

Construction and Renovation Infection Control Precautions

1. **PURPOSE:** To identify and reduce the risk of acquiring and transmitting infections among patients, employees, physicians and other independent practitioners, contractors, vendors, contract service workers, volunteers, students, visitors, and any other building occupants during hospital renovation or construction activities. Fungal organisms released into the air during these activities can cause illness and even death in people with poor immunity. This memorandum is to be included in the (Green) Safety Manual.

2. **POLICY:** Precautions will be taken to make conditions as safe as possible during all construction and renovation to protect the environment from hidden infectious disease hazards which may be released into the air, carried on dust particles or on clothing during construction activities. (For example: Aspergillus species may be found in decaying plaster, drywall, and settled dust found on ceiling tiles and in areas that have been undisturbed for long periods of time.) This applies to all construction and/or renovation managed by Engineering Service, Department of Veterans Affairs Tennessee Valley Healthcare System (VA TVHS) at TVHS campuses and facilities, including Community Based Outpatient Clinic's (CBOC) and cemeteries.

3. **RESPONSIBILITIES:**

a. **Engineering Service and Infection Control Officers**, will screen future construction/renovation projects during the project design phase and at the project start for construction activity types. Construction activity types will be defined by the amount of dust that is generated, the duration and extent of the activity, and the amount of shared heating and air conditioning systems. Infection Control will conduct an initial risk assessment for all construction projects.

b. **Infection Control Practitioners (ICP)** will help make recommendations for implementation of safety/infection control practices for the duration of the job. Precautions taken in specific settings will be agreed upon after corroboration between Infection Control, Engineering Service and the service chief of the specific area.

c. **The Immediate Job Supervisor, Superintendent, Foreman (VA or Contractor):** of the construction/renovation will be responsible for insuring that coordinated precautionary measures are properly enacted and maintained throughout the work.

d. **Infection Control, Engineering Service, and the project Contracting Officer Technical Representative (COTR)** will monitor these temporary measures by conducting documented periodic inspections at predetermined intervals during construction/renovation.

e. **Environmental Management Service (EMS)** will have an integral part in cleaning of the areas immediately adjacent to the site and in certain cases within the work site itself.

f. **Engineering/Safety, Infection Control, EMS and/or the construction team** should be contacted if any regulation is questionable under these guidelines.

4. **DEFINITIONS OF CONSTRUCTION ACTIVITY TYPES:** Using the following table, identify the Type of Construction Project Activity.

TYPE A	Inspection and Non-Invasive Activities. Includes, but is not limited to: <ul style="list-style-type: none">▪ removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet▪ painting (but not sanding)▪ wallcovering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
TYPE B	Small scale, short duration activities which create minimal dust Includes, but is not limited to: <ul style="list-style-type: none">▪ installation of telephone and computer cabling▪ access to chase spaces▪ cutting of walls or ceiling where dust migration can be controlled.
TYPE C	Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies Includes, but is not limited to: <ul style="list-style-type: none">▪ sanding of walls for painting or wall covering▪ removal of floorcoverings, ceiling tiles and casework▪ new wall construction▪ minor duct work or electrical work above ceilings▪ major cabling activities▪ any activity which cannot be completed within a single workshift.
TYPE D	Major demolition and construction projects Includes, but is not limited to: <ul style="list-style-type: none">▪ activities which require consecutive work shifts▪ requires heavy demolition or removal of a complete cabling system▪ new construction.

5. DESIGNATED INFECTION CONTROL RISK GROUPS:

LOW	MEDIUM	HIGH	HIGHEST
<ul style="list-style-type: none"> Administrative areas Admission and Discharge areas Biomedical Conference rooms Engineering/EMS Office areas Outside construction (unless adjacent to building intake vents) Swimming pool Warehouse Information Systems Laundry services Library Lodging areas Maintenance Medical Information Prosthetic Services 	<ul style="list-style-type: none"> All ancillary patient care areas (example: Rehabilitation Medicine clinics/areas) Cardiology Echocardiography Endoscopy Imaging Services- Radiology/MRI Nuclear Medicine Mental Health-In patient Food Service/Canteen Physical Therapy Respiratory Therapy 	<ul style="list-style-type: none"> Ambulatory/Outpatient Surgery CCU GI Lab Dialysis Emergency Room/Department Extended Care Wards Laboratories –specimen & Research Medical and Surgical Wards Surgical Units PACU (Post Anesthesia Care Unit) Pharmacy-Inpatient and Outpatient 	<ul style="list-style-type: none"> Any area caring for immunocompromised patients Cardiac Catheterization Angiography areas Negative pressure isolation rooms Oncology Operating Rooms Pharmacy Admixture ICU's (MICU, SICU, etc.) Sterile Processing & Supply / Acquisition and Materials Management decontamination and storage areas

*Unless designated otherwise

6. CONSTRUCTION ACTIVITY/ INFECTION CONTROL MATRIX:

Determine the level of infection control procedures necessary for the work by matching the construction activity with the risk group of the work area in the following Matrix.

Patient Risk Group (Low, Medium, High, Highest) with the planned Construction Project Type (A, B, C, D) the following matrix, to find the Class of Precautions (I, II, III, IV) or level of infection control activities required.

Class I-IV Precautions are delineated below:

Patient Risk Group	Construction Project Type			
	TYPE A	TYPE B	TYPE C	TYPE D
LOW Risk Group	I	II	II	III/IV
MEDIUM Risk Group	I	II	III	IV
HIGH Risk Group	I	II	III/IV	IV
HIGHEST Risk Group	II	III/IV	III/IV	IV

C Matrix – Class of Precaution: Construction Project by Patient Risk

NOTE: Infection Control approval will be required when the Construction Activity and Risk Level indicates that Class III or Class IV control procedures are necessary.

7. **RESPONSIBILITIES BY ACTIVITY CLASS:** The specific measures to be implemented for the job will be based on the below recommendations, but will carefully be applied to each situation and designated on the Risk Assessment form (see Attachment A). The precautions escalate from Class I to IV; therefore **measures specified in subsequent classes are IN ADDITION to the requirements of the previous class or classes.**

a. **Class I – During Construction Project**

- (1) Execute work by methods to minimize raising dust from construction operations.
- (2) Immediately replace any ceiling tile displaced for work or visual inspection.

b. **Class I – Upon Completion of Construction Project**

- (1) Clean work area.

c. **Class II – During Construction Project**

- (1) Provide active means to prevent airborne dust from dispensing into atmosphere and surrounding areas:
- (2) Construct any temporary barriers. Note: **critical barriers** are not required.
- (3) Seal unused doors with masking tape.
- (4) Isolate HVAC system or remove in area where work is being performed to prevent contamination of duct and areas outside the work area. Filter any return air at the work area.
- (5) Block off and seal air diffusers/vents, IF inactive.
- (6) Place carpet dust mat at entrance and exit of work area. Monitor and clean/change as needed.
- (7) Water mist work surfaces to control dust while performing any activity that may produce airborne dust (such as cutting, sweeping, etc.).
- (8) Dispose of waste/debris/dust and clean in accordance with defined procedures designated on Risk Assessment form (see Attachment A-1).
- (9) Contain construction waste before transport in tightly covered containers or carts. Tape covering (poly, etc.) unless solid lid.

d. **Class II – Upon Completion of Project**

- (1) Project workers shall wipe-down and/or HEPA vacuum (with HEPA-filtered vacuum) exposed surfaces, and then wet mop with water and a suitable disinfectant.

(2) Remove any temporary barriers.

(3) Remove isolation of Heating, Ventilation, & Air Conditioning (HVAC) system in area where work is being performed, and restore HVAC system to proper/normal operation.

(4) VA Environmental Management Service (EMS) will disinfect and terminally clean entire project site.

e. **Class III – During Construction Project**

(1) Create and maintain negative pressure in area where work is being performed. Adjust air supply/return system and adjust or provide exhaust system by method designated on Risk Assessment form (see Attachment A-1) in areas where work is being performed.

(2) Construct **critical barriers** before construction begins. Isolate work area using full height plastic/poly sheeting securely taped on all edges, sealed drywall partition taped to permanent construction at perimeter, or equivalent dust-tight construction method from floor to deck above (or to intact ceiling that must remain in place, undisturbed, throughout work).

f. **Class III – Upon Completion of Project**

(1) Project workers must insure that any accumulated debris and dust above ceiling is removed prior to project completion.

(2) Do not remove temporary critical barriers until complete project site is cleaned, and Department of Veterans Affairs (VA) Safety Officer and Infection Control Department shall inspect and clear space for occupancy. Project workers shall HEPA vacuum all exposed surfaces and then wet mop using water and suitable disinfectant. Then, EMS shall disinfect/terminally clean entire site.

(3) Remove temporary barrier materials carefully to minimize spreading of dirt and debris associated with construction.

g. **Class IV – During Construction Project**

(1) Seal holes, pipes, conduits, and punctures between work site and adjacent areas appropriately.

(2) Construct anteroom and require all personnel to pass through this room so they can be vacuumed using an HEPA vacuum cleaner before leaving work site, or they can wear cloth or paper coveralls that are removed each time they leave the work site.

(3) Provide sticky walk-off mats and carpet mats that are monitored closely for dust buildup at entrance to work area within the anteroom. Replace used mats with new or clean mats as needed.

(4) Wrap large waste items that contain dust and debris in a barrier material before transport from construction site.

Class IV – Upon Completion of Project (Same as Class III)

8. REFERENCES:

a. Association for Professionals in Infection Control and Epidemiology. *Text of Infection Control and Epidemiology: Construction Renovation*, Second Edition: Chapter 108; 1-16. Washington, DC: APIC, 2005

b. American Lung Association, Environmental Protection Agency, Consumer Product Safety Commissions, American Medical Association. *Indoor Air Pollution: An Introduction for Health Professionals*. Washington, DC: US Government Printing Office, 1994. Publication 523-217/81322

c. American Institute of Architects. *Guidelines for Design and Construction of Hospital and Healthcare Facilities*. Washington, DC: AIA Press: 1996

d. Occupational Safety and Health Administration, Legionnaires' disease. In *OSHA Technical Manual* Section II, 1997;7:1-46, U.S. Department of Labor

e. VHA Center for Engineering & Occupational Health and Safety. *Construction Safety Guidebook*. St. Louis, MO. April 2005

9. RESCISSION: None

10. RESPONSIBILITY AND REVIEW DATE: This memorandum will be reviewed annually by the Chief, Engineering with the assistance of Infection Control and Environmental Management Service and will be reissued no later than June 30, 2011.

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Health System Director

Attachments:

A - Infection Control Risk Assessment (ICRA)

B - Infection Control / Safety Program, Periodic Construction Rounds Compliance Monitor

DISTRIBUTION: Green Safety Manual

June 1, 2008

ATTACHMENT A

(Note: To be filled out by Infection Control and Engineering Service during project design and revalidated at the start of construction.)

INFECTION CONTROL RISK ASSESSMENT					
Date:	Location:		Risk Group: <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Highest		
Activity Type:	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	Designation: <input type="checkbox"/> Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3 <input type="checkbox"/> Class 4			
INFECTION CONTROL MEASURES TO BE IMPLEMENTED					
Temporary Barriers					
<input type="checkbox"/>	Sheetrock wall (tape/seal joints and seams). Doors shall be solid/hinged.				
<input type="checkbox"/>	Plastic/poly sheeting (tape/seal joints and seams). Doors shall be minimum double overlapping sheeting.				
<input type="checkbox"/>	Antechamber construction to provide place for donning and removing cover attire and HEPA vac.				
HVAC					
<input type="checkbox"/>	Insure negative pressure (required for Classes III & IV) by...		<input type="checkbox"/> Adjusting existing system	<input type="checkbox"/> Providing air exhaust system (with HEPA filtration)	
Supply	<input type="checkbox"/> Close outlets	<input type="checkbox"/> Turn-off air handling unit	<input type="checkbox"/> Maintain filtration at _____% in affected rooms (if returning/ recycling air)		
Return	<input type="checkbox"/> Filter	<input type="checkbox"/> Close inlets	<input type="checkbox"/> Turn-off fan		
Exhaust	<input type="checkbox"/> Filter	<input type="checkbox"/> Close inlets	<input type="checkbox"/> Turn-off fan		
Control of Construction Dust (in project site and migrated to surrounding areas)					
<input type="checkbox"/>	Broom sweep				
<input type="checkbox"/>	Dust mats (provided by construction workers)- <input type="checkbox"/> Carpet mats <input type="checkbox"/> Sticky mats, change when no longer sticky or as manufacturer directs				
<input type="checkbox"/>	Damp mop <input type="checkbox"/> Periodically through out work shift as dust accumulates <input type="checkbox"/> At end of work shift <input type="checkbox"/> Weekly				
<input type="checkbox"/>	Vacuum, with HEPA filtered machine				
Transport and Disposal of Waste					
<input type="checkbox"/>	Tightly covered carts				
<input type="checkbox"/>	Large items wrapped in plastic on cart/dolly				
<input type="checkbox"/>	Waste chutes constructed				
<input type="checkbox"/>	Service Elevator, with no patients riding				
<input type="checkbox"/>	Attempt to remove on "off shifts"				
Cleaning					
<input type="checkbox"/>	Project workers to manage construction dust build-up within construction barriers and surrounding areas during construction work shift as specified above. Project workers shall leave area clean at end of shift.				
<input type="checkbox"/>	EMS to clean areas outside construction barriers. EMS responsible for making area "hospital clean" (all cleaning required beyond project workers sweeping, vacuuming, & mopping).				
<input type="checkbox"/>	EMS to terminally clean areas surrounding construction site every _____ days. (Infection Control shall evaluate and specify interval).				
Monitoring of site					
Note: Complete "Periodic Construction Rounds Compliance Monitor" attachment A-2					
<input type="checkbox"/>	Initial monitor and Final check (short duration job) by VA and Project Superintendent/Foreman				
<input type="checkbox"/>	Project Superintendent/Foreman inspection (Infection Control shall evaluate and specify required interval):				
<input type="checkbox"/>	VA inspection (Infection Control shall evaluate and specify required interval):				
//s//	Engineering:_____			Date: __/__/__	
//s//	Infection Control:_____			Date: __/__/__	
//s//	Contractor:_____			Date: __/__/__	

Attachment B

(Note: Fill out for Class II, III, and IV at interval specified by Infection Control on A-1)

Infection Control / Safety Program Periodic Construction Rounds Compliance Monitor			
Location:	Observed by:	Review Date:	Review Date:
1. Barriers		Review Time:	Review Time:
a. Construction signs posted for the area		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
b. Doors properly closed and sealed		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
c. Floor area clean, no dust tracked		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
2. Air Handling			
a. All windows closed behind barrier		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
b. Negative air at barrier entrance (Types III & IV)		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
c. HVAC system adjusted/modified (Per Attachment. A-1)		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
3. Project Area			
a. Debris removed in appropriate container		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
b. Dust Control mats: Walk off mats clean & adequate to contain construction dust		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
c. Routine cleaning of trash/waste/debris		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
4. Traffic Control			
a. Restricted to necessary staff only with proper escort and construction workers		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
b. All doors and exits free of debris		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
5. Dress Code			
a. Appropriate for the area		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
b. Required to enter		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
c. Required to leave		Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Comments			