airborne asbestos fibers must complete a Supervisors' Injury and Illness Report via: https://www.cmu.edu/hr/work-life/life-experiences/work-injury.html and submit to Human Resources for their maintenance.

Students who were potentially exposed to airborne asbestos fibers must complete the relevant sections of the Supervisor's Injury and Illness Report and submit it to EHS at

safety@andrew.cmu.edu.

EHS will maintain any asbestos air sampling records and all other relevant records of the exposure for the duration of the person's employment at CMU plus 30 years. EHS will provide a copy of relevant records to the employee as information is received or soon after incident investigation is completed.

For records requests, contact EHS at safety@andrew.cmu.edu.

e. Smoking and Asbestos Exposure

Smoking and asbestos exposure have a synergistic effect on the body, which increases a person's risk for developing lung cancer by 50x's or more than the general population.

Smoking cessation resources can be found via Human Resources' Healthy Living Resources webpage.

10. Repair, Encapsulation, Enclosure, and Removal of Asbestos Materials

a. General Project Requirements

Asbestos abatement includes any repair, enclosure, encapsulation, or removal of asbestos materials and their debris. Asbestos abatement activities must occur prior to any renovation or maintenance work that will directly or indirectly disturb the asbestos materials, including if there is a reasonable potential for the material to be disturbed as a result of the work. Abatement must be conducted in accordance with ACHD Title XXI, ACHD permit (where applicable), 29 CFR 1926.1101, NESHAP, CMU requirements, and any other applicable local, state, or federal regulations.

Please also note that whenever asbestos-containing floor tiling is identified, this material and its associated mastic, if applicable, may not be covered with carpeting or any other type of covering. In other words, where asbestos-containing floor tiling or mastic is present for a project which includes changes to flooring or any other impact to the flooring, the floor tiling and/or mastic must be properly abated (at a minimum, within the scope of work) before any other flooring work commences. This also applies to any other asbestos materials that are uncovered during work and may become re-covered as part of a renovation, e.g. pipe insulation that is discovered behind a wall—this must be abated (at a minimum, within the scope of work) before any type of covering is installed.

It is understood that for some work, such as installing shelving on TACM or ACM plaster or penetrations to roofing systems with asbestos-containing tar, removal of the entirety of material may not be feasible. In such instances, it is permitted to only abate the penetrations impacted within the scope of work. Please consult with EHS.

All asbestos abatement activity will be coordinated by the work manager. It is their

responsibility to develop the scope of work, facilitate its proper completion, and to ensure compliance with regulatory and EHS requirements—EHS will provide guidance as needed. EHS must be informed of all[7] asbestos activity prior to its planning and implementation and be updated as the work progresses, including when it is completed.

Prior to demolition, abatement of all ACM and PACM is required before any demolition work may begin. Removal of TACM prior to demolition may be required and will be determined on a case-by-case basis.

A Work Manager Quick Guide is provided in **Appendix K** to aid work managers through the asbestos assessment and abatement processes.

A Contractor TACM Quick Guide is provided in **Appendix P** to aid work managers and contractors in performing TACM work on CMU property.

b. Approval of Asbestos Contractors and General Contractors

i. ACM and PACM

All asbestos abatement work on ACM, PACM, and assumed ACM, must only be performed by approved, ACHD-licensed and PA DL&I-certified asbestos abatement contractors who employ duly accredited and licensed supervisors and workers. For a listing of approved, asbestos contractors please contact safety@andrew.cmu.edu. See section **11** for the EHS approval process for asbestos contractors new to the university.

It is the responsibility of work managers coordinating abatement work to ensure that all contractor certifications and licensing are up-to-date and accurate at the time of the abatement work and that they have EHS approval.

ii. TACM

It is required that all TACM be handled by contractors able to perform work on materials containing trace amounts of asbestos. Approved asbestos abatement contractors are always permitted to perform this type of work without further approval by EHS; however, they must still follow CMUs TACM work expectations and EHS must still be notified of the work to occur and be provided with records of the abatement.

Other contractors wishing to perform work on TACM must submit any programs or plans detailing their TACM work policies and procedures. Review of their program

[7] Exemptions apply for emergency situations where it would be infeasible to provide notification prior to commencing abatement (e.g. a pipe burst and the insulation is assumed to be asbestos containing by the work manager who immediately calls an abatement contractor for proper removal). However, the work manager must notify EHS as soon as practical via the EHS Emergency Hotline (412-268-8182) or safety@andrew.cmu.edu. See section 6.a for more information.

must be completed by EHS prior to the contractor commencing such work for the first time. They will also be required to submit a site-specific work plan for each, individual project.

For more information regarding contractor approval for performing TACM work, see Section **11**. Additionally, a Contractor TACM Quick Guide is provided in **Appendix P** to aid work managers and contractors in performing TACM work on CMU property.

iii. General Contractors

Work managers should ensure that all contractors not performing asbestos work meet the special conditions clauses of their contract (e.g. completion of 2-hour asbestos awareness training by all contract workers). At no point in time are un-trained, un-certified, or un-licensed personnel, whether from CMU or a third party, permitted to perform any type of work disturbing ACM, PACM, or assumed ACM, including their debris, regardless of the nature or size of the project.

c. Abatement Permitting

i. Work Impacting ≥160sf or 260 linear feet of ACM and/or PACM

All asbestos abatement work that impacts ≥160sf or 260 linear feet of ACM and/or PACM, require notification, permit application, and fee sent to ACHD. Completed notifications and permit applications must be sent to EHS for signature before submittal to ACHD. Please note that the fee and completed permit with signatures from both EHS and the abatement contractor must be sent to ACHD at least 10 business days prior to the abatement's start date and abatement work may not proceed until the approved permit from ACHD is received. The abatement contractor will typically complete the permit application forms and send/deliver to ACHD.

Clearance air sampling, described in section **10.f**, must occur once abatement is completed and prior to site inspection by ACHD.

ii. Work Impacting <160sf or 260 linear feet of ACM and/or PACM

Abatement work that impacts <160sf or 260 linear feet of ACM and/or PACM may fall under an O&M permit, if an abatement contractor that holds a current, O&M permit for the university is used. Abatement contractors must apply for the O&M permit on an annual basis through ACHD—a listing of abatement contractors that have up-to-date O&M permits can be obtained by contacting FMCS or EHS.

For work conducted under an O&M permit, there is no 10-day waiting period prior to commencing abatement work. Additionally, no ACHD notification, permit application, or individual project fees are required. The abatement contractor must still, however, follow all relevant sections of ACHD Title XXI, 29 CFR 1926.1101, NESHAP, and any other applicable local, state, or federal regulations. The contractor is required to submit quarterly reports to ACHD with the details of such work activities.

If work of this size is completed using a contractor that does not hold an O&M permit for the university, the abatement contractor must complete an ACHD notification and there is a 10-business-day waiting period before work may begin. Completed notifications must be sent to EHS for signature. No permit application or permit fee is required.

iii. Work Impacting any Amount of TACM

Work impacting TACM does not require a permit through ACHD. However, contractors who are not licensed asbestos abatement contractors must still seek approval from EHS before commencing work (see section **10.b.II** and **11**) and obtain a permit through EHS by submitting site-specific work plans as detailed below. Only contractors who have been approved by EHS to perform TACM work on campus or who are approved licensed asbestos abatement contractors are permitted to request a TACM permit.

EHS must grant approval for all TACM work prior to its commencement. Notification to EHS must be made to safety@andrew.cmu.edu at least two business days prior to the proposed start date of work. However, it is highly suggested to submit notification as early as possible to prevent potential delays created by deficiencies found in the submission. Notification may be completed by the CMU work manager or a competent representative from the contractor.

For emergencies, as much of the below information should be supplied to safety@andrew.cmu.edu. The permitting process can be waived to ensure expediency of response actions. EHS will follow up as needed for additional information pertaining to the work and subsequent repair actions.

The following information that is specific to the TACM worksite must be supplied:

1. Planned start and finish dates of TACM work
2. TACM work location, including building name, room number, and any other relevant locational identifiers
3. Name of CMU work manager
4. Name of contractor performing TACM work
5. Name and contact information for competent representative from the TACM contractor who can be reached regarding questions related to this submission and for questions that may arise during work or after its completion
6. Detailed description of project-specific work practices that will be followed from work start to completion as it relates to the TACM work. This should include descriptions of the following:
    - Daily work plans—describe in detail what work will occur each day including:
        - Types of tools and equipment to be utilized

- Plans for posting signage of the TACM work area
- Plans for protection of office supplies equipment and/or erection of containment, if needed
- Plans for air monitoring, area and/or personal
- Plans for responding to elevated air monitoring results, breaks in containment, or other issues that may feasibly arise
- Supplemental drawings or photos of the work area, identifying where penetrations and/or demolition is planned to be conducted

Once notification is received by EHS, a review will be completed to ensure all appropriate actions are being taken to protect CMU personnel and property. If EHS has questions regarding the submission or identifies any deficiencies, EHS will reach out to the CMU work manager and the contact supplied in the notification for clarification or to rectify deficiencies. Once approved, EHS will supply a permit to the requestor for the duration of the proposed work date(s).

EHS must be notified via safety@andrew.cmu.edu if changes to any of the following occurs:

- Work date(s)
- Scope of work
- Method of removal (only if significantly different from what was originally proposed)

A summary of updates along with the original permit must be submitted to EHS at safety@andrew.cmu.edu before proceeding with work.

iv. Demolition

Demolition includes activities such as razing a building, removal of a load-bearing structural member, raising (lifting) a building, and intentional burning of a building. Such projects follow the same permitting requirements as renovation and maintenance projects with regard to square footage of ACM to be removed; however, demolition projects also require notification to both ACHD and EPA 10 working days prior to the start of abatement regardless if the project is permitted by ACHD, including if no asbestos materials are identified.

d. Third-party Project Monitoring

For certain projects, oversight by an approved, independent consultant may be required to monitor abatement activities. For a listing of approved, contractors that can perform these activities contact safety@andrew.cmu.edu.

Project monitoring oversight may include: visual inspections of abatement containment and abatement work, air sampling outside of the abatement containment collected throughout the project's duration and during clearance air sampling, project specification

monitoring, and regulatory coordination. Based on the scope and complexity of an abatement project in addition to the type of asbestos material being abated, more or less involvement by the project monitor will be required as determined by EHS. The project monitor will be independent of the abatement contractor and will be contracted by the CMU work manager.

Project monitoring can typically be conducted by the contractor chosen to perform clearance air sampling—see section **10f**.

Project monitoring is required if the abatement project involves an ACHD permit AND the abatement of friable asbestos. EHS may also require more-stringent use of project monitoring for additional projects when the situation merits. The below table summarizes when project monitoring is, or may be, required[8].

Table 1. Abatement Work that Requires Third-Party Project Monitoring

Amount of Impacted Materials	**Materials are Friable[9]**	**Materials are Non-friable**
<160sf or <260 linear feet of ACM and/or PACM	Project monitoring may be required if the work is in an occupied or otherwise sensitive area, as determined by EHS.	None typically required, but may be otherwise determined by EHS.
≥160sf or ≥260 linear feet of ACM and/or PACM	Project monitoring is required. Number of air samples will be based on size, scope, and duration of the work.	Project monitoring if sensitive area, as determined by EHS or if abatement quantity is more than 500sf.
Any amount of TACM	Project monitoring required if sensitive area, as determined by EHS, or if abatement quantity is more than 500sf.	Not typically required.

Project monitoring air samples must be taken 10 feet away from the containment area with at least one of the required samples being taken during clearance testing and the remainder collected during abatement activities.

Air sampling must be performed in accordance with NIOSH Method 7400 and analyzed at a laboratory certified to perform this analysis—see section **11** for more information on laboratory approval.

[8] Project monitoring air-sample collection for outdoor work is not listed and will be determined on a case-by-case basis.

[9] This includes materials that will become friable upon abatement.

f. Emergencies

Abatement work that is emergency in nature and that must be completed within 24 hours may be exempted from third-party project monitoring to ensure quick abatement action to protect employee and occupant health, building integrity, assets, etc. Notification should be made as soon as possible to EHS at the **EHS Emergency Hotline 412-268-8182** for guidance.

f. Reporting and Handling of Newly Discovered Asbestos Materials during Non-Abatement-Related Work Activities on Multi-Employer Worksites

Although thorough asbestos assessments must be conducted prior to renovation, maintenance, and other work activities, some materials are not always identified due to their inaccessibility at the time of the assessment. This predominately includes materials located behind walls or other immoveable structures. It is to be reasonably expected that suspect materials are located underneath carpeting and above drop-panel ceilings and, due to their relative ease of access, should have already been included as part of the initial assessment.

When such new materials are identified, it is important that this information be reported to the appropriate parties within a timely manner to ensure both awareness and unintended disturbance. The following are responsibilities of various parties.

i. **CMU personnel and contractors who find new, suspect asbestos materials** must notify their supervisor and the CMU work manager within two hours of the discovery, reporting the material identified, its location and estimated quantity. If newly found materials were damaged during discovery, the Accidental Fiber Release Procedure found in **Appendix G** should be followed.

ii. **CMU work managers** must communicate all information provided from reports of newly found asbestos materials to the rest of the contractors or employees working at the site (this may be achieved by notifying the prime contractor who will, in turn, notify the remaining contractors) and EHS within 24 hours of the discovery. If newly found materials were damaged during discovery, the Accidental Fiber Release Procedure found in **Appendix G** should be followed.

As described in **section 10.a**, asbestos materials are not permitted to be re-covered and must be removed within the scope-of-work prior to enclosing the area. The asbestos material must also be removed prior to performing any other work that would potentially disturb it.

iii. **EHS** must document the reported findings and sampling and abatement activities for inclusion in the asbestos activity database. EHS must also enact the Accidental Fiber Release Procedure in **Appendix G**, as necessary.

g. Clearance Air Sampling

Many asbestos abatement projects will require clearance air sampling to determine that safe airborne asbestos concentrations are present within the abatement area prior to removal of containment and/or re-occupancy. Clearance air samples must always be conducted by a contractor independent of the asbestos abatement contractor. Additionally, the air sampling contractor must be hired by the CMU work manager. All clearance air sampling and analysis must be performed by the contractor in accordance with ACHD Title XXI, Section J.

The following table outlines clearance air sampling requirements:

Table 2. Clearance Air Sampling Requirements for Asbestos Materials

Amount of Material Impacted	Friable[10] Material Abatement	Non-friable Material Abatement
<160sf or <260 linear feet ACM and/or PACM	At least three clearance samples if area is more than 20 linear feet or 20sf; otherwise, use contractor's personals as clearance.	Use contractor's personal air samples as clearance test.
≥160 sf or ≥260 linear feet ACM and/or PACM	Five clearance samples per the first 5,000sf plus one sample per each additional 5,000sf OR one sample of air per room required by ACHD.	Five clearance samples per the first 5,000sf plus one sample per each additional 5,000sf OR one sample of air per room required by ACHD.
>100sf or >100 linear feet TACM	At least three clearance air samples if impacted area is more than 100sf or 100 linear feet. More air samples may be required as determined by EHS based on size, scope, and complexity of work.	Not typically required.

h. Abatement Documentation and Recordkeeping

It is crucial that thorough documentation is maintained pertaining to every asbestos abatement, regardless of size. The information included in this section must be provided to the work manager by the asbestos abatement contractor, air sampling contractor, and

[10] This includes materials that will become friable during abatement.

project monitor, where applicable, at the conclusion of an abatement project. Checklists are provided at the end of the Work Manager Quick Guide found in **Appendix K.** The checklists should be completed by the contractor and submitted along with the listed documentation. The information must then be forwarded by the work manager to EHS for indefinite recordkeeping and inclusion in the asbestos database.

By maintaining documentation, future projects will require less asbestos bulk sampling, reducing potential time delays and costs for additional asbestos assessments. Without proof that asbestos has been abated in a given area, it cannot be assumed that there is no asbestos. Additionally, if there is ever a question of exposure to airborne asbestos fibers, the documentation can aid with fact finding.

i. Abatement Contractor's Report for ACHD-Permitted Work

1. A copy of the clearance inspection from ACHD.
2. A copy of the signed, landfill waste-manifest for all waste generated from the project.
3. A copy of the ACHD permit under which the work occurred, including any amendments made to the original permit.
4. A copy of all personal air monitoring results, log-in sheets, and work-progress forms used during the project.
5. Locations and quantities of any known remaining asbestos materials within the project's scope of work.
6. A written description of any unusual issues or problems related to the project.
7. Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional)

ii. Abatement Contractor's Report for O&M Work

1. A copy of the signed, landfill waste-manifest for all waste generated from the project.
2. A copy of all personal air monitoring results, log-in sheets, and work-progress forms used during the project.
3. Locations and quantities of any known remaining asbestos materials within the project's scope of work.
4. Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc.
5. A written description of any unusual issues or problems related to the project.
6. For work not performed under an O&M permit, a copy of signed ACHD notification
7. Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional)

iii. Contractor's Report for TACM Work

1. The following documentation is required for work disturbing >100 sf or 100 linear feet of TACM:

- A written description of the work performed (i.e. exact description of where wall penetrations were made, what walls were removed, etc.). Drawings/sketches may be utilized for additional illustration.
- Identification of any unusual issues or problems related to the project.
- Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional).

2. The following documentation is required for work disturbing ≤100 sf or 100 linear feet of TACM (this information may be generated by the work manager in lieu of the contractor).
   - A written description of the work performed—i.e. exact description of where wall penetrations were made. Drawings/sketches may be utilized for additional illustration.
   - Identification of any unusual issues or problems related to the work.
   - Any other documents or materials produced by the contractor or work manager, such as on-site photographs, project drawings, notes, etc. (optional).

iv. Project Monitor's/Air Sampling Contractor's Report

1. All air monitoring results, including from project monitoring and clearance samples, collected by the consultant.
2. Maps of air sampling locations.
3. Copies of any log forms or checklists used by the consultant during the project.
4. A written description of any unusual issues or problems related to the project.

11. EHS Approval Process for Asbestos Contractors

Just as for any hazardous materials operations, proving an individual's or company's competence to perform said work is of the utmost importance—cost of service is only one factor in the selection of a contractor. Therefore, the following applies for asbestos contractors working on campus for the first time and those who have not yet completed work for CMU.

Before performing work on campus for the first time, all contractors performing asbestos work, including ACM And TACM work, abatement, air and bulk sampling, and laboratory analysis, must meet prequalification requirements and submit a performance-based proposal to EHS for approval. Approval must be granted by EHS prior to a contractor bidding on work for the first time and prior to rendering any services.

For a listing of approved asbestos-related contractors contact safety@andrew.cmu.edu.

a. Asbestos Abatement, Clearance Air Sampling, Project Monitor, and Building Inspector Contractors

Items for submission include the following:

i. Resumes for all employees, stating certifications, licenses, training, and experience.
ii. Copies of all active certifications and licenses for personnel who will be working on

campus.

iii. Listing of any citations by any regulatory body issued either to the oversight contractor or abatement contractor whom they were charged with to keep in compliance during abatement operations.

iv. Listing of laboratories used for sample analysis and their associated certifications to perform such analysis.

v. Reference from at least one existing client detailing the work performed and the proficiency with which it was performed, citing any particular positives and/or negatives.

b. Bulk Asbestos Analysis and Air Sample Analysis Contractors

The generation of accurate and precise testing results is essential for a contractor providing analytical services to CMU. There are a number of proficiency registries and accreditations available to help ensure quality analytical results. At a minimum, the laboratory must demonstrate the following:

i. For asbestos fiber counts performed in the field, all analysts must be registered by and perform successfully in the Asbestos Analysis Registry of the American Industrial Hygiene Association (AIHA).

ii. For asbestos bulk analyses, all laboratories must be accredited by the AIHA, the National Institute of Science and Technology (NIST), or the National Voluntary Laboratory Accreditation Program (NVLAP) for this analysis.

iii. For asbestos analyses by Transmission Electron Microscopy or Phase Contrast Microscopy, the laboratory must be accredited in the NIST/NVLAP for this analysis.

Demonstration of the above accreditation/registrations shall consist of supplying a copy of the current accreditation or registration AND the submittal of any applicable proficiency or round-robin testing activity for the past year.

c. Contractors Working with TACM

Approval must be obtained by contractors before performing TACM work on CMU property for the first time. To receive approval, each contractor must submit to EHS via safety@andrew.cmu.edu their TACM work program that establishes compliance with relevant components of the OSHA Asbestos Construction Standard (1926.1101), including but not limited to:

i. Practices for handling TACM and subsequent worker protection, which should include processes and procedures, as needed, for:
   1. Negative exposure assessments and employee exposure monitoring
   2. Written Respiratory Protection Program and respirator specifications for TACM work
   3. Medical monitoring requirements
   4. Engineering controls and work practices, such as:
      - Utilization of tools equipped with HEPA vacuums, wet methods, drop cloths,

methods for dust control, etc.
- Prohibition of: dry sweeping, utilization of compressed air to remove asbestos materials, employee rotation as a means to reduce exposure to airborne asbestos fibers, etc.
- Waste handling and disposal—prompt clean-up, double-bagging into 6-mil plastic bags and sealed shut, and appropriate disposal of waste.
- Demonstrated competency to construct containment areas out of poly sheeting to prevent migration of dust.

Additionally, contractors must acknowledge CMUs requirements for performing TACM work on CMU property and submit a site-specific plan to EHS at least two business days before commencing work. Detailed information can be found in the Contractor TACM Quick Guide found in **Appendix P and** section **10.c.iii**.

12. TACM Work by In House Personnel

There are times when it may be appropriate for in-house personnel to work on TACM. Practices for handling TACM and worker protection, must include:

a. A job-specific hazard analysis (JHA) must be created by FMCS for each TACM task to be performed, e.g. TACM plaster scraping and repair, drilling holes into TACM plaster, etc.

b. The JHA must be approved by EHS before beginning work and include the following:
   i. Planned start and finish dates of TACM work
   ii. TACM work location, including building name, room number, and any other relevant locational identifiers
   iii. Name of CMU work manager
   iv. Name of personnel performing TACM work
   v. Confirmation that personnel performing the work activities are enrolled and complying with the EHS Respiratory Protection Program.
   vi. Personal exposure monitoring must be minimally performed on an annual basis and additionally when there are changes in work practices that would change exposure, such as changes to tools, procedure, etc. Exposure monitoring will follow practices identified in section **6.d.iv**. Each JHA must confirmation that personal exposure monitoring has been within the past year for said task. If no monitoring has been conducted, it must be conducted at the time of performing the new task.
   vii. Competency to construct containment areas out of poly sheeting to prevent migration of dust.
   viii. Detailed description of project-specific work practices that will be followed from work start to completion as it relates to the TACM work. This should include descriptions of the following:
      - Daily work plans—describe in detail what work will occur each day including:
        - Types of tools and equipment to be utilized
          - E.g. Using tools equipped with HEPA vacuums, utilization of wet methods, utilization of drop cloths, etc.
        - Plans for posting signage of the TACM work area

- Plans for protection of office supplies equipment and/or erection of containment, if needed
- Plans for air monitoring, area and/or personal
- Plans for responding to elevated air monitoring results, breaks in containment, or other issues that may feasibly arise
- Supplemental drawings or photos of the work area, identifying where penetrations and/or demolition is planned to be conducted
- Detailed work methods such as wetting of the TACM to prevent dust creation and prohibition of: dry sweeping, utilization of compressed air to remove asbestos materials, and employee rotation as a means to reduce exposure to airborne asbestos fibers.
- TACM being impacted shall be no greater than 160sf, unless otherwise exempted and approved by EHS.
- Waste handling and disposal plans
  - Prompt clean-up
  - Double-bagging into 6-mil plastic bags
  - Sealing of waste so that is it leak-tight before removal from the work site
  - Disposal of waste into roll-off dumpster for disposal as a non-regulated waste. Waste is not permitted to be placed into trash compactors.

13. Training for CMU Personnel

a. Asbestos Awareness Training

For CMU employees who may conduct maintenance, repair, renovation, or construction work near asbestos materials and those whose work activities involve oversight of such activities or oversight of personnel who perform such activities, 2-hour Asbestos Awareness training provided by EHS is required. Personnel performing maintenance, repair, or renovation work are required to successfully complete training within the first 60 days of employment. Personnel overseeing maintenance, repair, or renovation work are required to successfully complete training prior to or at the time of initial assignment conducting such oversight work. Training for all personnel must be conducted at least annually after initial training so long as their duties remain within the scope as described in this section.

i. Personnel Required to Attend 2-hour Asbestos Awareness Training

EHS offers Asbestos Awareness training during several different sessions and dates throughout the year and targets specific departments and personnel who are required to attend at least annually. However, any CMU personnel wishing to receive Asbestos Awareness training may do so by contacting safety@andrew.cmu.edu. Examples of specific groups that have personnel that are required to complete annual Asbestos Awareness training include:

1. FMCS
2. CDFD
3. Housing and Dining

4. Building Managers and Facility Coordinators
5. Telecomm, Data Services, and Media Tech

Although EHS will make attempts to remind work managers and supervisors of personnel who require training, it is the responsibility of work managers and supervisors to ensure that they and their employees are present for training.

ii. Training Program Requirements

As prescribed by OSHA and EPA, the training program must be two hours in length and cover the following topics at a minimum:

1. Information regarding asbestos and its various uses and forms.
2. Information on the health effects associated with asbestos exposure.
3. Locations of presumed or known asbestos-containing thermal systems insulation and surfacing materials.
4. Locations of asbestos-containing flooring and flooring that has not been proven to not contain asbestos.
5. Recognition of damage, deterioration, and delamination of ACM.
6. Name and phone number of the department designated to carry out the responsibilities of the Asbestos Management Program.
7. The availability and location of the Asbestos Management Program.

iii. Training Recordkeeping

EHS maintains records of in-person trainings and attendees using sign-in sheets—if a person does not sign in on the sign-in sheet, they will not receive credit for the class and will be required to attend another session. For virtual training sessions, attendance will be taken based on the list of attendees that appear on the screen—any personnel who are sitting together and logged in under one user's name must notify the instructor of the names of all personnel present in order for them to receive credit. All attendance records will be transcribed into the SciShield Asbestos Awareness training page for tracking.

Training documentation will be maintained for at least one year beyond an employee's last day of employment.

b. Asbestos Work Manager Training

i. All personnel who oversee renovation, maintenance, or other similar work, including those who oversee personnel who perform such work, are required to attend Asbestos Work Manager training (in addition to 2-hour Asbestos Awareness training) before performing those duties. Training will be offered by EHS and include information relevant to managing asbestos-related work and understanding how to use the Work Manager Quick Guide found in Appendix K. Additional review will be performed, as needed, of workflows found in Appendices L, M, and N.

ii. After initial training, it is recommended that work managers attend this training annually. However, attendance will be required at least once every two years.
iii. EHS will maintain records of training sessions in the same manner as described in section 13.a.iii.

c. Training for CMU Personnel Performing Work on TACM

Personnel performing work on TACM must undergo hands-on in-house training prior to completing work on TACM in addition to completing 2-hour Asbestos Awareness training. Hands-on training will include, at a minimum:

i. Understanding and completing a JHA and seeking approval from EHS
ii. Understanding limits for TACM work, i.e. no work on areas of TACM greater than 160sf unless otherwise approved by EHS
iii. Proper use of HEPA-vacuum-equipped tools and other equipment that may need to be used during TACM work
iv. Use of drop clothes and erection of plastic containment areas
v. Proper methods for demarcating the work area and restricting access
vi. Use of wet methods for dust suppression and practices that reduce the generation of dust during work where wet methods aren't feasible (e.g. near electrical hazards).
vii. Creation of work documentation and drawings
viii. Review of prohibited work activities:
    1. Dry sweeping of TACM debris
    2. Work on ACM or PACM
    3. Use of compressed air to remove TACM
ix. Prompt clean-up practices
x. Waste handling and disposal practices to include:
    1. Wetting of waste
    2. Double-bagging into 6-mil plastic bags and sealing so that they are leak tight
    3. Disposing of waste into roll-off dumpster. Waste is not permitted to be placed into trash compactors.
xi. Respiratory protection training and enrollment into the EHS Respiratory Protection Program

Training must be conducted in-person using hands-on methods to illustrate work practices. All attendees must sign a sign-in sheet in order to receive credit for the training. The sign-in sheet must be provided to EHS for retention for at least one year beyond the employee's last day of employment.

d. Asbestos Building Inspector and Management Planner Training, Licensing, Certification Maintenance and Recordkeeping

Personnel performing asbestos assessments and collecting bulk asbestos samples must obtain certification training and PA DL&I licensing as an Asbestos Building Inspector prior to conducting any such activities. Associated refresher training, certification updates, and license renewal must be conducted on an annual basis.

Building inspectors must be enrolled in the EHS Respiratory Protection Program (see **section 6.d.V**) and undergo medical evaluation, if needed (see section **6.d.VI**).

Staff preparing specifications for treatment of asbestos materials, e.g. exercising judgement for how asbestos containing plaster is to be repaired, removed, or encapsulated, should obtain PA DL&I licensing as an Asbestos Management Planner prior to conducting any such activities. Associated refresher training, certification updates, and license renewal must be conducted on an annual basis.

Copies of all licenses must be supplied to EHS via safety@andrew.cmu.edu where they will be maintained indefinitely. Upon receipt of a new or updated license, it must be promptly supplied to EHS where it will be added to the license inventory.

14. Permitted and Non-Permitted Work Activities

Work that does not directly or indirectly disturb asbestos materials is permitted at any time. An employee may work near such materials as long as they are not disturbed or are not likely to be disturbed. Consideration should be taken for activities that cause significant vibrations or air movement that could inadvertently dislodge or damage asbestos materials that may be outside of the work area, but in close enough proximity to be impacted by such work. Additionally, it is expressly prohibited to install or apply any materials that contain any amount of asbestos and cover any asbestos materials that are discovered during work.

The following are examples of permissible activities:

- Repairing plumbing or other facility items that are covered with fiberglass insulation—be aware of asbestos-containing wraps of fiberglass insulation, however.
- Cleaning or buffing floor tiles that have sufficient finish so that the cleaning or buffing will not contact the floor tile.
- Cutting a hole in drywall inside a building that was newly constructed in 2018, e.g. Tepper Quad.
- Painting of plaster walls in MMCH—consider if the plaster, which is PACM, is in good condition and won't become damaged upon applying pressure to it. However, if preparations need to be completed where the wall needs sanded or physically disturbed, then these preparation activities must first be performed by an approved contractor.
- Any work done NEAR asbestos materials but not disturbing them.

Work that disturbs or may disturb asbestos materials is NOT permitted. Some examples of activities that are not permitted are:

- Sanding or drilling through asbestos-containing floor tiles or asbestos cement board.
- Lifting or replacing ceiling tiles in areas where asbestos-containing fireproofing is overhead.
- Drilling holes or creating any physical damage to trace asbestos-containing plaster, unless appropriately trained.
- Moving furniture or other items that may scratch asbestos-containing floor tiling.

- Removing asbestos-containing insulation or floor tiles.
- Buffing asbestos-containing floor tiles that does not have sufficient finish to avoid contacting the floor tile.
- Stripping finishes from asbestos-containing floor tiles, excepting chemical removal.
- Scraping paint from presumed asbestos-containing plaster.
- Performing renovations in areas where suspect ACM is present or in areas where PACM is present without first performing an asbestos assessment.
- Installing mastic with <1% asbestos.
- Covering asbestos-containing floor tiling and mastic with new carpeting without first appropriately abating such floor tiling and mastic.

15. Building Occupant Expectations and Notification

It is important to communicate the presence of asbestos materials to building occupants so that they can understand the hazard within their spaces. It also is more likely that building occupants will not disturb the materials in question and prevent release of airborne asbestos fibers if they are aware of what is around them.

CMU-owned buildings have been categorized based on the likelihood of the presence of asbestos materials as outlined in the following table:

Category	Likelihood of Asbestos Presence
Red	High
Yellow	Moderate
Green	Low/none

See **Appendix J** for a listing of buildings by their color category.

An annual notification detailing background information of asbestos, preventing exposure to airborne asbestos fibers, health effects of asbestos, the listing of building color categories, and Asbestos Location Summary will be communicated to the community through a combination of the following such outlets: departmental leadership, the EHS webpage, EHS Newsletter, FMS Announce e-mail service, and flyers, posters, and other physical postings throughout academic and administrative buildings.

16. General Recordkeeping Requirements

Thorough documentation of all asbestos management activities is a requirement of CMU. All inspection, O&M surveillance, corrective actions, exposure reports, and abatement work must be thoroughly documented and retained. This documentation shall include items such as: the written reports of inspection, surveillance and testing performed, laboratory reports, copies of certifications, accreditations and licenses, copies of all correspondence with regulatory

authorities (including notifications and permits), reports of potential exposure, training records, and inventory of known asbestos materials. This information shall be provided to and retained by EHS.

See the following sections for recordkeeping requirements for the associated topic:

- Section 5.b—Inventory and Recordkeeping of Asbestos Materials
- Section 6.d.IV—Personal Exposure Monitoring
- Section 8—Operations and Maintenance
- Section 9.d—Accidental Damage to Asbestos Material and Exposure to Airborne Asbestos Fibers
- Section 10.g—Abatement Documentation and Recordkeeping
- Section 13.a.III, 13.c, and 13.d—Training Recordkeeping
- Section 13.d— Asbestos Building Inspector and Management Planner Training, Licensing, Certification Maintenance, and Recordkeeping

17. Program Review

At least annually, EHS shall review this program to ensure that its specifications reflect the performance of asbestos management activities at CMU and also to ensure regulatory compliance. Where applicable, changes in the procedures and/or program shall be made as soon as practicable. The date of the review and any corresponding updates will be documented by EHS in the "Program Amendment" spreadsheet found in **Appendix H** and communicated to stakeholders as needed.

18. Appendices

Appendix A: O&M Inspection Areas

O&M Inspection Areas		
Building	**Area**	**Material(s)**
Wean Hall	Penthouse mechanical room	Pipe insulation and fittings
	Floor 6 mechanical room	Pipe fittings
	Chiller	Pipe insulation and fittings
	Ceilings of hallway corridors	Pipe fittings (brown wrapped)
Hunt Library	Above drop-panel ceiling on floor 4	Spray-on fireproofing and pipe fittings
4615 Forbes Avenue (GATF)	Floors 2, 3, and 4 mechanical rooms	Pipe fittings
Margaret Morrison and Carnegie Hall	Floor 1 hallway wing and rooms 123, 124, and 127	Textured ceiling
Greek Quad	Central mechanical room	Pipe insulation and fittings and tank insulation
Hamerschlag Hall	B133	Pipe insulation and fittings in rear and front of room; mud-insulated duct on right wall
Doherty Hall	Pipe shaft across from A129 mechanical room	Pipe insulation and fittings

Mellon Institute	Ceiling of floor 2 hallway corridor	Pipe insulation
Morewood Gardens E-Tower	Basement/A3, between A3 and A9	Pipe insulation
	Stairwell closest to Morewood Ave. between floors 5 and 6	Leftmost pipe fitting

Appendix B: O&M Inspection Form

O&M activities will be performed periodically by appropriately qualified personnel, either in-house or via a third party, depending on the level of work and the timeliness required.

Inspections which will include surveillance of friable and accessible ACM as identified in the O&M Inspection Areas spreadsheet. This process consists of visually inspecting the areas of friable ACM and identifying damage, change in condition or friability from the previous assessment, change in the material's potential to become damaged, and bulk sampling where necessary. Records of this activity will be retained indefinitely by EHS.

If the inspection and assessment identifies areas of damage or potential fiber release, corrective actions must be initiated to address these conditions, following the guidance in the Asbestos Management Program.
For each area to be inspected, the information on the following page must be supplied. A copy of all forms must be saved in the O&M Inspections Box Folder.

1. Identify material being inspected.

2. Date of inspection.

3. Name of person performing inspection.

4. Identify location of material being inspected.

5. Photo of material being inspected.

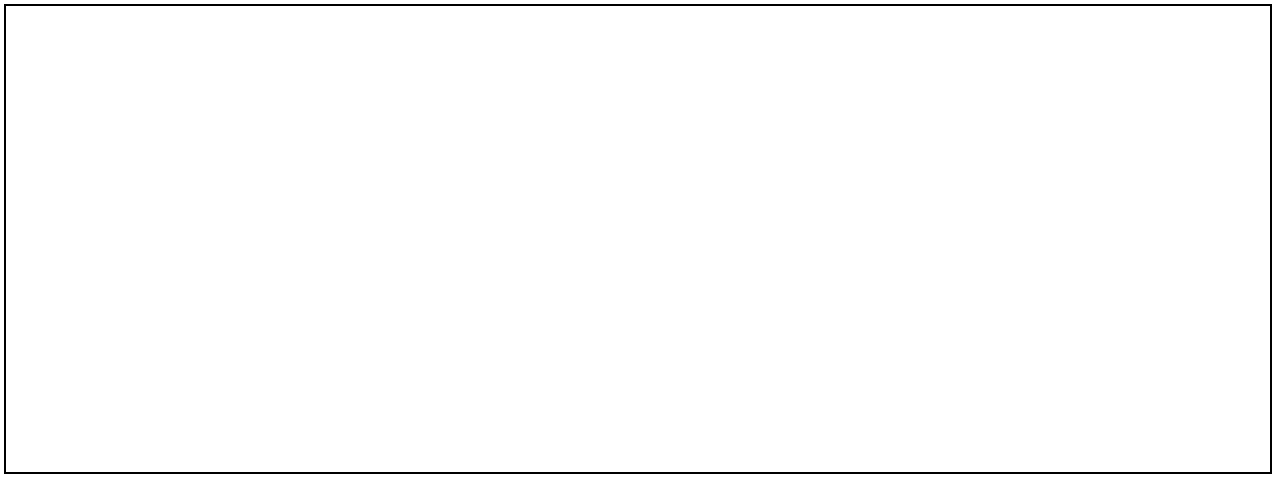


Photo Description:

6. Assessment of condition

Percent damage: _____% localized; _____% distributed

Type of damage: _____ Deterioration _____ Water _____ Physical _____ None

Overall condition: _____ Good _____ Damaged _____ Significantly Damaged

7. Identify the primary space usage (e.g. mechanical room, office, hallway, etc.).

8. Has the primary space usage changed since prior O&M inspection?

9. Identify the material's potential for damage (i.e. low potential, potential for damage, or potential for significant damage—consider potential for direct contact by space occupants and water in addition to influence of vibrations and air erosion).

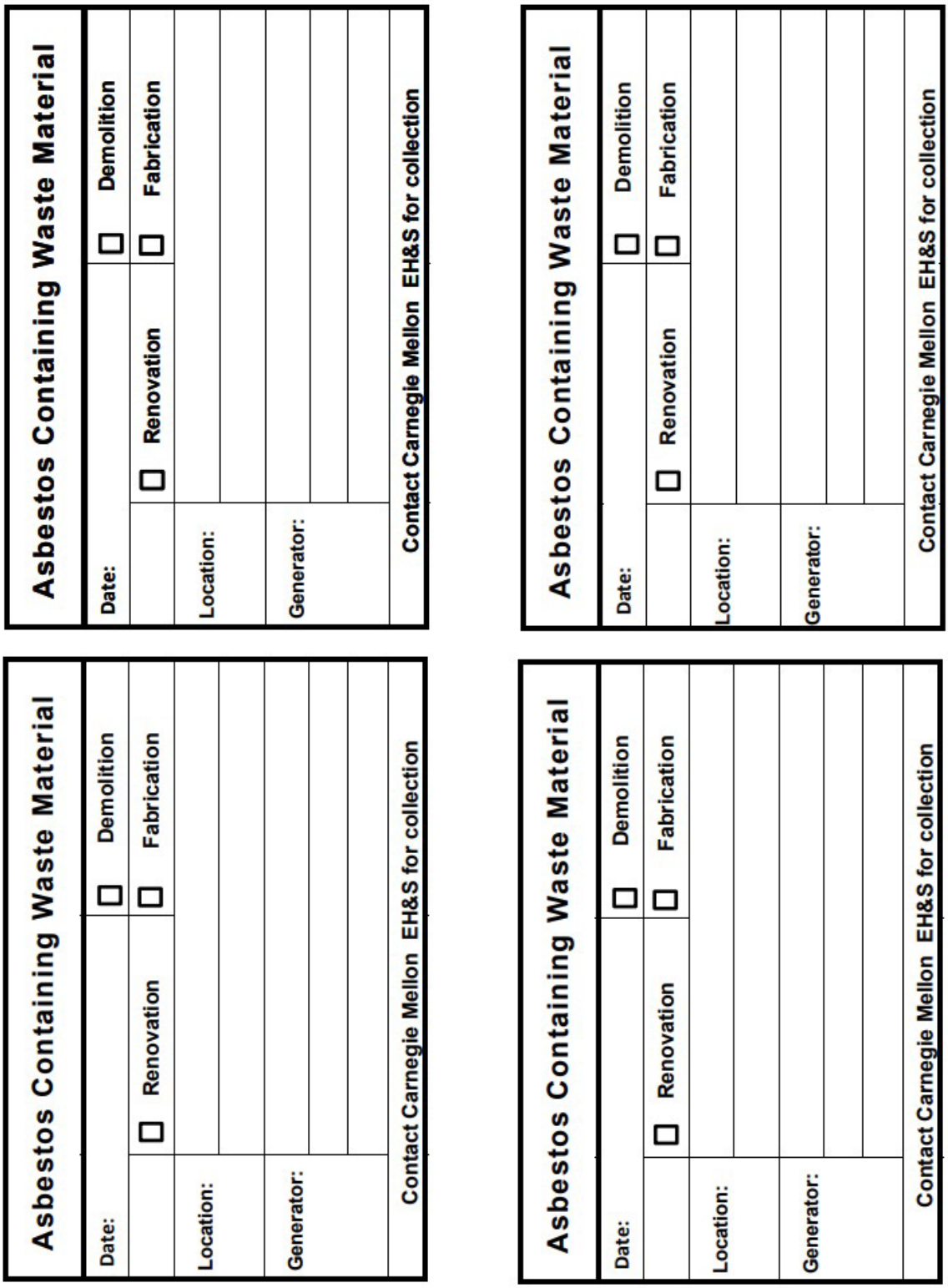
10. Recommendations for abatement action, which could include repair, encapsulation, enclosure, or removal.

Appendix C: Regulated Area Signage with Respiratory Protection Note

ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY

WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA

Appendix D: Asbestos 3.5x5 Waste Sign



Appendix E: Personal Exposure Monitoring Procedure

29 CFR 1926.1101, Appendix A

Mandatory Appendix to 1926.1101

Asbestos Personal Exposure Monitoring Procedure

This mandatory appendix specifies the procedure for analyzing air samples for asbestos and specifies quality control procedures that must be implemented by laboratories performing the analysis. The sampling and analytical methods described below represent the elements of the available monitoring methods (such as Appendix B of this regulation, the most current version of the OSHA method ID-160, or the most current version of the NIOSH Method 7400). All employers who are required to conduct air monitoring under paragraph (f) of the standard are required to utilize analytical laboratories that use this procedure, or an equivalent method, for collecting and analyzing samples.

Sampling and Analytical Procedure

1. The sampling medium for air samples shall be mixed cellulose ester filter membranes. These shall be designated by the manufacturer as suitable for asbestos counting. See below for rejection of blanks.

2. The preferred collection device shall be the 25-mm diameter cassette with an open-faced 50-mm electrically conductive extension cowl. The 37-mm cassette may be used if necessary but only if written justification for the need to use the 37-mm filter cassette accompanies the sample results in the employee's exposure monitoring record. Do not reuse or reload cassettes for asbestos sample collection.

3. An air flow rate between 0.5 liter/min and 2.5 liters/min shall be selected for the 25/mm cassette. If the 37-mm cassette is used, an air flow rate between 1 liter/min and 2.5 liters/min shall be selected.

4. Where possible, a sufficient air volume for each air sample shall be collected to yield between 100 and 1,300 fibers per square millimeter on the membrane filter. If a filter darkens in appearance or if loose dust is seen on the filter, a second sample shall be started.

5. Ship the samples in a rigid container with sufficient packing material to prevent dislodging the collected fibers. Packing material that has a high electrostatic charge on its surface (e.g., expanded polystyrene) cannot be used because such material can cause loss of fibers to the sides of the cassette.

6. Calibrate each personal sampling pump before and after use with a representative filter cassette installed between the pump and the calibration devices.

7. Personal samples shall be taken in the "breathing zone" of the employee (i.e., attached to or near the collar or lapel near the worker's face).

8. Fiber counts shall be made by positive phase contrast using a microscope with an 8 to 10 X eyepiece and a 40 to 45 X objective for a total magnification of approximately 400 X and a numerical aperture of 0.65 to 0.75. The microscope shall also be fitted with a green or blue filter.

9. The microscope shall be fitted with a Walton-Beckett eyepiece graticule calibrated for a field diameter of 100 micrometers (+/- 2 micrometers).

10. The phase-shift detection limit of the microscope shall be about 3 degrees measured using the HSE phase shift test slide as outlined below.

    a. Place the test slide on the microscope stage and center it under the phase objective.

    b. Bring the blocks of grooved lines into focus.

       Note: The slide consists of seven sets of grooved lines (ca. 20 grooves to each block) in descending order of visibility from sets 1 to 7, seven being the least visible. The requirements for asbestos counting are that the microscope optics must resolve the grooved lines in set 3 completely, although they may appear somewhat faint, and that the grooved lines in sets 6 and 7 must be invisible. Sets 4 and 5 must be at least partially visible but may vary slightly in visibility between microscopes. A microscope that fails to meet these requirements has either too low or too high a resolution to be used for asbestos counting.

    c. If the image deteriorates, clean and adjust the microscope optics. If the problem persists, consult the microscope manufacturer.

11. Each set of samples taken will include 10% field blanks or a minimum of 2 field blanks. These blanks must come from the same lot as the filters used for sample collection. The field blank results shall be averaged and subtracted from the analytical results before reporting. A set consists of any sample or group of samples for which an evaluation for this standard must be made. Any samples represented by a field blank having a fiber count in excess of the detection limit of the method being used shall be rejected.

12. The samples shall be mounted by the acetone/triacetin method or a method with an equivalent index of refraction and similar clarity.

13. Observe the following counting rules.
    a. Count only fibers equal to or longer than 5 micrometers. Measure the length of curved fibers along the curve.

b. In the absence of other information, count all particles as asbestos that have a length-to-width ratio (aspect ratio) of 3:1 or greater.
c. Fibers lying entirely within the boundary of the Walton-Beckett graticule field shall receive a count of 1. Fibers crossing the boundary once, having one end within the circle, shall receive the count of one half (1/2). Do not count any fiber that crosses the graticule boundary more than once. Reject and do not count any other fibers even though they may be visible outside the graticule area.

d. Count bundles of fibers as one fiber unless individual fibers can be identified by observing both ends of an individual fiber.

e. Count enough graticule fields to yield 100 fibers. Count a minimum of 20 fields; stop counting at 100 fields regardless of fiber count.

14. Blind recounts shall be conducted at the rate of 10 percent.

Quality Control Procedures

1. Intralaboratory program. Each laboratory and/or each company with more than one microscopist counting slides shall establish a statistically designed quality assurance program involving blind recounts and comparisons between microscopists to monitor the variability of counting by each microscopist and between microscopists. In a company with more than one laboratory, the program shall include all laboratories, and shall also evaluate the laboratory-to-laboratory variability.

2.a. Inter-laboratory program. Each laboratory analyzing asbestos samples for compliance determination shall implement an inter-laboratory quality assurance program that, as a minimum, includes participation of at least two other independent laboratories. Each laboratory shall participate in round robin testing at least once every 6 months with at least all the other laboratories in its inter-laboratory quality assurance group. Each laboratory shall submit slides typical of its own workload for use in this program. The round robin shall be designed and results analyzed using appropriate statistical methodology.

2.b. All laboratories should also participate in a national sample testing scheme such as the Proficiency Analytical Testing Program (PAT), or the Asbestos Registry sponsored by the American Industrial Hygiene Association (AIHA).

3. All individuals performing asbestos analysis must have taken the NIOSH course for sampling and evaluating airborne asbestos dust or an equivalent course.

4. When the use of different microscopes contributes to differences between counters and laboratories, the effect of the different microscope shall be evaluated and the microscope shall be replaced, as necessary.

5. Current results of these quality assurance programs shall be posted in each laboratory to keep the microscopists informed.

Appendix F: Personal Exposure Data Form

Safex

AIR SAMPLING DATA FORM

Project Information

Project: _____ Project Number:

Location/Site:

EHS Coordinator: _____ Sampling Date:

Person Conducting Sampling: Shift Length: ☐ 8 ☐ 10 ☐ 12

Sample Method

Contaminant(s):

Sampling Reading ☐ OSHA # _____ Method(s): NIOSH # Direct

Method Flowrate: _____ LPM Sampling Media: _____

Number of Blank Samples Submitted for samples:

Special sample shipping requirements: ☐ None ☐ Kept Cold ☐ Other

Pump Calibration

Pump Serial Number: Pump Mfg. & Model:

Precalibration Date: Calibrator:

Calibrated By: Last Mfg. Calibration:

1st Reading	2nd Reading	3rd Reading	Pre-Flow rate	Flowrate Units	
				liters/ minute	milliliters (cc)/ minute

Post Calibration Date: Calibrated By:

1st Reading	2nd Reading	3rd Reading	Post-Flow rate	Error	Sample Flowrate*

(1) if pre and post is <5%, then use average of the two, (2) if >5% and <10% use lowest of the two, or (3) if >10% sample is voided difference too large.

Employee Information

Employee/ Area Monitored	Employee Number	Job Title

Sampling Information

Sample Period: ☐ full shift ☐ task ☐ partial shift ☐ STEL ☐ ceiling ☐ grab

Sample Number	Start Time	Stop Time	Start Time	Stop Time	Total Time	Sample Flowrate	Sample Volume	Sample Type
								Area ☐ BZ ☐ Grab ☐
								Area ☐ BZ ☐ Grab ☐
								Area ☐ BZ ☐ Grab ☐
								Area ☐ BZ ☐ Grab ☐

Pump Check Times (*within first 30 mins., then at least every hour*)

Sampling Strategy

Sampling Strategy

Strategy: ☐ typical ☐ worst-case ☐ random ☐ complaint

Operation: ☐ routine ☐ non-routine ☐ maintenance ☐ emergency ☐ other

Assessment

Number of persons in similar exposure group: _____

Exposure Duration: Minutes _____ Times per day _____ Total minutes per day _____

Exposure Frequency: Days/Week _____ Days/Month _____ Months/year _____

Controls and PPE

Ventilation: ☐ Natural/ Outdoors ☐ Dilution ☐ Local Exhaust ☐ N/A

Personal Protective Equipment Used by Employees Performing Activities: ☐ Yes ☐ No

If yes, what kind?

Respiratory Protection: ☐ APR ☐ SCBA ☐ SAR ☐ fullface ☐ half-face ☐ other ☐ N/A

Hearing Protection: ☐ Plugs ☐ Muffs ☐ Semi-inserts NRR: _____ ☐ N/A

Eye/ Face Protection: ☐ Safety Glasses ☐ Goggles ☐ Faceshield ☐ Welding Helmet ☐ N/A

Clothing: ☐ Chemical type: _____ ☐ Leather ☐ Other: _____ ☐ N/A

Gloves: ☐ Chemical type: _____ ☐ Leather ☐ Cotton ☐ Thermal ☐ N/A

Shoes: ☐ Chemical type: _____ ☐ Leather ☐ Other: _____ ☐ N/A

☐ Hard Hat ☐ Steel Toes ☐ Metatarsal Guards ☐

Other: ☐

Welding Information

Type of Welding/Cutting/Brazing/Soldering Conducted:

AWS Electrode Number: _____ Electrode Brand Name/Number: _____

Electrode Diameter: _____ Base Metal (Coating): _____

Shielding Gas: _____ Wire Feed Rate: _____

Current: Polarity: Voltage:

Comments

Describe Task and Activities Sampled:

Illustrations

Collector's Signature: _____ **Date** _____

Appendix G: Asbestos-Fiber Release Procedure

The potential for accidental asbestos fiber release exists in all areas where asbestos is present at the university, particularly in areas with easily accessible or friable asbestos containing materials (ACM), trace ACM (TACM), or presumed asbestos containing materials (PACM), herein referred to as "asbestos materials". Through the Environmental Health and Safety (EHS) Asbestos Management Program, the risk of fiber release is minimized by means of periodic inspections of asbestos materials for physical integrity and employee awareness training.

Asbestos materials may include, but are not limited to, the following:

- Pipe insulation
- Spray-on Fireproofing
- Acoustical Plaster
- Plaster
- 9-inch x 9-inch floor tiling and associated mastic (adhesive)
- Ceiling tiles and associated mastic (most often 1'x1' ceiling tiles)
- Transite panels (cementitious panels typically used as walls and inside laboratory fume hoods)

Despite periodic inspections and employee training, asbestos materials may still be accidentally disturbed during routine maintenance, construction, or renovation[11] or deteriorated by water damage, air erosion, vibrations or other physical means. In the event that damage does occur, it is crucial to ***be familiar with*** this emergency response procedure so that exposure to yourself and to students, faculty, staff and other building occupants is reduced to the greatest extent possible.

Each instance of accidental fiber release will vary in size and scope and must be handled on a case-by-case basis. Each release episode, regardless of size and scope, must be reported to EHS as soon as possible. Appropriate training, licensing, and personal protective equipment is required to clean up and repair ***all*** impacted asbestos materials, whether ACM, TACM, or PACM. As such, only an approved and appropriately qualified contractor may respond to known or potential asbestos fiber releases. Information regarding the handling of ACM, TACM, and PACM can be found within the Asbestos Management Program.

[11] If you are ever uncertain whether or not the material you are working on or near contains asbestos, stop work and contact your supervisor and/or appropriate CMU representative. CMU EHS shall be consulted to provide clarification regarding need for bulk sampling prior to proceeding with work—see section 6 of the Asbestos Management Plan for work notification and asbestos bulk sampling requirements.

The following procedure should be followed by any person causing damage to asbestos materials or knowledgeable of damaged asbestos materials:

1. Stop all work in the area(s) of damaged asbestos materials.
2. Evacuate the area(s) of damage immediately, including any personnel in the immediate area. If it is safe to do so on your way out, close all windows within the space and doors that lead to other areas. Never re-enter the release area or attempt to clean up the impacted asbestos material(s). It is crucial that this step be performed immediately in order to limit potential exposure.
3. Notify your immediate supervisor and the appropriate CMU representative, if applicable.
4. Report the damage to CMU EHS at 412-268-8182. This number is monitored 24/7 to receive emergency EHS phone calls. Be prepared to provide the following information (additional details may be requested at a later time by EHS):
   a. Location of release [building and room number(s)]
   b. Date and time of release
   c. Type and amount of ACM disturbed
   d. Is the material known or appear to be friable (i.e. can it be reduced to a powder via crushing by hand)?
   e. Has the immediate release area been evacuated?
   f. Were doors and windows closed upon evacuating the release area?

   Upon receipt of the call, EHS, with the assistance of the CMU work manager or supervisor, will assess and coordinate additional response activities as necessary, including: evacuation of additional areas and/or the entire building, further isolation of the release area, cleanup activities, and re-entry approval.

EHS responsibilities upon receiving an accidental fiber release notification are generally as follows:

1. Gather information regarding the release from the person making the report.
2. Immediately notify EHS personnel overseeing the Asbestos Management Program. Those personnel will complete and/or direct the remaining steps.
3. Notify EHS Director.
4. Determine additional needs to contain fiber spread, such as modification of the HVAC system to restrict air flow to and from the affected area. As necessary, if the HVAC system cannot be modified, the affected area should be completed sealed so that fibers cannot escape from the affected area—any work to seal the space from the inside must be conducted by an approved contractor appropriately trained and/or licensed for the work. HVAC alteration and containment actions should be based on:
   a. The amount of asbestos material impacted;

b. The location of disturbed asbestos material with respect to the air handling system and overall air plenum;
c. Accessibility to the area by building occupants; and,
d. The amount of fibers potentially released (e.g. friable versus non-friable).

5. With assistance from the EHS Director, notify and evacuate, if needed, any occupied areas immediately adjacent to the release area and/or areas that could reasonably been impacted by the fiber release.

   Notification should also be made to the occupants of evacuated spaces. See **Figure 1** for an example e-mail notification that can be sent to department managers for distribution to their personnel.

Figure 1. Building Occupant Notification E-mail Example

Subject Line: [Location of Area(s) Impacted by Fiber Release] Asbestos Disturbance

Dear_____:

Test results have confirmed that asbestos was present in floors XX of XXX Hall. However, preliminary air quality test results throughout XXX Hall have revealed that no asbestos particles were released within the air space of the building. Please note that asbestos is not considered to be harmful unless it is disturbed and that the preliminary air quality results have determined that there was no disturbance. The final report from PSI (the company that performed the testing) is expected to be released late next week. Until this final report is issued declaring

Warner Hall safe to re-enter, the building will remain closed. If laptop computers are needed by staff in order to be able to perform work responsibilities during this time, please let me know. Environmental Health and Safety will be contacted to retrieve only essential computer equipment. Additionally, the Unified Communications Team is currently working to address off-site provisioning of phone capabilities to enable Undergraduate Admission staff to field calls during the holiday break.

XXX will be making arrangements for the asbestos to be abated. Please be assured that the process to abate the asbestos from floors XX-XX will be performed using the highest standards of safety and care. Additional third parties will be brought in to perform air monitoring, cleaning of spaces and replacement of air filters.

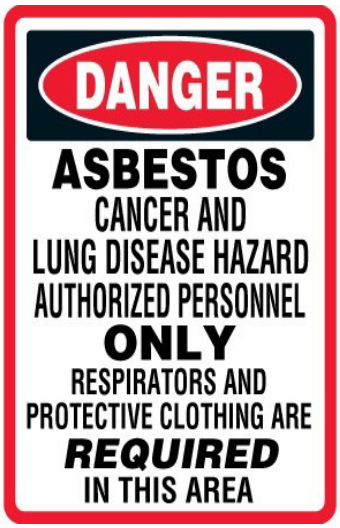
If you should have any discomfort or would like to make any alternate work arrangements once the abatement process begins, please let me know and we will coordinate accordingly.
Thank you for your continued patience, professionalism and resiliency throughout this process.

[Include your signature here.]

6. Post signage, as necessary, surrounding the release area to restrict access and prevent unintended entry by those not involved in response efforts. University Police may be contacted for assistance with heightened security as necessary. Sample signage may be seen in **Figures 2** and **3**.

Figure 2. Access Control Signage

Figure 3. Access Control Signage



7. Update evacuated personnel with information regarding the status of response efforts and when they can expect to be allowed to re-enter their spaces.
   a. During cleanup activities, if building occupants need to obtain critical work materials, coordination may be made with Environmental Risk Management, Disaster Recovery and Business Continuity so items can be safely obtained and alternate work locations can be organized. Depending on the severity of the asbestos disturbance, it may not be appropriate for personal item retrieval until clean-up is completed.
8. Assist work manager to engage approved and aptly trained contractor to clean up affected materials and any additional abatement as appropriate.

   Clearance air sampling should be coordinated by the work manager in accordance with state and federal regulations relevant to the abatement performed and additionally throughout the building as deemed necessary by EHS to confirm satisfactory cleanup.

   Tape-lift or micro-vacuum samples of dust may be required if it is suspected that a major release of fibers was circulated throughout the building to ensure asbestos fibers have not settled in remote locations, thus prompting further cleanup.

9. After clean-up and applicable air sampling confirms satisfactory clean-up, communicate to evacuated building occupants that it is safe to re-enter. All posted signage should be removed.

10. EHS will document activities regarding the event. As applicable, the following should be included:
    a. Date and time of the accidental damage (if known)
    b. Date and time of the report
    c. Name, e-mail, and phone number of person reporting the incident
    d. Location (building name and room number(s))
    e. Type of material disturbed
    f. Identify if the material is friable or non-friable
    g. Reason for the incident
    i. If applicable, did the person causing the damage attend asbestos awareness training within the past year?
    h. Actions taken to prevent the spread of fibers
    i. Areas of building evacuated
    j. Name of abatement contractor used for cleanup and all supporting disposal documentation
    k. Date of clean-up
    l. Air sampling results
    m. Names and contact information of persons who are concerned about possible exposure to asbestos fibers as related to the accidental release.

       Work managers, supervisors, etc. should be contacted to identify other personnel who may have had access to the area and/or may have been present that may not be aware of the release.
       i. CMU employees and paid students must fill out a Supervisor's Injury and Illness form and submit to Human Resources.
       ii. CMU students (unpaid) must fill out applicable sections of the Supervisor's Injury and Illness form and submit to EHS at safety@andrew.cmu.edu.

Reporting potential exposure to airborne asbestos fibers:

After it is confirmed that asbestos material was impacted and you suspect that you were potentially exposed to airborne asbestos fibers, you should report the exposure to your immediate supervisor and EHS. Additionally, you must also complete a Supervisor's Injury/Illness report so that the exposure is documented. Employees should send the form to Human Resources and students should submit to EHS. EHS will supply a copy of incident investigation records as applicable.

Appendix H: Asbestos Management Program Amendment Form

Date of Amendment	Reason for Amendment	Description of Amendment Made (Include page number and section that amendment was made)	Amendment Made By
3/25/24	Annual review	General formatting and update to wording to make more concise.	CG
3/13/25	Annual review	General formatting and update to wording to make more concise and to provide clarity.	CG

Appendix I: Asbestos Assessment Response Actions for Facilities Management and Campus Services (FMCS) Work Categories

	Work Examples	Notification Method	Entity Performing Asbestos Assessment[1]	Turnaround Time Expected for Receipt of Asbestos Assessment Results[2]
Emergency and Urgent Priorities (UPs)	• Opening walls, including plaster and drywall, for emergency piping repairs • Repairs to fireproofing if a result of flooding • Replacement of toilet accessories, urinals, etc. • Newly identified suspect materials found after work initiation	Notify Ron Cunningham and Jennifer Rogers OR Notify EHS via emergency hotline 412-268-8182	Primary: FMCS Back-up: EHS	Same day[3]
Daily Service	• General repairs to holes in plaster, peeling paint, water damage • Installing marker, bulletin, or chalk boards Installing interior and exterior signage	Notify EHS via webform	Primary: EHS Back-up: approved third party[4]	3-7 days
Projects, Preventive Maintenance, and Corrective Maintenance	• HVAC replacements including wall and ceiling mounted • Installation of wall-mounted drinking water fountain • Wiring runs for electrical and data • Cabinetry installations • Roofing replacements • Laboratory upgrades, including cabinetry and countertops • Elevator work, including cab and equipment work	Notify EHS via webform	Primary: EHS Back-up: approved third party[4]	14 days

1 Where FMCS and/or EHS are unable to perform sampling within a work category, an approved third party may be used in their place.

2 Best judgement should be used by the work manager in the event that a work activity's urgency changes and ultimately changes the urgency with which asbestos sampling results would be needed—e.g. if a daily service project turns into a UP, if a UP turns into a project, etc. Changes in urgency should be communicated as soon as possible to the sampling entity.

3 Samples must be delivered to lab by 11AM the day results are needed in order for results to be received that same day. Lab hours are Monday-Friday 8AM-5PM, but samples may be placed into the lab's drop-box at any time; however, will not be processed until open, business hours.

4 EHS will determine on a case-by-case basis when third-party assessment is necessary and will be based on EHS availability to sample and overall size, scope, and complexity of work. Contact EHS at safety@andrew.cmu.edu for a listing of approved contractors.

Appendix J: Red, Yellow, Green Building List

Building Name	Color Code[1]	PACM[2] Present?	Year Built	Additional Comments
203 South Craig				
205 South Craig				
211 South Craig				
300 South Craig		Yes	1935	
319 South Craig				
407 South Craig				
417 South Craig				
485 South Neville Garage		No	2020	
4570 Fifth (Rand Building)				
4609 Winthrop				
4616 Henry Street				
4618 Henry Street				
4620 Henry Street				
4700 Fifth				
4705 Fifth				
4721 Fifth				
4735 Fifth				
477 Melwood		Yes	1930s	
5170 Margaret Morrison Street (Spirit House)				
6555 Penn. Ave.				
Alumni House (5017 Forbes)				
ANSYS		No	2018-2019	
Baker Hall		Yes	1914	Plaster is known to be TACM in many areas; possibility for ACM plaster.
Bakery Square (leased?)				
Boss House		Yes	1915-1918	
Bramer House				
Clyde House (624 Clyde Street)				

		No	1996	A building-wide assessment was completed for most accessible materials in April 2023. A listing of materials is provided below that do NOT require further sampling for asbestos content. Please reach out to EHS if your project will impact materials other than what is listed below.
Cohon University Center (CUC)				Drywall and joint compound on the lower level and floors 1-2 are negative for asbestos.
				2'x4' pinholes ceiling tiles throughout building are negative for asbestos.
				2'x2' pinholes and valley ceiling tiles throughout are negative for asbestos.
				Grey fireproofing throughout on ceilings and support structures are negative for asbestos.
Collaborative Innovation Center (CIC)		No	2005	
College of Fine Arts Building		Yes	1912, 1916	Plaster is known to be TACM in most areas.
Cyert Hall		No	1983	
Dithridge Street Garage				
Doherty Hall		Yes	1908 (addition in 1950)	Plaster is known to be TACM; plaster is ACM in certain areas
Donner House		Yes	1954	
East Campus Garage and Gesling Stadium		No	1990	
FMCS Building		No	1988	
Forbes Beeler				
Gates and Hillman Center		No	2009	

GATF (4615 Forbes)		Yes	1966	
Greek Quad (lower)		Yes	1960	
Greek Quad (upper)		Yes	1970	
Hall of Arts (formerly GSIA)		Yes	1952	
Hamburg Hall		Yes	1915	A building-wide assessment was completed for most accessible materials in February 2024. A listing of materials is provided below that do NOT require further sampling for asbestos content. Please reach out to EHS if your project will impact materials other than what is listed below.
				Drywall and joint compound throughout floors A-3 are negative for asbestos.
				Skim coat and base coat plasters on floors A-3 are negative for asbestos.
				2'x2' pins and valleys drop-panel ceiling tile throughout building is negative for asbestos.
				White terrazzo floor, floor A hallway is negative for asbestos.
Hamerschlag Hall		Yes	1913	TACM plaster in most areas; possibility for ACM plaster.
Hamerschlag House		Yes	1960	
Henderson House		Yes	1915-1918	
Highlands Apartments (618 Clyde Street)				
Hunt Library		Yes	1961	
III (4612 Forbes)				
INI (4616 Forbes)		No	1985	

Landscape Support Facility (535 South Neville)				
Margaret Morrison Apartments		No	1984	
Margaret Morrison and Carnegie Hall		Yes	1907	Plaster is known to be TACM in most areas; possibility for ACM plaster.
Margaret Morrison and Carnegie Hall Intelligent Workplace Addition		No	1997	
Margaret Morrison Plaza		No	1982	
McGill House		Yes	1915-1918	
Mellon Institute		Yes	1931	
Mill 19				
Morewood Gardens		Yes	1927	
Morewood Gardens E-Tower		Yes	1962	
Mudge House		Yes	1922	
National Robotics Engineering Center (NREC)				
Neville Apartments				
Newell Simon Hall		No	2001	A building-wide assessment was completed for most accessible materials in September 2023. A listing of materials is provided below that do NOT require further sampling for asbestos content. Please reach out to EHS if your project will impact materials other than what is listed below.
				Drywall and associated joint compound throughout floors A-4 are negative for asbestos.
				Grey fireproofing found on floors A-3 is negative for asbestos.
Pittsburgh Technology Center (PTC)		No	1995	

Porter Hall		Yes	1906	Plaster is known to be TACM in most areas; potential for ACM plaster.
Posner Center/Hall		No	2000-2004	
Purnell Center for the Arts		No	1999	A building-wide assessment was completed for most accessible materials in January 2025. A listing of materials is provided below that do NOT require further sampling for asbestos content. Please reach out to EHS if your project will impact materials other than what is listed below.
				Drywall and joint compound on floors A-3 are negative for asbestos.
				White and grey fireproofings throughout building are negative for asbestos.
				2'x2' pinholes and ridges ceiling tiles throughout building are negative for asbestos.
Rand Building (4570 Fifth)				
Residence on Fifth		No	1986	
Resnik		No	1990	
Roberts Hall		No	1996	A building-wide assessment was completed for most accessible materials in August 2022. A listing of materials is provided below that do NOT require further sampling for asbestos content. Please reach out to EHS if your project will impact materials other than what is listed below.

				Drywall and joint compound on floors 1-4 are negative for asbestos.
				12"x12" red floor tile and associated black mastic on floors 1-3 are negative for asbestos.
				Fireproofing on 4th floor is negative for asbestos.
Roselawn Terrace Apartments		Yes	1925	
Scaife Hall			2021-2022	Old Scaife demolished 2021
Scobell House		Yes	1915-1918	
Scott Hall		No	2016	
Skibo Gymnasium		Yes	1924-1932	Demolished 2021
Smith Hall		Yes	1939	
Software Engineering Institute (SEI)		No	1987	
Stever House		No	2003	
Tartans Pavillion		No	2007	
TCS Hall		No	2020	
Tepper Quad		No	2018	
University Technology Development Center (4516 Henry Street)				
Warner Hall		Yes	1966	
Wean Hall		Yes	1971	
Welch		Yes	1915-1918	
West Wing		No	1990	
Woodlawn Apartments				
WQED (4802 Fifth)		Yes	1960's?	

[1] All buildings that are listed as Red or Yellow must be assessed for asbestos prior to commencing work and all buildings that are listed as Green do not need assessed for asbestos prior to commencing work.
Red= high likelihood of encountering asbestos materials
Yellow= moderate likelihood of encountering asbestos materials
Green= no risk of encountering asbestos materials

[2] Thermal systems insulation and surfacing materials (e.g. plaster) in buildings constructed on or before 1980 must be presumed to be asbestos containing material until appropriately sampled.

Appendix K: Work Manager Quick Guide to Assessing Presence of Asbestos Materials

This quick guide was created to assist CMU work managers with assessing the presence of suspect asbestos materials (asbestos containing materials, presumed asbestos containing materials, and trace asbestos containing materials) prior to performing renovation, maintenance, or other work that will physically impact building materials, to help managing asbestos-related work, and to supplement information found in the EHS Asbestos Management Program (AMP).

Due to variability between work activities, all information needed for an individual project may not be included in this document to ensure succinctness. Certain exceptions to the outlined process will apply for emergencies—contact EHS for additional guidance.

Please reference the Asbestos Management Program for full details and contact EHS at safety@andrew.cmu.edu or 412-268-8182 for additional guidance.

1. **Receive request for work.**

2. **Use "Red, yellow, green building list" to determine if work will require an asbestos assessment.**

   - If building is listed as green, no asbestos assessment is necessary. Work may proceed.
   - If building is listed as red or yellow:

     Contact EHS using the webform. You may also submit a request to safety@andrew.cmu.edu including the below-listed information; however, using the webform is preferred. EHS will perform a records review and advise of asbestos assessment needs.

     1. Name and contact information for CMU work manager
     2. Work location—this should include building name, room number, and any other relevant locational identifiers
     3. Work order number or other project number (if applicable)
     4. Summary of scope of work/project specifications—this may include a listing of building materials that will be impacted by the work (e.g. drywall, plaster, pipe insulation, etc.), a description of the work to occur (flooring replacement, window replacement, wall demo, repair to water-damaged ceiling, etc.) and project drawings or marked-up floorplans

5. Anticipated start and end dates of work
6. Contact information for space occupant, if applicable
7. *Requested* date for receipt of assessment summary
8. FMCS only—identify if work is emergency/urgent priority, daily service, or project/preventive maintenance/corrective maintenance
9. FMCS only—name of FMCS building inspector performing assessment, if applicable
10. Attach any additional photos, project drawings, etc.

To prevent delays to schedules, work notification must be submitted to EHS as soon as possible in advance of work initiation or at the beginning or work planning, whichever is sooner. It is highly suggested to send notification as early as possible to allow ample time for scheduling subsequent bulk sampling by EHS, FMCS or an approved third-party contractor.

EHS will provide the work manager with any relevant historical records and identify what entity should perform the asbestos assessment. EHS will perform asbestos assessments for small and some mid-sized work activities based on availability in addition to scope and complexity of the work. Work that is complex or large in scope will most often need assessed by an approved third party. FMCS only—FMCS personnel who are licensed asbestos building inspectors may perform asbestos assessments for work that is categorized as emergency/urgent priority or daily service.

3. Oversee asbestos assessment activities.

The work manager is responsible for coordinating and managing asbestos assessment activities. All materials that will be impacted within the scope of work must be included in the assessment.

Please also consider the following:

- **It is not the responsibility of the work manager to identify suspect asbestos materials that require sampling within a work area**. The work manager must provide the asbestos building inspector, whether in-house or third-party, with the entire scope of work and project specifications so that they can make the determination of what materials require sampling. This will ensure lesser-known suspect materials, such as caulking, joint compound, roofing materials, etc., are not overlooked. Historical records provided by EHS should also be provided to the building inspector to aid in their inspection.
- Even though certain areas may have previously undergone renovation and abatement, e.g. flooring replacement that required asbestos abatement, please consider the

possibility that additional asbestos materials may be located behind walls, above ceilings, etc. if the previous scope of work did not include this kind of activity. Additionally, in areas where TACM plaster is present, it is likely that all the TACM plaster was not completely removed.

- Asbestos bulk sampling does not always include sampling of materials located behind immovable structures, such as walls. Consideration should be made for the benefits of such sampling to the proposed work. Access to certain materials may require surface repairing after the inspection is completed based on space occupancy, work start date, etc. Any such work should be coordinated by the work manager with the asbestos building inspector for sampling and general contractor for access and repairs.
- Some sampling activities, such as the collection of bulk samples of roofing materials or high-temperature pipes, may require assistance by a trade-specific contractor to prevent negative impact to a building or its occupants, maintain item's warranty, etc. The trade-specific contractor must be contracted and coordinated by the work manager to complete bulk sampling under the oversight of the asbestos building inspector and/or make repairs to the sampled material(s).
- All plaster samples collected at the university must be point counted when there is a positive result from the PLM bulk analysis. Positive plaster samples are most likely to be found in the following buildings: Baker and Porter Halls, Doherty Hall, College of Fine Arts building, Hamerschlag Hall and Margaret Morrison and Carnegie Hall.

4. Review results and recommendations of asbestos assessment.

When EHS performs the asbestos assessment, EHS will send a summary to the work manager with an interpretation of the results and recommended response actions. When assessments are conducted by third parties, their summary report must be forwarded to EHS for review—see below for report requirements based on size/scope of work activities.
For all assessments (see exception below for small assessments), the following information, where applicable, should be provided to EHS:

- Summary of the assessment, e.g. scope of assessment work, building information, and inspection and sampling methodology
- Photographs of any uncommon materials—all photos should be labeled with a description
- Summary of samples and associated laboratory results. Summary must include, at a minimum, a description of each homogeneous area (estimated quantity and material

description), sample IDs associated with each homogeneous area, sample results, a listing of any materials assumed to be asbestos containing, listing of locations that were inaccessible or not able to be sampled and maps of sampling locations.

- Copies of lab reports, chains of custody and sample log forms/onsite notes.
- Recommendations based on results.

Exception to the above reporting requirements may be made for certain small work activities where only 2-3 homogeneous areas of materials are assessed—e.g. one section of pipe insulation that needs sampled for pipe repair, floor tiling and mastic that needs sampled in a small closet, or one plaster wall that needs sampled due to water damage. For such assessment work, the third party[1] must supply the following to EHS:

- Copies of lab reports, chains of custody and any sample log forms/onsite notes
- Summary of samples and associated laboratory results. Summary must minimally include:
    - a description of each homogeneous area (estimated quantity and material description) and sample IDs associated with each homogeneous area
    - Map of sampling locations

5. Response actions based on assessment results and recommendations

- All sample results identify no ACM and/ or TACM
    - Renovation, maintenance, or other work may proceed.
        - Contractors should be aware of the potential for new, suspect materials to be uncovered during work. See step 14 for procedures for handling newly found materials.
- Sample results identify ACM and/or TACM.
    - Prior to commencing work that will impact ACM and/or TACM, appropriate abatement activities must commence. Proceed to step 6.

6. Select approved contractor for abatement.

The work manager is responsible for selecting an abatement contractor to perform asbestos abatement activities. A contractor with appropriate-level training/certifications/licensing and approval by EHS must be selected to perform any type of asbestos abatement work, including cleanup of asbestos debris. Contact EHS for a listing of approved contractors.

[1] The work manager may assist with supplying the last two bullet-point items but must be present during assessment to ensure accuracy.

Please note that contractors selected to perform TACM work must have an EHS-approved TACM program and must additionally submit a site-specific plan at least 48 hours prior to commencing TACM work. See Contractor TACM Quick Guide of the AMP for additional details.

Table 1 below summarizes entities able to perform work on asbestos materials.

Table 1. Entities Permitted[1] to Perform Asbestos Work	
Type of Asbestos Material Impacted	**Entities**
ACM (i.e. materials containing >1% asbestos), including PACM and other assumed asbestos materials	• Licensed asbestos abatement contractors
TACM (i.e. materials containing >0% and ≤1% asbestos)	• Contractors with TACM program • Licensed asbestos abatement contractors • Trained FMCS personnel (<160sf of material only)[2]

Project documentation requirements for abatement contractors can be found in Checklists #1-#4 at the end of this document. This information should be provided to abatement contractors during the bidding process.

7. Determine need for project monitoring.

Project monitoring oversight may include: abatement planning and specification, visual inspections of abatement containment and abatement work, project specification monitoring, regulatory coordination, air sampling outside of the abatement containment collected throughout the project's duration and clearance air sampling. Based on the scope and complexity of an abatement project, in addition to the type of asbestos material being abated, more or less involvement by the project monitor will be required as determined by EHS.

See **Table 2** below for abatement work that requires project monitoring air samples. The project monitoring contractor must be independent of the abatement contractor and hired by the CMU work manager. Typically, the contractor performing clearance air sampling can also fulfill project monitoring needs.
Project monitoring air samples must be collected 10 feet away from the containment area or abatement work. At least one of the required air samples must be collected during clearance air sampling and the remainder collected while abatement activities are occurring. Air

[1] Before performing work on campus for the first time, all contractors performing asbestos work must be approved by EHS and will be required to submit documentation related to licensing, training, and overall competency to perform asbestos work. Any such contractors should contact EHS via safety@andrew.cmu.edu for approval.
[2] FMCS personnel only perform TACM work for FMCS-related work activities

sampling must be performed in accordance with NIOSH Method 7400.

Abatement work that is emergency in nature and that must be completed within 24 hours may be exempted from third-party project monitoring to ensure quick abatement action to protect employee and occupant health, building integrity, assets, etc. Notification should be made as soon as possible to EHS at the **EHS Emergency Hotline 412-268-8182** for guidance.

Table 2. Abatement Work that Requires Third-Party Project Monitoring

Amount of Material Impacted	Materials are Friable[1]	Materials are Non-friable
<160sf or <260 linear feet of ACM and/or PACM	Project monitoring may be required if the work is in an occupied or otherwise sensitive area, as determined by EHS.	None typically required, but may be otherwise determined by EHS.
≥160sf or ≥260 linear feet of ACM and/or PACM	Project monitoring is required. Number of air samples will be based on size, scope, and duration of the work.	Project monitoring if sensitive area, as determined by EHS or if abatement quantity is more than 500sf.
Any amount of TACM	Project monitoring required if sensitive area, as determined by EHS, or if abatement quantity is more than 500sf.	Not required.

8. Determine needs for permitting.

Table 3 below identifies asbestos work that requires a permit and/or notification to the Allegheny County Health Department (ACHD). The work manager should coordinate with their selected contractor to complete permits and notifications as required. All permit applications must be sent to EHS for signature.

Table 3. Permitting Requirements

Amount of Material Impacted	Notification and Permitting Requirements
<160sf or <260 linear feet of ACM and/or PACM	If the selected abatement contractor does NOT hold an O&M permit for the university, a notification must be sent to ACHD and there will be a 10-working-day waiting period before abatement work may commence.

[1] This includes materials that will become friable upon abatement.

	By utilizing an asbestos abatement contractor that holds an ACHD operations and maintenance (O&M) permit for the university, the notification and 10-working-day waiting period is waived. Abatement work may commence as soon as needed.
≥160sf or ≥260 linear feet of ACM and/or PACM	ACHD permit fee and notification required. 10-working-day wait period applies before abatement may begin.
Any amount of TACM	EHS permit/approval required. At least 48 hours prior to commencing work, contractor must submit site-specific work plans. See Contractor TACM Quick Guide for site-specific work plan requirements.

9. Determine clearance air sampling needs.

Many asbestos abatement projects will require clearance air sampling to determine that safe airborne asbestos concentrations are present within the abatement area prior to re-occupancy. **Table 4** below outlines clearance air sampling requirements.

Clearance air samples must always be conducted by a contractor independent of the asbestos abatement contractor and hired by the work manager. It is the responsibility of the work manager to contract with an approved, contractor to perform this air sampling. Typically, the contractor performing project monitoring air sampling (if required for your project) can also fulfill project monitoring needs.

Table 4. Clearance Air Sampling Requirements for Asbestos Materials

Amount of Material Impacted	**Friable[1] Material Abatement**	**Non-friable Material Abatement**
<160sf or <260 linear feet ACM and/or PACM	At least three clearance samples if area is more than 20 linear feet or 20sf; otherwise, use contractor's personals as clearance.	Use contractor's personal air samples as clearance test.
≥160sf or ≥260 linear feet ACM and/or PACM	Five clearance samples per the first 5,000sf plus one sample per each additional 5,000 sf OR one sample of air per room required by ACHD.	Five clearance samples per the first 5,000sf plus one sample per each additional 5,000sf OR one sample of air per room required by ACHD.

[1] This includes materials that will become friable during abatement.

>100sf or >100 linear feet TACM	At least three clearance air samples. More air samples may be required as determined by EHS based on size, scope, and complexity of work.	None typically required.

10. Proceed with asbestos abatement activities.

All asbestos abatement activity will be coordinated by the work manager. It is their responsibility to develop the scope of work, facilitate its proper completion and to ensure compliance with regulatory and EHS requirements—EHS will provide guidance as needed. EHS must be updated as the work progresses, including when it is completed.

All asbestos abatement activities must occur prior to any renovation, maintenance, or demolition work that will disturb the asbestos materials, including if there is a reasonable potential for the material to be disturbed. Removal of TACM prior to demolition may be required—EHS will make this determination on a case-by-base basis.

Please note that it is prohibited to cover asbestos materials that are within the scope of work—e.g. asbestos-containing floor tiling may not be covered with carpeting and asbestos-containing pipe insulation may not be sealed behind walls—they must first be appropriately abated.

11. *ACHD-permitted work only*—ACHD inspection of abatement worksite.

All ACHD-permitted projects (i.e. work that impacts ≥160sf or ≥260 linear feet of ACM and/or PACM) must been inspected by ACHD prior to removing containment associated with the abatement in addition to re-occupancy of the space. The abatement contractor must schedule the inspection AFTER clearance air sampling has been successfully completed and the worksite has been cleared of all asbestos-containing waste and visible residue within the work area.

Once the inspection has been completed, the ACHD inspector will provide a "Final Clearance Inspection" form granting or denying final clearance. If denied, the inspector will cite deficiencies that need corrected before a follow-up inspection is scheduled.

12. Supply EHS with asbestos abatement documentation.

It is the responsibility of the work manager to ensure the documentation outlined below is supplied to EHS by the contractor at the completion of abatement activities. Checklists are

provided at the end of this quick guide that should be supplied to the abatement contractor. The abatement contractor should complete and submit the checklist and submit it along with the listed documentation.

Abatement Contractor's Report for ACHD-Permitted Work (≥160sf or 260 linear feet of ACM)

- A copy of the ACHD clearance inspection form.
- A copy of the signed, landfill waste-manifest for all waste generated from the project.
- A copy of the ACHD permit under which the work occurred, including any amendments made to the original permit.
- A copy of all personal air monitoring results, log-in sheets and work-progress forms used during the project.
- Locations and quantities of any known, remaining asbestos materials within the project's scope of work.
- A written description of any unusual issues or problems related to the project, if applicable.
- Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional)

Abatement Contractor's Report for O&M Work and Work Involving <160sf or 260 linear feet of ACM

- A copy of the signed, landfill waste-manifest for all waste generated from the project.
- A copy of all personal air monitoring results, containment log-in sheets, and work-progress forms used during the project.
- Locations and quantities of any known, remaining asbestos materials within the project's scope of work.
- Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc.
- A written description of any unusual issues or problems related to the project.
- For work not performed under an O&M permit, a copy of signed ACHD notification
- Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional)

Contractor's Report for TACM Work

The following documentation is required for work disturbing >100sf or 100 linear feet of TACM.

- A written description of the work performed (i.e. exact description of where wall penetrations were made, what walls were removed, etc.). Drawings/sketches may be utilized for additional illustration.
- Identification of any unusual issues or problems related to the project.
- Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional).

The following documentation is required for work disturbing ≤100sf or 100 linear feet of TACM (this information may be generated by the work manager in lieu of the contractor).

- A written description of the work performed—i.e. exact description of where wall penetrations were made. Drawings/sketches may be utilized for additional illustration.
- Identification of any unusual issues or problems related to the work.
- Any other documents or materials produced by the contractor or work manager, such as on-site photographs, project drawings, notes, etc. (optional).

Air-Sampling Contractor's/Project Monitor's Report

- All air monitoring results from area/project monitoring and final clearance samples.
- Maps of air sampling locations.
- Copies of any log forms, checklists and work-progress forms completed by the consultant during the project.
- A written description of any unusual issues or problems related to the project.

13. Proceed with renovation, maintenance, or other work activities.

Once all asbestos materials that will be impacted by a project have been abated and all applicable clearance air sampling and ACHD inspections have been completed, the renovation, maintenance or other work may proceed. If the scope of work changes, EHS should be contacted as soon as possible to determine if additional asbestos assessment is necessary.

If new materials are discovered that weren't included in the initial assessment (e.g. pipe insulation behind walls), see step 14.

14. Reporting and handling of newly identified suspect asbestos material after work initiation.

Although thorough asbestos assessments are conducted prior to renovation, maintenance, and other work, some materials are not always identified due to their inaccessibility at the time of assessment. This will predominately include materials located behind walls or other immoveable structures. Additionally, new materials may be encountered if the scope of work changes. When such new materials are identified, it is important that information be reported to the appropriate parties within a timely manner to ensure both awareness and unintended disturbance.

- Personnel who find new, suspect asbestos materials must notify their supervisor and the CMU work manager within two hours of the discovery, reporting the material identified, its location and estimated quantity.
- CMU work managers must communicate all information provided from reports of newly found asbestos materials to the rest of the contractors or employees working at the site (this may be achieved by notifying the prime contractor who can, in turn, notify their sub-contractors) and EHS within 24 hours of the discovery. As needed, EHS or a third party should collect samples of the material to determine asbestos content; otherwise, the material must be assumed to be ACM.

If newly found materials were damaged during discovery, the Accidental Fiber Release Procedure found in Appendix G of the Asbestos Management Program should be followed.

Checklist #1: Abatement Contractor's Report for ACHD-Permitted Work (≥160sf or 260 linear feet of ACM)

This checklist should be completed and submitted by the contractor along with the documentation listed below.

Required documentation:

- ☐ A copy of the ACHD clearance inspection form(s).
- ☐ A copy of the signed, landfill waste-manifest for all waste generated from the project.
- ☐ A copy of the ACHD permit under which the work occurred, including any amendments made to the original permit.
- ☐ A copy of all personal air monitoring results, containment log-in sheets, and work-progress forms used during the project.
- ☐ Locations and quantities of any known, remaining asbestos materials within the project's scope of work.
- ☐ A written description of any unusual issues or problems related to the project, if applicable.

Additional documentation (optional):

- ☐ Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc.

Checklist #2: Abatement Contractor's Report for O&M Work and Work Involving <160 sf or 260 linear feet of ACM

This checklist should be completed and submitted by the contractor along with the documentation listed below.

Required documentation:

- ☐ A copy of the signed, landfill waste-manifest for all waste generated from the project.
- ☐ A copy of all personal air monitoring results, containment log-in sheets, and work-progress forms used during the project.
- ☐ Locations and estimated quantities of any known remaining asbestos materials within the project's scope of work.
- ☐ For work not performed under an O&M permit, a copy of signed ACHD Asbestos Abatement and Demolition/Renovation Notification Form.
- ☐ A written description of any unusual issues or problems related to the project, if applicable.

Additional documentation (optional):

- ☐ Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc.

Checklist #3: Contractor's Report for TACM Work

This checklist should be completed and submitted by the contractor or work manager, where noted, along with the documentation listed below based on size of TACM disturbance.

Required documentation for work disturbing >100 sf or 100 linear feet of TACM:

- ☐ If different from the information from the information supplied in the permit: a written description of the work performed (i.e. exact description of where wall penetrations were made, what walls were removed, etc.). Drawings/sketches may be utilized for additional illustration.
- ☐ Identification of any unusual issues or problems related to the project.
- ☐ Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional).

Required documentation for work disturbing ≤100 sf or 100 linear feet of TACM (this information may be generated by the work manager in lieu of the contractor):

- ☐ If different from the information from the information supplied in the permit: a written description of the work performed—i.e. exact description of where wall penetrations were made. Drawings/sketches may be utilized for additional illustration.
- ☐ Identification of any unusual issues or problems related to the work.
- ☐ Any other documents or materials produced by the contractor or work manager, such as on-site photographs, project drawings, notes, etc. (optional).

Checklist #4: Air Sampling Contractor's/Project Monitor's Report

This checklist should be completed and submitted by the contractor along with the documentation listed below.

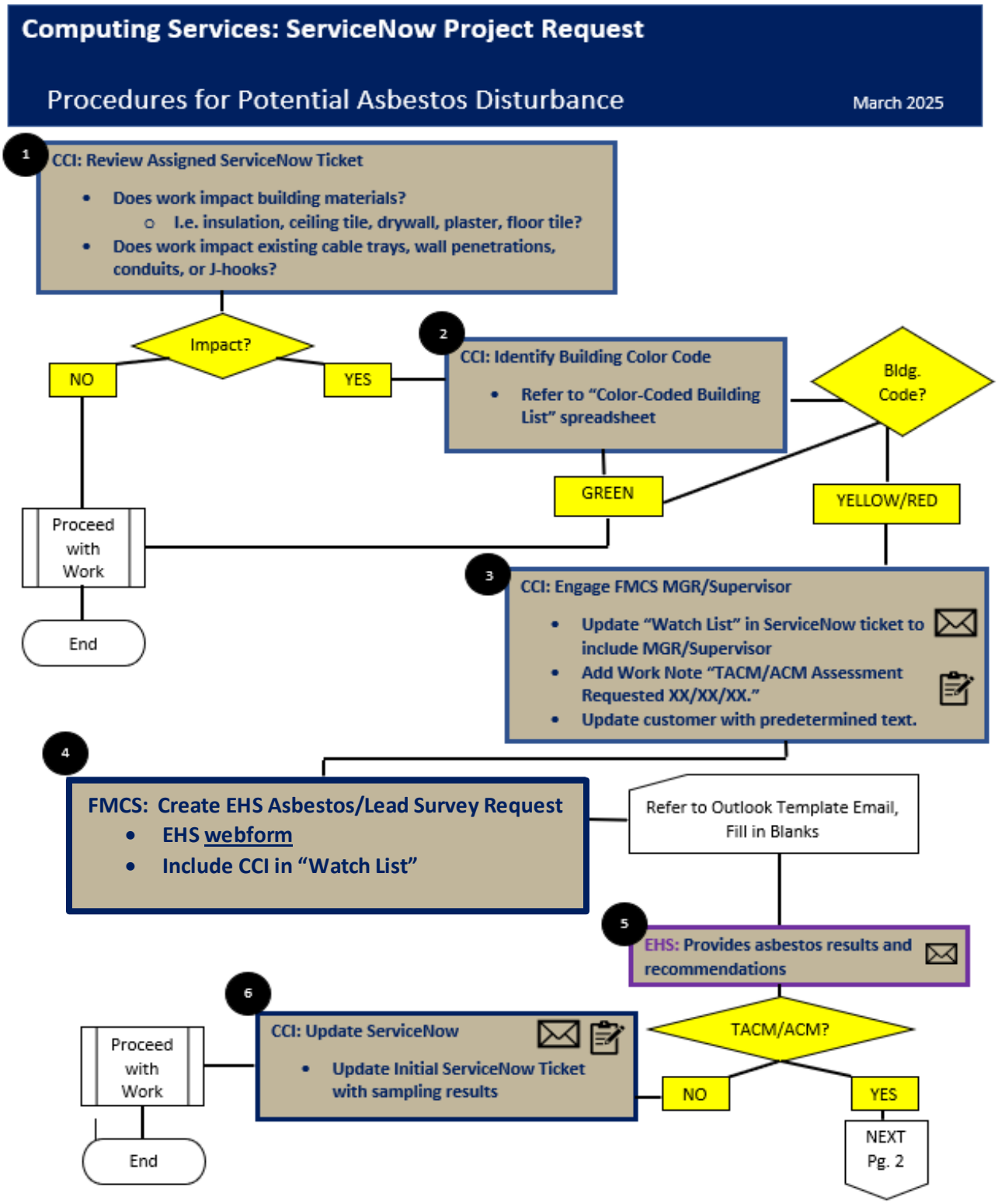
Required documentation:

- ☐ All air monitoring results from area/project monitoring and final clearance samples.
- ☐ Maps of air sampling locations.
- ☐ Copies of any log forms, checklists, and work-progress forms completed by the consultant during the project.
- ☐ A written description of any unusual issues or problems related to the project.

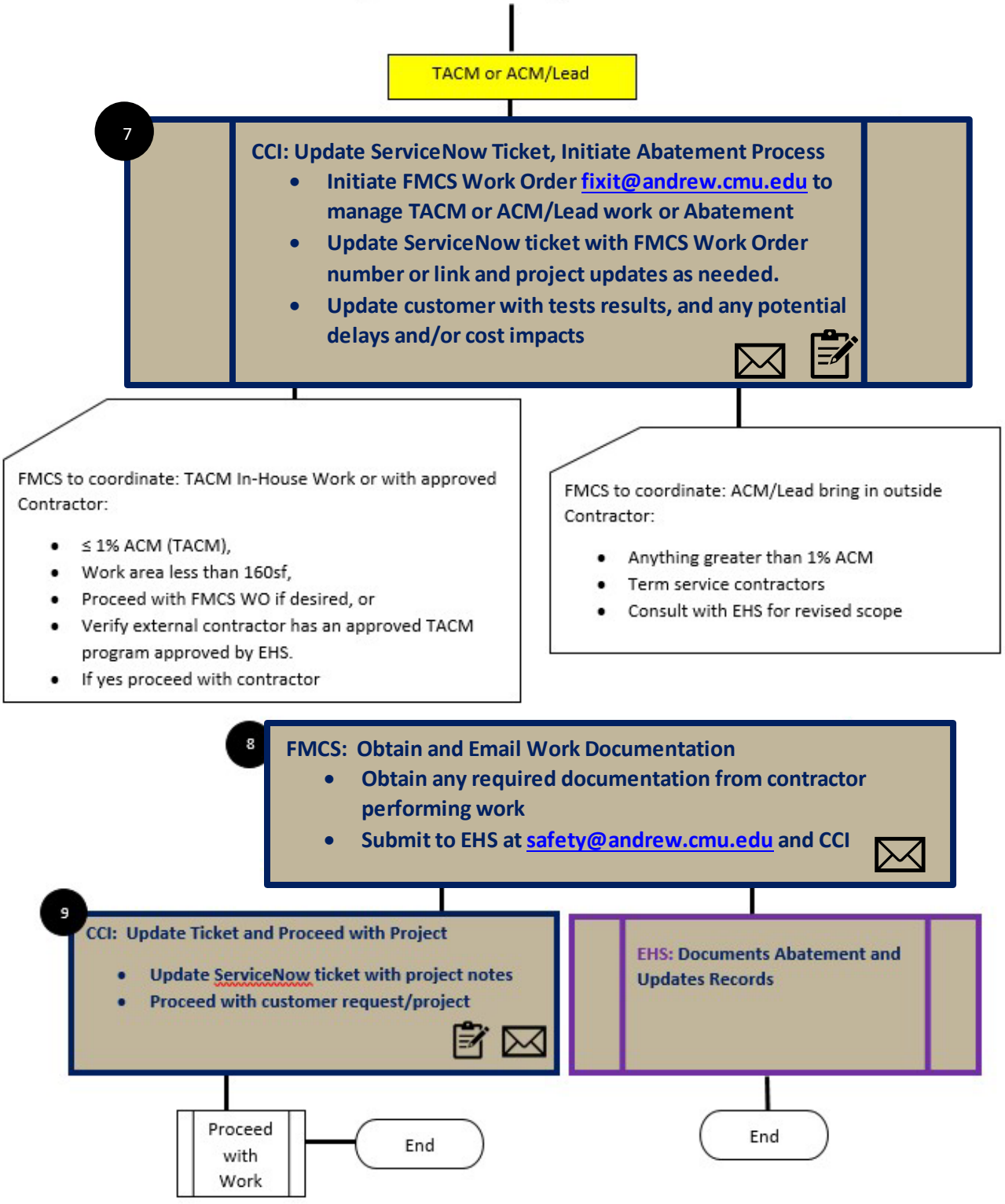
Additional documentation (optional):

- ☐ Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc.

Appendix L: Building Disturbance (TACM or AMC) Computing Services Work Flow



Work Order Process: Daily Service & Project - Continued

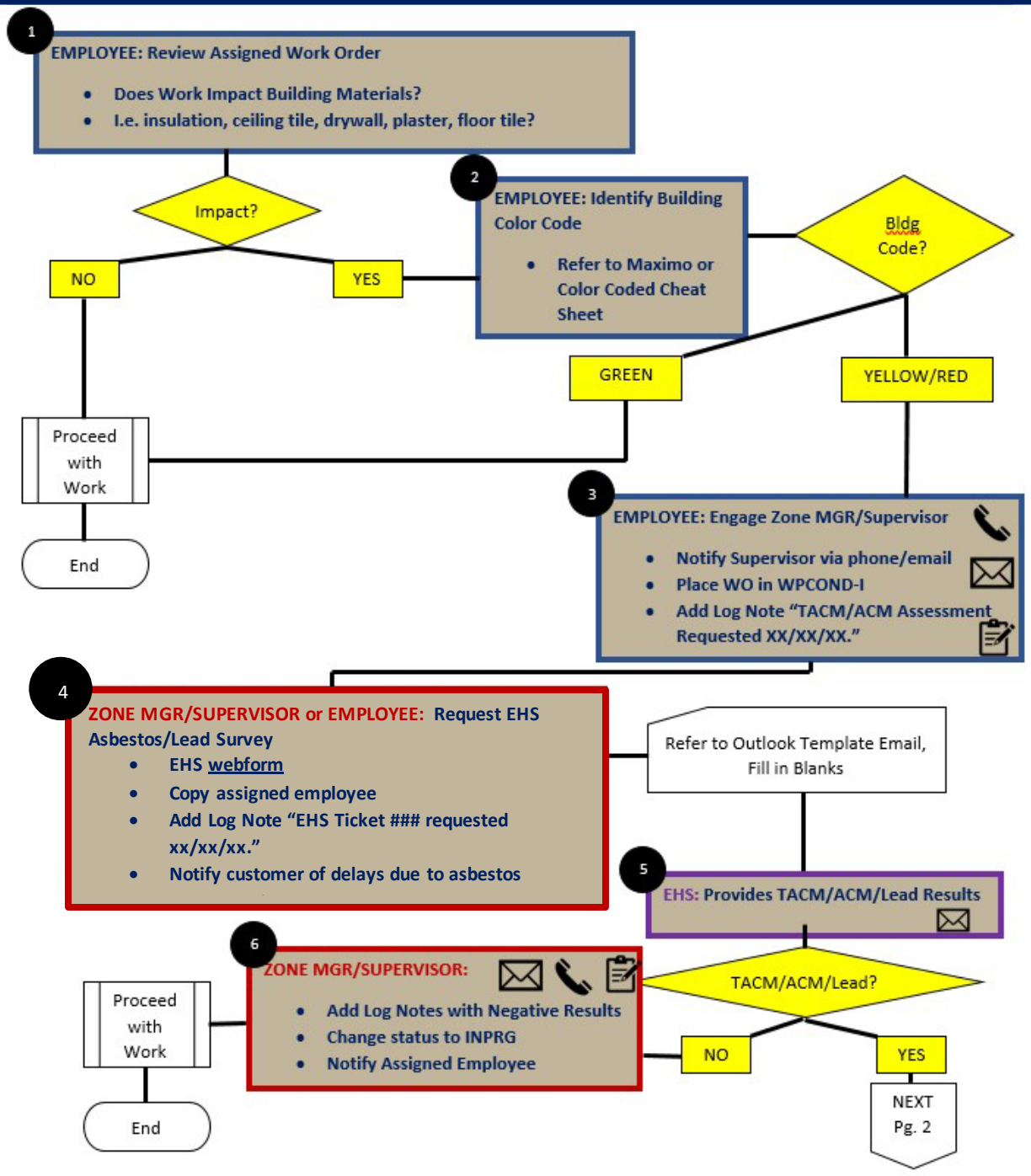


Appendix M: FMCS Daily Service/Preventative Maintenance Work Flow

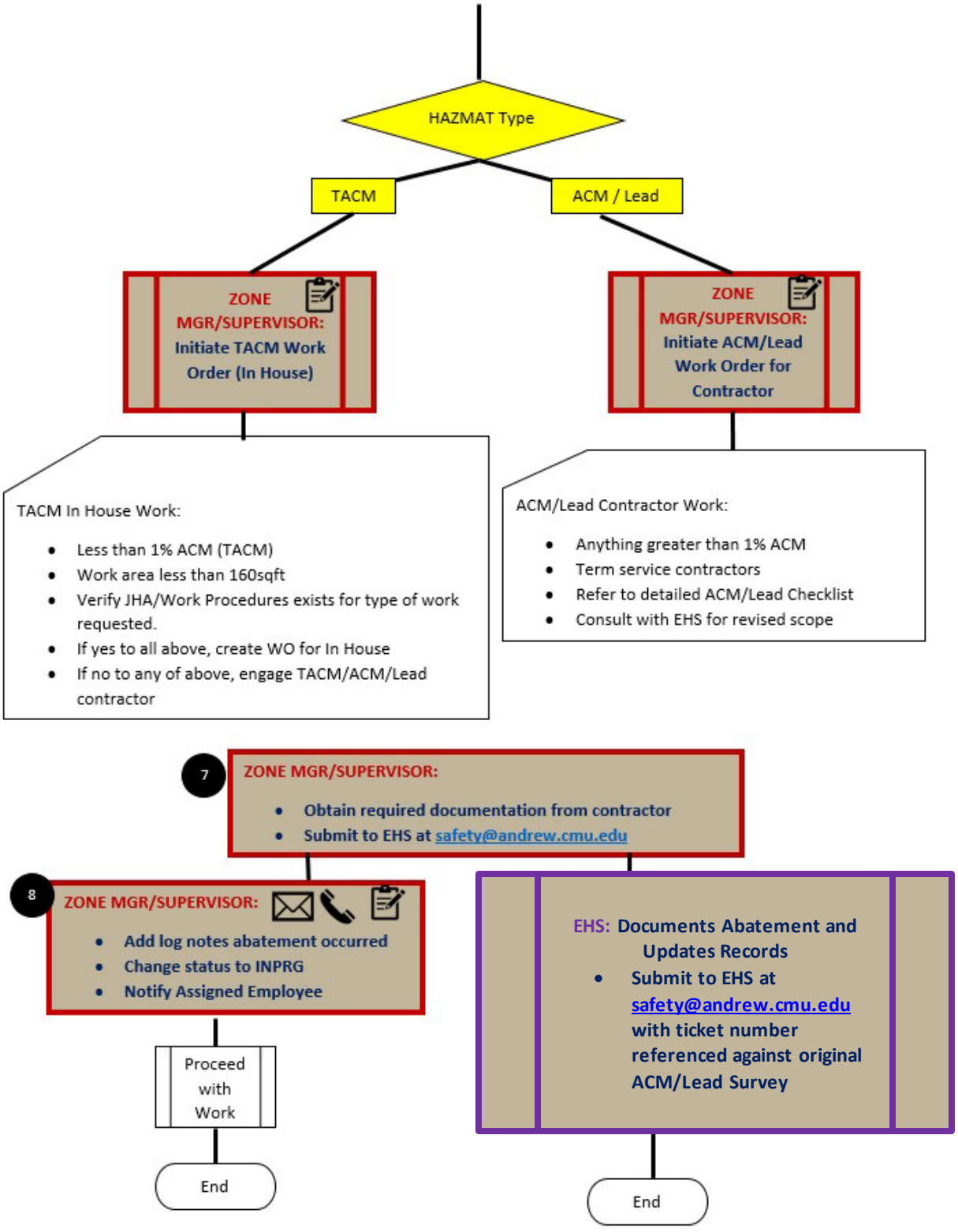
Work Order Process: Daily Service & Project
Procedures for Potential TACM/ACM Disturbance

For HVAC, EL, LB, PL, SF, MS, PT, and other trades

March 2025

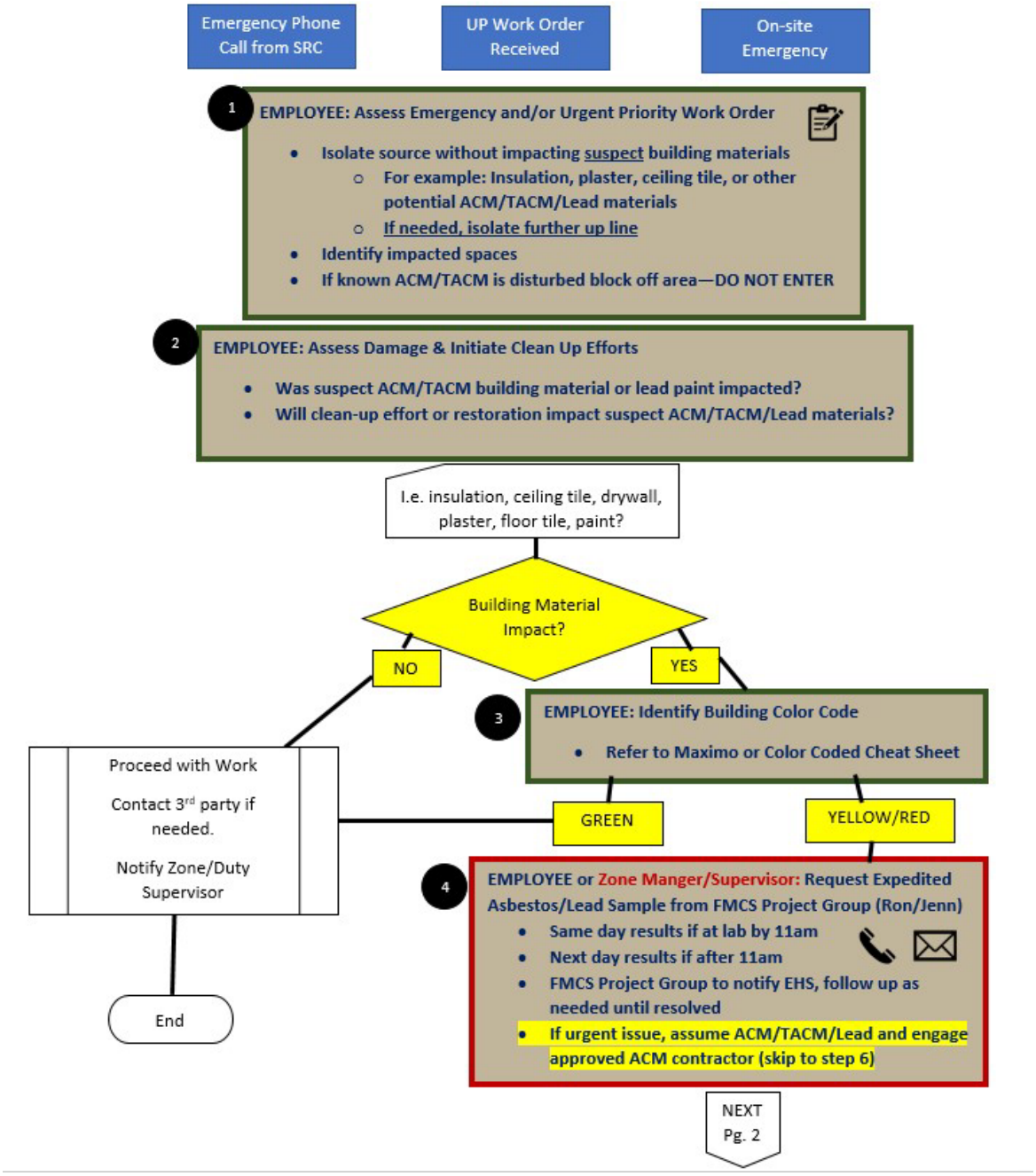


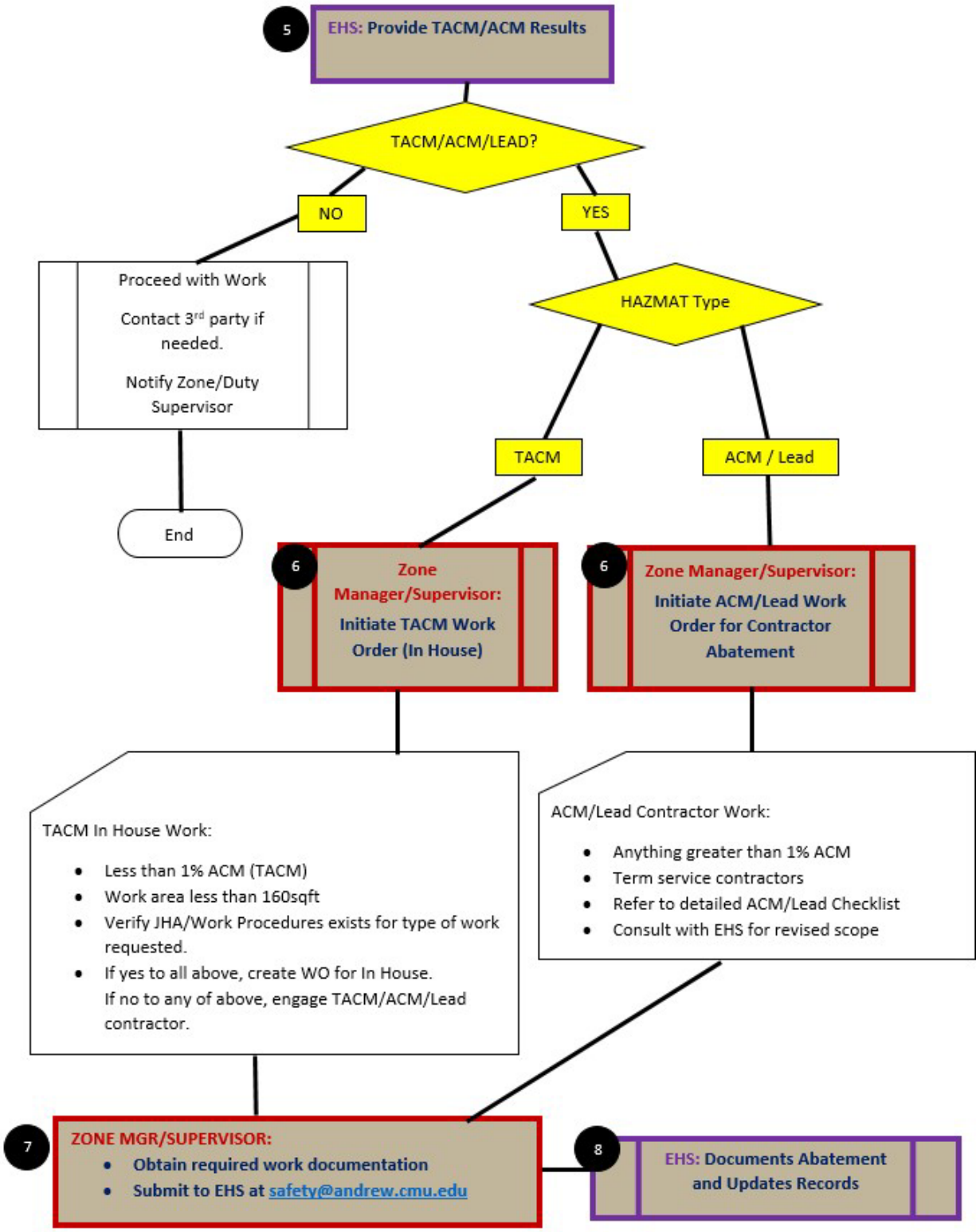
Work Order Process: Daily Service & Project - Continued



Appendix N: FMCS Emergency/Urgent Priority Work Flow

Work Order Process: UP & Emergency Response
Procedures for Potential TACM/ACM Disturbance
March 2025




5
EHS: Provide TACM/ACM Results
TACM/ACM/LEAD?
NO
YES
Proceed with Work
Contact 3rd party if needed.
Notify Zone/Duty Supervisor
End
HAZMAT Type
TACM
ACM / Lead
6
Zone Manager/Supervisor: Initiate TACM Work Order (In House)
6
Zone Manager/Supervisor: Initiate ACM/Lead Work Order for Contractor Abatement
TACM In House Work:
Less than 1% ACM (TACM)
Work area less than 160sqft
Verify JHA/Work Procedures exists for type of work requested.
If yes to all above, create WO for In House.
If no to any of above, engage TACM/ACM/Lead contractor.
ACM/Lead Contractor Work:
Anything greater than 1% ACM
Term service contractors
Refer to detailed ACM/Lead Checklist
Consult with EHS for revised scope
7
ZONE MGR/SUPERVISOR:
Obtain required work documentation
Submit to EHS at safety@andrew.cmu.edu
8
EHS: Documents Abatement and Updates Records

Appendix O: Asbestos Bulk-Sampling Box Folder Requirements

A new folder should be created for each new, bulk sampling project. Each new folder should be titled using the following format:

- "Date (MM.DD.YY) of bulk sampling" "High-level description of project including building name, room number, renovation/maintenance/repair work activities to occur"
- E.g. Bulk sampling is to occur in Margaret Morrison and Carnegie Hall room 201 on March 30, 2021. The maintenance work is to repair the water-damaged plaster ceiling. The title of the bulk sampling Box folder may be as follows: 03.30.21 MMCH 201 Damaged Ceiling Plaster

Information and documentation to include in the Box folder:

The below information should be included in the Box folder as soon as possible after sampling is completed—same-day or next-day, if possible. This is important in the event that the person who performed sampling is unexpectedly out of the office or unable to follow up with the sampling results. If that occurs, other EHS personnel can easily find the sampler's information in the Box folder and pick up where they left off.

- EHS ticket number and/or copy of the completed Asbestos Records Inquiry and Assessment form
- Copy of chain-of-custody (COC)
    - Create a listing of all bulk samples, including sample ID, physical description of the sampled material, and analysis requested. If you don't wish to include the sample listing as an attachment to the lab's COC form, please be sure to still include a physical description of the sampled material despite there not being a designated spot for this information.
    - E.g. see tab "PSI COC" for separate listing of samples from lab's COC https://cmu.app.box.com/file/758632112534
    - E.g. sample description written on PSI's COC form https://cmu.app.box.com/file/761185351927
        - Copy the lab's COC form that has been filled in with all relevant project information into the folder as soon as possible after samples are collected. This will help in the event follow-up with the lab needs to occur as it is easiest to send the COC to reference. E.g. https://cmu.app.box.com/file/758634824939
- Sampling map
    - Floorplans should be utilized to create a map of bulk-sampling locations—each sampling location should be labeled with the sample ID. Where the use floorplans are not ideal or feasible, a hand-drawn map may be created.
    - E.g. https://cmu.app.box.com/file/628725315190 - Photos with descriptions of what they are showing.
    - Photos may be of the overall sampling area, specific materials, etc. and may be used in conjunction with the sampling map to identify sampling locations.

        - Descriptions can be provided on the title of the photo, or the photos can be edited in Word or Adobe.
- Summary Excel spreadsheet
    - The summary spreadsheet should be used to create the listing of samples for the COC and summarize sampling information. The summary must include the following:
      Table of results, to include:
        - Identification and description of established homogeneous areas
        - Sample IDs
        - Description of sampled material (e.g. white 12"x12" floor tiling)
        - Sample location description
        - Sample result (include point-count results, where necessary)
    - Additional description, as necessary, of:
        - Work manager
        - Renovation/maintenance/repair work to be conducted and estimated timeline.
        - Work area
            - E.g. affected area has a wooden floor and plaster walls and ceiling; all pipe runs were fiberglass, and all pipe elbows were cementitious.
            - Make note of any suspect materials within the work areas that were not included in the sampling assessment and why.
        - Samples collected
        - Any other relevant project details.
            - Sample spreadsheet: https://cmu.app.box.com/file/635606067919
- Lab report
- Any additional notes, e-mail correspondences, project specification drawings, etc. that are relevant or useful for documentation.

Asbestos Activity Database Requirements

A new entry in the Asbestos Activity Database must be created for each new, bulk sampling project. The below-listed information should be provided to EHS via safety@andrew.cmu.edu EHS will make the addition to the spreadsheet.

- Building name
- Activity
    - Describe the general reason bulk sampling is occurring.
    - E.g. inspection for renovation, inspection for maintenance, inspection for emergency repairs, inspection for occupant concern, etc.
- Date of bulk sampling
    - This must match the date used on the title of the Box folder.
- Room/area

  - This should identify all room numbers and areas that are included within the scope of work and sampling scope.
- Sampled materials
  - This should include a general listing of all materials that were bulk sampled.
  - E.g. pipe insulation, floor tiling and mastic, ceiling plaster, wall plaster, cove base and mastic, caulking, window glazing, etc.
- Results
  - This should include a high-level summary of all positive results.
  - E.g. floor tiling positive, base-coat plaster confirmed TACM.
- Action/notes
  - This should be a more-detailed description of the renovation/maintenance/renovation work to occur.
  - E.g. FMCS project to replace flooring—managed by Ron Cunningham; FMCS urgent priority work to repair leaking pipe behind plaster wall, plaster, drywall and ceiling tiles to be impacted—managed by Ralph Hilbert.
- Operations and Maintenance (O&M)
  - Indicate whether or not O&M inspections will need to occur for the material(s). O&M inspections apply to friable materials that are being left in place.
- Abatement activity
  - If applicable, indicate when abatement will occur and by what abatement contractor.
- Highlighting of entry lines
  - All entry lines should be highlighted in yellow if asbestos materials were identified and they will remain in place.
  - Materials being left in place could be due to the identified asbestos materials extending beyond the scope of work or if it has been decided that it is acceptable for the asbestos materials to remain in place despite being within the scope of work.

General Do's and Don'ts When Working in the Asbestos Box Folder

- Don'ts
  - Don't delete, alter, or reorganize anything that was not uploaded by you—someone may need that down the line.
  - Don't reorganize or alter the Box folder's setup without first consulting with the folder's administrators.
- Do's
  - Upload information and documentation related to an assessment request and bulk sampling activities as soon as possible—this can be crucial if someone else needs to pick up where you left off (especially in the instance of unexpected time off) or needs to reference your assessment work in the future.
  - Be organized, thorough, and detailed.

Appendix P: TACM Contractor Quick Guide

This quick guide was created to assist contractors with CMU requirements for performing work on trace asbestos containing materials (TACM) on CMU property. TACM includes all materials that have been confirmed to contain >0% and ≤1% asbestos.

Licensed asbestos abatement contractors will be required to follow this Quick Guide to the extent noted throughout.

The information found herein is meant to supplement information in the Asbestos Management Program (AMP). Please reference the Asbestos Management Program webpage for full details and contact EHS at safety@andrew.cmu.edu or 412-268-8182 for additional guidance.

1. Receive EHS approval to perform TACM work

Approval must be obtained by contractors before performing TACM work on CMU property for the first time. To receive approval, each contractor must submit to EHS via safety@andrew.cmu.edu their TACM work program that establishes compliance with relevant components of the OSHA Asbestos Construction Standard (1926.1101), including but not limited to:

- Practices for handling TACM and subsequent worker protection, which should include processes and procedures, as needed, for:
    - Negative exposure assessments and employee exposure monitoring
    - Written Respiratory Protection Program and respirator specifications for TACM work
    - Medical monitoring requirements
    - Engineering controls and work practices, such as:
        - Utilization of tools equipped with HEPA vacuums, wet methods, drop cloths, methods for dust control, etc.
        - Prohibition of: dry sweeping, utilization of compressed air to remove asbestos materials, employee rotation as a means to reduce exposure to airborne asbestos fibers, etc.
        - Waste handling and disposal—prompt clean-up, sealing of all waste into sealed, leak-tight bags, and appropriate disposal of waste.
        - Demonstrated competency to construct containment areas out of poly sheeting to prevent migration of dust.

The contractor must also submit to EHS "Attachment #1: Contractor Acknowledgement of CMU Expectations TACM Work on CMU Property," which can be found at the end of this Quick Guide.

Additional notes:

- It is not necessary for a contractor to wait to be awarded work involving TACM before seeking EHS approval to perform such work. Approval may be granted to a contractor at any time in anticipation of the potential need to perform work on TACM.

- Licensed asbestos abatement contractors are not required to submit a TACM program as described above, but must still be approved by EHS prior to working on campus for the first time. Contact EHS for more information.
- Licensed asbestos abatement contractors are required to submit a completed copy of Attachment #1, which can be found at the end of this Quick Guide.

2. Submit site-specific work plan and obtain EHS permit

This section details the permitting process for TACM work on CMU property conducted by approved TACM contractors and licensed asbestos abatement contractors. Only contractors who have been approved by EHS to perform TACM work on campus or approved licensed asbestos abatement contractors are permitted to request a TACM permit.

EHS must grant approval for all TACM work prior to its commencement. Notification to EHS must be made to safety@andrew.cmu.edu at least two business days prior to the proposed start date of work. However, it is highly suggested to submit notification as early as possible to prevent potential delays created by deficiencies found in the submission. Notification may be completed by the CMU work manager or a competent representative from the contractor. For emergencies, as much of the below information should be supplied to safety@andrew.cmu.edu. The permitting process can be waived to ensure expediency of response actions. EHS will follow up as needed for additional information pertaining to the work and subsequent repair actions.

The following information that is specific to the TACM worksite must be supplied:

- Planned start and finish dates of TACM work
- TACM work location, including building name, room number, and any other relevant locational identifiers
- Name of CMU work manager
- Name of contractor performing TACM work
- Name and contact information for competent representative from the TACM contractor who can be reached regarding questions related to this submission and for questions that may arise during work or after its completion
- Detailed description of project-specific work practices that will be followed from work start to completion as it relates to the TACM work. This should include descriptions of the following:
    - Daily work plans—describe in detail what work will occur each day including:
        - Types of tools and equipment to be utilized
        - Plans for posting signage of the TACM work area
        - Plans for protection of office supplies equipment and/or erection of containment, if needed
        - Plans for air monitoring, area and/or personal
        - Plans for responding to elevated air monitoring results, breaks in containment, or other issues that may feasibly arise

- Supplemental drawings or photos of the work area, identifying where penetrations and/or demolition is planned to be conducted

Once notification is received by EHS, a review will be completed to ensure all appropriate actions are being taken to protect CMU personnel and property. If EHS has questions regarding the submission or identifies any deficiencies, EHS will reach out to the CMU work manager and the contact supplied in the notification for clarification or to rectify deficiencies. Once approved, EHS will supply a permit to the requestor for the duration of the proposed work date(s).

EHS must be notified via safety@andrew.cmu.edu if changes to any of the following occurs:
- Work date(s)
- Scope of work
- Method of removal (only if significantly different from what was originally proposed)

A summary of updates along with the original permit must be submitted to EHS at safety@andrew.cmu.edu before proceeding with work.

3. Submit work documentation

It is the responsibility of the contractor, including licensed asbestos abatement contractors, to ensure the documentation outlined below is supplied to the CMU work manager in a timely manner at the completion of work. Checklists are provided in Attachment #2 at the end of this quick guide and are intended to be completed by the contractor and submitted along with the listed documentation.

The following documentation is required for work disturbing >100 sf or 100 linear feet of TACM.
- If different from the original description submitted for permitting: a written description of the work performed (i.e. exact description of where wall penetrations were made, what walls were removed, etc.). Drawings/sketches may be utilized for additional illustration.
- Identification of any unusual issues or problems related to the project.
- Any other documents or materials produced by the contractor, such as on-site photographs, project drawings, notes, etc. (optional).

The following documentation is required for work disturbing ≤100 sf or 100 linear feet of TACM (this information may be generated by the work manager in lieu of the contractor).
- If different from the original description submitted for permitting: a written description of the work performed—i.e. exact description of where wall penetrations were made. Drawings/sketches may be utilized for additional illustration.
- Identification of any unusual issues or problems related to the work.
- Any other documents or materials produced by the contractor or work manager, such as on-site photographs, project drawings, notes, etc. (optional).

Attachment #1: Contractor Acknowledgement of CMU Expectations for TACM Work on CMU Property

By signing this form, you are acknowledging (insert contracting company's name)'s, herein referred to "the contractor," capability and agreement to comply with the below CMU requirements for performing TACM work on CMU property.

It is CMUs expectation that the contractor will protect their own employee's and property and personnel of the university by complying with the contents of the contractor's own TACM program. TACM program contents must be compliant with all relevant components of the Occupational Safety and Health Administration's (OSHA) Asbestos Standard for Construction (1926.1101). Additionally, CMU expects the contractor to comply with the following while performing work that impacts TACM on CMU property:

- At no time should the contractor perform work on ACM, including ACM debris, PACM, and suspect ACM, unless an appropriately licensed asbestos abatement contractor.
- All work must be performed in a manner that reduces creation of dust and uses wet methods. Where wet methods are infeasible for safety concerns (e.g. around electrical equipment), equipment outfitted with local, HEPA filtration must be utilized.
- Regardless if wet methods are used, it is preferred that all power equipment utilized to cut, drill or otherwise impact TACM be outfitted with local, HEPA filtration. Equipment that is not fitted with HEPA filtration must be utilized in conjunction with a HEPA vacuum to catch any falling dust or debris directly from the area being worked on.
- The following activities are prohibited:
    - Dry sweeping of TACM and its debris
    - Use of compressed air to remove TACM
    - Use of high-speed abrasive disc saws that are not equipped with HEPA filtration
- All materials (e.g. desks, shelves, chairs, rugs, etc.) within a work space that may be impacted by the TACM work must be removed from the space or sufficiently protected with plastic sheeting/tarps prior to commencing work to prevent unwanted dust, water, etc. from settling on them.

It will be the responsibility of the CMU space owner to coordinate removal of electronics or other sensitive items from the space, as needed, prior to the start of work.

- All waste generated from work must be promptly cleaned up by wetting the waste, double bagging it and sealing the bag shut so that it is leak tight. No waste is permitted to be removed from the work site until it has been bagged and sealed shut as described.
- Signage must be placed surrounding the work area that identifies TACM work is being performed. Only approved TACM contractors and authorized CMU personnel are permitted to enter the immediate area of TACM work.
- A permit must be obtained from EHS prior to conducting TACM work (see section "TACM Work Permitting for Approved TACM Contractors" of the Contractor TACM Quick Guide).

Written Name	Company
Signature	
Date	

Attachment #2: Contractor's Report for TACM Work

This checklist should be completed and submitted by the contractor or work manager, where noted, along with the documentation listed below based on size of TACM disturbance.

Required documentation for work disturbing >100 sf or 100 linear feet of TACM:

- ☐ If different from the information supplied in the permit: a written description of the work performed (i.e. exact description of where wall penetrations were made, what walls were removed, etc.). Drawings/sketches may be utilized for additional illustration.
- ☐ Identification of any unusual issues or problems related to the project.
- ☐ Any other documents or materials produced by the contractor, such as onsite photographs, project drawings, notes, etc. (optional).

Required documentation for work disturbing ≤100 sf or 100 linear feet of TACM (this information may be generated by the work manager in lieu of the contractor):

- ☐ If different from the information from the information supplied in the permit: a written description of the work performed—i.e. exact description of where wall penetrations were made. Drawings/sketches may be utilized for additional illustration.
- ☐ Identification of any unusual issues or problems related to the work.
- ☐ Any other documents or materials produced by the contractor or work manager, such as on-site photographs, project drawings, notes, etc. (optional).