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Healthcare Construction and Renovation: Are the Workers on Your Site Compliant?

A White Paper on Healthcare Construction Resources

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Are you keeping up with the healthcare construction requirements? It is now required to provide workers with new training about chemicals; and companies that work in hospitals or other healthcare facilities must provide infection control training to all workers on site. If you are not already familiar with the acronyms GHS and ICRA, then it's time to get caught up! The terms Globally Harmonized System (GHS) and Infection Control Risk Assessment (ICRA) are getting focused attention from regulators, business owners, and property managers with new requirements. Do the contractors and staff working in your healthcare facilities have their necessary training certificates for compliance?

This white paper provides information on:

- Healthcare Construction and Renovation Requirements Summary with Resource List
- Caution: The Training Requirements are Constantly Changing!
- Contractor Selection and the Impact on Compliance: Get the Right Credentials and Qualifications
- Useful Tools: GHS Hazardous Class Matrix & ICRA Checklists

Did you know it takes ongoing specialized training to perform construction work in a healthcare facility?

Healthcare and university teaching healthcare facilities are included in these requirements. Training and accreditation is now necessary as a result of the regulatory environmental changes and the PPACA (Patient Protection Affordable Care Act) as mandated by TJC (The Joint Commission) and CMS (Centers for Medicare and Medicaid Services). Healthcare workers and the construction teams working in healthcare facilities need to have their **Infectious Control Risk Assessment** (ICRA) training certificates as well as **OSHA's annual Bloodborne Pathogen Training**. To help expedite following the latest guidelines, a list of tools and documents can be downloaded for use at http://www.ashe.org/resources/tools. This library helps facility managers with checklists and updates so that compliance can achieved with confidence.

Compliance standards for all construction activities in healthcare facilities are mandated and they continue to evolve every year. These standards are specific to the impact of exposure of airborne pathogens during construction and their impact on the Health, Safety, and Welfare of patients, caregivers, workers, and employees during the construction process.

The ASHE resource site listed above is a great place to start but we want to share resources and access to the documents and research needed for compliance. In addition to OSHA standards, guidelines from the following organizations apply to construction and renovation activities conducted at or within healthcare facilities:

The Joint Commission (TJC) sets requirements for construction and renovation projects that address design and planning criteria, fire safety, patient privacy, employee training and performance, and infection control. To help health care facilities comply with Environment of Care standards, the Joint Commission has issued Planning, Design, and Construction of Health Care Environments. The Joint Commission also requires that organizations develop a policy to compensate for hazards. These standards and documents are also located at both the ASHE site http://www.ashe.org/resources and the Joint Commission site http://www.jointcommission.org.

The American Institute of Architects (AIA) has issued guidelines for the design and construction of healthcare facilities that contain information on standards for construction, ventilation, and equipping new medical facilities. According to the AIA, facility managers should inform contractors of the following planning and design elements:

- ✓ Involvement of infection control, safety, and risk management
- ✓ Risk assessment of susceptible patient locations
- ✓ The effects of shutting off power, shutting down heating, ventilation, and air conditioning systems, disruptions of ventilation and air flow, and outdoor wind patterns
- ✓ Air flow (from patient-occupied areas to construction site)
- ✓ Instructions on building services interruption
- ✓ Communication requirements-both internal and external

Workers need Infectious Control Risk Assessment (ICRA) Training certificates and OSHA's annual Bloodborne Pathogen Training.

The Centers for Disease Control (CDC)'s Hospital Infections Program addresses infection control issues related to construction and renovation projects. CDC works 24/7 to protect America from health, safety and security threats, both foreign and in the U.S. The CDC provides information regarding the use of ventilation and ultraviolet germicidal irradiation for preventing the transmission of tuberculosis in healthcare facilities. Recommendations for engineering controls include:

- ✓ local exhaust ventilation (i.e., source control)
- ✓ general ventilation considerations, including dilution and removal of contaminants, airflow patterns within rooms, airflow direction in facilities, negative pressure in rooms, and TB isolation rooms
- ✓ air cleaning or disinfection, accomplished by filtration of air (e.g., through high-efficiency particulate air filters) or by ultraviolet germicidal irradiation

The National Fire Protection Agency (NFPA) has developed building construction codes that include standards for windows and doors; chimneys and vents; the fire-resistivity of floor-ceiling assemblies, walls used to form compartments and other finish materials; exterior or interior bearing walls; and other structures. http://www.nfpa.org/codes-and-standards

Contractor Selection: How do you make sure the workers have the right credentials?

Many healthcare institutions have decided to include ICRA training certificate requirements and proof of completion of Blood borne Pathogen training in the project qualification/bid process to ensure compliance. This is the easiest way to qualify proposed staff and it creates documentation with copies of certificates on file to demonstrate compliance. The most common courses are Construction ICRA: Best Practices in Healthcare Construction in addition to OHSA's required Blood borne Pathogen standard.

TRIVIA

Did you know the most important unnecessary infection in a healthcare facility is due to Aspergillus (a fungal spore)?
Environmental disturbances due to construction and/or renovation activities in and around hospitals raise the airborne Aspergillus spore counts in hospitals and have been associated with unnecessary pneumonia. Aspergillus commonly occurs in soil, water, and decaying vegetation. The fungi have been cultured from unfiltered air, ventilation systems, contaminated dust dislodged during hospital renovation and construction, horizontal surfaces, food, and ornamental plants.

About the Authors:

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Resource Library For Facility Managers, Project Managers and Contractors:

AIA Academy of Architecture for Health (AAH)—Contains reports, and other documents related to healthcare design & Construction.
http://network.aia.org/academyofarchitectureforhealth

Guidelines for the Design and Construction of Health Care Facilities by the Facility Guidelines Institute
http://www.fgiguidelines.org/

OSHA's Bloodborne Pathogens and Needlestick Prevention Safety and Health Topics web page at:
https://www.osha.gov/SLTC/bloodbornepathogens

American Hospital Association—Information generally focused on financial and organizational issues, but includes a good resource center and checklist tools.
http://www.aha.org/

American Society for Healthcare Engineering (ASHE)—An advocate for continuous improvement in the health care engineering and facilities management professions.
http://www.ashe.org

Green Guide for Health Care™—A best practices guide for healthy and sustainable building design, construction, and operations for the healthcare industry.
http://www.gghc.org

Joint Commission on the Accreditation of Healthcare Organizations (JCAHO)—Has some facility related information, though it is largely concerned with operational issues.
http://www.jointcommission.org

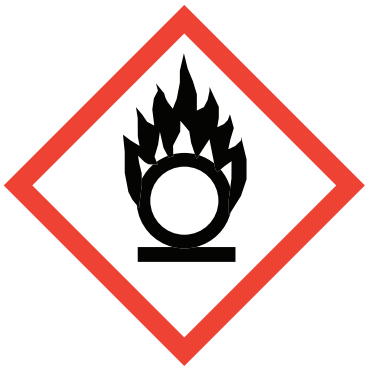
Practice Greenhealth—The nation's leading membership and networking organization for institutions in the healthcare community that have made a commitment to sustainable, eco-friendly practices.
https://practicegreenhealth.org/

Obtaining the Certified Healthcare Constructor certification provides qualified personnel the opportunity to be recognized among the elite in the critical field of healthcare construction.
http://www.aha.org/certifcenter/CHC

The Center for Health Design An extensive site focusing on healthcare facility design and EDAC certification.
https://www.healthdesign.org

VA Office of Construction & Facility Management (CFM) Technical Information Library—Includes manuals, guides, and other standards covering all aspects of health care facility design.
http://www.cfm.va.gov/til/index.asp

The Globally Harmonized System (GHS) Hazard Classifications are demonstrated in this chart for ease in identification.



- OXIDIZERS

- FLAMMABLES
- SELF-HEATING
- SELF REACTIVES
- EMITS FLAMMABLE GAS
- PYROPHORICS
- ORGANIC PEROXIDES

- EXPLOSIVES
- SELF REACTIVES
- ORGANIC PEROXIDES

- ACUTE TOXICITY (SEVERE)

- CORROSIVES

- GASES UNDER PRESSURE

- TARGET ORGAN TOXICITY
- CARCINOGEN
- RESPIRATORY SENSITIZER
- MUTAGENICITY
- REPRODUCTIVE TOXICITY
- ASPIRATION TOXICITY

- ENVIRONMENTAL TOXICITY

- IRRITANT
- NARCOTIC EFFECTS
- DERMAL SENSITIZER
- RESPIRATORY TRACT
- ACUTE TOXICITY (HARMFUL)
- IRRITATION

Step One

Using the following table, *identify* **the Type of Construction Project Activity (Type A-D)**

TYPE A	**Inspection and Non-Invasive Activities.** Includes, but is not limited to: • removal of ceiling tiles for visual inspection only, e.g., limited to 1 tile per 50 square feet • painting (but not sanding) • 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.
TYPE B	**Small scale, short duration activities which create minimal dust** Includes, but is not limited to: • 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: • 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: • activities which require consecutive work shifts • requires heavy demolition or removal of a complete cabling system • new construction.

STEP 1: _____

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Step Two

Using the following table, *identify* **the Patient Risk Groups** that will be affected. If more than one risk group will be affected, select the higher risk group:

LOW RISK	MEDIUM RISK	HIGH RISK	HIGHEST RISK
• Office areas	• Cardiology • Echocardiography • Endoscopy • Nuclear Medicine • Physical Therapy • Radiology/MRI • Respiratory Therapy	• CCU • Emergency Room • Labor & Delivery • Laboratories (specimen) • Medical Units • Newborn Nursery • Outpatient Surgery • Pediatrics • Pharmacy • Post Anesthesia Care Unit • Surgical Units	• Any area caring for immunocompromised patients • Burn Unit • Cardiac Cath Lab • Central Sterile Supply • Intensive Care Units • Negative pressure isolation rooms • Oncology • Operating rooms including C-section rooms

STEP 2: _____

Step Three

Match the

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

IC Matrix - Class of Precautions: Construction Project by Patient Risk

	Construction Project Type			
PATIENT RISK GROUP	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

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

STEP 3: _____

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	During Construction Project	Upon Completion of Project
CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection	1. Clean work area upon completion of task.
CLASS II	1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Place dust mat at entrance and exit of work area 6. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with cleaner/disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Upon completion, restore HVAC system where work was performed.
CLASS III	1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Contain construction waste before transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape covering unless solid lid.	1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Prevention & Control Department and thoroughly cleaned by the owner's Environmental Services Department. 2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with cleaner/disinfectant. 5. Upon completion, restore HVAC system where work was performed.
CLASS IV	1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Seal holes, pipes, conduits, and punctures. 5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site. 6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.	1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Prevention & Control Department and thoroughly cleaned by the owner's Environmental Services Dept. 2. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction. 3. Contain construction waste before transport in tightly covered containers. 4. Cover transport receptacles or carts. Tape covering unless solid lid. 5. Vacuum work area with HEPA filtered vacuums. 6. Wet mop area with cleaner/disinfectant. 7. Upon completion, restore HVAC system where work was performed.

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Step Four

Identify the **areas surrounding the project area**, assessing potential impact

UNIT BELOW	UNIT ABOVE	LATERAL	LATERAL	BEHIND	FRONT
Risk Group:	Risk Group:	Risk Group:	Risk Group:	Risk Group:	Risk Group:

Step Five

Identify **specific site of activity** e.g., patient rooms, medication room, etc.

Step Six

Identify **issues related to:** ventilation, plumbing, electrical in terms of the occurrence of probable outages.

Step Seven

Identify **containment measures,** using prior assessment. **What types of barriers?** (E.g., solids wall barriers);
Will HEPA filtration be required?

(Note: Renovation/construction area shall be isolated from the occupied areas during construction and shall be negative with respect to surrounding areas)

Step Eight

Consider **potential risk of water damage**. Is there a risk due to compromising structural integrity? (e.g., wall, ceiling, roof)

Step Nine

Work hours: Can or will the work be done during non-patient care hours?

Step Ten

Do plans allow for adequate number of isolation/negative airflow rooms?

Step Eleven

Do the plans allow for the required number & type of handwashing sinks?

Step Twelve

Does the infection prevention & control staff agree with the minimum number of sinks for this project?
(Verify against FGI Design and Construction Guidelines for types and area)

Step Thirteen

Does the infection prevention & control staff agree with the plans relative to clean and soiled utility rooms?

Step Fourteen

Plan to discuss the following containment issues with the project team. E.g., traffic flow, housekeeping, debris removal

Appendix: Identify and communicate the responsibility for project monitoring that includes infection prevention & control concerns and risks. The ICRA may be modified throughout the project. Revisions must be communicated to the Project Manager.

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Infection Control Construction Permit

	Permit No:
Location of Construction :	Project Start Date:
Project Coordinator:	Estimated Duration:
Contractor Performing Work	Permit Expiration Date:
Supervisor:	Telephone:

YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Low Risk
		TYPE B: Small scale, short duration, moderate to high levels			GROUP 2: Medium Risk
		TYPE C: Activity generates moderate to high levels of dust, requires greater 1 work shift for completion			GROUP 3: Medium/High Risk
		TYPE D: Major duration and construction activities Requiring consecutive work shifts			GROUP 4: Highest Risk

CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection.	3. Minor Demolition for Remodeling
CLASS II	1. Provides active means to prevent air-borne dust from dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Wipe surfaces with cleaner/disinfectant.	6. Contain construction waste before transport in tightly covered containers. 7. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 8. Place dust mat at entrance and exit of work area. 9. Isolate HVAC system in areas where work is being performed; restore when work completed.
CLASS III **Date** **Initial**	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Do not remove barriers from work area until complete project is checked by Infection Prevention & Control and thoroughly cleaned by Environmental Services.	6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with cleaner/disinfectant 8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 9. Contain construction waste before transport in tightly covered containers. 10. Cover transport receptacles or carts. Tape covering. 11. Upon completion, restore HVAC system where work was performed.
CLASS IV **Date** **Initial**	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Seal holes, pipes, conduits, and punctures appropriately. 6. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a 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. 7. All personnel entering work site are required to wear shoe covers.	8. Do not remove barriers from work area until completed project is checked by Infection Prevention & Control and thoroughly cleaned by Environmental. Services. 9. Vacuum work area with HEPA filtered vacuums. 10. Wet mop with disinfectant. 11. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 12. Contain construction waste before transport in tightly covered containers. 13. Cover transport receptacles or carts. Tape covering. 14. Upon completion, restore HVAC system where work was performed.

Additional Requirements:

_____ Date Initials	_____ Exceptions/Additions to this permit Date Initials are noted by attached memoranda
Permit Request By:	Permit Authorized By:
Date:	Date:

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