Status **Active** PolicyStat ID **12661891**

Origination	07/2010
Last Approved	11/2022
Effective	11/2022
Last Revised	11/2022
Next Review	11/2025
Owner	William Boone: Asst Dir Envmtl Hlth/Safety
Policy Area	Environmental Health and Safety
Applicability	UNC Medical Center

Safety and Infection Prevention Management Plan for Construction, Renovation, and Modernization Projects

I. Description

Identifies, measures, and mitigates potentially hazardous materials and situations to patients and staff prior to work beginning during the design, development, and implementation phases of construction, renovation and/or modernization projects, including cabling projects performed by outside contractors or in-house force labor in UNC Medical Center facilities. For the purposes of this policy, UNC Medical Center refers to UNC Hospitals, Ambulatory Care, WakeBrook, Hillsborough Hospital Campus, Jim and Betsy Bryan Hospice Home, UNC Hospitals satellite clinics, UNC Faculty Physician community-based practices, and non-clinical satellite facilities. These policies exclude all other affiliated hospitals and UNC PN practices.

II. Rationale

This plan provides a comprehensive strategy to significantly reduce the risk of injury and infection associated with construction, renovation and modernization projects. All new projects to existing facilities shall be planned/designed in accordance with applicable health and safety codes, consensus standards, good work practice standards, and will be reviewed to ensure that all applicable infection control and life safety codes, regulations, and guidelines are incorporated into the project prior to implementation.

These requirements shall apply to all worksites where in-house personnel or outside contractors are to perform work, services, or maintenance for UNC Medical Center. Each contractor performing services for UNC Medical Center is required to meet all the applicable requirements of UNC Medical Center's Infection Control and Environmental Health and Safety Management Program, policies, and Occupational

Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulations.

III. Safety and Infection Control Requirements

A. General Information

Construction/renovation activity by both outside contractors and in-house personnel will be performed in accordance with this policy. When planning demolition, construction, or renovation work, a proactive risk assessment must be conducted using risk criteria to identify hazards that could potentially compromise patient care in occupied areas of the organization's buildings. The scope and nature of the activities will determine the extent of the risk assessment required. Specifically, contractors and project managers must ensure there are specified methods in use to minimize dust generation and dispersal, reduce vibration and noise, and observe interim life safety measures as necessary. Construction projects in, near, or potentially impacting patient care areas will be evaluated by Infection Prevention (IP) and UNC Medical Center Environmental Health and Safety (UNCMC EH&S) prior to work beginning and during regularly scheduled construction site rounds until the work is completed and final cleaning has taken place. It will be the responsibility of Project Manager to ensure compliance. For the purpose of this policy, Project Manager will refer to either the Plant Engineering or Planning project manager assigned to the project. Routine maintenance activities that do not generate dust or odors are excluded from this policy.

Modernization projects including cabling projects can also have an impact on patient care. It is imperative that modernization projects be coordinated through Plant Engineering, UNCMC EH&S and Infection Prevention to ensure a safe environment. Contractors working on modernization projects must also comply with the policy.

B. Pre-Construction Activities

1. Plan Review
    a. Representatives from IP and EH&S, in conjunction with Plant Engineering or Planning, will review plans for all construction and renovation projects.
    b. EH&S will review plans for safety, indoor air quality, and ergonomics issues and to ensure that all state and federal safety regulations have been considered in the design of the project.
    c. IP will review plans for issues relating to infection prevention, see Attachment 1, and to ensure that all infection prevention standards and applicable guidelines have been considered in the design of the project.
    d. In the absence of state design codes for physician practices and specialty clinics, IP and EH&S will rely on recommendations provided in the most current edition of the *Guidelines for Design and Construction of Hospital and Outpatient Facilities* published by the Facility Guidelines Institute (FGI).
    e. In order to make informed recommendations on plans, knowledge of the function of the planned space is necessary. This may require IP and EH&S to request a walk-through of the proposed project with the Project Manager,

clinical staff and/or other appropriate personnel.

f. Any recommendations for plan changes will be submitted in writing at plan review meetings to the Plant Engineering project manager for submittal to the designer. The Plant Engineering project manager will implement recommendations as deemed appropriate.

g. The safety and health review of major capital improvements is supplemental to the Division of Health Service Regulation and the Department of Administration review. The contractor shall provide workplace safety and meet all OSHA and UNC Medical Center safety and infection control requirements for capital improvement and facilities improvement projects.

2. Pre-Construction Notification to Building Occupants through the Project Manager

   a. Building occupants must be notified as soon as possible but not less than 48 hours in advance of scheduled activities that are likely to impact the Indoor Environmental Quality (IEQ) in their work area(s). Examples of such activities include roofing projects, flooring projects, and any construction or renovation activities that generate excessive noise, vibration, or air contaminants that could affect occupied spaces beyond the immediate project area. Notification must be made in writing to the manager(s) of all potentially affected departments and must include the following information:

      - A brief description of the project and how it could impact Indoor Environmental Quality (IEQ) within the building
      - Steps taken to reduce the impact of the project on building IEQ
      - The expected project start date and the expected project completion date
      - The expected daily work hours
      - The name, phone number, and email address of the project manager and/or other person(s) who may be contacted to request assistance or to report a problem
      - What to do in the event of an occupational injury or illness

3. Pre-Construction Meetings

   Representatives from IP and EH&S will attend pre-construction meetings so infection control and safety issues can be discussed prior to the start of construction. This is a multidisciplinary team including Plant Engineering, Contractor Project Managers, Nursing, IP, EH&S, and other UNC Medical Center departments affected by the construction/renovation project.

   Examples of the kinds of issues discussed at these meetings include: (1) risk assessment, including identification of areas where high-risk patients are treated or housed; (2) determination of whether construction poses sufficient increased risk to recommend that patients be moved to an area in which no construction is occurring; (3) coordination of the relocation of affected patients and pedestrian traffic routes to

avoid construction areas ; (4) determination of optimal routes for construction traffic, including transport of construction supplies and waste; (5) types of infection control measures and barriers recommended (e.g., plastic or solid); (6) contractor compliance with UNC Medical Center's construction, industrial hygiene and safety programs (e.g., PPE, dust control, fire prevention, ILSM, compressed gas storage, etc.); and (7) proposed start and end dates. Departments are responsible for obtaining code compliant temporary storage for departmental materials and equipment, which will be displaced during the renovation period. The storage of any items in corridors or stairwells is strictly prohibited.

4. Risk Assessment

   For all projects that are in, near, or may impact patient care areas, the Plant Engineering Project Manager will initiate a Preconstruction and Infection Control Risk Assessment (ICRA) form and forward it to IP and EH&S for approval. For construction and renovation projects that do not utilize UNC Hospitals Plant Engineering Project Managers and/or are not managed by UNC Hospitals Plant Engineering Department, (e.g., ISD or Telecommunications projects or most community-based outpatient projects) the Infection Preventionist responsible for that project's oversight will prepare the "Preconstruction and Infection Control Risk Assessment" in partnership with EH&S.This pre-construction risk assessment will include risk criteria that have been developed to address the impact of demolition, renovation, or new construction activities have on air quality requirements, infection control, utility requirements, noise, vibration, and emergency procedures. The four-step Risk Assessment assists in identifying the patient populations at risk and the preventive measures to be implemented. After approval by the aforementioned departments, the Risk Assessment form is returned to the Plant Engineering project manager **prior to the start date of the project (including any demolition work)**. The project manager is responsible for ensuring that all infection prevetnion and safety requirements on the Risk Assessment form are implemented.

   a. Required Steps for Completing the Infection Control portion of the PCRA (Attachment 2)

      i. **Step One: Definition of Construction Activity Types (Type A, B, C, and D)** – The construction activity types are defined by the amount of dust that is generated and the duration of the work.

      ii. **Step Two: Definition of Infection Control Risk Groups (Group 1-Low Risk; Group 2-Medium Risk; Group 3-High Risk; Group 4-Highest Risk)** – Identify areas in which patients are at risk of developing adverse outcomes if exposed to construction-related dust.

      iii. **Step Three: Definition of the Class of Precautions:** Use the Infection Control Matrix to determine of the Class of Infection Control Precautions **(I, II, III, or IV**) that will be required. This is based upon Construction Project Type **(A, B, C, or D)** and the Patient Risk Group **(Low, Medium, High, Highest).**

      iv. **Step Four: Implement the appropriate Infection Control**

Construction Precautions. The Precautions are based upon the project classification **(I, II, III, or IV)** selected from the Infection Control Matrix.

5. Controlling Dust and Extrinsic Contamination of the Hospital Environment – Quick Reference for Construction Barrier Specifications (Attachment 3)
    a. Products and Materials
        i. Approved Barrier Products
            - Sheet Plastic: Fire retardant polyethylene, minimum 6-mil thickness. Fire retardant rating shall be printed on plastic.
            - Dry wall with metal studs or other approved Class-C rated materials per the NC Fire Code.
            - Solid core, wooden doors in metal frames, preferably varnished or painted.
            - Portable dust containment system, such as "ZipWall" as manufactured by Zip Wall, LLC, Cambridge, Mass., or equivalent.
            - Reuseable temporary dust containment wall systems, such as Edge-Guard, StarcSystem or equivalent products.
            - Mobile Dust Containment Carts (heavy-duty, flexible, vinyl, portable, ceiling access modules) can be used for limited ceiling access.

        ii. HEPA-Filtered Ventilation Units: Unit will be maintained and filters will be changed in accordance with manufacturer's recommendations and as necessary. A pre-project inspection of HEPA filtered equipment should be conducted by the Project Manager or for in-house projects, the PED Project Manager, to verify that the filters are clean and that there are no potential by-pass issues, such as damaged filters or seals.

        iii. Exhaust Hoses: Heavy duty flexible steel reinforced ventilator/ blower hose.

        iv. Adhesive Walk-Off Mats: Provide mats with a minimum size of 24 inches x 36 inches. Ideally, adhesive mats will be used. The adhesive sheets should be replaced regularly to maintain effective dust elimination. Bleach (10%) spray on wet carpet will be allowed *inside* the site when needed for heavy demolition/high dust producing activities. In addition, the wet carpet should be replaced or professionally cleaned weekly because of the decreased effectiveness of the bleach in the presence of heavy dirt and debris.

        v. Disinfectants: Environmental Services uses the following UNC

Medical Center approved surface disinfectants – Metriguard, Oxivir TB and Sani-Cloths for horizontal surfaces; A-458-2N for floor cleaning. See Environmental Services Infection Control Policy for details.

b. Dust Reduction and Containment Measures

i. **Barriers**

- Construction activities causing disturbances of existing dust or creating additional dust will be conducted in tight enclosures designed to prevent the flow of dust into adjacent areas.
- Barriers should be in compliance with applicable codes and standards.
- Dust barriers will be installed prior to work beginning, including demolition or equipment removal, and will remain in place until construction is complete.
- For the purpose of infection prevention, barriers must remain in place until a terminal clean is completed by EVS or an outside service hired by the project manager.
- Plant Engineering project managers will be responsible for routinely monitoring the integrity of barriers (e.g., daily).
- Construction supervisors should ensure that gaps or breaks in barrier joints are repaired upon identification.
- Where containment is possible utilizing existing walls and doors, the doors should be kept closed and sealed with appropriate tape to prevent the escape of dust. The construction entrance door should be kept closed except during entrance/egress.
- In areas where containment is not possible utilizing existing walls and doors, the following methods of containment may be used. If the project includes any high risk construction techniques (i.e., torch cutting, welding, burning) non-combustible barriers (i.e., sheet rock, gypsum board) should be used instead of plastic barriers.
    - Drywall barriers. Seams or joints will be covered or sealed to prevent dust and debris from escaping. Self-closing (e.g., metal spring) construction site entrance doors will be used for areas with drywall barriers. Prior to building drywall barriers, a temporary plastic barrier should be placed to prevent dust contamination of areas outside the

construction site, see Attachment 3.

- An anteroom or double entrance opening should be considered in highest risk areas (e.g., Surgical Services, Intensive Care Units, Oncology Units and other highest risk areas listed at the bottom of the table provided in Attachment 2, Step 2) and approved by IP prior to start of project.
- Airtight plastic barriers extending from floor to ceiling decking, or to the ceiling tiles if ceiling tiles will not be removed. Plastic barriers should be wrapped at the top and bottom with wood or metal and pinned to the floor and ceiling with support rods. Seams will be sealed with appropriate tape. Plastic barriers requiring an entrance will have an overlapping, weighted flap, minimally 2 feet wide or zippered closure for personnel access. Portable dust containment units such as Zip Wall (or equivalent), with polyethylene pulled tight against floor, ceiling and walls with appropriate tape or equivalent. **Plastic barriers are acceptable only for short term projects (e.g., < 2 weeks).**
- Portable dust containment wall panels (e.g., Edge-guard, StarcSystem) should extend from floor to ceiling and wall to wall to prevent dust leaving the construction site. The edge where the panel touches the ceiling, floors and walls should be taped with a well adhering tape as an added measure.

- Tightly sealed barriers will be placed at penetration of ceiling envelopes, chases and ceiling spaces. Dust barriers should be erected at elevator shafts or stairways within the construction area, allowing for emergency egress. Holes, pipes, conduits, punctures and penetrations of existing perimeter walls should be sealed (See Plant Engineering for proper controls).
- Replace any ceiling tile displaced for inspection immediately when unattended if outside the construction barrier.
- All penetrations should be sealed with plastic and appropriately taped within the construction/renovation area to prevent the incursion of dust outside the containment barrier.

- Staff should report any problems or concerns regarding barriers or the construction site to the Project Manager and/or IP.

c. Ventilation

i. If possible, remove or isolate the HVAC system in areas where work is being performed to prevent contamination of the duct system. Block off and seal unused air vents.

ii. If possible, exhaust fans discharging directly outside will be utilized to maintain negative pressure within the construction area. Exhaust discharge should be at least 30 feet from any air intake. Where direct outside exhaust or minimum air intake separation is not possible, HEPA-filtered units will be used to filter recirculated air. Exhaust fans and HEPA filters will run continuously within the construction project area throughout the project. Equipment will be maintained and filters monitored and changed as needed in accordance with manufacturer's recommendations. When exhaust discharging directly outside will involve dust/debris, the exhaust air stream shall be filtered.

iii. When indicated by PCRA, negative air pressure will be continuously maintained within the construction area at 0.01 inch water gauge or less when all doors are closed as measured by an installed digital manometer. If negative air pressure cannot be achieved as determined by the on-site supervisor and/or the PED Project Manager, alternative methods of environmental control should be utilized (e.g., HEPA filtration air scrubbing) and IP must be notified.

iv. In areas where an anteroom is used, airflow will be maintained from the clean area through the anteroom and into the work area (i.e., negative pressure differential will be maintained in the work area).

v. Windows should remain closed on the project site.

vi. If a chute is used for debris removal, ensure negative pressure differential is maintained between the project area and the hospital.

vii. IP or the Project Manager may request an initial barrier inspection be conducted prior to start of work. If questions arise regarding the negative pressure following a visual inspection of the containment barriers, EH&S can be contacted to conduct testing with smoke tubes or other visual indicators to verify negative pressure has been achieved at all sides of the containment.

viii. Depending on the project, other measures besides ventilation and containment may be needed to assure adequate health and safety is maintained. These may include pre-selection of products (i.e. low VOC), local exhaust controls for power tools, etc., and

modification or substitution of application methods.

d. Cleanliness and Surface Disinfection
    i. Adhesive walk-off mats will be used inside and/or outside of exits and entrances to the work area. Adhesive walk-off mats will be changed as frequently as needed (i.e. when no longer preventing dusty footprints outside the work area). Bleach (10%) spray on wet carpet will be allowed *inside* the site when needed for heavy demolition/high dust producing activities. In addition, the wet carpet should be replaced or professionally cleaned weekly because of the decreased effectiveness of the bleach in the presence of heavy dirt and debris.
    ii. When construction is in an occupied area, the construction area will be vacuumed or damp-mopped at the end of each work day and more frequently as needed.
    iii. Vacuum cleaners will have HEPA filters.
    iv. Ensure that patient care equipment and supplies are protected from dust exposure.
    v. Execute work by methods to minimize raising dust from construction operations. Water mist work surfaces to control dust, when appropriate.
    vi. Keep dust and accumulated dirt in the work site to a minimum. Keep area around site clean. Any dust tracked outside the barrier must be removed immediately. Wet mop with disinfectant to minimize dust and debris in and outside of the work site.
    vii. The wheels of carts used for waste transport will be kept clean to avoid dust tracking outside the site.
    viii. Cover construction supplies, materials and debris during transport within the facility to and from the work site.

e. Traffic Control
    i. Construction traffic will be routed to avoid patient transport routes when possible. These routes should be discussed at the pre-construction meeting and communicated from the construction supervisors to all workers.
    ii. Pedestrian traffic in construction areas is prohibited.
    iii. Ideally, designate an elevator for the sole use of construction workers. Elevators used primarily by the public should be avoided.
    iv. Clean and sterile patient care items should not be transported through or stored within construction/renovation areas.
    v. UNC Medical Center staff are prohibited from entering the construction site unless supervised by the Project Manager or Safety Officer and must not damage or alter temporary barriers.

This does not refer to designated Plant Engineering, Infection Prevention and UNCMC EH&S staff.

f. Storage of Building Supplies and Departmental Supplies

i. Departments are responsible for obtaining temporary storage for departmental materials and equipment that will be displaced during the renovation project. The storage of any items in corridors or stairways is strictly prohibited. Patient care items may not be stored within the construction areas as it cannot be appropriately protected from contamination.

ii. Construction materials such as drywall will be stored in clean, dry areas to prevent growth of bacteria and fungi.

iii. Ductwork materials will be stored in a clean, dry area to prevent the accumulation of dust in the ductwork prior to installation. Ideally, all of the ductwork should have plastic covering over each open end to ensure that no dust or debris collects prior to installation.

iv. Storage of construction related equipment and supplies should be within the construction area (i.e. within the barriers or in a location approved by the Plant Engineering Project Manager).

g. Protective Clothing

i. In some highly sensitive areas, such as the Surgical Suites, protective clothing (e.g., coveralls, hair covering, shoe covers) may be required. Protective clothing will be removed any time the worker leaves the immediate work area.

ii. Used protective clothing will be disposed of in a non-regulated waste container located in or near the work zone exit.

h. Precautions for Patients in Clinical Areas Where Ceiling Work is Planned

- When contractors, in-house personnel and other departments (e.g. ISD, Telecommunications) must enter ceilings to perform repairs or maintenance, an open ceiling permit (see Attachment 8) must be requested prior to work beginning. If the ceiling access is occurring in the highest risk areas, IP must be informed in order to determine the need for the use of a mobile dust containment cart (i.e., infection control cube) or plastic barriers prior to beginning the work. This assessment may be done in collaboration with Plant Engineering and the nurse managers. The list of highest risk areas and information on precautions for above ceiling work is in the Infection Prevention Policy: Plant Engineering and Maintenance under Attachment 3: Precautions for Patients in Clinical Areas Where Ceiling Work is Planned

i. Special Precautions for Water Handling (Plumbing Alterations)

i. Caution will be used when handling fluids (i.e., removing plumbing

pipes and fixtures) to prevent wetting and/or contamination of building materials or work areas.

ii. Before an area is released for patient occupancy/use, Plant Engineering will ensure appropriate water temperature and potability.

6. Construction-Related Infection Control and Safety Education

   Plant Engineering will provide training to all prime and sub-contractors and their employees. It is the contractor's responsibility to ensure coordination with Plant Engineering for training.

7. Safety Compliance

   a. All companies performing construction or renovation on UNC Medical Center property shall comply with all federal, state, and UNC Medical Center safety and environmental regulations. For example, all outside contractors must comply with the federal and state requirements as outlined in Occupational Safety and Health Standards for the Construction Industry, 29 CFR Part 1926 as adopted by 13 NCAC 7C.0101, including 29 CFR Part 1910 General Industry Safety and Health Standards applicable to construction. It is the responsibility of the contracting department to ensure that the contractor is complying with all applicable safety regulations. UNCMC EH&S is available for consultation as needed to address issues relating to safety program requirements.

   b. All contractors performing construction or renovation projects for UNC Medical Center are required to have documented safety programs and comply with such programs. These programs should not only meet the requirements of any Federal (OSHA), State, and local agencies, but should also meet the requirements of UNC Medical Center policies. For multi-prime, single prime, tiered construction projects, etc., it shall be the responsibility of the lead contractor to ensure that the work site, the subcontractors and their employees, the machinery/equipment being utilized, and all other aspects of the construction project remain in compliance with the project's safety program, as set forth in the project documentation. If the contractor performs work in occupied patient care areas, the provisions of this policy set forth in Attachment 4 and Attachment 5 shall also be applicable, as appropriate.

C. Activities During Construction

1. Maintenance and Construction Meetings

   These multidisciplinary meetings including representatives from IP and EH&S are held on a biweekly basis to discuss issues with pending and ongoing construction and maintenance projects within the hospital.

2. Safety

a. Construction and renovations in occupied buildings should not interfere with required exits. If it is necessary for an exit to be closed, temporary approval must first be obtained from the Director of Plant Engineering or ACC Administration, or designee. Projects which may cause disruptions of the life safety systems are required to complete an Interim Life Safety Measures document (see Section IV). The purpose of this plan is to establish and document the necessary safety provisions. Said document, if required, is to be finalized at the design phase of the project. UNCMC EH&S will be notified in the event any exit has to be closed. Temporary emergency evacuation routes shall be posted by the Project Manager for any areas, which require temporary modifications in their evacuation routes due to construction activities.

b. The contractor is required to keep the jobsite free of debris and loose combustible materials. All debris is to be removed from the construction area periodically or as directed by the Project Manager and/or project requirements.

c. Signage shall be placed at all entrances to the project site identifying the area as unsafe and closed to all but authorized construction personnel. Should it be necessary for employees to enter the construction site, permission must be obtained from the Plant Engineering Project Manager and appropriate personal protective equipment worn.

d. To ensure compliance with the public protection provisions, the Project Manager will inspect, with the architect and engineer, each project periodically and will report findings to UNC EH&S and/or IP as appropriate. The Project Manager assigned to the project shall monitor safety activities on the site and shall ensure compliance with all safety requirements. The Project Manager will also complete the Weekly Monitoring Checklist: ILSM-PCRA Precautions (Attachment 6) and maintain copies of these inspections with other documentation pertinent to the project.

3. Construction Site Rounds

   As a means of assessing compliance with this policy, regularly scheduled visits to construction sites will be performed by UNCMC EH&S and IP and a representative of Plant Engineering. IP and EH&S will prepare a written report of the findings with recommendations for correction of deficiencies. The Plant Engineering Project Manager is responsible for ensuring that deficiencies presenting a significant infection, safety, or environmental risk are corrected within 24 hours. Construction/renovation activity may be halted when a significant breach in infection prevention and/or safety measures is identified by IP and/or UNCMC EH&S that poses a direct and immediate risk to patients, staff and/or contractors.

4. General Contractor Inspections

   The general contractor shall maintain on-site a list of all contractors trained to maintain compliance with all PCRA and ILSM findings.

D. Post Construction Activities

1. The contractor will vacuum and clean all surfaces in the completed construction area, rendering them free of visible soil and dust prior to the removal of barriers.
2. Barrier materials should be removed carefully to minimize spreading of dirt and debris. They should be damp wiped, HEPA vacuumed or water misted prior to removal and should be discarded as construction debris.
3. A final inspection may be conducted by the Project Manager, Infection Prevention, UNCMC EH&S and others as may be necessary.
4. Environmental Services will perform the final cleaning of construction/renovation areas before allowing patients to occupy the area.
5. All blockages from the air systems will be removed.
6. The ventilation system will be balanced, as necessary, to conform to design specifications. Ensure the ventilation system is functioning properly and is free from contamination with construction debris/dust after construction/renovation is complete.
7. HVAC equipment and filters will be examined by Plant Engineering for blockage and/or leakage.
8. Any barriers or covers placed during construction to prevent activation of smoke or heat detectors must be removed.
9. Documentation on all sign-offs, including that of containment barriers/negative pressure and inspections shall be provided to PE project manager.

IV. Interim Life Safety Measures (ILSM)

UNC Medical Center will implement, document, and enforce reasonable interim life safety measures (ILSMs) necessary to protect occupants during periods when the Life Safety Code® is not met or during periods of construction.

Shutdown of existing fire protection systems for renovations and maintenance shall be kept to a minimum. Plant Engineering or UNC-CH Facilities Services will notify the following agencies and departments: 1) Hospital Police or UNC Public Safety; 2) the departments being effected by the shutdown; 3) the Chapel Hill Fire Department; 4) the North Carolina Department of Insurance – the Property Insurance section; and 5) the North Carolina Department of Insurance – the State Fire Marshal with jurisdiction over the Hospitals. if the shutdown will be greater than 4 hours. A fire watch will be initiated when a fire alarm or sprinkler system is out of service more than 4 hours in a 24-hour period in an occupied building. Notification and fire watch times are documented.

Plant Engineering or UNC-CH Facilities Services will post signage identifying the location of alternative exits to everyone affected.

ILSM will be evaluated and applied as necessary when Life Safety Code® deficiencies cannot be immediately corrected or during periods of construction. The Joint Commission requires that Interim Life Safety Measures (ILSMs) be evaluated for routine maintenance activities as well as for issues

identified in the Plans for Improvement (PFIs). For routine maintenance, the employees in Maintenance and contractors will be educated on life safety compliance and ways to prevent the requirement to implement ILSMs. In regard to barrier penetration based PFIs, Plant Engineering and UNCMC EH&S have determined that the aggregate sizing of the wall or ceiling penetrations historically discovered within the existing facility do not pose an immediate threat to life safety and that no additional ILSMs need to be implemented unless the nature of the deficiency is related to another type of issue or if the penetration is greater than 5% of the rated barrier. For all other deficiencies listed as a PFI, a risk assessment will be performed to determine the need for the implementation of interim life safety measures.

The following criteria for evaluating when and to what extent the hospital follows special measures to compensate for increased life safety risk during maintenance activities:

- Determine if the impact is significant
- In general, projects less than a week in length which do not reduce the level of life safety below Life Safety Code® minimum requirements are not significant
- Activity which takes place in a room with an intact door which does not penetrate walls generally does not require an ILSM
- Activities that block or compromise exit stairs, required exit corridors, or exit discharge areas for more than one shift generally require an ILSM

The following criteria for evaluating when and to what extent the hospital follows special measures to compensate for increased life safety risk during construction and renovation activities will be utilized.

- Inspects exits in affected areas on a daily basis. Means of egress for exiting renovation/ construction areas will be inspected daily by the PE/FS Project Manager or the on-site contractor supervisor.
- Provides temporary but equivalent fire alarm and detection systems for use when a fire system is impaired. PE/FS Electronics Shop will ensure the fire alarm, detection, and suppression systems are in good working order. Temporary but equivalent fire alarm and detection systems as determined by project specific site needs shall be provided when any fire system is impaired. The contractor will provide, install, and maintain temporary fire extinguishers throughout the work until the permanent system is in place.
- Provides additional firefighting. PE/FS will provide additional fire-fighting equipment as may be deemed necessary.
- Uses temporary construction partitions that are smoke-tight, or made of noncombustible or limited-combustible material that will not contribute to the development or spread of fire as determined by PE/FS and the contractor in charge of the project.
- Increases surveillance of buildings, grounds, and equipment, giving special attention to construction areas and storage, excavation, and field offices. As determined by ILSM, fire, safety, and infection control inspections will be conducted by PE/FS, Hospital Police, UNCMC EH&S, or IP in conjunction with the contractor in charge of the project. Rounds will be coordinated between PE, UNCMC EH&S, and IP.
- Enforces storage, housekeeping, and debris-removal practices that reduce the building's flammable and combustible fire load to the lowest feasible level. The contractor in charge of the project will develop and enforce storage, housekeeping, and debris-removal practices that

reduce the building's flammable and combustible fire load to the lowest feasible level. The contractor shall establish procedures to minimize storage of combustible and flammable materials on site. Combustible trash shall be removed from the site daily. The project manager for PE or FS will monitor activities daily to implement appropriate housekeeping measures, when necessary.

- Provides additional training to those who work in the hospital on the use of firefighting equipment as may be deemed necessary.
- Conducts one additional fire drill per shift per quarter if deemed necessary by the Plant Engineering Project Manager and/or UNCMC EH&S.
- Inspects, tests, and documents the testing date for temporary systems monthly.
- Conducts education to promote awareness of building deficiencies, construction hazards, and temporary measures implemented to maintain fire safety. UNC HC EH&S, in conjunction with information provided by PE/FS, will train personnel when structural or compartmentation features of fire safety are compromised. This training will be conducted for individuals that work in or adjacent to the affected area(s), to compensate for impaired structural or compartmentalization features of fire safety.
- Trains those who work in the hospital to compensate for impaired structural or compartmental fire safety features. During the construction and renovation of new and existing areas of the hospitals and ambulatory occupancies, Plant Engineering (PE) or UNC-CH Facilities Services (FS) will implement reasonable and appropriate measures to provide free and unobstructed exits in the Hospitals or ambulatory occupancies in those construction/renovation areas. Personnel will receive training when alternative exits are designated from the Department Safety Coordinator or UNCMC EH&S. In order to ensure that the appropriate DSC is contacted, PE/FS will provide UNCMC EH&S with a list of all areas with alternative exits at least one month prior to the closure. Buildings or areas under construction must maintain escape routes for construction workers at all times. UNCMC EH&S will conduct training as may be deemed necessary.

ILSMs will also be evaluated for issues identified in the Statement of Conditions at regularly scheduled meetings between PE and UNC HC EH&S.

Documentation will be maintained for each measure as may be required for any given project.

V. Ceiling Opening and Fire/Smoke Barrier Penetrations

No ceiling throughout the entire Hospital complex may be opened nor may any penetration into or through a fire/smoke barrier be modified or created without prior written permission from the Plant Engineering (PE) Department. No ceiling located on the 1st floor of the Ambulatory Care Center may be opened nor may any penetration into or through a fire/smoke barrier be modified or created without prior written permission from the Ambulatory Care Center (ACC) Administrative Office. This section of the policy also applies to the Hillsborough Hospital Campus, WakeBrook, and ambulatory care occupancies at Meadowmont B. No ceiling at the Jim & Betsy Bryan Hospice Home may be opened nor may any penetration into or through a fire/smoke barrier be modified or created without prior written permission from Real Estate Development and / or its designee. Opening a ceiling means to remove or alter any

ceiling to gain access to the area above it. Examples are: lifting a tile in a drop ceiling just enough to see above it, drilling a hole in any ceiling, opening any access door, removing a portion of a ceiling or an entire ceiling, or any other activity which may result in the opening of a ceiling.

A. Procedure

1. Departments or contractors who need to create an opening(s) in a ceiling(s), or who need to create a new opening or modify an existing opening in a fire/smoke barrier to perform a permissible function must first obtain either an "Open Ceiling Permit" or a "Fire/Smoke Barrier Penetration Permit" or both. These permits will be obtained from the facilities operations staff on site. The request will be evaluated and permission will be granted or denied based upon the information provided at the time of the request, operations occurring within the respective facility during the request period, and the amount of disruption the request will generate as it may require staffing notices, closures, or additional management/department reviews.

   Note: Contractors shall be required to work through their hiring department to make the request(s) as the hiring department shall be responsible for ensuring the quality of the work being performed and the integrity of both the ceiling(s) and any barriers that were modified during the work.

2. When working in a patient care area, the department should check with the charge nurse before beginning work so the charge nurse can ensure that at-risk patients are in their rooms and the respective doors are closed. Attachment 3 of the Infection Prevention policy for Plant Engineering and Maintenance also contains guidelines for "Precautions for Patients in Clinical Areas Where Ceiling Work is Planned."

3. When the work is being performed in the highest risk areas, the department overseeing the work should also contact IP for guidance before opening the ceiling. At the time of notification Infection Prevention will also reiterate the infection prevention measures provided to the contractors by Plant Engineering to include:

   a. Immediately prior to beginning ceiling work in a patient care area, the individual conducting the work should consult the charge nurse, so she/he can assess the potential impact of the work on immunocompromised patients in the area and ensure that patients are in their rooms and doors are closed.

   b. All above ceiling work in highest risk areas must be performed using some form of dust containment (e.g., mobile dust containment cart, temporary barrier, or equivalent).

   c. No patients may be housed in rooms where work is being conducted or ceiling tiles have been removed in the patient's room.

   d. During the period in which tiles have been removed and work is being done, all immunocompromised patients should wear a surgical mask that covers the mouth and nose *when in the area of the ceiling opening*.

   e. Thorough cleaning following all work should be done by Environmental Services before patients are allowed to remove their masks.

   f. Depending on the location and details of the project, a plastic barrier or

cube may be required.

4. Once the permit(s) are issued, the department overseeing the work will be required to maintain a log of the specific ceiling opening locations and dates that include fire/smoke barrier penetration additions or modifications. This log shall be submitted to Plant Engineering or ACC Administration as part of the permit close-out at the conclusion of the project.
5. After the permit(s) have been approved, the requester and the PED Safety Officer shall retain a copy of the signed permit(s). The permit(s) must be readily available at the location of the ceiling opening or the fire/smoke barrier penetration during the process of performing the work for any health care personnel who may have reason to determine if permission has been granted. Employees in areas where ceilings are opened should verify that the department manager is aware of the ceiling opening project and, if unaware, should contact PE or ACC to confirm that the work has been approved.
6. When work begins, if previously undetected hazardous materials or suspected asbestos containing materials are found, activities in the area must immediately stop and notification be given to PE or ACC Administration. Activities cannot resume in the area until materials have been examined by PE/Facilities Services and permission has been given to resume work. If an asbestos abatement is performed, a clearance form must be provided giving approval by the Asbestos Control Officer to re-occupy the area. Additional requirements may be located in the Asbestos Control Policy.
7. If dust and debris are anticipated or are created during the work, IP must be contacted to coordinate remedial action as necessary.
8. If at any time any individual becomes aware that a rated-wall assembly, i.e. a fire or smoke barrier or ceiling, has been penetrated or compromised, that individual must note the location of the compromise on the fire/smoke barrier penetration permit for notification to Plant Engineering or ACC Administration during close-out of the permit to document that the penetration/compromise was corrected at the time of and as part of the work. If the compromise is to be left uncorrected during the duration of the work the Department is to immediately notify Plant Engineering or ACC Administration so that appropriate corrective/protective measures can be implemented.
9. When the individual or firm completes the activity for which permission was issued, the permit(s) and supporting data shall be returned to Plant Engineering or ACC Administration so that the permit can be removed from the active permit's list.
10. The contractor is responsible for proper sealing and/or resealing of penetrations in accordance with all applicable codes and standards. The contractor is responsible for returning the area in which the work was performed to its original state.
11. Plant Engineering may provide direction at the request of the Department or Contractor to ensure compliance. Plant Engineering may also conduct periodic reviews of past permit closures to ensure that the work was completed in accordance with all applicable codes and standards as well as to ensure the integrity of the Life Safety systems and barriers. Should discrepancies arise, it shall be

incumbent upon the Department that either self-performed the work or was responsible for overseeing the work to provide a suitable resolution at the direction of Plant Engineering. After completion of the above procedure, the close-out section of the sheet must be signed by the requesting Department's representative and returned to Plant Engineering or ACC Administration.

B. Implementation

It will be the responsibility of PE and ACC Administration to implement these procedures as outlined below:

1. Contractors who are responsible for sub-contractors must include written notification on the contract document of the ceiling opening requirements. Notification can be a statement typed on a purchase request form that states, "All activities caused by this contract must comply with UNC Medical Center's Ceiling Opening Requirements" or if a formal contract is used, it must be one of the general conditions. Alternatively, having the Contractor go through the PE Contractor orientation class shall also be deemed as acceptable notification.
2. Individuals or firms who want to open a ceiling must request permission by completing the request section (Section I, REQUEST) of the Ceilings Control Sheet (Attachment 8) which is available from the Safety Officer or ACC Administration.
3. The project manager will complete the approval section of the control sheet, granting or denying permission to work in the area requested. If permission is denied, the reason is to be written on the sheet. If permission is granted, the project manager will issue the sheet to the requester and will notify the Department of Infection Prevention where and when the project is going to take place.
4. The requester will retain the sheet in the project area and make it available to any UNC Medical Center personnel who may ask to see it.
5. The requester will return the control sheet to the project manager after the project has been completed. The project manager will inspect the work area for damages and complete the inspector's section (Section III, Close-Out Inspection). If there are damages they will be described on line C and suitable arrangements will be made with the individual or firm to resolve them. After all of the damages have been resolved, the project manager shall sign the close-out section. A copy of this sheet shall be given to the requester and the Safety Officer or ACC Administration.
6. The project manager will file the control sheet with the project document. A completed status report will then be filed to permit payment for the project. A completed status report must not be filed until clearance has been given for the project.
7. PE/ Facilities Services (FS) trade supervisors, other designated PE/FS personnel, and the Director of UNCMC EH&S, or designee, are exempt from the conditions of these requirements due to the nature of their work.

VI. References

CDC. *Guidelines for Environmental Infection Control in Health-Care Facilitie*s. MMWR 2003:52 (No. RR-10);

1-42.

Guidelines for Design and Construction of Hospitals. The Facility Guidelines Institute. 2022 Edition.

Guidelines for Design and Construction of Outpatient Facilities. The Facility Guidelines Institute. 2022 Edition.

ASHE. American Society for Healthcare Engineering of the American Hospital Association web site. Infection Control Risk Assessment 2.0, Matrix of Precautions for Construction, Renovation and Operations. Web address: https://www.ashe.org/system/files/media/file/2022/05/ICRA-2.0-FORM-202205%20Final.pdf.

Kanamori[BM1] [SE2] H, Rutala WA, Sickbert-Bennett EE, Weber DJ. Review of fungal outbreaks and infection prevention in healthcare settings during construction and renovation. Clin Infect Dis. 2015 Aug 1;61(3):433-44. doi: 10.1093/cid/civ297. Epub 2015 Apr 13. PMID: 25870328.

Buchanan MO, Thompson SC, DiBiase LM, Sickbert-Bennett EE, Weber DJ. Does a mobile dust-containment cart reduce the risk of healthcare-associated fungal infections during above-ceiling work? Infect Control Hosp Epidemiol. 2021 Apr;42(4):477-479. doi: 10.1017/ice.2020.469. Epub 2020 Oct 9. PMID: 33032667.

VII. Comments

For comments or questions about the contents of this policy, contact:

- Environmental Health and Safety, 984-974-0749
- Infection Prevention, 984-974-7500
- Plant Engineering, 984-974-0320

Attachments

- Attachment 1 - Sample Infection Prevention Blueprint Review for Clinical Areas
- Attachment 10 - Fire/Smoke Barrier Penetration Log
- Attachment 2 - Preconstruction Risk Assessment
- Attachment 3 - Quick Reference for Construction Barrier Specifications.docx
- Attachment 4 - Contractor Employment Requirements.docx
- Attachment 5 - Health Screening Criteria.docx
- Attachment 6 - Weekly Monitoring Checklist: ILSM-PCRA Precautions
- Attachment 7 - Interim Life Safety Measures Construction Project Assessment

Attachment 8 - Open Ceiling Permit

Attachment 9 - Rated Assembly Permit

Plant Eng - Att 3 - Precautions for Patients in Clinical Areas Where Ceiling Work is Planned - revised 4-2021 .pdf

Approval Signatures

Step Description	Approver	Date
Policy Stat Administrator	Kimberly Novak-Jones: Nurse Educator	11/2022
VP Operations - UNCMC	Daniel Lehman: VP Operations Suppt & Prof Svcs	11/2022
	Dalton Sawyer: Dir Emerg Mgmt/Env Hlth Safety	11/2022
	William Boone: Asst Dir Envmtl Hlth/Safety	11/2022

Applicability

UNC Medical Center