Office of Origin: Facilities Management

I. PURPOSE

To minimize the risk of healthcare-associated infections (HAIs) that may result when fungi or bacteria are dispersed into the air via dust or water aerosolization during construction, renovation, or demolition activities conducted on the campus locations licensed under UCSF Health.

II. REFERENCES

Facility Guidelines Institute. 2022 Guidelines for Design and Construction of Hospitals. St. Louis, MO: Facility Guidelines Institute; 2022.

Facilities Guidelines Institute. Adoption of FGI guidelines. Last updated August 21, 2024. https://fgiguidelines.org/guidelines/adoption-map/

American Society for Healthcare Engineering. ASHE ICRA 2.0 Toolkit. https://www.ashe.org/icra2

Sehulster LM, et al. Guidelines for environmental infection control in healthcare facilities. Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Chicago, IL; American Society for Healthcare Engineering/American Hospital Association; 2004; Updated July 2019.

https://www.cdc.gov/infection-control/hcp/environmental-control/index.html

UCSF Health Environment of Care Manual (EOC) Policy 5.1.4 Interim Life Safety Measures.

III. DEFINITIONS

Containment: a system of barriers and/or negative pressure equipment that isolates the construction zone air space from the adjacent hospital environment.

HEPA filter: high-efficiency particulate air filter that removes 99.97% of particles 0.3 micrometers and is even more efficient for particles of larger sizes.

Immunocompromised: having an altered immune response due to underlying medical condition and/or immunosuppressive agent that confers a higher risk of infection.

Infection Control Risk Assessment (ICRA): Process that evaluates patient risks due to construction, demolition, or renovation activities that is focused on reducing the risk of infection by identifying appropriate risk mitigation measures.

Negative pressure: Pressure within a system that is less than the environment that surrounds that system.

Patient care area: A location where patient care is provided, not limited to direct treatment, and can include waiting rooms, lobbies, food service areas, medication preparation areas, and other places throughout the facility where patients may be present.

Project manager: The person responsible for managing the project and will typically be a member of UCSF Design and Construction or Facilities Management.

IV. POLICY

This policy outlines UCSF Health's program for prevention of HAIs associated with construction, renovation and maintenance activities. All parties involved in these activities are responsible for the integration of the infection prevention and control principles in this policy throughout the planning, managing, and completion of the Work. This process is identified as the Infection Control Risk Assessment (ICRA).

An ICRA must be performed for all construction, renovation, and maintenance work in any facility that potentially impacts patient care activities including work vertically or horizontally adjacent to patient care areas. This includes, but is not limited to common spaces around patient care areas, medical laboratories, cafeterias, pharmacies, etc. The Project Manager for each specific project will submit the ICRA at least two weeks in advance for all routine projects and scheduled activities.

There will be a multidisciplinary, collaborative process for ICRA development. The ICRA team must include, at minimum, Facilities Management (FM), Design and Construction, and Hospital Epidemiology and Infection Prevention (HEIP), and will have continuous involvement in the assessment, revision, monitoring, and compliance with the ICRA. Additional groups such as the representatives of the clinical groups impacted by the project should be included as needed.

Recommended revisions to this policy and procedure will be the responsibility of Facilities, with subject matter expert input from HEIP and Environmental Health & Safety (EH&S).

V. PROCEDURES

The following procedures are designed to assist all parties involved in or impacted by construction, renovation, and/or maintenance activities to evaluate the potential risks associated with the activities and to identify and implement an appropriate mitigation plan. See Appendix A for a summary of the ICRA process.

Infection Control Risk Assessment (ICRA) process and authorization:

1. Performing an ICRA requires a multidisciplinary, documented assessment process to proactively identify and mitigate risks from infection that could occur during construction, demolition, and renovation activities.
2. The ICRA process shall be a part of integrated facility planning, design, construction, and commissioning activities.
3. In addition to Facilities, Design and Construction (D&C), Hospital Epidemiology and Infection Prevention (HEIP), and the area leadership, the scope of the project will dictate whether there are other hospital groups that should also participate.
4. The Project Manager or other responsible party will complete and submit an ICRA initial assessment during the planning phase of the project before the start of construction, renovation, or maintenance activities. The leadership of the area involved in the construction should be informed prior to the initiation of any construction.
5. The multidisciplinary group will utilize a shared Smartsheet based system that facilitates review and completion of the ICRA form which is then signed by HEIP and pertinent stakeholders.
6. As part of the initial assessment, the Project Manager will follow these steps:
    a. **STEP 1:** Identify the **Type of Construction Activity** (Types A-D) using **Table A (Appendix B)**. If Activity Type classification is unclear using these criteria or if

modifications should be considered, the Project Manager will discuss these with the ICRA team to reach consensus.

b. **STEP 2:** Identify the **Population and Geographic Risk Groups** that will be affected (Low, Medium, High, Highest) using **Table B (Appendix B)**. If more than one Risk Group is affected, choose the highest Risk Group.

c. **STEP 3:** Apply the **Type of Construction Activity** and **Population and Geographic Risk Groups** to the **Table C** (Appendix B) matrix to determine the Class of Precautions (I-V) that must be implemented before the start of work and during work activities. The ICRA document should be reviewed each time there are substantial changes to the work effort, which can either increase or decrease the classification.

d. **STEP 4:** Refer to the **Class of Precautions Matrix** to determine the required mitigation activities from **Table D (Appendix B)**. These measures should be implemented before and during work activities. Adjust as needed based on Surrounding Area Assessment.

e. **STEP 5:** If applicable, assess the potential risk to areas surrounding the project and the need for additional mitigation measures using **Table E (Appendix B)**.

7. Class I and II projects require an ICRA to be completed by the Project Manager or Facilities Team and posted at the job site. These ICRAs do not require HEIP approval unless HEIP input is needed for appropriate classifications.

8. Class III, IV, and V projects must be reviewed and approved by the full ICRA team prior to commencement of the project.

   a. ICRA requests are reviewed through the Smartsheet process and discussed as needed during weekly ICRA meetings.

   b. In the events of an emergency (any unplanned event that can cause harm to patients and/or team members), an ICRA authorization will be completed and reviewed per this document as soon as possible after initial mitigation.

9. ICRA interventions based on the Class of Precautions for the project must be implemented prior to the start of work and maintained during work and must include at minimum the components listed in Table D, Step 4.

10. Phased work or work requiring construction activities outside of the area of construction as identified/covered in the project ICRA Authorization should have an ICRA Authorization for the overall project as well as separate ICRA Authorizations for each phase/work area of the project.

11. A signed copy of the ICRA Authorization form will be displayed at the job site or work area (including mobile dust containment units) prior to beginning work and will be displayed for the duration of the project.

<u>General maintenance and oversight of ICRA interventions</u>

12. The Project Manager is responsible for posting the ICRA form at the project site and ensuring compliance with the ICRA recommendations prior to the start of the activities and using daily audits while the project is ongoing with the support of Facilities Management.

13. Barrier management

a. If barriers are part of the ICRA-based risk mitigation plan, the Project Manager will ensure the barriers are maintained for the duration of the project to prevent dust and debris from escaping the work zone.

b. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above and all penetrations through the barrier shall meet the appropriate fire rating requirements.

c. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage. Apply tape that will not leave a residue to seal gaps between barriers, ceiling or floor. Seal all penetrations in containment barriers, including floors and ceiling, using approved materials.

d. Regular inspections of the barrier are performed during the course of the work shift; daily inspections will include, but will not be limited to ensuring that:

   i. Doors are operating correctly, i.e., self-closing and latching

   ii. All seams, joints and penetrations are sealed (pipe, conduit, cable, etc.)

   iii. Temporary firestop systems are installed/maintained

14. Negative pressure/HEPA filtration

    a. If required based on the project ICRA, negative pressure and HEPA filtration must be maintained continuously until completion of dust-generating activities and pre-barrier removal activities.

    b. Out-of-range monitoring results will be immediately reported to the Project Manager and evaluated.

15. When conducting the ICRA and developing the mitigation requirements for building and site areas anticipated to be affected by construction, the following shall be addressed:

    a. How patients and staff could be affected by project-related disruptions to essential services.

    b. Determining the specific hazards (e.g., air quality, noise, vibration, water) and mitigation strategies for each construction area and phase.

    c. Locations of patients according to their susceptibility to infection and the definition of risks to each.

    d. Impacts of movement of construction debris, traffic flow, cleanup procedures, and testing and certification of installed systems.

    e. Assessment of external as well as internal construction activities.

    f. Location of known hazards.

Elements of Compliance

16. ICRA Documentation:
    a. The written record shall remain an active part of the project documents for the duration of the construction project and through commissioning.
    b. The ICRA is filed into the master file for the specific project.
17. The ICRA will expire 90 days after the initial approval date.
    a. When the ICRA expires, a new one must be completed by the Project Manager and approved by the ICRA team.
18. The ICRA must include the list of risk mitigations agreed upon by the ICRA team required to prevent transmission of air- and waterborne biological infectious agents during construction as well as during commissioning when HVAC, plumbing systems, and equipment are started/restarted.

Training for Facilities Management, Design and Construction, and Construction Vendors

19. The project team, contractors, and subcontractors will receive training covering the ICRA process and dust mitigation measures prior to beginning project work and on an annual basis.
20. Facilities and Design and Construction must retain a list that documents workers who have watched the UCSF construction video and this must be completed prior to working on-site for projects and at least yearly.

Pre-construction Inspection

21. After risk mitigation measures are in place and before the project begins, HEIP or the project manager may require a 'Pre-Construction Infection Prevention Survey' (Appendix C) to be completed. A pre-construction survey is required for Class III-V projects, except in cases where specific conditions are met, such as urgent or emergent repairs, preventative maintenance, or other circumstances as determined through discussions between HEIP and the Project Manager (PM).
22. This survey may include the project manager, the contractor at the job site, and HEIP to inspect the job site and will be completed at the time of this walkthrough.
23. When the PRE-CONSTRUCTION INFECTION PREVENTION SURVEY form is completed and signed, it will be posted at the project site.
24. Large projects may require several phases of demolition and/or construction. Each phase may require a separate pre-construction survey and a new submission of an ICRA to HEIP.
25. Major exterior construction, demolition or remodeling projects performed in the vicinity of Medical Center buildings also require contractor compliance with dust mitigation measures. These include but are not limited to partial or total building demolition adjacent to UCSF controlled properties. (Appendix D)

Air Sampling:

26. ICRA recommendations may include particulate air sampling by Environment, Health, and Safety (EH&S) staff for Class IV or V projects involving high dust-generating activity lasting > 1 week duration. Other sampling/monitoring (e.g., viable fungal air sampling, water quality, noise, vibration) may be requested based on project specifics.

VI. RESPONSIBILITY

All staff

1. Follow all construction signage.
2. Notify the Project Manager or HEIP if breaches in the ICRA risk mitigation measures are noted.
3. Perform any applicable patient and family education and communication regarding ICRA risk mitigation measures, as applicable.

Project Manager

4. Identify infection prevention risks relative to new project and initiate ICRA development and authorization.
5. Administer and maintain training program related to HEIP.
6. Is responsible for ensuring daily monitoring of project compliance to approved ICRA risk mitigation measures.

Facilities Management

7. Ensures compliance with the ICRA program elements and project-specific ICRA risk mitigation recommendations.

HEIP

8. Reviews and approves ICRAs for all Class III-V projects.
9. Participates in pre-construction surveys
10. Participates in the multidisciplinary ICRA group.
11. May perform supplemental audits of ICRA compliance and has the authority to stop work for: excessive noise/vibration, breach of containment, non-compliance with ICRA requirements, or other issues that may compromise patient safety.

Contractors

12. Participate in pre-construction planning activities, approval, and sign-off meetings.
13. Completes training prior to the start of projects and on an annual basis and maintains personnel compliance records.
14. Implement risk mitigation measures as required by the ICRA permit.
15. Monitor project compliance related to approved ICRA policies.

VII. HISTORY OF POLICY

Reviewed by:

Facilities Management Operations Council
Infection Prevention Committee
Quality Improvement Executive Committee
Environment of Care Committee

VIII. APPENDIX

Appendix A: ICRA Workflow

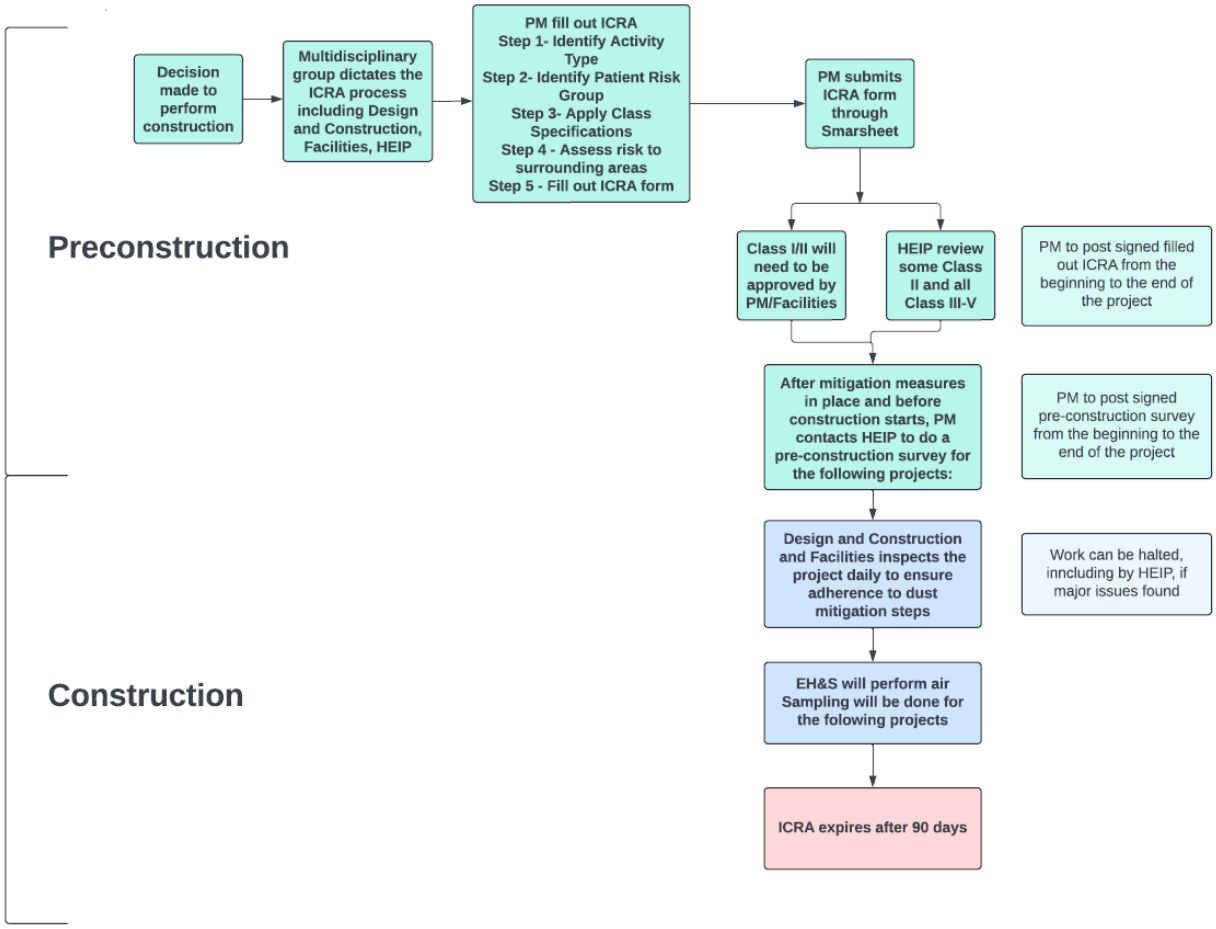
Appendix B: Instructions for Completing the Infection Control Risk Assessment Checklist

Appendix C: Pre-Construction Survey

Appendix D: Dust Mitigation Checklist for Major Exterior Projects

Appendix E: Air Sampling Requests

Appendix A: ICRA Workflow



Appendix B: Instructions for Completing the Infection Control Risk Assessment Checklist

The Infection Control Risk Assessment (ICRA) Checklist will be completed by Project Managers during the design planning phase of the construction/renovation project by the multidisciplinary planning group. For Class III-V projects, Hospital Epidemiology and Infection Prevention personnel must be involved in each major phase of the project to ensure that the appropriate prevention measures are initiated and maintained. The ICRA will automatically expire 90 days from the signed approval date. A new ICRA must be completed on or before the expiration date.

Table A describes the type of activity. The type of "Activity" is determined by selecting the level of activity that best describes the project being planned.

Table B identifies the "Population and Geographic Risk Group" that may be affected by the project because of its physical proximity or potential exposure to the activity.

Table C identifies the appropriate class of infection prevention measures by matching the activity with the population risk group. As indicated in Table C, the appropriate mitigation measures for the project are identified. A copy will be reviewed and approved by HEIP and filed by Design and Construction or Facilities Management for all Class III, IV and I categories. Adaptations to the prevention measures may be made only after approval has been provided by HEIP.

➡ **A copy of the ICRA checklist must be sent to HEIP when matrix indicates Class III- V preventive measures are required.**

UCSF Health
UCSF Benioff Children's Hospital

GUIDELINES FOR CONSTRUCTION/RENOVATION/DEMOLITION PROJECTS AND ENVIRONMENTAL CONTROL OF INVASIVE FUNGAL INFECTION AND OTHER HOSPITAL ACQUIRED INFECTIONS

POLICY 5.2
Issued: 12/06
Last Approval: 5/25

***Table A – Type of Construction Activity:** Select Type of Activity

Type A	**Inspection and non-invasive activities.** These include, but are not limited to: ☐ Removal of ceiling tile for visual inspection-limited to 1 tile per 50 square feet with limited exposure time. ☐ Limited building system maintenance (e.g., pneumatic tube station, HVAC system, fire suppression system, electrical and carpentry work to include painting without sanding) that does not create dust or debris. ☐ Clean plumbing activity limited in nature.
Type B	**Small scale, short duration activities that create minimal dust.** These include, but are not limited to: ☐ Work conducted above the ceiling (e.g., prolonged inspection or repair of firewalls and barriers, installation of conduit and/or cabling, and access to mechanical and/or electrical chase spaces). ☐ Fan shutdown/startup. ☐ Installation of electrical devices or new flooring that produces minimal dust and debris. ☐ The removal of drywall where minimal dust and debris is created. ☐ Controlled sanding activities (e.g., wet or dry sanding) that produce minimal dust and debris.
Type C	**Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies (e.g., counter tops, cupboards, sinks). Work that meets this criteria and includes**, but not limited to: ☐ Removal of preexisting floor covering, walls, casework, or other building components. New drywall ☐ placement. * ☐ Renovation work in a single room. * ☐ Non-existing cable pathway or invasive electrical work above ceilings. ☐ The removal of drywall where a moderate amount of dust and debris is created. * Dry sanding where a ☐ moderate amount of dust and debris is created. * ☐ Work creating significant vibration and/or noise. ☐ Moderate to high level of dust generating activities that cannot be completed in a single work shift.
Type D	**Major demolition, construction, and renovation projects**. Work that meets this criteria and includes, but not limited to: ☐ Removal or replacement of building system component(s). ☐ Removal/installation of drywall partitions. * ☐ Invasive large-scale new building construction. * ☐ Renovation work in two or more rooms. *

Note: *Items that are typically associated with high levels of dust generation. This is not a comprehensive list; each project should be evaluated individually

❖Table B – Population and Geographic Risks Groups: Select the Determined Risk

Group 1 Low Risk Non-patient care areas such as:	Group 2 Medium Risk Patient care support areas such as:	Group 3 High Risk Patient care areas such as:	Group 4 Highest Risk Procedural, invasive, sterile support and highly compromised patient care areas such as:
☐ Public hallways and gathering areas not on clinical units. ☐ Office areas not on clinical units. ☐ Breakrooms not on clinical units. ☐ Bathrooms or locker rooms not on clinical units. ☐ Mechanical rooms not on clinical units. ☐ Hospitality closets not on clinical units.	☐ Waiting areas. ☐ Clinical Technologies work areas. ☐ Materials management. ☐ Sterile processing department - dirty side. ☐ Kitchen, cafeteria, gift shop, coffee shop, and food kiosks.	☐ All acute care units and patient care room, excluding those falling withing the Highest Risk groups. ☐ Emergency department. ☐ Occupational health clinics. ☐ Pharmacy - general work zone. ☐ Medication rooms and clean utility rooms. ☐ Imaging suites: diagnostic imaging. ☐ Clinical laboratory.	☐ All transplant and intensive care units. ☐ All oncology units. ☐ Perioperative areas. ☐ Procedural suites. ☐ Pharmacy compounding. ☐ Sterile processing department - clean side. ☐ Transfusion services. ☐ Dialysis ☐ Imaging suites: invasive imaging.

Note: ❖Designation of grouping for any location may be changed at the discretion of HEIP

°Table C – Class of Precautions: Select Class according to Type and Risk

Patient Risk Group	TYPE A	TYPE B	TYPE C	TYPE D
Group 1 - LOW	I	II	II	III
Group 2 - MEDIUM	I	II	III	IV
Group 3 - HIGH	II	III	IV	V
Group 4 - HIGHEST	III	IV	V	V

Note: °Class III precautions that cannot be sealed and completely isolated from occupied patient care spaces should be elevated to include negative air exhaust requirements as listed in Class IV

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DEPARTMENT OF HOSPITAL EPIDEMIOLOGY AND INFECTION PREVENTION (HEIP) AND FACILITIES MANAGEMENT

Infection Control Risk Assessment Checklist

Matrix of Precautions for Construction, Renovation and Operations

Table D – Minimum Required Infection Control Precautions by Class | Before and During Work Activity

Class of Precautions	Mitigation Activities (Performed Before and During Work Activity)
Class I ○ ***Does Not Need HEIP Approval***	1. Perform noninvasive work activity as to not block or interrupt patient care. 2. Perform noninvasive work activities in areas that are not directly occupied with patients. 3. Perform noninvasive work activity in a manner that does not create dust. 4. Immediately replace any displaced ceiling tile before leaving the area and/or at end of noninvasive work activity.
Class II (Includes Class I) ○ ***Does Not Need HEIP Approval***	1. Perform only limited dust work and/or activities designed for basic facilities and engineering work. 2. Perform limited dust and invasive work following standing precautions procedures approved by the organization. 3. This Class of Precautions must never be used for construction or renovation activities.
Class III (Includes Class II) ○	1. Provide active means to prevent airborne dust dispersion into the occupied areas. 2. Means for controlling minimal dust dispersion may include hand-held HEPA vacuum devices, polyethylene plastic containment, or isolation of work area by closing room door. 3. Remove or isolate return air diffusers to avoid dust from entering the HVAC system. 4. Remove or isolate the supply air diffusers to avoid positive pressurization of the space. 5. If work area is contained, then it must be neutrally to negatively pressurized at all times. 6. Seal all doors with tape that will not leave residue. 7. Contain all trash and debris in the work area. 8. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 9. Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy. Adhesive mats must be changed routinely and when visibly soiled. 10. Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces.
Class IV (Includes Class III) ○	1. Construct and complete critical barriers meeting NFPA 241 requirements including: Barriers must extend to the ceiling or, if ceiling tile is removed, to the deck above, and all penetrations through the barrier shall meet the appropriate fire rating requirements. 2. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage. Apply tape that will not leave a residue to seal gaps between barriers, ceiling, or floor. 3. Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type). 4. Containment units or environmental containment units (ECUs) approved for Class IV precautions in small areas totally contained by the unit and that has HEPA-filtered exhaust air. 5. Negative airflow pattern must be maintained from the entry point to the anteroom and into the construction area. The airflow must cascade from outside to inside the construction area. The entire construction area must remain negatively pressurized. 6. Maintain negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows does not require HEPA-filtered air. 7. If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas. 8. Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is not acceptable. 9. Install device on exterior of work containment to continually monitor negative pressurization. To assure proper pressure is continuously maintained, it is recommended that the device(s) have a visual pressure indicator. 10. Worker clothing must be clean and free of visible dust before leaving the work area. HEPA vacuuming of clothing or use of cover suits is acceptable. 11. Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed. 12. Consider collection of particulate data during work to monitor and ensure that contaminates do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies. 13. Air sampling may be required for Activity Type C work and is required for Activity Type D work lasting greater than 1 week in duration and performed in Groups 3 and 4 population.
Class V (Includes Class IV) ○	1. Construct anteroom large enough for equipment staging, cart cleaning, workers. The anteroom must be constructed adjacent to entrance of construction work area. 2. Personnel will be required to always wear disposable coveralls to and from the anteroom when path of travel intersects areas of high-risk population groups. Coveralls must be stored in a clean, dust-free area.

☐ Not Applicable (Check for projects that are class I, II, and preventative maintenance (PM) ICRAs unless otherwise specified).

Table E – Surrounding Area Assessment: Complete for Class III, IV, and V ICRAs, excluding PMs

Unit Below:	Unit Above:	Unit Lateral:	Unit Behind:	Unit in Front:
Risk Group: Select Below Risk	Risk Group: Select Above Risk	Risk Group: Select Lateral Risk	Risk Group: Select Behind Risk	Risk Group: Select Front Risk
Contact:	Contact:	Contact:	Contact:	Contact:
Phone:	Phone:	Phone:	Phone:	Phone:
Additional Controls: ☐ Noise ☐ Vibration ☐ Dust Control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevator/Stairs **Systems Impacted:** ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	**Additional Controls:** ☐ Noise ☐ Vibration ☐ Dust Control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevator/Stairs **Systems Impacted:** ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	**Additional Controls:** ☐ Noise ☐ Vibration ☐ Dust Control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevator/Stairs **Systems Impacted:** ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	**Additional Controls:** ☐ Noise ☐ Vibration ☐ Dust Control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevator/Stairs **Systems Impacted:** ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	**Additional Controls:** ☐ Noise ☐ Vibration ☐ Dust Control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevator/Stairs **Systems Impacted:** ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water

Noise & Vibration Mitigation Strategies

- ☐ Use diamond drills instead of powder-actuated fasteners.
- ☐ Schedule noise-making periods with adjacent spaces.
- ☐ Use beam clamps instead of shot.
- ☐ Prefab where possible.
- ☐ Use tin snips to cut metal studs instead of using a chop saw.
- ☐ Install metal decking with vent tabs, then use cellular floor deck hangers.
- ☐ Consider compression style fittings instead of soldering, brazing, or welding.
- ☐ Wet core drill instead of dry core or percussion.
- ☐ Instead of jackhammering concrete, use wet diamond saws.
- ☐ Use HEPA vacuums instead of standard wet/dry vacuums.
- ☐ Use mechanical joining system sprinkler fittings instead of threaded.
- ☐ Where fumes are tolerated, use chemical adhesive remover (flooring glue) instead of mechanical.
- ☐ To remove flooring, consider abrasive blasting instead of using a floor scraper.
- ☐ Use electric sheers instead of reciprocating saw for ductwork cutting.
- ☐ Install exterior man/material lifts.

Ventilation & Pressurization Mitigation Strategies

- ☐ HEPA to exterior.
- ☐ Install temporary ductwork.
- ☐ Utilize temporary HVAC equipment.
- ☐ Vacate the area.
- ☐ Install temporary partitions.
- ☐ Use carbon filtration to filter odors.

Impact to Other Systems Mitigation Strategies

- ☐ Schedule outages.
- ☐ Provide temporary systems.
- ☐ Back-feed electricity or medical gases.

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GUIDELINES FOR CONSTRUCTION/RENOVATION/DEMOLITION PROJECTS AND ENVIRONMENTAL CONTROL OF INVASIVE FUNGAL INFECTION AND OTHER HOSPITAL ACQUIRED INFECTIONS

POLICY 5.2
Issued: 12/06
Last Approval: 05/25

PLEASE PUT THIS PAGE ON TOP WHEN POSTING AT CONSTRUCTION SITE

ICRA 2.0 Infection Control Risk Assessment and Permit	Project Name:				
	Project Number:			Requested By:	
Project Manager (PM)		Phone		Original Project Start Date	
Contractor Performing Work		Phone		Project End Date	
Approving Authority (HEIP)		Phone			
Location of Work Activity					

Please note that the signature below is approval of the work activity as described and assessed documented here.
Should the scope of work change or the discovery of additional toxic or biological substances occur, STOP WORK and seek additional approval and guidance before proceeding.

Comments and/or Additional Information from PM or Contractor

1. Type of Activity	Select Type of Activity
Type A: Non-Invasive	
Type B: Small-scale, short duration	
Type C: Large-scale, longer duration	
Type D: Major demolition, construction	
2. Patient Risk Area	Select the Determined Risk
Grp 1 - Low: Non-patient care area	
Grp 2 - Medium: Patient care support areas	
Grp 3 - High: Patient care areas	
Grp 4 - Highest: Invasive, sterile, or highly compromised care	

3. Class of Precautions — Select Class according to Type and Risk

	TYPE A	TYPE B	TYPE C	TYPE D
Group 1 Low	I	II	II	III
Group 2 Medium	I	II	III	IV
Group 3 High	I	III	IV	V
Group 4 Highest	III	IV	V	V

Signatures of Approval

Requester: (Design or Facilities)		Date:	
Permit Authorized By: (HEIP: Only needed for Class III, IV, or V)		Date:	*(Permit Expires 90 Days from ICP Date):*

Exceptions / Additions to this permit are noted below or by attached memoranda

Date	**Initials**	**Explanation:**

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Appendix C: Pre-Construction Survey

Risk Assessment and Plan for Dust Mitigation Measures Completed _ / _ / _

Class I II III IV V (**circle one**)

Project Title/No.:	**Project Location:**
Project Manager:	**Phone:**
Contractor:	**Phone:**

A final survey of Infection Prevention measures as described in Contract Specification Section 01021 was conducted. The following Infection Prevention measures have been incorporated in this report and approval is hereby given to proceed with demolition and/or construction activities as described in the contract documents. Contractor is responsible to ensure that the Infection Prevention dust mitigation measures attested to in this document remain in effect for the duration of the project.

MEASURES IN PLACE and Confirmed / Completed by Project Manager:

The project team has met with the Infection Preventionist (IP) to review project requirements. All workers have completed the Infection Prevention test and training. HEIP may request records at any time.

1. All workers Current: Y N

2. Date negative air machines certified by DOP test: (meets requirements for one year after test date) __/__/__

3. Construction space has negative air pressure with barricade door fully open: (≥100fpm) DATE___/__/__

MEASURES IN PLACE and Confirmed / Completed by HEIP Representative:

1. Infection Prevention Compliance Survey sheet completed: Y N

DATE SURVEY COMPLETED: __/__/__

DATE OF FOLLOW-UP SURVEY: __/__/__ or TBD

REMARKS: _____

2. Air sampling Required: Y N (refer to IPRA) to be performed during demolition

If Y Date Ordered: __/__/__

3. Continuous Differential Pressure Monitoring Required: Y N (refer to IPRA)

Installed and verified to be operating through duration of the project (Log?): __/__/__

Project Manager: **Date:**

HEIP Representative: **Date:**

OFFICE OF DESIGN AND CONSTRUCTION & FACILITIES MANAGEMENT
INFECTION PREVENTION COMPLIANCE SURVEY

Project No.: _____ Location: _____ Date___/____/____

□ Initial Survey prior to start of construction/demo. □ Follow–up Survey

1. *Construction Barricade*	Yes	No	N/A
• Barricades sealed, no penetrations	___	___	___
• Walk-off mats in place, clean	___	___	___
• Barricade doors have closers	___	___	___
• Door frames gasketed, doors close & seal properly	___	___	___
• Signs posted cautioning about dust hazards	___	___	___
• Infection Prevention Risk Assessment & Mitigation Plan	___	___	___
• Project Manager contact information posted	___	___	___
• Adjacent ceiling areas intact	___	___	___
• Adjacent floor area clean, no dust tracked	___	___	___
• Correct installation of wall/ceiling enclosure	___	___	___

Comments: _____

2. *Negative Air*	Yes	No	N/A
• Negative pressure at barricade entrance	___	___	___
• All windows and doors closed behind barricade	___	___	___
• Negative air machines running	___	___	___
• Negative air machines filters clean	___	___	___
• Negative air discharge hoses intact	___	___	___
• Project requires use of vestibule	___	___	___
• Continuous Differential Pressure Monitor	___	___	___

Comments: _____

3. *Jobsite*	Yes	No	N/A
• Project area clean, debris removal path verified	___	___	___
• Debris removed in suitable containers	___	___	___
• Debris removed scheduled at time specified	___	___	___
• Adjacent areas been notified by Project Manager	___	___	___
• Patient/staff/visitor traffic diverted	___	___	___
• HEPA-filtered vacuum ready to use	___	___	___
• Disposable patient care items removed from jobsite	___	___	___

Comments: _____

4. *Occupied Areas*	Yes	No	N/A
• Work authorized and scheduled	___	___	___
• Polyethylene barricade in place, properly sealed	___	___	___
• Ceiling access tag posted	___	___	___
• Surrounding area clean	___	___	___

Comments: _____

HEIP Representative: _____ **Date:** ___/_____/

OFFICE OF DESIGN AND CONSTRUCTION & FACILITIES MANAGEMENT INFECTION PREVENTION AND COMPLIANCE SURVEY

Appendix D: Dust Mitigation Checklist for Major Exterior Projects

Dust Mitigation Measures for the Medical Center	Date Completed
Windows Facing Construction Site	
Screwed/locked shut	
Multilingual signs to remind patients and staff to keep windows closed posted on all windows	
Doors	
Multilingual signs attached to all doors leading to the stairwells (facing the construction activities generating dust) reminding staff, patients, and visitors not to use the doors except for emergency (during demolition only)	
Security will help monitor stairwell during land demolition phase	
All affected stairwell doors have been gasketed and have had closing devices installed	
Plastic curtains have been installed across the large openings; i.e., breezeways, stairwells, etc. on affected levels	
Elevators	
During the hard demolition phase, staff will be encouraged to transfer immunocompromised patients using Moffitt elevators or to mask the patient	
A daily cleaning schedule is in place	
Loading Docks Facing Construction Activities	
Doors and curtains are propped or tied open when not in use	
Elevator vestibule doors will be kept closed when not in use	
Fliers have been distributed by project manager to delivery drivers explaining loading dock procedures	
Air Intakes	
Filters will be monitored by Facilities Maintenance for more frequent replacement	
Air quality monitoring samples will be taken down stream of the supply fans to monitor air quality	
Additional pre filters will be installed as needed	
Education	
A letter will be sent by Patient Care Services to advise patients and visitors of the disruptions and hazards of dust	
Medical Center personnel will be educated on the procedures in place for the project via campus publications and fliers	

Date: _____

Facilities Management Associate Director

Date: _____

Hospital Epidemiology & Infection Prevention

Dust Mitigation Measures for Major Exterior Projects

Dust Mitigation Measures for the Project Site	Date Completed
Contractor	
Any activity that creates dust will be kept continuously wet	
Loose debris will be wet when loaded	
Debris hauled away by trucks will be moist and covered prior to hauling	
Roadways will be kept free of dirt build-up, washed daily	
Construction workers will not be allowed to enter the Medical Center	
Contractor has established a daily check list to be filled out by site personnel dealing with site cleanliness and dust control	
Avoid damaging the underground water system (i.e., buried pipes) to prevent soil and dust contamination of the water	
Contractor will stop all dust-producing activities if water is not available or if a situation arises leading to uncontrollable dust creation	
Schedule permitting, contractor to stage activities so that multiple dust generating activities are not happening concurrently	
Education	
Materials to be reviewed include rationale for dust mitigation measures in demolition and construction projects in and around the hospital, patient populations served at UCSF, infectious agents of concern, air sampling for mold, and specific measures for dust mitigation. Records of attendance will be maintained by the Contractor(s) and made available upon request.	
Contractor/Engineer shall attend Construction Advisory Committee meetings when requested.	
Monitoring	
At the discretion of HEIP, air sampling to be performed by Office of Environmental Health and Safety to monitor air quality and identify any dust mitigation problems	
Unannounced monitoring for dust compliance by HEIP, Facilities, and project site Manager	
Specific traffic control measures per individual project will be assessed and instituted as part of the Risk Assessment	
Concerns from the department managers who may be affected will be voiced to the contractor through Design and Construction and corrective action will be taken	
Hospital leadership has been given the authority to halt the construction if an emergency situation related to vibration develops within an area that impacts patient care	
A contact phone number is in place to answer general questions regarding the project. The phone number is:	

Date:

Facilities Management Associate Director

Date:

Hospital Epidemiology & Infection Prevention

Appendix E: Air Sampling Requests

The purpose of air sampling is to assess mitigation measures in and around construction/renovation work areas around the Medical Center. In addition to airborne particulate measurements, viable air sampling for mold may be collected at strategically important locations during the demolition, renovation and construction phases of projects based on the project's ICRA and recommended risk mitigation measures. Air sampling may be required for projects meeting of the following criteria:

- Class IV or V project AND
- High dust-generating activity lasting > 1 week duration. For projects greater than 4 weeks duration, multiple rounds of air sampling may be required.

If results of air sampling are found to be unacceptable (as defined in Table 5.1E.1.), work activities may be ordered stopped by the ICRA team.

Department Responsibility

Hospital Epidemiology and Infection Prevention (HEIP):

- Performs routine surveillance for clinical invasive fungal infections for high-risk patients.
- Provides input during the ICRA process to identify areas requiring air sampling.
- Requests particulate air sampling as appropriate using the Medical Center Support Services (MCSS) Air/Water/Environmental Sampling request category >5 business days prior to the start of scheduled construction project. The requesting infection preventionist will alert EH&S in the ICRA database or provide ICRA ID and contact info of the project manager.
- Requests additional air sampling related to construction as needed.
- Orders additional event-related air sampling (e.g., post water leakage in ceilings, ceiling tile collapse, etc.) as appropriate.

Environment, Health and Safety (EH&S):

- Maintains a calibrated TSI AeroTrak Particle Counter.
- Maintains a calibrated Bio Sciences International Surface Air Sampler (SAS).
- Maintains a limited supply of MEA agar plates for air sampling (at least 1 sleeve of 10 plates).
- Conducts particle count sampling as requested in MCSS ticket and attaches summary results to MCSS ticket and ICRA database.
- Records results of all air sampling on the Air Sampling Project Sheet
- Performs fungal culturable sampling using a SAS instrument for speciation analysis when indicated by ICRA or at the specific request of HEIP.

Design and Construction and Facilities Management:

- Provides dates of specific construction and demolition phases to allow timely ordering of air sampling.
- Requires a calibrated manometer to be installed at each construction containment as required by the Infection Prevention Risk Assessment and Mitigation Plan (IPRAMP).
- Requests air sampling as appropriate using the Medical Center Support Services (MCSS), Air/Water/Environmental Sampling request category >5 business days prior to the start of

scheduled construction project. The requesting project manager is to task EH&S in the ICRA database or provide ICRA ID that has been approved by HEIP

Air Monitoring Strategy

Air sampling will be conducted by EH&S staff. In instances where viable fungal air sampling is warranted in addition to particulate air sampling, specimens will be submitted by EH&S to an accredited analytical laboratory for analysis. Laboratory reports received will be attached to the original MCSS request ticket and ICRA database.

Air sampling shall be based upon a completed ICRA for each project.

1. HEIP personnel or the Project Manager will complete the MCSS ticket and attach the ICRA signed by HEIP that is automatically routed to EH&S. Based on ICRA for protected environments, HEIP may request viable air sampling.
2. Should air sampling be needed on an emergent basis, HEIP or the CPM will follow-up the MCSS request with a phone call to designated members of EH&S' Industrial Hygiene Group.
3. Should the ICRA trigger fungi air sampling, this will be clearly communicated in the MCSS ticket to EH&S. The construction potentially affecting the following protected environments will require fungi air sampling: C6 BMT all patient rooms, PICU rooms 1, 2 and 15, and Long Hospital floors 11th and 12th.

Indoor locations for sampling will be decided during the ICRA and may require a site walk through by HEIP or by the Project Manager. Those locations will be detailed in the MCSS ticket submitted to EH&S. Typically, air sampling is obtained outside the barriers. Once onsite, EH&S will determine an additional sample location not impacted by construction (indoor control) for comparison and data quality control.

Outside ambient air sampling location will be collected at a location that is deemed representative of air that may enter the building (ED parking lot, roof top near outdoor air intakes, and/or loading dock) and will be collected with each sampling event to compare to indoor sample locations.

Timing and frequency of sampling:

1. The Project Manager will arrange in advance with EH&S the desired testing dates for specific locations when repeat sampling will be needed during a construction project. Such arrangements shall be noted on the MCSS ticket.
2. HEIP or the Project Manager will ideally provide >5 business days advance notice for routine particulate air sampling. EH&S will make reasonable efforts to accommodate urgent requests, such as air sampling in response to cases of healthcare-associated invasive fungal infections. Requests requiring off-hours sampling or rapid turnaround times for results may require HEIP or the CPM to contract services with a third-party vendor.
3. Frequency of sampling will be determined based on the complexity and length of the project.

Sampling Procedure and Reporting Results:

- HEIP or Project Manager submits EH&S Work Order in MCSS with project location, locations where air samples shall be taken, and dates that samples shall be taken.
- EH&S will notify HEIP and Project Manager of the approximate date/time that air samples will be taken.

Items to be addressed in the "Notes/Environmental Conditions" section of the Air Sampling Project Sheet by EH&S staff include physical condition of the area, amount of traffic, time, and weather conditions, open vs. closed windows and doors, barrier conditions, etc. Observations should include factors associated with increased risk of the presence of fungal spores such as plants, holes in ceilings or walls, or obviously dusty conditions.

1. Unless otherwise specified, all baseline and construction air sampling will include particle counts only
2. The ICRA team and EH&S will utilize a decision algorithm to determine appropriate response actions based on predetermined threshold particulate levels. This decision algorithm will consider the ambient outdoor sample, barrier indoor sample, and control indoor sample to compare against baseline results and determine the presence and/or source of elevated particle concentrations. (See Table 5.1E.1)
3. Unless otherwise specified, air sampling in protected environments will include baseline fungal sampling and a follow-up collection after construction and final cleaning. Total colony-forming units (CFU) must remain below 10 to deem the patient environment in the newly constructed space acceptable.
    a. Following sampling EH&S will attach the results and a summary to the corresponding MCSS ticket and ICRA database.
    b. Following sampling, if additional cleaning in recommended by EH&S, the PM will contact Hospitality Services via MCSS to complete the task.
    c. Regular reports, including walk-through assessments/plans, interventions and written evaluations will be completed by Facilities Management or Design & Construction staff. As appropriate, these reports will be sent to HEIP or EH&S for review, assessment, and recommendations. Sampling results will be kept in the ICRA database.

Should repeat air sampling reveal elevated particle counts, HEIP, EH&S, the Project Manager and/or Facilities Management will investigate for possible sources and determine what, if any, interventions are to be taken. Additional Preconstruction Surveys may be required with HEIP, CPM, and construction team to ensure that risk mitigation measures are implemented correctly.

Particulate Count Action Levels:

Table 5.2E.1. Action Levels			
Initial Sample		**Re-Sample**	
% Baseline Outdoor Difference	*Action*	*% Baseline Outdoor Difference*	*Action*
0 – 10%	No Action	< = 10%	No Action
> = 11%	Re-Sample	11 – 25%	Check containment; additional cleaning
	Re-Sample	26 - 40%	Check containment; additional cleaning; Re-sample after cleaning
		> = 41%	Stop work; check containment; additional cleaning; investigate potential issues; re-sample after cleaning
Key Terms: *% Baseline Outdoor Difference*: The percent difference between indoor conditions and outdoor levels when compared to baseline samples. *Action:* Specific steps to be taken based on the range of the baseline difference.			

Explanation of the Table 5.1E.1

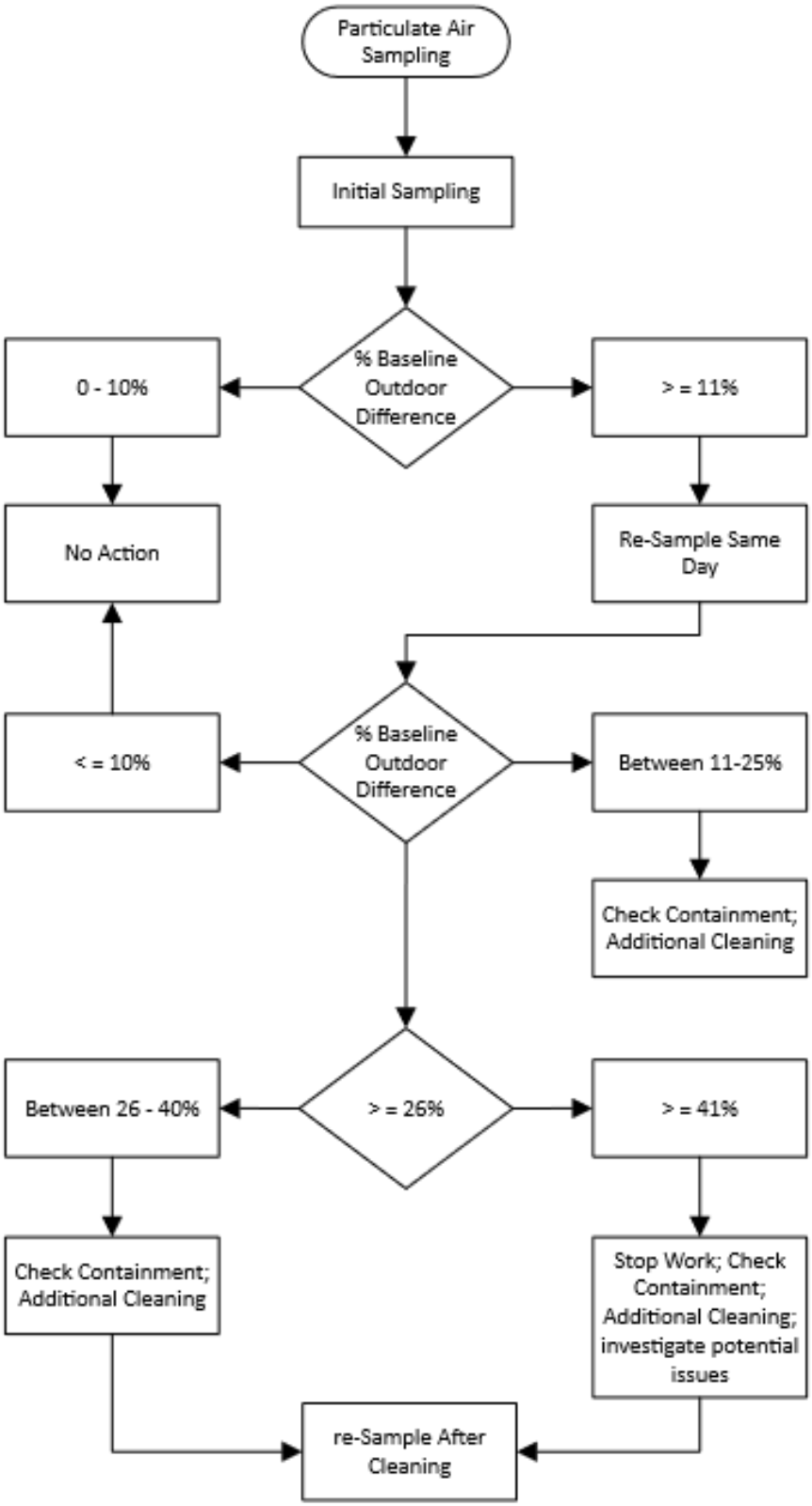
This table outlines action levels based on the percentage difference between baseline indoor and outdoor airborne particle concentrations.

The table is designed to guide actions while collecting construction air samples during two phases: Initial Sample and Re-Sample, indicating what steps should be taken based on the magnitude of the difference in readings.

During construction sampling, the %Baseline Outdoor Difference for a specific location is calculated as follows:

$$Construcion\ \left(\frac{Indoor\ Particle\ Concentration}{Outdoor\ Particle\ Concentration}\right)\% - Baseline\ \left(\frac{Indoor\ Particle\ Concentraion}{Outdoor\ Particles\ Concentration}\right)\%$$

Table 5.2E.1. above is represented the flowchart below:


Particulate Air Sampling
Initial Sampling
% Baseline Outdoor Difference
0 - 10%
> = 11%
No Action
Re-Sample Same Day
% Baseline Outdoor Difference
< = 10%
Between 11-25%
Check Containment; Additional Cleaning
> = 26%
Between 26 - 40%
> = 41%
Check Containment; Additional Cleaning
Stop Work; Check Containment; Additional Cleaning; investigate potential issues
re-Sample After Cleaning