

PENTRATIONS IN FIRE/SMOKE BARRIERS

Changes:

- This is a new policy to augment Above Ceiling Entry and Wall Construction Permit 2011 Policy Memorandum 578-07-001-102 (R-2) and Statement of Conditions

Responsibility: Facilities Management Service and those sections as identified within this document in order to comply with Joint Commission and NFPA 101, *The Life Safety Code*

Related forms: Located: R/forms/policy forms/FMS

- Attachment A: Above Ceiling Entry/Wall Penetration Policy
- Attachment B: Above Ceiling Entry/Wall Penetration Permit
- Attachment C: Infection Control Risk Assessment for Construction/Renovation Projects
- Attachment D: FMS/ SOP
- Joint Commission criteria (insert reference location)
- NFPA (insert latest version and reference location)

Key words: fire barrier, fire stopping, penetration, smoke barrier, smoke partition, infection control, construction, above ceiling, inspection, certification

PENETRATIONS IN FIRE AND SMOKE BARRIERS

1. **PURPOSE:** To establish policy and procedures to protect veteran patients, employees, and visitors from potential hazards of fire and smoke within all patient care buildings. Pro-actively identify, document and repair penetrations in smoke and fire barriers in a timely manner, as based existing manpower and funding resources. As a service to provide a quality control and quality assurance/quality control process so the as existing infrastructures are modified, penetrations in smoke and fire barriers are properly sealed. Professionally define and describe a redundant program to perform preventive maintenance and inspection procedures for identifying and repairing penetrations at the second largest VA Hospital. Finally, to fully be in compliance with NFPA 101, *The Life Safety Code* and Joint Commission standards as an engineering service. This policy will provide a three level approach by augmenting the existing Above Ceiling Policy, obtaining contractual support from a certified firm and implementing in-house resources and manpower, when available.

2. **POLICY:**

a. Facility Management Service (FMS) staff, contractors, and other VA employees will follow the established standards and operating procedures (SOP), and building codes for maintaining proper fire and smoke barrier control when working in patient care areas in performing repair and preventative maintenance in assigned areas that involves penetrations in smoke or fire barriers, including floors, ceilings and walls, shall:

- (1) Attend training and obtain certification in the fire stopping from a recognized company before engaging in any work.
- (2) Obtain a project-specific Above Ceiling Wall Entry and Construction Permit
- (3) Refer to Facilities Maintenance Service latest set of smoke and fire barrier drawings for ratings of smoke and fire barriers. In the absence of adequate drawings, consult with Safety Office or Project Planning's Statement of Condition representative for information on ratings.
- (4) Drawings for the facility buildings are located at: (insert web link)
- (5) Ensure that each penetration, created or observed, is properly sealed in a timely manner upon completion of work.
- (6) Either seal each penetration with material that returns the barrier to its original rating, or report the penetration to the appropriate department (See Responsibilities Section)

b. For non-FMS facility work, contractors failing to conform to this policy will be prohibited working on the Hines VA hospital campus and pay costs associated with time, labor and material for repairs conducted by FMS staff.

c. FMS will issue such permits which will include:

- (1) Identification of the type of activity,
- (2) Risk assessment for contamination of the involved areas,

(3) Precautions for the prevention of such contamination in both critical and non-critical patient care areas.

Depending on the risk score, appropriate mobile containment systems will be required and utilized by employees and contractors prior to any vertical or horizontal ceiling and wall entries that have been identified as potential infection control hazards.

d. This policy covers every penetration in a smoke or fire barrier as located within a Hines VA facility, owned or leased, including penetrations that are new or existing, used or not used for but limited utilities, conduits, duct work, pipe and cabling (telephone, data network, fiber-optics, security devices, motion detectors, surveillance cameras, card swipes, biomedical devices, nurse call, nurse call, fire alarms, overhead page, audio visual equipment, telecom carriers, wireless and microwave communications, cable TV, and developmental wiring).

3. **DEFINITIONS:**

a. Above ceiling entries are vertical entries into existing ceiling spaces which involve the removal and/or replacement of existing ceiling tiles.

b. Wall entries are horizontal entry into existing walls and include cutting into existing walls as well as repairs and construction of door frames and door frame openings.

c. Mobile containment systems are portable enclosures which are designed to seal off the point of entry and include the capability to place such containments under filtered negative air conditions.

d. Fire barrier: Any wall, floor, ceiling, or roof which has a fire-resistance rating. A fire barrier also restricts the movement of smoke.

e. Fire stopping: Any component or product installed to maintain or regain the fire resistance rating of a fire barrier that has a penetration. All fire stopping systems must be tested and listed by an accredited third party testing agency for their appropriate use.

f. Penetration: Any compromise of a required wall floor, or ceiling's integrity and/or continuity. This breach of integrity and/or continuity may be the result of a hole made in the wall or slab to permit the installation of utilities or data services, or the disruption of an existing fire rated patch of a previous penetration due to work on the same wall or slab. Open junction boxes, pull boxes, conduit, and raceways are potential penetrations and are to be appropriately sealed or covered.

g. Infection control hazards are foreign contaminants such as dust, fibers, dirt, and debris generated during the performance of maintenance and/or construction activity within one hundred (100) feet of direct patient care areas. Identified bio-hazards may also be included as infection control hazards.

h. Smoke barrier: A barrier which divides a floor into smoke compartments. A smoke barrier may or may not have a fire rating. In newly constructed or renovated areas, smoke barriers have a fire resistance rating of a least one hour.

i. Smoke partition: Any construction designed to prevent passage of smoke. A smoke partition is not required to be fire rated.

4. RESPONSIBILITY:

a. Contractual agreement with a certified vendor:

(1) FMS will maintain a contract as awarded by the Great Lake Acquisition Center to actively survey and inspect Hines facilities for penetrations in the smoke and fire walls;

(2) Conducting semi-annual Quality Assurance inspections for penetrations on the Hines VA campus and distributing summary reports and revised as-built drawings;

(3) Conduction a weekly Quality Assurance inspection of one construction site on the on the campus and distributing quarterly summary reports;

(4) Ensure that any deficiencies found remaining will be discussed with the appropriate first line Supervisors and any Contracting Officer's Technical Representatives (COTR) involved with the work;

(5) Functioning as a consultant on an as-need basis to provide guidance on fire code, the structural features of fire protection and fire stopping materials.

(6) Provide training to certify FMS staff for the proper inspection, documentation and repair of smoke and fire, and;

(7) Provide training to all services' staff directly impacted by this policy

b. Office of the Chief FMS:

(1) Review this program and all documentation at least annually;

(2) Retaining a trained life safety professional at least once every three (3) years to review and survey the wall floors, and ceiling for penetrations as part of the Joint Commission (JC) Statement of Conditions (SOC) requirement for assigned hospital areas:

(3) Maintain the Joint Commission electronic Plan for Improvement (ePFI) and documenting efforts to comply with the plan. Entering all penetrations that cannot be repaired within 45 days into the ePFI;

(4) Provide oversight to Maintenance and Operations (M&O) and Project Planning to successfully manage the penetrations preventative maintenance, as based on adequate manpower and resources without providing a strain to critical patient care areas, program to document all penetrations that can be repaired with 45 days, including locations, date of discovery and correction;

(5) Chief Maintenance and Operations (M&O), working under the direction of the Chief FMS, is responsible for reviewing the program quarterly for compliance of all penetrations that can be repaired by in-house shop staff

(7) Assistant Chief Maintenance and Operations (M&O) is responsible for implementing the program on a day-to-day basis for repairs to be performed under 45 days

(8) Chief Project Planning working under the direction of the Chief FMS, is responsible for reviewing the program quarterly for compliance of all penetration surveys and repairs as addressed through awarded contracts by the Great Lakes Acquisition Center, and oversee the COTR duties as assigned for said contract and Statement of Conditions;

(9) Builder's Shop Foreman is responsible for inspections and repair/maintenance work. This includes:

- a. Coordinating monthly inspections by assigned staff of all walls, above and below the ceiling line.
- b. Reporting all identified penetrations to the Assistant Chief M&O
- c. Coordinating repair of all penetrations during their inspections through the work order system, as maintained by the Maintenance Controller.
- d. Accurately identify penetrations that can be successfully repaired within 45 days through available manpower and materials.
- e. Coordinating all penetration penetrations identified inspections during monthly inspections with fire stopping vendor and Chief M&O.

(10) Project Planning Chief is responsible for:

- a. Assign COTR for major fire stopping contract and Statement of Conditions.
- b. Ensure that project engineer implements the program on a day-to-day basis.
- c. Report all identified penetrations to the Chief FMS.
- d. Coordinating repair of all identified penetrations via approved fire stopping contract.
- e. Coordinating the receipt of summary reports and verifying the close out, by vendor inspection, that all penetrations have been properly sealed.
- f. Contractors working on hospital renovation projects adhere to this policy through assigned COTRs.
- g. Ensuring that every project manager is trained on and familiar with the requirements of this policy.
- h. Including the requirements of this policy in bid documents.
- i. Ensuring that contractors are appropriately trained and informed about the policy.
- j. Ensuring the policy is implemented and all requirements are followed.
- k. Planning and programming VISN contracts.
- l. Planning and programming NRM contracts.

- (11) Project Managers are responsible for implementing the policy on their projects. Their responsibilities include, but are not limited to:
- a. Ensuring that contractors and employees use the appropriate materials to seal and restore barriers.
 - b. Reporting on new construction projects at the weekly construction coordinating meeting.
 - c. Conducting (or coordinating) daily inspections during the project duration and following up on identified issues.
- (12) Hines Service line departments that coordinate work involving penetrations are responsible for compliance with the policy. Their responsibilities include:
- a. Ensuring that every project manager or business manager is trained on and familiar with the requirements of this policy.
 - b. Including the requirements of this policy in bid documents.
 - c. Ensuring that contractors are appropriately trained and informed about the policy.
 - d. Ensuring the policy is implemented and all requirements are followed.

5. STANDARDS

(1) Ratings of Smoke and Fire Barriers

- a. FMS Project Planning maintains drawings and information on the structural features of fire protection for all critical patient care buildings.
- b. Drawings for the main campus buildings are located at (insert web site or location)

(2) Standard ratings for smoke and fire barriers: The following general rules apply:

- a. Stairwells, pipe shafts, and elevator shafts have a two hour fire rating.
- b. Mechanical rooms and laboratories have at least a one hour fire rating.
- c. Smoke barriers used to divide floors into smoke compartments have at least one-half hour fire rating. Smoke barriers in newly constructed or renovated areas have a one hour fire rating.
- d. Exit corridors, in general, must be sealed to limit the spread of smoke.

(3) Materials and procedures: Employees and contractors working on the Hines VA campus shall seal penetrations in accordance with the following guidelines.

- a. Provide and use penetration seal assemblies whose fire resistance ratings have been determined by testing (ASTM E-814) in the configurations required and which have

fire resistance ratings at least as high as that of the fire-rated assembly in which they are to be installed.

- b. Comply with Underwriters Laboratories (UL) listed methods and procedures, such as those found in the Hilti Fire Stopping Systems book 07270/07840 – Fire stopping.
- (4) Smoke Stopping: Use any caulking-gun type or poured joint sealant suitable for the application. Use only fully curing types where accessible in the finished work. For smoke partitions, rated fire stopping is not required.
 - a. In all cases, use products which allow normal expansion and contraction movement of adjacent materials without failure of the penetration seal, and which emit no hazardous, combustible, or irritating by-products during installation or the curing period.
 - (5) For high-traffic openings, use materials specifically designed for retrofit, such as in tumescent fire stop putty or pillows. Typical high-traffic openings include cable tray penetrations of walls and floor, openings for voice, data and communication cabling, and all sleeved cabling openings.
 - (6) When a penetration in a smoke or fire barrier is made in error or is too large to be sealed using fire stopping, repair it using the original materials of construction.
 - (7) Obtain approval from the project manager prior doing work that involves exception to these general rules.
 - (8) Contractors are responsible for ensuring that appropriate mobile containment systems are utilized for above ceiling entry as well as wall construction in critical and non-critical patient care areas.
 - (9) COTRs are responsible for ensuring that all contractors adhere to this policy during performance of any work which involves above ceiling entry or wall penetration construction.
 - (10) Staff Supervisors are responsible for ensuring that staff technicians, engineering journeymen, and service contractors under their direction adhere to this policy during performance of any work which involves “above ceiling” entry or wall penetration construction.
 - (11) Personnel who do work involving penetrations must attend training about the building codes for smoke and fire barrier penetrations and know the appropriate seals and techniques for the repair/restoration of penetrations.
 - (12) Evidence may be a certificate or a roster of trained individuals from the manufacturer of the fire stopping material (or other authorized organization) verifying that all listed individuals have been trained in the UL approved methods and installing fire stopping material, as required by awarded contracts or permit requirements.
 - (13) Training can be arranged though FMS through contract or certified staff for contractors and non-FMS staff.

- a. Personnel who do work involving penetrations must attend training about the building codes for smoke and fire barrier penetrations and know the appropriate seals and techniques for the repair/restoration of penetrations.
- b. Employees and contractors working in Hines VA campus space must obtain certification by submitting evidence of training of applicable personnel to FMS.
- c. Evidence may be a certificate or roster of trained individuals from the manufacturer of the fire stopping material (or other authorized organization) verifying that all listed individuals have been trained in the UL approved methods of installing fire stopping material.

(14) Construction and renovation projects.

- a. A permit is issued as part of the Interim Life Safety Measures (ILSM) documentation and is good of the length of the project.
- b. The permit is good only for work within the project site.
- c. Periodic renewal of the permit is not required.
- d. Any project-related work that entails running cables, pipe, etc. outside the project side is subject to the rules in Section (15), listed below.
- e. A drawing articulation the locations of all work where the penetration of the fire/smoke barriers may occur must be appended to the permit.
- f. Final inspection and sign-off is performed at the project's completion.

(15) Other penetrations work.

- a. Employees and contractors must obtain an Above Ceiling entry and/or wall penetration permit to install infrastructure from FMS other service lines.
- b. A request for a permit must include evidence of training for all personnel, and the following information: company name, cabling location (building, floor, and path of cable (from – to)), number of cable runs, and names/phone numbers of project managers.
- c. A drawing articulating the locations of all work where penetration of the fire/smoke barriers may occur must be appended to the request for a permit.
- d. A request for permit will be processed and finalized in accordance with the above ceiling entry and/or wall penetration policy.

(16) Existing penetrations. After using an existing penetration, an employee or contractor must seal and fire stop the penetration:

- a. If is of similar size and scope to one that the individual needed to make to accommodate the penetrating it, or

- b. If the proper sealing of all pre-existing penetrations was included in the scope of work.
- c. Report the penetration to the project manager or appropriate FMS representative if it is of a size and scope beyond the needs or current job. Reporting of penetrations for in-house repair is generally confined to those found during small scale wiring projects.
- d. If a contractor or employee does not either create or use, but observes a penetration in a fire wall or smoke barrier, the individual must either repair the penetration or to report it to the project manager or appropriate FMS representative.

(17) Procedures for construction and renovation projects, via contract management.

- a. Awarded contract drawings must indicate rated smoke and fire barriers.
- b. For every significant construction or renovation project, the project manager must inform all bidders of their responsibility to bring all rated fire walls and smoke barriers into code compliance.
- c. Bidders must be given the opportunity during walk-through to examine these areas so as to bid accordingly.
- d. The project manager must provide bidders with any penetration survey drawing of the area.
- e. For those projects where areas may not be visible until after demolition begins, the project manager must: 1). Include an allowance for any found penetrations beforehand; 2). Issue a change order to cover the additional work afterwards; or 3). After discussions with the appropriate administration, transfer responsibility for to the appropriate FMS shop for repairs, only to be based upon available man-power.
- f. Each project manager or his/her designee conducts daily Interim Life Safety (ILS) inspections, which include an inspection for penetrations for assigned projects. If deficiencies are identified, they are corrected as soon as possible.
- g. The project manager ensures that the contractor records penetrations on the daily Quality Assurance/Quality Control report and ensures that the general contractor is aware of the problem. The project manager follow-ups with the general contractor to ensure the work are completed. Penetrations may be submitted to the contractor in the form of a punch list to be completed as work progressed.
- h. The project manager's ILS inspection records and documentation of corrective action are maintained in the project file.
- i. For final payment to a contractor, contract land permit language requires contractors to properly seal all penetrations, a failure to do so may result in withholding and/or reducing payment until such work is completed.
- j. Should the contractor fail to complete the work, the withheld monies may be used to cover the expense of hiring another contractor/vendor to rectify the work. Note: This approach will have to be approved by the Great Lakes Acquisition (GLAC).

(18) Procedures for preventative maintenance and inspection (PMI).

- a. The Maintenance and Operations Chief and the Foreman Builder's Shop coordinate and document inspections and repairs in with the following general guidelines.
- b. Consulting life safety experts inspect all walls below the ceiling line at least once every three years. The Building Systems Manager or the project engineer as assigned by the Chief Project Planning maintains documentation of the inspections.
- c. Contractors may be used at the Maintenance and Operations level or the Project Planning level to supplement the in-house staff for repairs due to limited manpower and budget constraints.

(19) FMS maintains the documentation for identified penetrations.

- a. 45 day list: The Building Systems Manager or his designee maintains a 45 day list and related documentation, including logs created by in-house staff.
- b. Penetrations that can be reasonably repaired within 45 days are entered into a 45 day list of penetrations. They are initially entered in the Joint Commission ePFI.
- c. If a penetration is not repaired after 30 days, it is entered into the Joint Commission ePFI. The schedule of repair will be determined on the availability of manpower and materials at the time of assessment.

(20) Joint Commission ePFI.

- a. Penetrations in smoke and fire barriers in patient care areas that are not repaired within 30 days of their discovery are entered into the Hines VA Hospital's Center Statement of Conditions (SOC), electronic Plan for Improvement (ePFI).
- b. The ePFI is available on the www.jointcommission.org web-site to authorized users.

(21) FMS will conduct performance monitoring.

- a. Maintenance and Operations will conduct monthly supplemental rounds through the FMS Safety Committee to inspect assigned areas (e.g., mechanical rooms, electrical closets, machine rooms, etc.).
- b. FMS supports weekly environmental of care (EOC) rounds as coordinated with the Safety Office and Associate Directors, assigned staff with inspect FMS areas with the patient care areas (e.g., electrical closets, mechanical rooms, etc.).
- c. FMS project engineers will monitor contractors for approved/awarded contracts for renovation and new construction to ensure the general contractors obtain the proper permits and complete work in accordance with approved plans and specifications while maintaining integrity of smoke and fire barrier systems.

- d. Professional Fire and Smoke Consulting firm conducts annual quality assurance inspections and provide detailed summary reports and as-built drawings for noted deficiencies, as located in existing smoke and fire barrier system, found within established buildings located on the Hines VA campus.

6. **ACTIONS:** In cases of above ceiling entry and/or wall penetration construction in either critical and non-critical direct patient care areas by non-FMS staff or a contractor, the following steps are required.

- a. Prior to any above ceiling entry and/or wall penetration by both non-staff personnel and contractors, all said work is to be approved by the FMS/Project Planning Section. The appropriate Supervisor and/or the identified COTR will ensure that a risk assessment is conducted and proper permits are issued.

- b. For non-FMS facility work, an “**Above Ceiling Entry/Wall Penetration**” permit (see Policy) must be obtained from FMS/Project Planning Section prior to the start of the work. All permits will be available for inspection at the work site.

- c. An “**Infection Control Risk Assessment**” (see Above Ceiling Entry/Wall Penetration) will be conducted prior to the start of the work for the purpose of identifying any potential hazards to the environment of care which may be caused during the performance of the work.

- d. Upon completion of the work, all points of ceiling entry and/or wall penetration will be secured and cleaned in accordance with established Hospital infection control guidelines.

- e. Upon completion of the work, a visual inspection for approval must be requested from the FMS first-line Supervisor **or** the COTR involved with the work. This inspection will be conducted for the purpose of ensuring compliance with this policy and verification that all penetrations have been sealed.

- f. All above ceiling entry and wall penetration/construction work will be performed in accordance with Joint Commission Infection Control Standards IC.1.10, IC.2.10, and IC.3.10 as well as established Hospital policy and guidelines.

- g. The completed permit and infection control risk assessment will be signed by the individuals who performed the work and the FMS first line Supervisor or COTR representative and submitted as the official document of record. The signed forms will be submitted for filing with the FMS Project Planning Section.

- h. Project Planning will maintain the Statement of Conditions and oversee ILS management process for assigned and awarded GLAC contracts that address professional services from engineering firms qualified to provide surveys and oversee repairs to the aforementioned requirements.

- i. Maintenance and Operations (M&O) will coordinate and oversee repairs that may be conducted by purchase order, as based on the existing manpower and funding within the appropriate Funding Control Point.

j. Hines VA Hospital service lines are responsible for the quality control and quality assurance all and any work that impacts the Fire and Smoke Barrier system within any of the campus buildings.

k. Office of the Chief will conduct a quality assurance review of Statement of Conditions and associated ILS management documents for record accuracy.

l. Maintenance Controller will coordinate and manage any work orders submitted by in-house staff requiring the immediate repair of any fire and smoke barrier penetrations, as approved and programmed by Maintenance and Operations Chief and coordinated to be repaired by the Foreman Builder's Shop.

m. Great Lake Acquisition Center will provide Contracting Officer to oversee and maintain a contract, as awarded, to actively survey and inspect Hines facilities for penetrations in the smoke and fire walls. Contracting Officer to provide the letter of designated authority to the FMS designee to serve as Contracting Officer Technical Representative (COTR) for said contract.

7. **REFERENCE:**

a. Joint Commission Life Safety Standard **LS.02.01.10**. Accessible on SharePoint/Joint Commission RFIs, 2010.

b. Joint Commission Infection Control Standard IC.1.10, IC.2.10 and IC.3.10. Accessible on SharePoint / Joint Commission Hospital Standards 2010.

c. National Fire Protection Association (NFPA), *Life Safety Code 101*, Section 6-2.3.6 and *Fire Walls and fire Barrier Walls 221*, Section 6-1

8. **RESCISSION:** N/A

9. **RECERTIFICATION:** This Policy Memorandum will be recertified on or before January 29, 2015.

10. **FOLLOW-UP RESPONSIBILITY:** Chief, Facility Management Service (138).

Sharon M. Helman, MBA
Hospital Director

Distribution: Hines Intranet Website and Service Chiefs/Service Line Managers via e-mail