

SUBJECT: INFECTION CONTROL DURING CONSTRUCTION

POLICY NO: 918

Purpose: To prevent the spread of diseases, which may be caused by construction induced airborne pollution in susceptible individuals (patients, staff and the public) in Department of Health Services (DHS) facilities. Department of Health Services facility is defined here as any Los Angeles County Department of Health Services facility or site. Construction is defined here as building additions, demolition, retrofit, alterations, new construction and maintenance activities.

Policy: All contractors, including, but not limited to independent contractors, sub-contractors, consultants, engineers, architects, vendors, inspectors and their employees and agents are herein known as Contractor, Facilities Management and all other Los Angeles County Department personnel shall adhere to the following procedures when engaged in construction activities at DHS facilities.

Rationale: Construction and maintenance can be a risk factor for infections in patients, staff and the public, especially those who are immuno-suppressed. Activities that disturb dust may be associated with various illnesses. The dispersion of dust can spread spores, which when inhaled by susceptible individuals may result in invasive fungal disease.

Procedures:

I. CONSTRUCTION AND REMODELING:

- A. At the commencement of the design phase of proposed construction, Facility Administration shall appoint a designated person to represent the facility as the Infection Control Coordinator. The Infection Control Coordinator shall be the Hospital Epidemiologist, the Chairman of the Infection Control Committee, the Facility Medical Director or their designee. If construction shall occur in a Department of Health Services facility that has no assigned Medical Director, the Infection Control Coordinator shall be appointed by the Facility Manager in consultation with the Service Planning Area Medical Director for that facility.

- B. The Infection Control Coordinator must review and approve infection control plans for new construction or renovation projects to ensure a safe environment. These infection control plans must include infection control measures to contain dust, debris etc. and protect the patients, employees, and visitors in this environment. Facilities Management and the County's

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Project Manager will be responsible for routinely monitoring construction/renovation areas for compliance with this policy.

- C. Procedures that relate to pre-construction planning activities at design and pre-construction phases shall involve meetings with the Infection Control Coordinator and representatives of the project as determined by the Facility Manager and the County's Project Manager. These procedures are delineated in the Draft Guidelines for Planning and Design for Infection Control During Construction.
- D. In the event of an emergency that requires construction in a DHS facility, or a breach in infection control precautions during construction the Infection Control Coordinator on duty will be contacted and consulted by the Facility Manager on duty regarding the risks and precautions classifications to be followed. The construction plans and sign off sheet will be formalized by the Infection Control Coordinator, the Project Manager and the Contractor, on the next regular business day.
- E. The Infection Control Coordinator and the Facility Safety Officer have independent authority to stop construction-related activity immediately when:
 - 1. The patients, staff and the public may be adversely affected by infection control hazards generated during construction-related activities and
 - 2. The infection control precautions and/or engineering controls are inadequate to contain the hazard
- F. When a work stoppage is in effect, the Facility Safety Officer and/or the Infection Control Coordinator must notify each other and the Facility Project Manager and the County Project Manager immediately.
- G. The County Project Manager has the authority to restart a halted construction activity in consultation with the Infection Control Coordinator, the Facility Safety Office and the Facility Project Manager.

II. **CONSTRUCTION ACTIVITY TYPES**

The construction activity types are identified by the amount of dust generated, the duration of construction activity and the number of shared Heating, Ventilation and Air Conditioning (HVAC) systems. If construction activity is not defined under these guidelines, the Infection Control Coordinator shall assign an appropriate risk category and Precaution Class.

Step One:

Using the following table, Facilities Management shall identify the project by the Construction (or Renovation) activity type (Types A through D).

1. **Type A:**
Inspection and Non-Invasive Activities.
Includes, but is not limited to:
 - a. Removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet.
 - b. Painting (but not sanding).
 - c. Wall-covering, 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.

2. **TYPE B:**
Small scale, short duration activities which create minimal dust.
Includes but is not limited to:
 - a. Installation of telephone and computer cabling.
 - b. Access to chase spaces.
 - c. Cutting of walls or ceiling where dust migration can be controlled.

3. **TYPE C:**
Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies. High level of dust is defined as suspended particles that are visible to the naked eye and moderate level of dust is that which is perceivable on horizontal surfaces after eight to twelve hours.

Includes but is not limited to:
 - a. Sanding of walls for painting or wall covering.
 - b. Removal of floor covering, ceiling tiles and casework.
 - c. New wall construction.
 - d. Minor ductwork or electrical work above ceilings.
 - e. Major cabling activities.
 - f. Any activity which cannot be completed within a single work-shift.
 - g. Plumbing work requiring cutting into walls.

4. **TYPE D**

Major demolition and construction projects

Includes but is not limited to:

- a. Activities which require consecutive work shifts.
- b. Activities which requires heavy demolition or removal of a complete system.
- c. New construction.

III. INFECTION CONTROL RISK GROUPS

The level of infection control classification necessary for the work is determined by matching the construction activity with the designated risk group in the definitions and matrixes shown on this specification. The infection control risk must be assessed for patients, staff, visitors and the construction workers.

Step Two:

Using the following table, the Infection Control Committee shall identify the Infection Control Risk Groups that will be affected. If more than one risk group will be affected, select the higher risk group:

Low Risk Group 1	Medium Risk Group 2	High Risk Group 3	Highest Risk Group 4
Office areas Storage Rooms Conference Rooms	Ambulatory Care (Non-specialty clinics) Echocardiography Occupational / Physical Therapy Psychiatry areas Respiratory Therapy Waiting Rooms	All Nursing Units Emergency Department Laboratories Food Preparation / Serving areas + Cafeteria Interventional Radiology Labor & Delivery Newborn Nursery Outpatient Surgery and Specialty Clinics Pediatrics Post Anesthesia Care Unit Admissions Area Physical Therapy Tank Area Nuclear Medicine Radiology/MRI	All Critical Care Units ICUs /CMAs Any area caring for immuno-compromised patients (Oncology, Infusion Center etc) Burn unit Cardiac Catheterization area Heart Center Operating rooms Pharmacy Sterile Reprocessing Transplant Unit Dialysis Unit Endoscopy Area Pulmonary Function

IV. CLASS OF PRECAUTION

A. Step Three:

Using the Infection Control Matrix, match the Infection Control Risk Group (Group 1 through 4) with the Construction Activity Type (Type A through D) to obtain the Class of Precautions (Class I through IV) that shall be maintained.

INFECTION CONTROL MATRIX: Class of Precautions				
Risk Group	Construction Activity Type			
	Type A	Type B	Type C	Type D
LOW Risk - Group 1	I	II	II	III/IV
MEDIUM Risk - Group 2	I	II	III	IV
HIGH Risk - Group 3	I	II	III/IV	IV
HIGHEST Risk - Group 4	III	III/IV	III/IV	IV

B. The Infection Control Coordinator is also responsible for:

- airborne environmental disease surveillance
- assessment of the physical placement of immunocompromised patients during construction
- assessment of personal protective equipment needs of immunocompromised patients who may be affected by construction activities
- identification of alternative access routes to and from the DHS facility for patients, public and staff in coordination with the Facility Manager and Project Manager
- identification of the access route to and from the construction site for all construction activities and personnel
- Work stoppage whenever patient, staff and the public may be adversely affected by infection control hazards generated during construction.
- Notify the Facility Project Manager, the County Project Manager and the Facility Safety Officer immediately in the event of a work stoppage

C. The Class of Precaution defines the protective measures required by the contractor during a construction project. Advanced written approval is required for all Construction Activity Types regardless of Infection Control Risk Group. The Class of Precaution may be of singular or multiple class as identified on the drawings. If more than one Class of Precaution is identified, select the higher Class. The Class I through Class IV Coded Precautions are delineated as follows:

1. CLASS I

- a. Must obtain infection control consult before construction begins. This consultation should advise any specific infection control risk at this site (Infection Control Hazard).
- b. Signage will be required and posted at the facility, by the Infection Control Coordinator or their designee.
- c. Execute work by methods to minimize raising dust from construction operation.
- d. Immediately replace a ceiling tile displaced for visual inspection.

2. CLASS II

- a. Must obtain infection control consult before construction begins. This consultation should advise any specific infection control risk at this site (Infection Control Hazard).
- b. Signage will be required and posted at the facility, by the Infection Control Coordinator or their designee.
- c. Isolate HVAC system in areas where work is being performed.
- d. Block and seal air vents.
- e. Provide active means to prevent airborne dust from dispersing into atmosphere.
- f. Water mist or wet work surfaces to control dust while cutting.
- g. Seal unused doors with duct tape.
- h. Place and replace dust mat at entrance and exit of work area daily.
- i. Contractor will wet mop areas with hospital approved disinfectant daily.
- j. Environmental Services will wipe all surfaces within immediate patient care environment and staff areas with a hospital approved disinfectant daily.
- k. Contain construction waste before transport in tightly covered containers.
- l. Contractor shall vacuum with HEPA filtered vacuum before leaving area daily.

- m. Provide biological monitoring by a third party (consultant) during work that generates a moderate to high level of dust.

3. CLASS III

- a. Must obtain infection control consult before construction begins. This consultation should advise any specific infection control risk at this site (Infection Control Hazard).
- b. Signage will be required and posted at the facility by the Infection Control Coordinator or their designee.
- c. Remove or isolate HVAC system in areas where work is being done to prevent contamination of duct system.
- d. Complete construction of all critical barriers before construction begins including:
 - 1. Airtight plastic barriers (fire-rated Visqueen or other material approved by the Project Manager) must extend from floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping. The Contractor will check the integrity of this barrier at all times.
 - 2. Drywall barriers erected with joints shall be covered or sealed to prevent dust and debris from escaping.
 - 3. All penetrations in existing barriers must be sealed airtight.
 - 4. Anterooms or double entrance openings shall be created when feasible to allow workers to remove protective apparel or HEPA vacuum off existing clothing.
 - 5. Cloth or paper overalls may be worn and shall be removed each time the work site is exited.
 - 6. All personnel entering the work site are required to wear shoe covers; the shoe covers must be changed each time the work personnel exits the work site.
 - 7. Construct overlapping flaps minimum 2 feet wide at polyethylene enclosures for personnel access.
 - 8. Duct-type tape applied over the frame and door is acceptable for project containment.

9. Adequate window seals should be obtained to prevent outside air from entering room.
 10. Place adhesive mats or wet mats at barricade entrance and in anterooms for personnel to wipe feet when leaving site. Mats shall be changed daily and as needed to prevent dust / dirt being taken out of work area.
- e. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
 - f. Seal holes, pipes, conduits and punctures with duct tape or other material.
 - g. Do not remove barriers from work area until complete project is thoroughly cleaned by the Contractor and inspected/approved by the Environmental Service Manager or the Infection Control Coordinator.
 - h. Vacuum work area with HEPA filtered vacuum.
 - i. Remove barrier materials carefully folding inward to minimize spreading of dirt and debris.
 - j. Vacuum all surfaces with a HEPA filtered vacuum to remove dust.
 - k. Contain construction waste before transport in tightly covered containers.
 - l. Cover transport receptacles or carts.
 - m. If the transport receptacles or carts do not have a solid lid, tape the cover.
 - n. Contractor will wet mop areas with hospital approved disinfectant daily.
 - o. Environmental Services will wipe all surfaces within immediate patient care environment and staff areas with a hospital approved disinfectant daily.
 - p. Provide biological monitoring by a third party (consultant) during work that generates a moderate to high level of dust.

4. CLASS IV

- a. Must obtain infection control consult before construction begins. This consultation should advise any specific infection control risk at this site (Infection Control Hazard).
- b. Signage will be required and posted at the facility by the Infection Control Coordinator or their designee.
- c. Remove or isolate HVAC system in areas where work is being done to prevent contamination of duct system.
- d. Complete construction of all critical barriers before construction begins including:
 1. Airtight plastic barriers (fire-rated Visqueen or other material approved by the Project Manager) must extend from floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping. The Contractor will check the integrity of this barrier at all times.
 2. Drywall barriers erected with joints shall be covered or sealed to prevent dust and debris from escaping.
 3. All penetrations in existing barriers must be sealed airtight.
 4. Anterooms or double entrance openings shall be created when feasible to allow worker to remove protective apparel or HEPA vacuum off existing clothing.
 5. Cloth or paper coveralls may be worn and shall be removed each time the work site is exited.
 6. All personnel entering a work site are required to wear shoe covers. Shoe covers must be changed each time the worker personnel exits the work site.
 7. Construct overlapping flaps minimum 2 feet wide at polyethylene enclosures for personal access.
 8. Duct-type tape applied over the frame and door is acceptable for project containment.
 9. Adequate air seals should be obtained to prevent outside air from entering room.

10. Place adhesive mats or wet mats at barricade entrance and in anterooms for personnel to wipe feet when leaving site. Mats shall be changed daily and as needed to prevent dust / dirt being taken out of work area.
- e. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
- f. Seal holes, pipes, conduits and punctures with duct tape or other material.
- g. Do not remove barriers from work area until work area is thoroughly cleaned by the Contractor and inspected/approved by the Environmental Services Manager or the Infection Control Coordinator.
- h. Vacuum work area with HEPA filtered vacuum.
- i. Remove barrier materials carefully folding inward to minimize spreading of dirt and debris.
- j. Vacuum all surfaces with a HEPA filtered vacuum to remove dust.
- k. Contain construction waste before transport in tightly covered containers.
- l. Cover transport receptacles or carts. If the receptacles or carts do not have a solid lid, tape the cover.
- m. Contractor will wet mop area with a hospital-approved disinfectant daily. Any dust tracked outside of the area shall be removed immediately.
- n. Environmental Services will wipe all surfaces within immediate patient care environment and staff areas with a hospital approved disinfectant daily.
- o. Provide biological monitoring by a third party (consultant) during work that generates a moderate to high level of dust.

IV. WORKMANSHIP

- A. When openings are made into existing ceilings, use control cube or provide an enclosure around ladder sealing off opening. Material used is to be secured at ceiling and floor. Safety cones are to be installed near the base of the ladder.
- B. Any ceiling access panels open for investigation beyond sealed areas shall be replaced immediately when investigation completed. Do not leave areas open unattended.
- C. The Contractor is responsible for maintaining equipment and replacement of HEPA and other filters in accordance with manufacturer's recommendations.
- D. The Contractor shall make daily checks on the cleanliness of intake filters in the ventilation system.
- E. The Contractor shall provide means necessary to protect work in place and existing finishes and material. Damage of any kind to work, finishes or material as a result of infection control measures shall be repaired immediately and restored to the previously existing condition.
- F. The Contractor shall obtain the "Contractor Information Packet" from Facilities Management. This packet details health clearance, infection control, safety education requirements and etc. All Contractors will not be permitted to work in DHS Facilities' project sites until all requirements met.
- G. At the completion of the infection control construction consultation process and prior to construction, Contractor employees who intend to work at the project site, shall be required to attend the Contractor Training given by the hospital Infection Control Office. No individuals will be permitted to work at the project site without first attending Contractor Training.
- H. Contractor and Facilities Management are responsible for maintaining all records related to Infection Control issues.

V. EXPOSURE RECORDS MAINTENANCE

- A. A current work-site exposure occurs when any patient, staff or worker is subjected to a toxic substance or harmful physical agent in the course of either their stay at medical facility or their employment. Such an exposure may occur through any route (inhalation, ingestion, skin contact or absorption, etc.). This does not include situations where toxic substance or harmful physical agent is not used, handled, stored, generated or present in the workplace in any manner different from typical non-occupational situation.
- B. Toxic or infectious substance means any biological agent (bacteria, virus, fungus, etc. which is listed in the latest printed edition of the National Institute for

Occupational Safety & Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS).

C. Record Retention:

1. Record Retention Period:

a. One year retention:

- The records of workers who have worked for less than 1 year that are not provided to the worker upon termination of employment.
- Background data to workplace monitoring or measuring such as laboratory reports and work sheets.

b. Thirty year retention:

- Material Safety Data Sheets (MSDS)
- Biological Monitoring Results by specific OSHA standards will be maintained per OSHA standard.
- Analyses using exposure or medical record.
- The worker exposure medical record.

2. All records other than medical records shall be maintained as follows:

- a. Background data shall be maintained by the Infection Control Office and the Contractor.
- b. MSDS sheets shall be maintained by the facility's Safety Office and Contractor.
- c. Analyses using exposure or medical record shall be maintained by the Infection Control Office and the Contractor.

3. Exposure Medical Records shall be maintained by:

- a. All patient exposure records shall be maintained by the medical facility where the work was conducted.
- b. Staff (workers employed by Los Angeles County) exposure records shall be maintained by the either the facility's designated Employee Health Services or the County's approved Workers Compensation provider.

- c. All Contractor employees' records shall be maintained by their Workers Compensation provider.

VI. REFERENCES

1. Centers for Disease Control and Prevention, "Guidelines for Environmental Infection Control in Health-Care Facilities, MMWR: June 6, 2003/ 52(RR10); 1-42.
2. Infection Control During Construction: A Guide to Prevention and JCAHO Compliance, Wayne Hansen editor, Opus Communications, Marblehead, MA, 2002, ISBN 1-57839-165-2.
3. Guidelines for Design and Construction of Hospital and Health Care Facilities (AIA), Facilities Guidelines Institute, Dallas, TX, 2001, ISBN 1-57165-002-4.
4. Bartley, Judene Mueller: APIC State-of-the Art Report: The role of infection control during construction in health care facilities. APIC, Washington, D.C., 2000, Publication No. 17/106055, pp 156-169.

APPENDIX- LAC+USC MEDICAL CENTER

Re: Infection Control for Maintenance & Minor Alterations not needing infection control consultation

- 1) Removal of ceiling tile for inspection limited to 1 tile per 50 square feet
- 2) Painting
- 3) Minor plumbing that does not generate dust
- 4) Minor electrical that does not generate dust
- 5) Installation of wall covering
- 6) Work in pipe chases
- 7) Minor entry (Cutting of walls or ceilings) where dust migration can be controlled
- 8) Removal of floor covering where dust migration can be controlled
- 9) Installation of bulletin boards, curtain tracks, window shades, x-ray view boxes, fire extinguisher installation of door and cabinet hardware, etc. where dust migration can be controlled
- 10) Patching and fire/smoke stop insulation of walls, floors, and ceilings