

Construction Risk Assessment



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Statistics to Consider

- Hospital acquired infections
 - Over 100,000 deaths per year
 - Majority are failure to comply with existing protocols and procedures
 - Hand washing by clinical/support staff
 - **Estimate 5% are related to environmental conditions, construction, and maintenance**
 - Costs for treating nosocomial infections is approximately \$5 billion a year

Construction Risk Assessment

Objectives

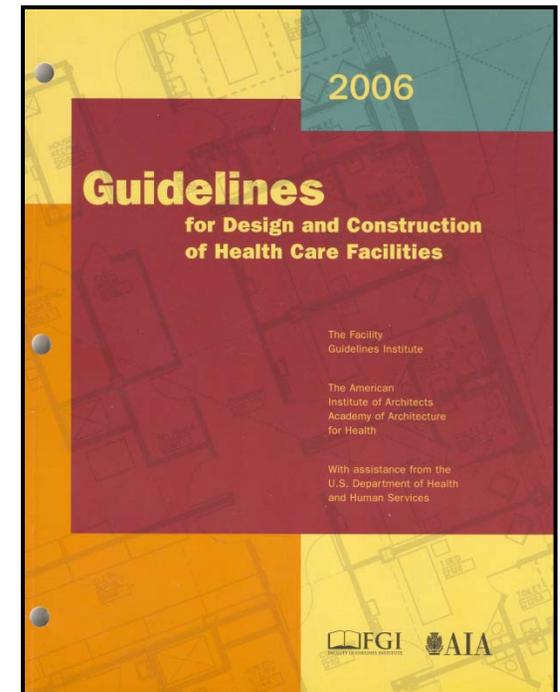
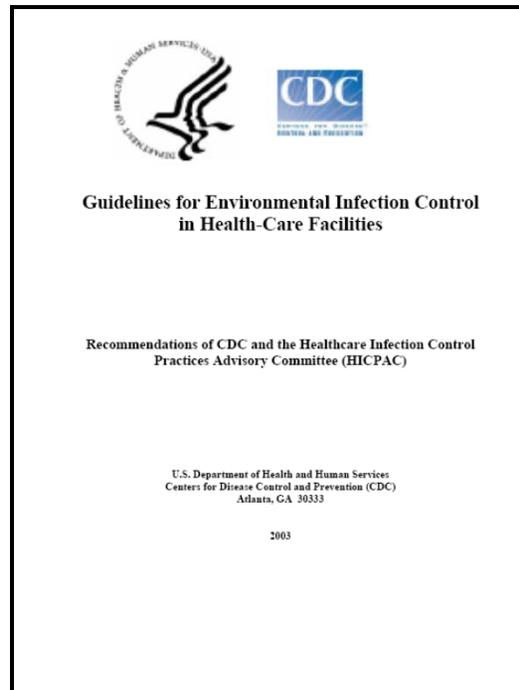
1. Define Construction Risk Assessment
2. Discuss Regulations & Recommendations
3. Use an Infection Control Risk Assessment tool to determine appropriate precautions.
4. Discuss features of an effective dust barrier
5. Test our Skills

What is a Constructing Risk Assessment?

- Proactive: Before the job begins (JCAHO)
- Involves multidisciplinary team (CDC, AIA)
- Performed by owner (AIA)
- Includes:
 - Infection Control Risk Assessment (JCAHO, CDC, AIA)
 - Noise, vibration, dust, utility requirements, air quality (JCAHO)
 - Life safety & protection of occupants (JCAHO, AIA)
- Addressed in bid documents (AIA)

Why Construction Risk Assessment?

- Patient Safety
- Regulations
- Recommendations



Who Is Responsible for the ICRA?

- Conducting the ICRA: Healthcare organization
- Implementing the ICRMR, (Infection Control Risk Mitigation Recommendations): Healthcare organization and Construction Company

What does CDC say?

*For external and internal demolition, **barriers** are required when:*

- Working with plumbing in sensitive areas
- Exposing ceiling cavity spaces
- Crawling into ceiling spaces
- Working on elevator shafts
- Demolishing wallboard, plaster, ceramic tile, ceiling tile
- Removing flooring
- Removing windows and doors
- Removing casework

Guidelines for environmental infection control in health-care facilities. CDC, 2003.

The Infection Control Risk Assessment Process

A Step-by-Step Process

ICRA (Infectious Control Risk Assessment)

Infection Control Risk Assessment Matrix of Precautions for Construction & Renovation

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

| | |
|---------------|---|
| TYPE A | <p>Inspection and Non-Invasive Activities.</p> <p>Includes, but is not limited to:</p> <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 | <p>Small scale, short duration activities which create minimal dust</p> <p>Includes, but is not limited to:</p> <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 | <p>Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies</p> <p>Includes, but is not limited to:</p> <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 | <p>Major demolition and construction projects</p> <p>Includes, but is not limited to:</p> <ul style="list-style-type: none"> activities which require consecutive work shifts requires heavy demolition or removal of a complete cabling system new construction. |

STEP 1: 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 |
|--|---|---|---|
| <ul style="list-style-type: none"> Office areas | <ul style="list-style-type: none"> Cardiology Echocardiography Endoscopy Nuclear Medicine (equipment) Radiology/MRI Respiratory Therapy | <ul style="list-style-type: none"> CCU Emergency Room Labor & Delivery Laboratories (equipment) Newborn Nursery Outpatient Surgery Pediatrics Pharmacy Post Anesthesia Care Unit Surgical Units | <ul style="list-style-type: none"> Any area caring for immunocompromised patients Burn Unit Cardiac Cath Lab Intensive Care Units Medical Unit 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

| Patient Risk Group | Construction Project Type | | | |
|--------------------|---------------------------|--------|--------|--------|
| | TYPE A | TYPE B | TYPE C | TYPE D |
| LOW Risk Group | I | II | II | IIIV |
| MEDIUM Risk Group | I | II | III | IV |
| HIGH Risk Group | I | II | IIIV | IV |
| HIGHEST Risk Group | I | IIIV | IIIV | 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:

| | | |
|---------|--|---|
| CLASS I | 1. Isolate HVAC system in area where work is being done to prevent contamination of duct system. | 1. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction. |
| | 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (can with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. | 2. Contain construction waste before transport in tightly covered containers. |
| | 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. | 3. Cover transport receptacles or carts. Tape covering unless solid lid. |
| | 4. Seal holes, pipes, conduits, and punctures appropriately. | 4. Vacuum work area with HEPA filtered vacuum. |
| | 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 the work site. | 5. Wet mop area with disinfectant. |
| | 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. | 6. Remove isolation of HVAC system in areas where work is being performed. |
| | 7. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. | |

Step 4. Identify the areas surrounding the project area, assessing potential impact

| Unit Below | Unit Above | Lateral | Lateral | Behind | Front |
|------------|------------|------------|------------|------------|------------|
| | | | | | |
| Risk Group |

Step 5. Identify specific site of activity eg. patient rooms, medication room, etc.

Step 6. Identify issues related to: ventilation, plumbing, electrical in terms of the occurrence of probable outages.

Step 7. Identify containment measures, using prior assessment. What types of barriers? (Eg. solids wall barriers). Will HEPA filtration be required?

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

Step 8. Consider potential risk of water damage. Is there a risk due to compromising structural integrity? (eg. wall, ceiling, roof)

Step 9. Work hours: Can or will the work be done during non-patient care hours?

Step 10. Do plans allow for adequate number of isolation/negative airflow rooms?

Step 11. Do the plans allow for the required number & type of handwashing sinks?

Step 12. Does the infection control staff agree with the minimum number of sinks for this project? (Verify against AIA Guidelines for types and area)

Step 13. Does the infection control staff agree with the plans relative to clean and soiled utility rooms?

Step 14. Plan to discuss the following containment issues with the project team.
Eg. traffic flow, housekeeping, debris removal (how and when)

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

| CLASS | Description of Required Infection Control Precautions by Class | |
|-----------|--|--|
| | During Construction Project | Upon Completion of Project |
| CLASS I | <ol style="list-style-type: none"> Execute work by methods to minimize raising dust from construction operations. Immediately replace a ceiling tile displaced for visual inspection. | <ol style="list-style-type: none"> Wipe work surfaces with disinfectant. Contain construction waste before transport in tightly covered containers. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. Remove isolation of HVAC system in areas where work is being performed. |
| CLASS II | <ol style="list-style-type: none"> Provide active means to prevent airborne dust from dispersing into atmosphere. Water mist work surfaces to control dust while cutting. Seal unused doors with duct tape. Block off and seal air vents. Place dust mat at entrance and exit of work area. Remove or isolate HVAC system in areas where work is being performed. | <ol style="list-style-type: none"> Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. |
| CLASS III | <ol style="list-style-type: none"> Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (can with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. | <ol style="list-style-type: none"> Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. |

| 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, moderate to high work shift completion | | | GROUP 3: Medium-High Risk |
| | | TYPE D: Major demolition and construction activities requiring consecutive work shifts | | | GROUP 4: Highest Risk |
| CLASS I | | <ol style="list-style-type: none"> Execute work by methods to minimize raising dust from construction operations. Immediately replace any ceiling tile displaced for visual inspection. | | | Minor Demolition for Remodeling |
| CLASS II | | <ol style="list-style-type: none"> Provide active means to prevent airborne dust from dispersing into atmosphere. Water mist work surfaces to control dust while cutting. Seal unused doors with duct tape. Block off and seal air vents. Wipe surfaces with disinfectant. | | | <ol style="list-style-type: none"> Contain construction waste before transport in tightly covered containers. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. Place dust mat at entrance and exit of work area. Remove or isolate HVAC system in areas where work is being performed. |
| CLASS III | | <ol style="list-style-type: none"> Obtain infection control permit before construction begins. Isolate HVAC system in areas where work is being done to prevent contamination of the duct system. Complete all critical barriers or implement control cube method before construction begins. | | | <ol style="list-style-type: none"> Vacuum work with HEPA filtered vacuum. Wet mop with disinfectant. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. Contain construction waste before transport in tightly covered containers. Cover transport receptacles or carts. Tape covering. Remove or isolate HVAC system in areas where work is being performed. |
| CLASS IV | | <ol style="list-style-type: none"> Obtain infection control permit before construction begins. Isolate HVAC system in areas where work is being done to prevent contamination of duct system. Complete all critical barriers or implement control cube method before construction begins. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. Seal holes, pipes, conduits, and punctures appropriately. Construct anteroom and require all personnel to pass through the 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. | | | <ol style="list-style-type: none"> All personnel entering work site are required to wear shoe covers. Do not remove barriers from work area until completed project is thoroughly cleaned by the Environmental Services Dept. Vacuum work area with HEPA filtered vacuum. Wet mop with disinfectant. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. Contain construction waste before transport in tightly covered containers. Cover transport receptacles or carts. Tape covering. Remove or isolate HVAC system in areas where work is being done. |
| Additional Requirements: | | | | | |
| Date Issued: | | Dispositions/Advisors to this permit: Date | | | |
| Permit Request By: | | Initials: use red ink for critical materials | | | |
| Date: | | Permit Authorized By: | | | |
| | | Date: | | | |

Step 1. Identify the **Type of Construction Project**

| | |
|----------------------|--|
| <p>TYPE A</p> | <p><u>Inspection and Non-Dust Generating Activities.</u> Includes, but is not limited to:</p> <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) •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 |
| <p>TYPE B</p> | <p><u>Small Scale, Short Duration Activities which Create Minimal Dust</u> Includes, but is not limited to:</p> <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 |
| <p>TYPE C</p> | <p><u>Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies</u> Includes, but is not limited to:</p> <ul style="list-style-type: none"> •sanding of walls for painting or wall covering •removal of floor coverings, 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 work shift |
| <p>TYPE D</p> | <p><u>Major demolition and construction projects</u> Includes, but is not limited to:</p> <ul style="list-style-type: none"> •activities which require consecutive work shifts •requires heavy demolition or removal of a complete cabling system •new construction |

Step 2. 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 Most outpatient areas | High Risk Special procedure Surgery recovery Newborns Bed-ridden patients | Highest Risk Immune-suppressed Open wound Transplant units Intensive care units |
|---|--|--|---|
| <ul style="list-style-type: none"> • Office areas • Clinics | <ul style="list-style-type: none"> •Cardiology •Echocardiography •Endoscopy •Nuclear Medicine •Physical Therapy •Radiology/MRI •Respiratory Therapy | <ul style="list-style-type: none"> •Emergency Room •Labor & Delivery •Laboratories (specimen) •Newborn Nursery •Outpatient Surgery •Pediatrics •Pharmacy •Post Anesthesia Care Unit •Surgical Units | <ul style="list-style-type: none"> •Any area caring for immunocompromised patients •Burn Unit •Cardiac Cath Lab •Central Sterile Supply •Intensive Care Units •Medical Units •Negative pressure isolation rooms •Oncology •Operating rooms |

Step 3. Use the matrix below to match the Patient Risk Group and Type of Construction and determine the Class of Precautions required during construction

| | Type of Construction | | | |
|---------------------------|-----------------------------|-----------------|-----------------|-----------------|
| Patient Risk Group | TYPE A | TYPE B | TYPE C | TYPE D |
| LOW Risk Group | I | II | II | III / IV |
| MEDIIUM 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. Use the matrix to match the Patient Risk Group and Type of Construction and determine the Class of Precautions required

| | Type of Construction | | | |
|--------------------|----------------------|----------|----------|----------|
| 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 |

Class of Precautions

Description of Required Infection Control Precautions by **Class**

| | During Construction Project | Upon Project Completion |
|----------------|---|--------------------------------|
| CLASS I | <ol style="list-style-type: none">1. Execute work by methods to minimize raising dust from construction operations.2. Immediately replace a ceiling tile displaced for visual inspection | Environmental cleaning |

| | Type of Construction | | | |
|--------------------|----------------------|----------|----------|----------|
| 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.

Description of Required Infection Control Precautions by **Class**

| | During Construction Project | Upon Project Completion |
|-----------------|--|---|
| CLASS II | <ol style="list-style-type: none"> 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. 7. Zip Wall containment w/ HEPA Jet Filter | <ol style="list-style-type: none"> 1. Wipe work surfaces with 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. Remove isolation of HVAC system in areas where work is being performed. |

Step 3. Use the matrix below to match the Patient Risk Group and Type of Construction and determine the Class of Precautions required during construction

| | Type of Construction | | | |
|--------------------|----------------------|----------|----------|----------|
| 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 |

Class of Precautions

During Construction Project

CLASS III

1. Remove or isolate HVAC system in work area to prevent contamination of duct system.
2. Before construction begins: Complete all critical barriers (e.g., sheetrock, plywood, plastic) to seal work area from non work area. For small areas, use control cube (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit)
3. Maintain negative air pressure within work area using HEPA equipped air filtration units.
4. Cover all transport receptacles or carts—includes waste containers. Tape covering unless solid lid.

Upon Completion

CLASS III

1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection 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 disinfectant.
5. Remove isolation of HVAC system in areas where work is being performed.

| | Type of Construction | | | |
|--------------------|----------------------|----------|----------|----------|
| 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.

During Construction Project

CLASS IV

1. All Class III precautions *PLUS*:
2. Construct anteroom. 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.
3. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.
4. Seal holes, pipes, conduits, and punctures appropriately.

Upon Completion

CLASS IV

1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection 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 disinfectant.
5. Remove isolation of HVAC system in areas where work is being performed.

Determine the Level of Protection

Examples

- Construction **TYPE A** in **LOW RISK** patient group:
 - Does not require barriers or negative pressure.
 - “Just get in and get it done”.
- Construction **TYPE B** in **MEDIUM RISK** patient group:
 - Provide active means for preventing dispersal of dust
- Construction **TYPE A-D** in **HIGH/HIGHEST RISK** patient group:
 - Barriers, HEPA filtered vacuums, negative air pressure

Other Steps...

Step 4. 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 5. Identify specific site of activity, e.g., patient rooms, medication room, etc.

Step 6. Identify issues related to: ventilation, plumbing, electrical in terms of the occurrence of probable outages.

Step 7. Identify containment measures, using prior assessment. What types of barriers, e.g., solid 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 8. Consider potential risk of water damage. Is there a risk due to compromising, structural integrity, e.g., wall, ceiling, roof?

Step 9. Work hours: Can or will the work be done during non-patient care hours?

Step 10. Plan to discuss containment issues with the project team, e.g., traffic flow, housekeeping, debris removal (how and when).

Step 11. Discuss who will do daily monitoring of construction area

| 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 than 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 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. Remove or isolate HVAC system in areas where work is being performed. | | |
| CLASS III | | 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. | 6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with 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. Remove or isolate HVAC system in areas where work is being performed/ | | |
| Date | | 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. | | | |
| Initial | | 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Env. Services Dept. | | | |
| CLASS IV | | 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. | 7. All personnel entering work site are required to wear shoe covers 8. Do not remove barriers from work area until completed project is thoroughly cleaned by the Environmental Service Dept. 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. Remove or isolate HVAC system in areas where is being done. | | |
| Date | | 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Seal holes, pipes, conduits, and punctures appropriately. | | | |
| Initial | | 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. | | | |
| Additional Requirements <i>(Additions to this permit are noted by attached memoranda)</i> | | | | | |
| Date | | Initials | Date | | Initials |
| Permit Request By | | | Permit Authorized By | | |
| Date | | | Date | | |

Implementing ICRA Precautions

Review: Class I & II Precautions

| | During Construction Project | Upon Completion of Project |
|-----------------|--|---|
| CLASS I | <ol style="list-style-type: none"> 1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection | |
| CLASS II | <ol style="list-style-type: none"> 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. 7. Zip Wall containment w/ HEPA Jet Filter | <ol style="list-style-type: none"> 1. Wipe work surfaces with 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. Remove isolation of HVAC system in areas where work is being performed. |

Temporary Construction Enclosures

- Good for smaller construction projects and maintenance tasks, such as replacing ceiling tiles or replacing fluorescent lamps.
- Abatement offers two, cost-effective temporary construction enclosures for applications where it is not practical to build a rigid barrier around the work zone

ZipWall® Temporary Construction Barrier

ZipWall is a versatile, easy-to-use protective barrier system that protects your facility from harmful dust and airborne particles. The ZipWall system goes up easily in minutes without the need for special tools. Telescopic, twist-lock ZipWall Poles topped with the patented spring-loaded ZipWall Jack enables you to screen off your work area with plastic sheeting, light canvas tarp or drop cloth.



TopSider™ Ceiling Access Module

- Perform operations and maintenance tasks within suspended ceilings without risking dust contamination to surroundings
- Heavy-duty vinyl enclosure and a strong, extendable aluminum frame mounted on a mobile platform
- Wheel the unit underneath a ceiling panel, zip the side opening shut, secure the spring-loaded seal against the ceiling and perform the maintenance task.

COST \$3420



Barriers (Short Duration)

- Fire-resistant plastic
- Airtight
- Negative pressure



Minti Video

Shortcut to [Minti ECU.Ink](https://Minti.ECU.Ink)

Review: Class 3 & 4 Precautions

All class 1 & 2 precautions plus:

- Complete critical barriers
- Negative pressure
- Anteroom-access control (Class 4)
- Shoe covers
- Sealing leaks

During

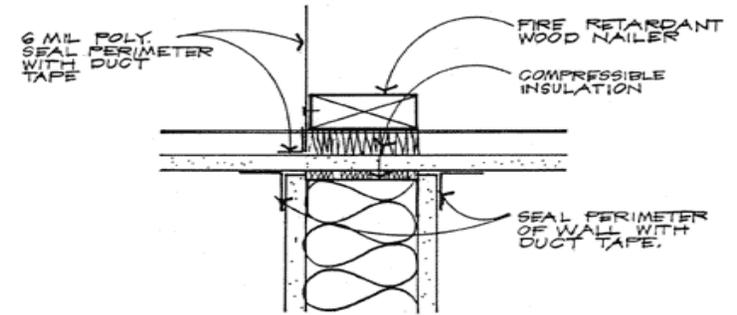
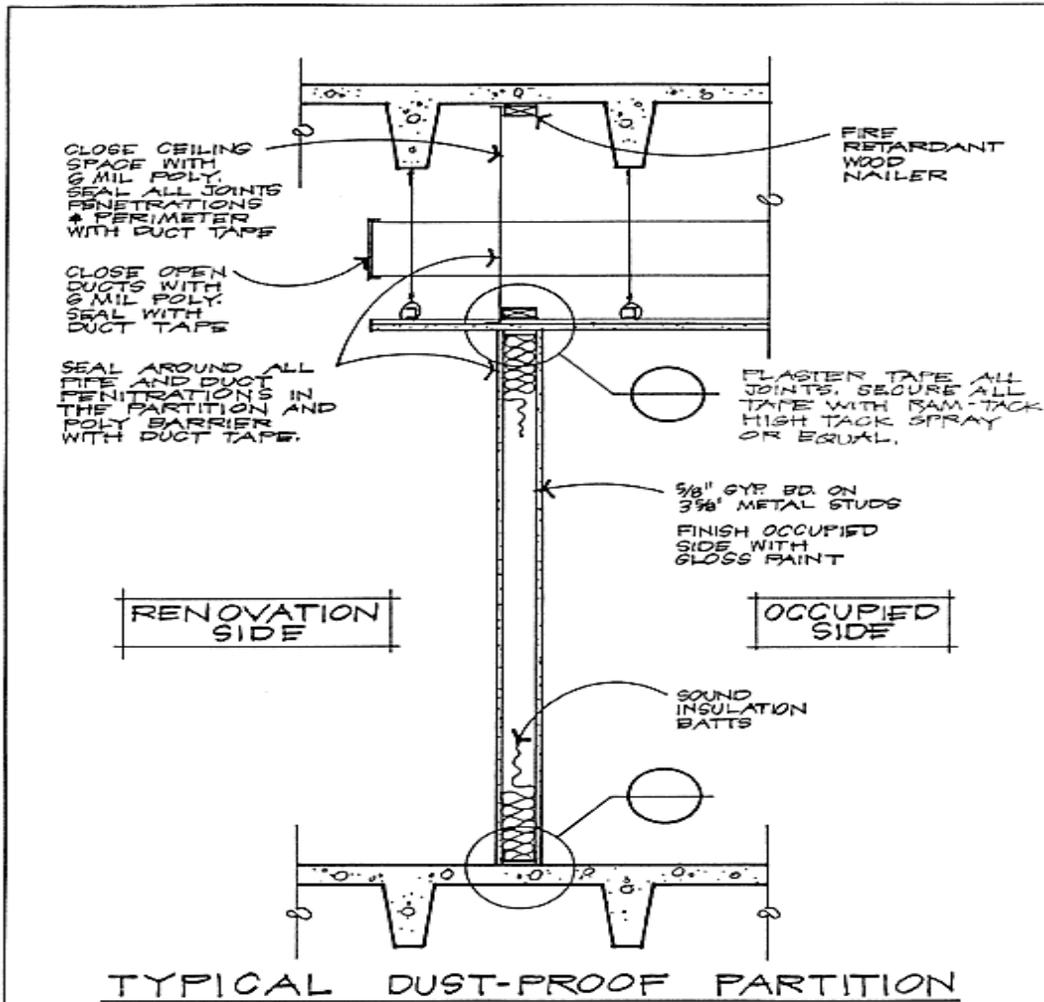
Upon Completion

| | | |
|------------------|---|--|
| CLASS III | 1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system. | 1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. |
| | 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. | 2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. |
| | 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. | 3. Vacuum work area with HEPA filtered vacuums. |
| | 4. Contain construction waste before transport in tightly covered containers. | 4. Wet mop area with disinfectant. |
| | 5. Cover transport receptacles or carts. Tape covering unless solid lid. | 5. Remove isolation of HVAC system in areas where work is being performed. |

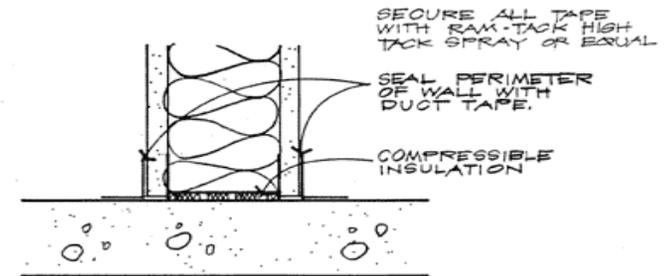




Fire Rated/Dust Partition Detail



○ PARTITION HEAD



○ PARTITION SILL

| | | |
|---|----------|--------------|
| <p>Hammel Green & Abrahamson Inc. Architects & Engineers 1201 Harmon Place Minneapolis, Minnesota 55403</p> | SCALE | 3/4" = 1'-0" |
| | DATE | |
| | DRAWN | HSA |
| | COMM NO. | |

During

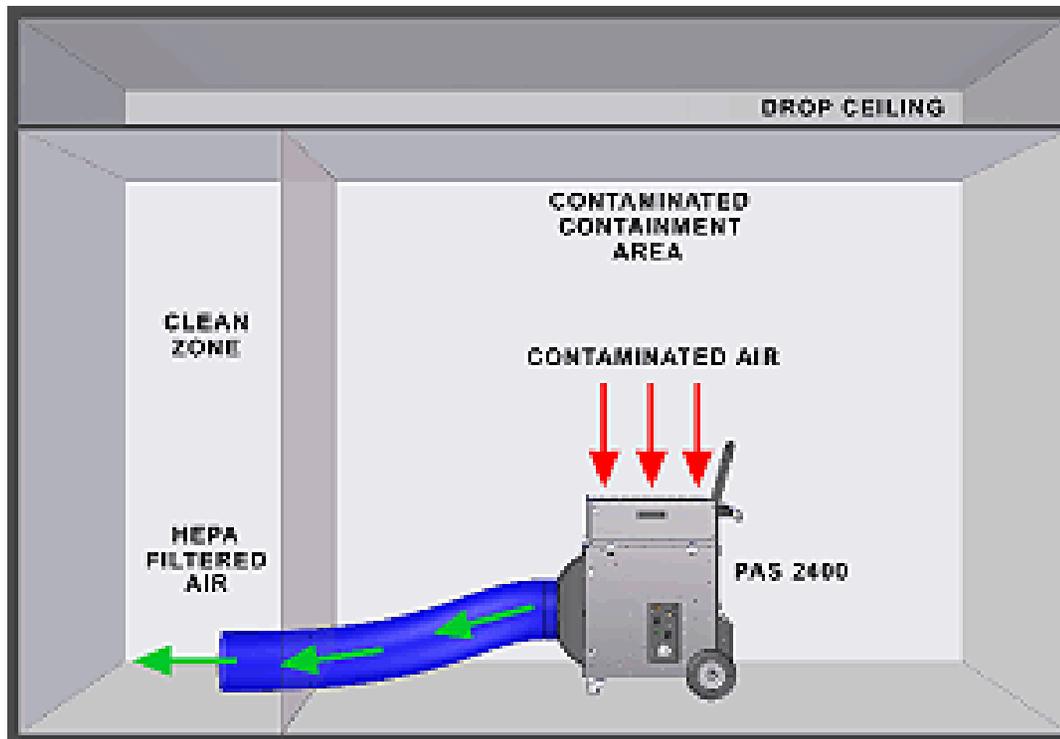
Upon Completion

| | | |
|-----------------|---|--|
| CLASS IV | 1. All Class III precautions Plus: | 1. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction. |
| | 2. 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. | 2. Contain construction waste before transport in tightly covered containers. |
| | 3. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area. | 3. Cover transport receptacles or carts. Tape covering unless solid lid |
| | 4. Seal holes, pipes, conduits, and punctures appropriately. | 4. Vacuum work area with HEPA filtered vacuums. |
| | | 5. Wet mop area with disinfectant. |
| | | 6. Remove isolation of HVAC system in areas where work is being performed. |
| | | 7. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. |



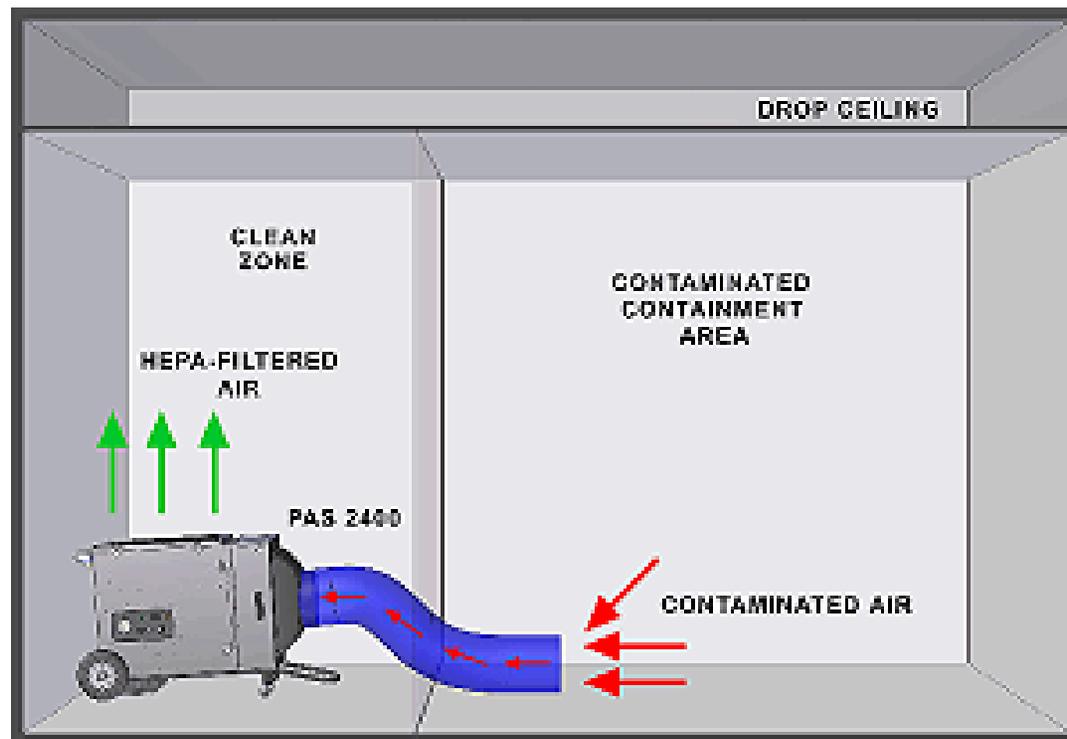
- **Negative pressure mode with the PAS located inside of the containment zone:**

The PAS pulls in contaminated air, filters out contaminants and propels the filtered air outside the containment zone through flexible ducting to negatively pressurize the work area.



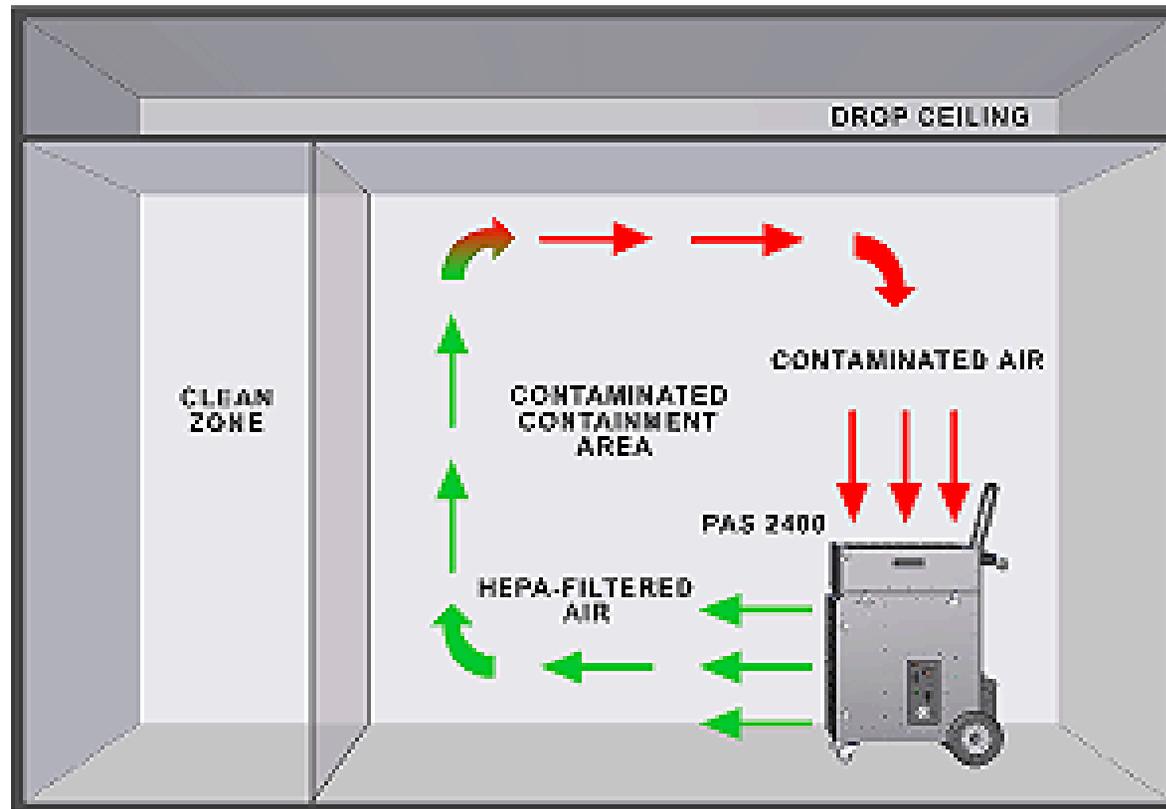
•**Negative pressure mode with the PAS located outside of the containment zone:**

Inlet ducting is used to pull contaminated air out of the zone to negatively pressurize it. Contaminants are removed by the PAS unit which is typically located adjacent to containment barrier so contaminated air can be fed directly into the inlet. Filtered air is ducted outside or to another area as required.



Continuous air cleaning and recirculation:

The PAS is located within the containment zone with no inlet or exhaust ducting, so there is no affect on room pressurization. The PAS accelerates the removal rate of airborne contaminants.



Indoor Air Quality

Monitoring

The facility owner will monitor effectiveness of ICRA procedures during the course of the project.

Guidelines for design & construction of healthcare facilities, 2006, AIA





Monitoring Critical Barriers

Micromanometer



- Document Pressure Differential inside containment vs. outside
- Negative Pressure of $-.02$ in wc
- Direct Reading spot checks or continuous monitoring
- Data logging
- Printer available
- Cost \$1,800

MODEL: EBT-720-Z1
 SERIAL: 90409040

DATA:

| TESTID | PRESS | UNITS | TEMP | UNITS | HUMIDITY | UNITS | TIME | DATE |
|--------|----------|--------|------|-------|----------|-------|----------|-----------|
| 21 | 0.00038 | in.H2O | 78 | °F | 29.4 | %rh | 8:51:39 | 3/23/2006 |
| 21 | 0.00871 | in.H2O | 78.7 | °F | 30.9 | %rh | 8:51:55 | 3/23/2006 |
| 21 | -0.0237 | in.H2O | 79.5 | °F | 30.9 | %rh | 8:52:25 | 3/23/2006 |
| 21 | -0.0239 | in.H2O | 79.9 | °F | 31.4 | %rh | 8:52:55 | 3/23/2006 |
| 21 | -0.0249 | in.H2O | 80.2 | °F | 31.6 | %rh | 8:53:25 | 3/23/2006 |
| 21 | -0.0182 | in.H2O | 80.4 | °F | 31.3 | %rh | 8:53:55 | 3/23/2006 |
| 21 | -0.019 | in.H2O | 80.5 | °F | 30.4 | %rh | 8:54:25 | 3/23/2006 |
| 21 | -0.0179 | in.H2O | 80.4 | °F | 28.9 | %rh | 8:54:55 | 3/23/2006 |
| 21 | -0.014 | in.H2O | 80.4 | °F | 27.6 | %rh | 8:55:25 | 3/23/2006 |
| 21 | -0.011 | in.H2O | 80.3 | °F | 25.9 | %rh | 8:55:55 | 3/23/2006 |
| 21 | -0.0111 | in.H2O | 80 | °F | 24.1 | %rh | 8:56:25 | 3/23/2006 |
| 21 | -0.00749 | in.H2O | 58 | °F | 25.9 | %rh | 10:03:55 | 3/23/2006 |
| 21 | -0.00798 | in.H2O | 57.9 | °F | 26 | %rh | 10:04:25 | 3/23/2006 |
| 21 | -0.0093 | in.H2O | 57.7 | °F | 26 | %rh | 10:04:54 | 3/23/2006 |
| 21 | -0.012 | in.H2O | 57.7 | °F | 25.9 | %rh | 10:05:25 | 3/23/2006 |
| 21 | -0.0138 | in.H2O | 57.6 | °F | 25.9 | %rh | 10:05:55 | 3/23/2006 |
| 21 | -0.0143 | in.H2O | 57.5 | °F | 26 | %rh | 10:06:25 | 3/23/2006 |
| 21 | -0.0148 | in.H2O | 57.4 | °F | 26.1 | %rh | 10:06:54 | 3/23/2006 |
| 21 | -0.016 | in.H2O | 57.4 | °F | 26.1 | %rh | 10:07:24 | 3/23/2006 |
| 21 | -0.0173 | in.H2O | 57.3 | °F | 26.2 | %rh | 10:07:54 | 3/23/2006 |
| 21 | -0.0185 | in.H2O | 57.2 | °F | 26.3 | %rh | 10:08:24 | 3/23/2006 |
| 21 | -0.015 | in.H2O | 57.2 | °F | 26.2 | %rh | 10:08:54 | 3/23/2006 |
| 21 | -0.0137 | in.H2O | 57 | °F | 26.3 | %rh | 10:09:24 | 3/23/2006 |
| 21 | -0.0149 | in.H2O | 57 | °F | 26.3 | %rh | 10:09:55 | 3/23/2006 |

STATISTICS:

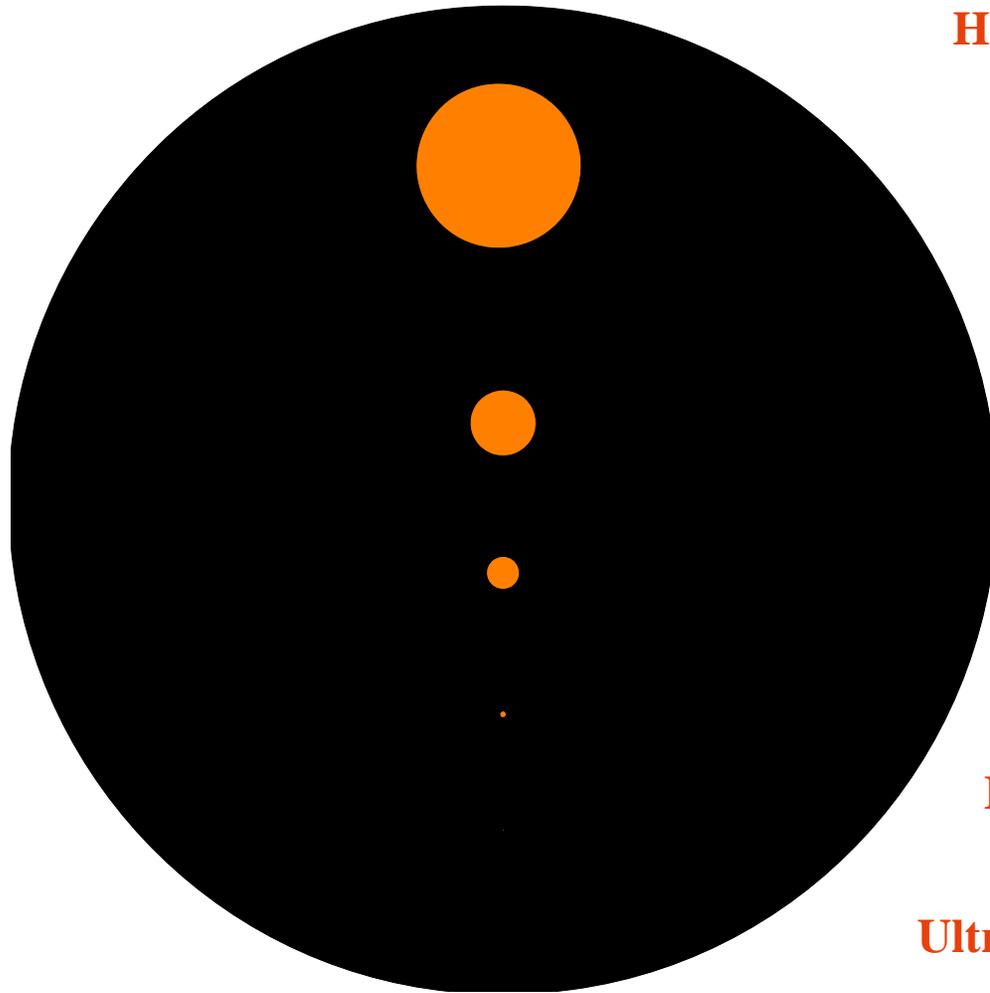
| TESTID | COUNT | MINIMUM | MAXIMUM | AVERAGE | UNITS | READING TYPE |
|--------|-------|---------|---------|---------|--------|--------------|
| 21 | 158 | -0.0249 | 0.00871 | -0.0128 | in.H2O | |
| 21 | 158 | 57 | 80.5 | 66.8 | °F | |
| 21 | 158 | 15.8 | 31.6 | 21.5 | %rh | |

Monitoring Construction Dust in Health Care Facilities



Sizing Particles and Dust

Particles < 0.1 micrometer diameter



Human Hair 120 μm

Visible Dust 25 μm

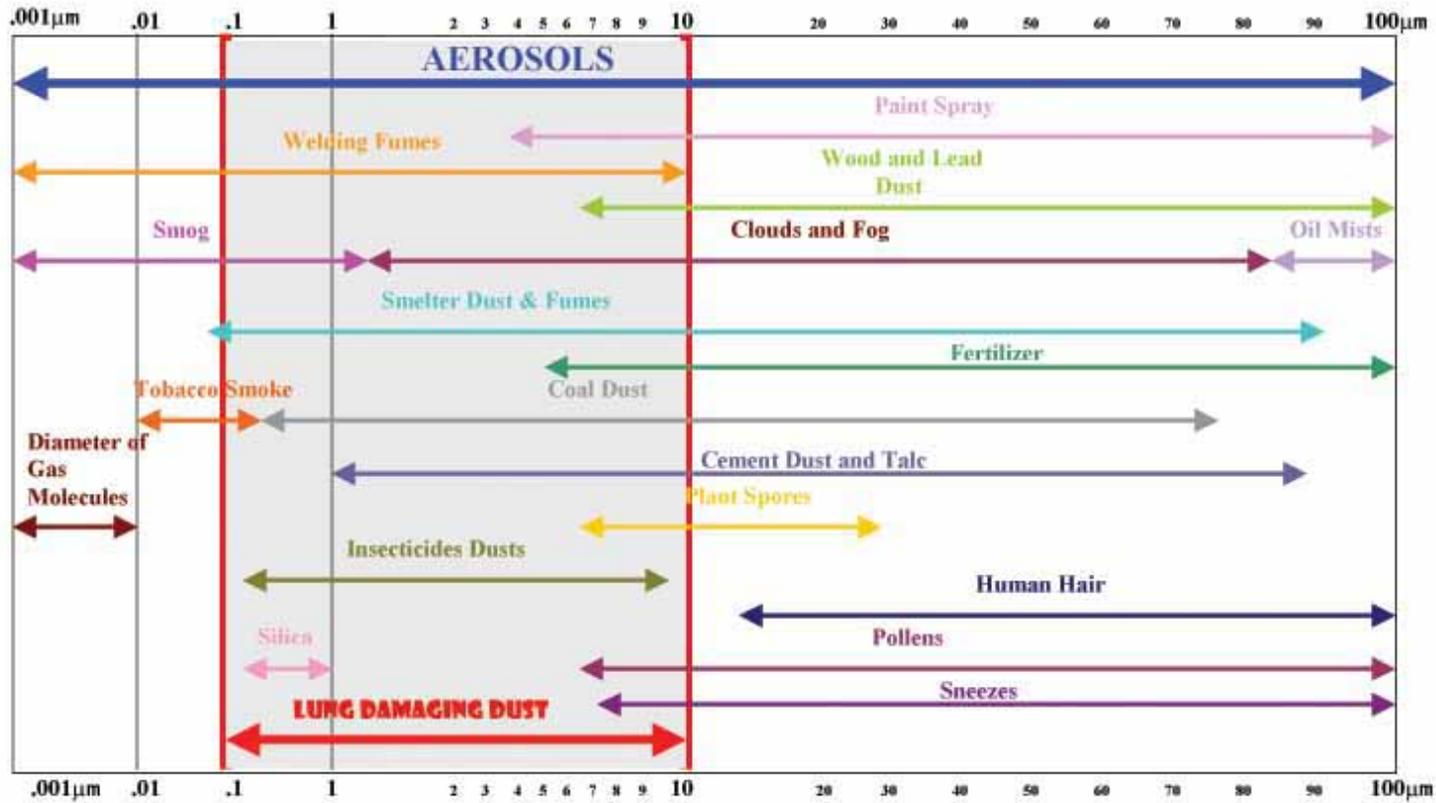
Common Allergens 5-10 μm

Non-visible Dust 10 μm

Metallic Fumes 0.3-1 μm

Ultrafine Particles < 0.1 μm

Relative Size of Lung Damaging Particles



Particle Diameter (μm) microns
 1.0 μm = .000254 inches

* Some information reproduced from Aerosol Technology by William Hinds 1982.

Photometers



- Direct reading of ambient levels in mg/m³
- Data logging of exposure over time
- Generate hard copy reports to document levels
- Measure particles from .1 μ m -100 μ m
- Battery or AC powered
- \$3,400 - \$4,200

Optical Particle Counter (OPC)

Size distribution for mid-size particles (fine & coarse)

Help identify probable source and potential exposure impact



- Uses light-scattering technology differently
- Estimates number concentrations from individual particle sizes,
- Breaks down particle count into 2- 6 bins by size
- 0.3, 0.5, 1, 3, 5, and 10 micron
- Commonly used for
 - Clean room monitoring ie: Class 5
 - 3250 particles at .5 micron per ft³
 - 29 at 5.0 microns
 - Filter testing & leak detection
 - Range .3 to 10 Micron
 - Data Logging
 - \$,3500

External Construction

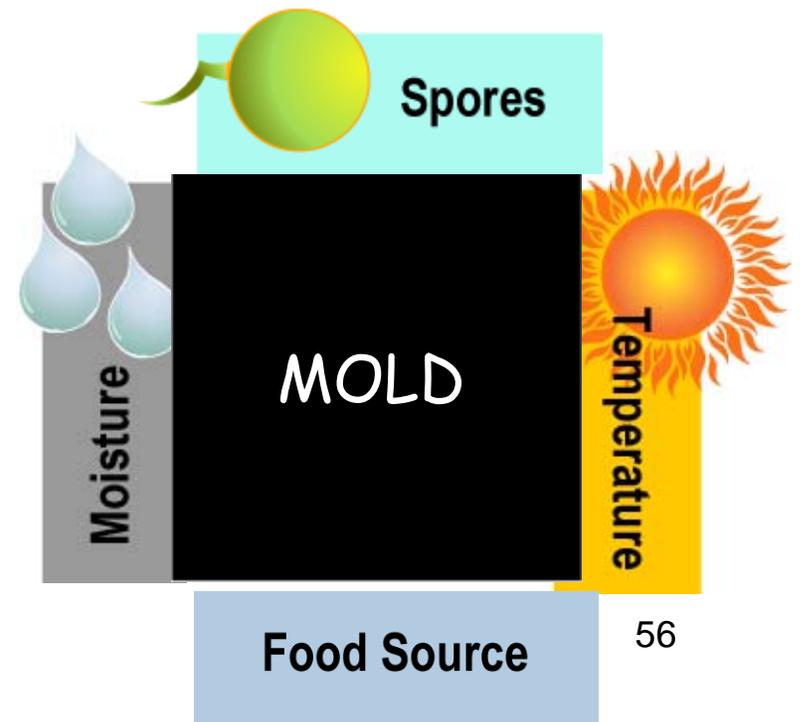
- Keep the facility air pressure positive to the outside
- Ensure that roughing filters are changed frequently and primary filters properly installed
- Seal and caulk windows
- Keep doors closed as much as possible
- Wet dust surfaces avoid track dirt

Building tie-in planning



Water Damage Management

- Reactive
 - respond to water incident
 - determine extent of water damage
 - cut out or dry
- Proactive
 - water resistant material
 - preservative application
 - proper installation



Rate of Growth for Selected Fungi

| <u>Fungus</u> | Rate of colony <u>formation at</u> <u>30° C (days)</u> |
|---------------------------------|---|
| Aspergillus species | 2-3 |
| Blastomyces dermatitidis (mold) | 5-21 |
| Candida albicans | 1-2 |
| Coccidioides immitus | 4-10 |
| Cryptococcus neoformans | 1-2 |
| Histoplasma capsulatum (mold) | 5-21 |
| Mucor species | 1-2 |
| Penicillium species | 2-3 |
| Rhizopus species | 1-2 |

Infrared Thermometer Can Detect Wetness



Warm surface



Cool surface

Other Components of ICRA

- Noise & vibration
- Indoor air quality
- Monitoring indoor air

Hospitals: Noise where Doctors and Patients Need Quiet

Hospitals & Noise

- High levels: (65-85 db)
- Increased 25-40% since 1960's
- Interfere with patient rest and adversely affect outcomes
- Can increase stress levels in healthcare workers
- Construction increases noise levels

Ulrich (2001) Effects of Healthcare Environmental Design on Medical Outcomes.
http://www.designandhealth.com/edu_res/Roger%20S.%20Ulrich%20p49.pdf

The impacts of Noise on the Healing process

- Lower Speech Intelligibility
- Sleep Disruption and Awakening
- Decreased Oxygen Saturation
- Elevated Blood Pressure
- Increased Heart and Respiration Rates
- Decreased Rate of Wound Healing
- Higher Incidence of Re-Hospitalization

Keep Noise and Dust Away From Most sensitive Arrears of The Hospital





Dewalt Cncrete Drill.mpg

Tool Performance, db rating

| Manufacturer | Tool Type | Feature | Model # | db rating * |
|------------------|------------------|-----------------------|---------------|--------------|
| DeWalt | Screw Gun | Silent Clutch | DW276 | 84.0 |
| Makita | Screw Gun | Silent Clutch | 6823N | 86.0 |
| Milwaukee | Screw Gun | Regular Clutch | 6798-1 | 100.0 |

* not tested under controlled conditions

What did we forget?

Documentation!!!

Guidelines for environmental infection control in health-care facilities. CDC, 2003.

| 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 than 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 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. Remove or isolate HVAC system in areas where work is being performed. | | |
| CLASS III | | 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. | 6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with 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. Remove or isolate HVAC system in areas where work is being performed/ | | |
| Date | | 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. | | | |
| Initial | | 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Env. Services Dept. | | | |
| CLASS IV | | 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. | 7. All personnel entering work site are required to wear shoe covers 8. Do not remove barriers from work area until completed project is thoroughly cleaned by the Environmental Service Dept. 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. Remove or isolate HVAC system in areas where is being done. | | |
| Date | | 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. | | | |
| Initial | | | | | |
| Additional Requirements <i>(Additions to this permit are noted by attached memoranda)</i> | | | | | |
| Date | | Initials | Date | | Initials |
| Permit Request By | | | Permit Authorized By | | |
| Date | | | Date | | |

DAILY INSPECTION LOG

Construction Surveillance of Major Demolition, Excavation, and Construction Projects

Instructions:

1. Department managers and Construction personal are to inspect the construction area daily and determine if the expectations below are met.
2. If any **EXPECTATIONS** are **NOT MET**:
 - a. Fill out section **A** below.
 - b. Contact the project manager immediately to make corrections.
 - c. Complete section **B**.
 - d. Fax completed form to Infection Control & Prevention Service and Construction Project mgr.
3. If all expectations are MET, log form.
4. If unsure, discuss with project manager or on-site contractor.

| | | |
|------------------------|---------------------|--------------|
| Site/Department | Today's Date | Time |
| Completed By | | Phone |

A.

| EXPECTATION | MET | NOT MET |
|---|-----|---------|
| Construction signs are posted | | |
| Traffic patterns are clearly identified | | |
| Non-construction areas are free of construction dust | | |
| Ceiling tiles removed for visual inspection are immediately replaced | | |
| Windows are closed to prevent circulation of dust/debris | | |
| Debris is transported in tightly covered containers | | |
| Construction area is cleaned on a daily basis | | |
| No signs of water leakage | | |
| No signs of pests (no visible signs of rodents, insects, birds, etc.) | | |
| Negative pressure monitors are operational | | |
| Negative pressure maintained in construction zone | | |
| All exits are maintained | | |

B. For items checked **NOT MET**, describe corrections made (who, what, when, where):

Summary: Constructing Risk Assessment

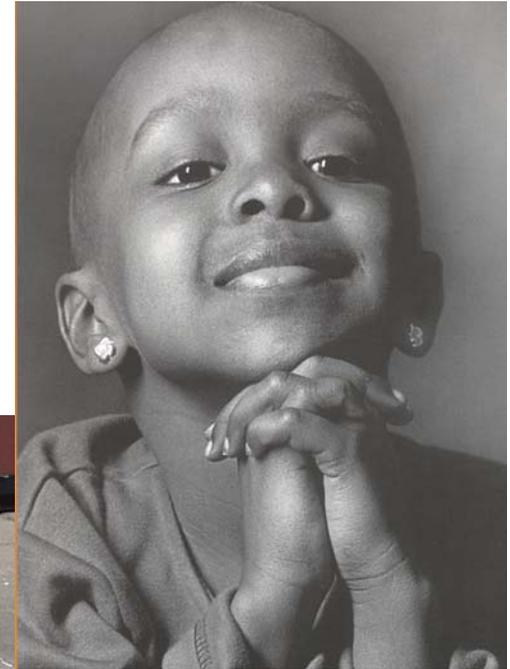
- Proactive
- Involves multidisciplinary team
- Includes:
 - Infection Control Risk Assessment
 - Noise, vibration, dust, air quality,
 - Utility requirements, life safety & protection of occupants

Our Challenge:

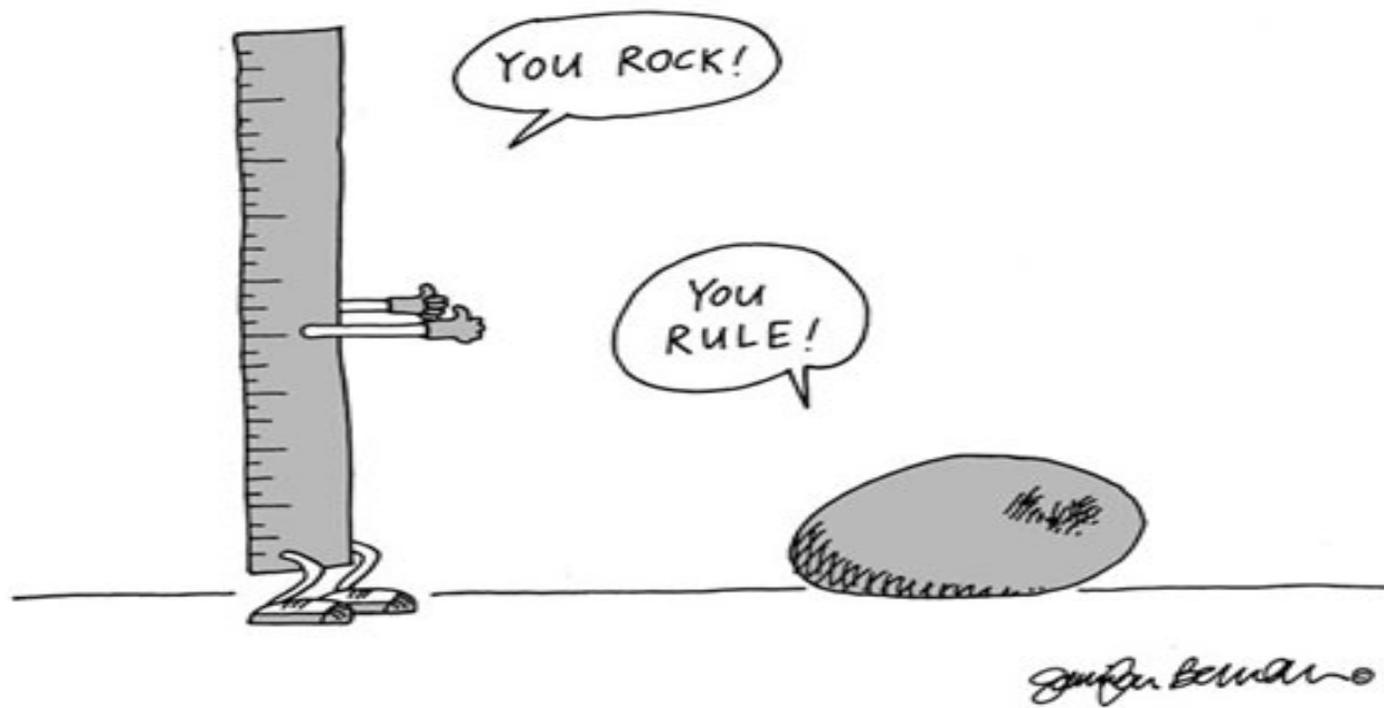
- To make a difference by changing our attitude toward construction and maintenance
- To use the proper techniques even when it is not the easiest thing to do
- To think before we begin a project

And most of all

Our Goal is to, Save Lives!!!



Questions?



Lets do some actual Healthcare construction
work requests assessments

Case Study

Directions: Use the ICRA Matrix to complete an Infection Control Construction Permit for each of the following work orders.

Work Order #1

You are asked to install computer cabling for new monitors in ambulatory care cardiology clinic. The job should take about 4 hours and you will need to access the space above the ceiling.

1. What type of construction activity is this job?

A B C D

2. What patient risk group are you dealing with?

LOW MEDIUM HIGH HIGHEST

3. What class of precautions is required for this job?

Class I Class II Class III Class IV

4. How should the following aspects of the construction risk assessment be addressed during this job?

- Noise: _____
- Vibration: _____
- Utility requirement _____
- Indoor air quality _____

5. Will other areas of the facility be impacted by this work.

6. How many ICRA's are necessary for this job?

Notes / Comments:

Case Study

Directions: Use the ICRA Matrix to complete an Infection Control Construction Permit for each of the following work orders.

Work Order #2

You are asked to install computers in two operation rooms. The phone / data closet is outside the department. The project manager has informed you that infection prevention is a primary patient safety goal for the hospital. Surgical operating rooms adjacent to the ones you will be working in will be in operation.

1. What type of construction activity is this job?

A B C D

2. What patient risk group are you dealing with?

LOW MEDIUM HIGH HIGHEST

3. What class of precautions is required for this job?

Class I Class II Class III Class IV

4. How should the following aspects of the construction risk assessment be addressed during this job?

- Noise: _____
- Vibration: _____
- Utility requirement _____
- Indoor air quality _____

5. Will other areas of the facility be impacted by this work.

6. How many ICRA's are necessary for this job?

Notes / Comments:

Case Study

Directions: Use the ICRA Matrix to complete an Infection Control Construction Permit for each of the following work orders.

Work Order #3

You need to replace an old sink and warped laminate countertop at the nursing station in the hospital oncology unit. The pediatric unit is directly below the oncology unit.

1. What type of construction activity is this job?

A B C D

2. What patient risk group are you dealing with?

LOW MEDIUM HIGH HIGHEST

3. What class of precautions is required for this job?

Class I Class II Class III Class IV

4. How should the following aspects of the construction risk assessment be addressed during this job?

- Noise: _____
- Vibration: _____
- Utility requirement _____
- Indoor air quality _____

5. Will other areas of the facility be impacted by this work.

6. How many ICRA's are necessary for this job?

Notes / Comments:

Case Study

Directions: Use the ICRA Matrix to complete an Infection Control Construction Permit for each of the following work orders.

Work Order #4

You are going to be replacing carpet in the small visitor's lounge located outside of the hospital ICU wing.

1. What type of construction activity is this job?

A B C D

2. What patient risk group are you dealing with?

LOW MEDIUM HIGH HIGHEST

3. What class of precautions is required for this job?

Class I Class II Class III Class IV

4. How should the following aspects of the construction risk assessment be addressed during this job?

- Noise: _____
- Vibration: _____
- Utility requirement _____
- Indoor air quality _____

5. Will other areas of the facility be impacted by this work.

6. How many ICRA's are necessary for this job?

Notes / Comments:

Case Study

Directions: Use the ICRA Matrix to complete an Infection Control Construction Permit for each of the following work orders.

Work Order #5

You are going to be repairing walls and painting the operation rooms.

1. What type of construction activity is this job?

A B C D

2. What patient risk group are you dealing with?

LOW MEDIUM HIGH HIGHEST

3. What class of precautions is required for this job?

Class I Class II Class III Class IV

4. How should the following aspects of the construction risk assessment be addressed during this job?

- Noise: _____
- Vibration: _____
- Utility requirement _____
- Indoor air quality _____

5. Will other areas of the facility be impacted by this work.

6. How many ICRA's are necessary for this job?

Notes / Comments: