## Infection Control Risk Assessment (ICRA) and Permit

An infection control risk assessment (ICRA) is a systematic process that determines level of risk to patients and defines controls to reduce risk. The purpose of the risk assessment is to identify the effects of the construction or renovation activities on air and water quality. Once the effects are understood, then control measures are designed and implemented for the purpose of reducing health risks to patients, visitors and staff.

Completing an ICRA for any construction or renovation project includes four steps:

- 1. Identify the type of construction
- 2. Identify the patient/resident or staff risk group that will be most affected
- 3. Determine the level of infection control classification using the ICRA Matrix
- 4. Assign appropriate controls that are needed to reduce or eliminate risk to patient/resident or staff risk group. Infection controls are documented in the ICRA Permit

<u>Step 1: Identify the type of construction:</u> For the purposes of performing an infection control risk assessment, construction activities have been divided into four types: A, B, C, and D. Each of these construction types is listed on the sample ICRA permit (below) and includes example construction activities for each type.

<u>Step 2: Identify the patient/resident or staff risk group:</u> Each healthcare facility may have its own unique patient/resident population with different susceptibility to construction related infections. Likewise, each facility may have different departments that have strict cleanliness requirements, which can be adversely affected by construction dust. For example, the Sterile Processing Department and Perioperative Department have very strict cleanliness requirements, whereas the facility's lobby or waiting areas likely have less stringent cleaning requirements. The patient/resident and staff risk group is obtained from a table with different assigned ratings of susceptibility to infections from airborne contaminants that may be released during construction/renovation activities. An example of one such table is provided. Another example can be obtained from

http://www.ashe.org/advocacy/organizations/CDC/pdfs/assessment\_icra.pdf

# **Risk Group**

Low	Medium	High	Highest
Administrative offices	Employee Health	Blood donor center	Any area caring for immunocompromised patients (ONC/BMT/Hematology)
Basement main hallways	Materials Management	Central supply	Cardiac Cath Lab
Cafeteria	Medical day treatment	Clinic lab	Cardiac Intensive Care Unit (CICU)
Chapel	Outpatient pharmacy	Dental clinic	Maternal Fetal Unit
Lobby	Physical therapy	Dialysis – Kidney center	Negative pressure isolation rooms
	Inpatient psychiatric unit	Endoscopy (GI Lab)	Newborn Intensive Care Unit (NICU)
	Sleep lab	Emergency room	Operating rooms
		Flight team area	Pediatric Intensive Care Unit (PICU)
		Inpatient floors	Pharmacy (IV room)
		Pharmacy (inpatient)	Positive pressure isolation rooms
		Perioperative Admit /Discharge Unit Post Anesthesia	Sterile Processing Department (SPD)
		Care Unit (PACU) Radiology – MRL CT	Adult Intensive Care Unit
		Nuclear Medicine	

Step 3: <u>Determine the level of infection control classification using the ICRA matrix</u>: Once the type of construction project and risk group is defined, then these two pieces of information are matched in a matrix to determine the infection control classification most appropriate for the project.

ICRA Matrix: Using the matrix, select the Infection Control Classification – I, II, III, or IV				
Construction Project			N Project Type	
Patient Kisk Group	Α	B	С	D
LOW Risk Group	Ι	Π	Π	III / IV
MEDIUM Risk Group	Ι	П	III	IV
HIGH Risk Group	I		III / IV	IV
HIGHEST Risk Group	II/III	III / IV	III / IV	IV

Step 4: Assign appropriate controls that are needed to reduce or eliminate risk to patient or staff risk group – See ICRA Permit

This form has been adapted using the Infection Control Risk Assessment Matrix of Precautions for Construction and Renovation. The original document can be downloaded at:

http://www.ashe.org/advocacy/organizations/CDC/pdfs/assessment\_icra.pdf

The Infection Preventionist can use the form within this section or the ASHE form to adapt to their particular needs and project characteristics.

A Medical Center					
Location of Construction	Location of Construction: Permit No :				
Project Manager & Cell	Project Manager & Cell: Permit Start Date:				
Construction Supervisor	Construction Supervisor & Call.				
Infaction Droventionist	Sonstituction Supervisor & Cen.				
Infection Preventionist c					
Construction Project Ty	pe – Based upon the type	of work, select (X) the co	nstruction project type		
Туре А					
Inspection, Non-Invasive Ac	etivity:				
<ul> <li>Removal of ceiling</li> </ul>	tiles for visual inspection limit	ted to 1 tile per 50 square fee	t		
Non-Invasive Activity:					
<ul> <li>Wall covering insta</li> </ul>	illation				
Electrical trim worl	k installation (i.e. cover plates	, data box covers)			
Minor plumbing rep	pairs (all plumbing outside of	wall cavities; i.e. change fauc	et)		
<ul> <li>Minor patch and patch</li> </ul>	int (without sanding)				
Changing door hard	dware, or making repairs on ca	binetry or millwork hardware	without sanding		
<ul> <li>Activities which do</li> </ul>	o not generate dust or require c	utting of walls or access to ce	ilings other than for visual		
inspection					
Type B					
Small scale, short duration a	ctivities which create minimal	dust or where dust migration	can be controlled at the		
source:					
• Above ceiling acce	ss to install cabling, electrical	equipment and/or conduits, el	ectrical or lighting fixtures,		
to perform minor p	lumbing repairs or clean/inspe	ct/repair VAVs, fan coll boxe	s or humidifiers		
• Access to wall chas	se spaces via access panels for	minor plumbing repairs, inve	stigation, electrical work		
• Cutting of walls or	ceiling where dust migration of	can be controlled			
Minor floor repairs	on vinyl or carpet flooring				
Installation of wall	art/framed pictures				
<u>Iype C</u>	note to high lovel of dust on m	ning damalitian non-aval an	d build book of one fined		
work that generates a model	rate to high level of dust of rec	juires demontion, removal and	a build-back of any fixed		
Sonding of walls for	mones.				
Sanding of wars to     Bemoval and rainet	allation of floor covering	ling tiles and accovary			
Removal and remst	tion	ling thes and casework			
New wall construct					
Millor HVAC duct	work				
Major electrical wo	a chose certifiers				
Wrajof cabling Work     Core drilling groups	tions				
Core ariting operation	uolis a activity which connot be see	anlated within a single work	hift		
<ul> <li>Any dust generating</li> <li>Type D</li> </ul>	g activity which cannot be con	inpreteu within a single work s	1111t		
Type D Major Demolition and Construction Projects:					
Activities which re-	anire consecutive work shifts				
Requires heavy den	nolition and removal of buildi	ng systems (i.e. walls floors	ceilings and infrastructure		
including numbing electrical HVAC)					
New construction					
Risk Group – Based upon the type of work, select (X) the Risk Group (See Risk Group List)					
P	Task Group Dased upon the type of norm, select ( <u>A</u> ) the Risk Group (See Risk Group List)				
Low	Medium	High	Highest		

ICRA Matrix – Using the matrix, select the ICRMR Classification – I, II, III, or IV					
Patient Risk Groun		Construction	n Project Type		
r utent rusk Group	Α	В	С	D	
LOW Risk Group	Ι	II	II	III / IV	
MEDIUM Risk Group	Ι	II	III	IV	
HIGH Risk Group	Ι	II	III / IV	IV	
HIGHEST Risk Group	II/III	III / IV	III / IV	IV	
Infection Controls: Using the You can combine controls fro	outcome from the outcome from the	ICRA Matrix, se ications, as need	elect ( <u>X</u> ) the appro	opriate controls.	
Preparation for work – Sele	ct Controls applical	ble for all Const	ruction Project Ty	vpes (V)	
All work personnel shall	have clean clothing ar	nd shoes at all time	s when in the facility	. Hard hats and high	
visibility clothing shall a All equipment, materials	lso be clean.	fer carts shall be wi	iped clean prior to en	try into the hospital	
and shall be clean at all t	imes when moving thr	oughout the hospit	al.		
to ensure clean, intact fil	ters and proper seating	of the HEPA filter	r on the filter gasket.	ction of the vacuum	
Clean interior and exterior	or surfaces of HEPA fi	ltered portable air	scrubber. Conduct de	etailed inspection of	
<ul> <li>Conduct detailed inspect</li> </ul>	ion of the HEPA filter	ed negative air mac	chine to ensure clean,	, intact filters and	
<ul><li>proper seating of the HE</li><li>☐ Have available a HEPA :</li></ul>	PA filter on the filter g filtered vacuum for the	asket. e purposes of vacuu	ming dust and debris	s from equipment,	
materials, carts and person	onnel clothing	ant or winos for the	numaca of wining	alaan all aquinmant	
materials and carts	ins and spray distinct	and of wipes for the	e purposes of wiphig	crean an equipment,	
□ No tool belts, gloves, or belts, tape measure, ham	rags shall be hanging f	rom contractor beli	ts or pockets. All sm side cleanable portab	all equipment (tool	
Have bunny suit ensemb	le (bunny suit, booties,	, hair bonnets) avai	lable	te containers.	
Have booties available					
<b>Class I and Class II Controls</b>	– Select all that ap	ply (√)			
Immediately replace a ce	iling tile displaced for	visual inspection			
Place HEPA filtered port	able air scrubber in ar	ea with open ceilin	g tile.		
Immediately upon replace	ement of ceiling tile, v	acuum personnel c	lothing, equipment, 1	ladder and floor to	
remove dust and debris g	remove dust and debris generated by removing and replacing the ceiling tile.				
Close door to work area	- the room will serve and materials from room	as containment.	work		
<ul> <li>Remove an equipment an</li> <li>Place tape and plastic ov</li> </ul>	er cabinets and shelvir	n prior to beginning	g work.		
<ul> <li>Place HEPA filtered port</li> </ul>	able air scrubber insid	e work area.			
Place HEPA filtered port	able air scrubber outsi	de of work area (in	adjacent occupied sp	paces).	
Seal unused doors with t	ape.	of the Town 1 1 D	on on 17-11-1-1 A * **	Valum a Dara ar	
the work area prior to co	trol Room a shut-dowr vering the supply air d	i of the Terminal B iffuser.	sox or Variable Air V	olume Box serving	

	Securely seal and block off supply air diffusers.
	Securely seal and block off return air grills
	Place MERV 11 filters over return air grills
	Securely seal and block off exhaust air grills
	Place MERV 8 filters over exhaust air grills
	Place tacky mat at corridor entrance into the work area. Change tacky mat as needed so it remains effective
	at capturing dust and debris
	Place tacky mat within work area at the exit to the adjacent corridor. Change tacky mat as needed so it
	remains effective at capturing dust and debris
	Canture dust during drilling by placing the pozzle of a HEPA filtered vacuum at the drill point
	Capture dust during autting by placing the nozzle of a HEDA filtered vacuum at the out point.
	Maintain a alam much and have any in a all offerted and and and the fit has a standard and the fit and the standard and the s
	Maintain a clean work area by vacuuming all affected surfaces with HEPA-filtered vacuums.
	Contain construction waste before transport in tightly covered containers. All trash carts shall be wiped
	clean (on all surfaces and wheels) prior to exiting the work area and again prior to re-entry into the hospital
	after dumping at the loading dock. This may necessitate placement of cleaning materials at the loading
	dock entrance.
	Cover transport receptacles or carts; tape covering down unless solid lid. All covers shall be clean and not
	stored on the floor when not in use; the covers shall be stored in a clean container or bag.
Class I	II and Class IV Controls – Select all that apply $(\sqrt{)}$
	Remove or isolate HVAC system in area where work is being done to prevent contamination of duct
	system.
	Coordinate with the Control Room a shut-down of the VAV serving the work area prior to covering the
_	supply air diffuser(s).
	Install all critical barriers, (i.e., sheetrock, plywood, plastic), to seal area from non-work area per attached
	Infection control schematic.
	Install hard-wall barriers with antercom
	Install plastic wall barriers without antercom
	Install plastic wall barriers with anteroom.
	Install plastic sheeting above the ceiling up to the ceiling deck.
	Seal holes, pipes, conduits, and all other penetrations through containment barrier.
	Maintain negative air pressure within work site utilizing HEPA-equipped air filtration units.
	Discharge negative air to: (write in discharge location)
	Place manometers with data logging or printing capabilities in each anteroom. Measure pressure
	differential between work areas identified in the infection control schematic. Program alarm set point at
	-0.01/-0.02/-0.03 inches water gage (circle selection).
	Place HEPA filtered portable air scrubber inside antercom
	Place HEPA filtered portable air scrubber outside of barriers at work area entrance
	Do not begin construction work until barriers and other infection controls are inspected by the Infection
	Preventionist and an infection control permit is issued.
	When bunny suits, booties and hair bonnet/hat cover are required, all clothing should be stored off the
	floor inside the anteroom
	Bunny suits shall be worn by all subcontractors within work area while dusty tasks are being performed.
	These tasks include demolition and installation/sanding drywall.
	Contain construction waste before transport in tightly covered containers. All trash carts shall be wiped
	clean (all surfaces and wheels) prior to exiting the work area and again prior to re-entry into the hospital
	after dumping at the loading dock. This may necessitate placement of cleaning materials at the loading
_	uoux entraneore recenteeles or corte: tang covering down unless solid lid. All covers shall be clean and not
	stored on the floor when not in use: the covers shall be stored in a clean container or bag
	Anteroom shall be clean at all times.

	Maintain a clean work area by vacuuming with HEPA-filtered vacuums.
	Maintain a clean work area. Use dust suppressant when broom sweeping.
	Workers are required to vacuum their clothes with a HEPA vacuum while in the anteroom and before
	exiting the work site
	Workers are to wear bunny suits, booties and hair bonnets/hat covers when exiting the work area.
	All personnel entering work site are required to wear shoe covers (booties). Shoe covers must be changed
	each time the worker exits the work area.
	Install new HVAC ductwork using clean duct protocols - cover all open ducts at the end of each shift.
When	work is above ceiling and requires the use of an Environmental Containment Unit – Select all
contro	ls that apply (\)
	Access above ceiling using a containment cube that has been cleaned on all interior and exterior surfaces
	Depressurize the containment cube using a HEPA filtered negative air machine
	Place HEPA filtered portable air scrubber in the work area and near the exhaust discharge of the
	containment cube
	Prior to exiting the cube, thoroughly clean (vacuum and wipe with disinfectant) the cube interior and all
	materials and equipment within the cube
	All work personnal shall therewally years and share prior to exiting the containment cube
	All work personner shall utoroughly vacuum crouning and shoes prior to exiting the containment cube.
_	Hard nats and nigh visibility clothing shall also be clean.
	Workers are to wear bunny suits, booties and hat covers when exiting the containment cube
	Contain construction waste in tightly covered cleanable containers.
Cut-ou	It Box (Bird-box) Controls – Select all that apply ( $$
	Use cutout box (bird box) when cutting drywall and/or installing electrical box and/or pulling cable into the
_	box
	Depressurize cutout box using a HEPA filtered vacuum
	Prior to removing the cutout box from the wall, thoroughly vacuum all dust and debris from within the box,
_	and then wipe the box interior with disinfectant
	Contain construction waste in tignity covered cleanable containers.
At the	the of an construction select the appropriate activities that must be completed prior to
patien	(Vresident and stall occupancy (V)
	Coordinate construction turnover sequence with Epidemiology/infection Preventionist/industrial Hygienist
	Perform a construction area clean by wiping all work surfaces with disinfectant.
	Perform a construction area clean by wet mopping.
	Perform a construction area clean by vacuuming the floor, walls and other affected surfaces at the
	completion of work using a HEPA filtered vacuum.
	Coordinate an Environmental Services EVS terminal clean at the completion of the work.
	Coordinate an EVS triple-terminal clean at the completion of the work.
	Remove isolation of HVAC system in areas where work was performed.
	Perform test, balance and adjustment of the HVAC system as required by Facilities Management.
	Do not remove barriers from work area until completed project is inspected by the Infection Preventionist.
	Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
L ist or	and ditional controls not included above
Permit	approved by:
	PRINT NAME SIGNATURE
Date:	

## Infection Prevention discussion with Project Coordinator, Construction Superintendent, Manager and Foreman

In order to development effective infection controls, the IP must have a thorough understanding of the construction scope of work. The following list can be used to discuss the construction project with the Contractor.

- 1. <u>Nature</u> Big picture information
  - a. How long is task?
    - i. Hours, days, weeks, months
  - b. How invasive?
    - i. Investigation only
    - ii. Above ceiling cable pulls
    - iii. Install card readers
    - iv. Drywall cutting
    - v. Remove carpet / vinyl flooring
    - vi. Patch and paint
    - vii. Major demolition and build-back
- 2. <u>Scope</u> The details!
  - a. Exact location of work floor plans & walking the work area
  - b. IP will need to characterize the work location
    - i. Pressurized or depressurized to adjacent/adjoining rooms
    - ii. Ventilation in work area
      - 1. Ducted supply and return air
      - 2. Plenum return air
      - 3. Exhaust present
    - iii. Occupants in or near the area
    - iv. Hospital materials moving through the area

- c. Will wall and/or ceiling cavities be opened?
- d. What tools will be used?
  - i. Hand tools drywall saws, sand paper block, hammer
  - ii. Power tools tin cutters, hammer drill, finishing sander
- e. Is HVAC system part of the scope?
- f. What downstream rooms will be affected?
- g. Will air handling unit (AHU) be turned off?
  - i. What areas will be affected?
- h. For above ceiling work, determine if ceiling cavity is pressurized.
- i. What building materials and equipment will be transferred to the work location?
- j. What waste materials will be generated?
  - i. Where will recycle and waste dumpsters be located?
  - ii. Can waste be removed through window chute?
  - iii. What noise levels will be generated and when?
- k. Will vibration be generated and when?
- l. Will there be disruptions to:
  - i. Medical gases
  - ii. Electrical power
  - iii. Fire detection / suppression
  - iv. Water supply
  - v. Emergency exit routes
- m. Will there be core drilling through floors?
- n. Does the scope include new domestic plumbing?

## **Containment Barrier Construction**

## Equipment

$\sqrt{\text{Tacky mat}}$	$\sqrt{Micromanometer}$	$\sqrt{Various}$ hand tools
$\sqrt{\text{HEPA}}$ filtered vacuum	$\sqrt{\text{Barrier materials}}$	$\sqrt{\text{Fire-rated tape}}$
$\sqrt{\text{Disinfectant wipes}}$	$\sqrt{\text{Rigid walls}}$	$\sqrt{\text{Waste Containers}}$
$\sqrt{\text{HEPA}}$ filtered negative air machine and GFCI	$\sqrt{Polyethylene}$ sheeting	$\sqrt{\text{Door for rigid wall}}$ / Zippers for poly barriers

## Sequence to build containments

- 1. Walk the work area to determine availability of electrical power. Use GCFIs as required by the facility's project coordinator.
- Do your math how does blocking SA, RA, EX within the work area affect system balance? Plan and adjust system balance as needed. This may require measurement of airflow volume from potentially affected supply air (SA) and return air (RA) grills prior to beginning project.
- 3. Confirm that all medical supplies, medical equipment, curtains, blinds computers, etc. have been removed from the work area.
- 4. Reduce supply airflow into the work area by closing manual dampers and/or VAV boxes. Secure plastic or solid barrier over SA diffusers.
- 5. Install MERV 8 filters on RA grill.
  - a. Step 2 and 3 will have the effect of creating slight depressurized condition within the work while containment barriers are being built.
- 6. Securely place painters plastic or shrink-wrap plastic over cabinets and wall and ceiling mounted equipment.
- 7. Build containment walls and anteroom.
- 8. Place tacky mats in locations identified in the ICRA Permit.
- 9. Install micromanometers in areas identified in the ICRA Permit. Program the alarm setpoint as defined in the ICRA Permit.
- 10. Install and turn on HEPA filtered negative air machines. Simultaneously isolate RA grills.
- 11. Collect static pressure measurements in adjacent rooms and compare with values determined in Step 1.
- 12. Install above ceiling sheeting monitor work area static pressure with ceiling open.
- 13. Place required infection control equipment in the anteroom Tacky mat, HEPA filtered vacuum, disinfectant wipes, waste container, fire extinguisher. Other equipment might include booties, bunny suits, and hair bonnets.
- 14. Installed required signage and ICRA Permit on the exterior of the containment barrier.
- 15. Obtain approval from infection prevention prior to beginning work.

## Equipment

 $\sqrt{\text{HEPA}}$  filtered vacuum

 $\sqrt{\text{Disinfectant wipes}}$ 

 $\sqrt{Various}$  hand tools

 $\sqrt{\text{Waste Containers}}$ 

## Sequence to remove containments

- 1. Perform detailed construction cleaning on all surfaces within the work area and anteroom.
- 2. Perform construction clean on all exterior containment walls paying special attention to the tape that attaches the walls to the floor.
- 3. Obtain approval from infection prevention prior to removing containment.
  - a. A series of Environmental Services (EVS) terminal cleans may be required prior to removing the containment or the removal task may be phased with several EVS terminal cleaning tasks between phases.
- 4. Keep the negative air machine on during containment removal.
- 5. Remove and secure tacky mats.
- 6. Removal all plastic sheeting covering equipment mounted on ceiling and/or walls.
- 7. Polyethylene sheeting barrier walls Remove plastic sheeting walls from the top down cut walls into manageable strips and then roll the plastic into itself so the dirty interior side is on the inside of the roll. Place the roll into trash bags. When full, all trash bags should be tightly sealed then placed into trash buggies with tight fitting lids.
- 8. Rigid barrier walls separate wall panels one panel at a time. Place panels on a clean transfer cart. If walls are to be re-used, cover each wall panel with shrink wrap prior to placing into storage. This will keep the walls clean.
  - a. During containment wall removal, immediately vacuum all debris generated. Do not allow debris to be tracked through the work area as containment walls are being removed.
- 9. Once all walls are removed, turn off negative air machine. Cover both ends of the machine in order to maintain cleanliness of the machine's interior.
  - a. Place the flex duct into waste bag and securely tie the bag prior to placement into trash buggy.
- 10. Remove isolation from return air grill(s).
- 11. Schedule an EVS terminal clean.
- 12. Once terminal clean is complete, remove isolation from the supply air diffuser(s).

## **Environmental Containment Unit (ECU)**

Portable infection control barrier units are recognized by several names, including some specific manufacturer names. Common names include:

- ECU (environmental containment unit)
- Control cube or CUBE
- Pop-up containment unit
- Mobile containment unit
- HEPA Cart

**Purpose:** The purpose of this paper is to provide ECU use instructions that are designed to complement infection control practices during construction and renovation activities within healthcare facilities.

ECU users must understand and follow all manufacturers' set-up and use instructions as presented in the ECU user's manual.

**ECU Criteria:** Only ECU's meeting the following structural design and use practices shall be permitted:

- The ECU must effectively satisfy all required infection control standards set by the CDC, the Joint Commission, CMS and APIC.
- The ECU must be structurally sound to withstand depressurization at 0.01 inches water gage.
- The ECU must be sized and designed to tightly fit ceiling and HVAC access points.
- The ECU must have side access panels to allow safe entry and exit of personnel and equipment.
- The ECU must be large enough to hold personnel, equipment (i.e. ladder, tools), and cleaning equipment such as a HEPA filtered vacuum.
- The ECU must have controlled access portholes, and the portholes must be properly sized for electrical cords, cable (for cable pulls), manometer tubing, and negative air machine inlet collars.
- The ECU must be built of non-combustible or limited combustible materials that will not contribute to the development or spread of fire.
- The ECU must be able to be cleaned with hospital approved cleaning agents without a compromise of the unit's structural or performance integrity.

## Construction or Renovation Tasks Where an ECU Shall Not Be Used:

- Welding or metal flame cutting operations, and
- Tasks that require the use of hazardous chemicals.

**ECU Infection Control Equipment:** The following equipment should be obtained, be in a clean condition, and ready for use prior to setting up the ECU:

- Portable HEPA filtered vacuum that is clean and has been inspected to ensure proper function and filtration
- Hospital approved disinfectant and clean cloths
- Negative air machine capable of pulling 300 to 800 CFM
- Inspect the negative air machine to ensure the filter is not damaged, properly fitted to filter gaskets and the unit's blower and fan are clean.
- Manometer, if required by Infection Control Risk Assessment (ICRA)
- As needed extension cords, painter tape, duct tape, bunny suits, booties, hair bonnets

## **Pre-use Instructions:**

- Inspect the ECU for cleanliness and damage. If damaged, repair per manufacturer's instructions. If repair is inadequate, obtain another ECU that is without damage.
- The ECU should be clean and free of dust, removable stains, and debris on both inside and outside surfaces.
- If the ECU will be used in environmentally controlled areas, (i.e. surgical department, isolation rooms), disinfect the unit according to the controlled area cleaning requirements prior to entering the controlled area. Pay particular attention to the cleanliness of the unit's bottom surface, and if applicable, the unit's casters.
- Obtain and connect a negative air machine capable of pulling 300 to 800 CFM. Make sure the negative air machine is properly inspected and cleaned.
- The exhaust termination point for the negative air machine will be determined on a case by case basis with input from the hospital infection control personnel.

## Use Instructions:

- Place the ECU under the ceiling panel or tile where ceiling access will occur.
- Lock the wheels.
- One person outside the ECU will guide the person inside the ECU while the enclosure is being raised. When raising the ECU walls, DO NOT lift the ceiling grid. Stop when the top of the ECU walls are ½ to 1 inch below the grid.
- Plug in the negative air machine. Secure the electrical cord to the floor in order to eliminate tripping hazard.
- Confirm all necessary equipment and tools are in the ECU.
- One person will enter the ECU while the second person, the spotter, remains outside the ECU.

- The person within the ECU will unzip one or two panels at the top of the ECU.
- The spotter will turn on the negative air machine.
- The person within the ECU can now open the ceiling panel or remove the ceiling tile.
- When the ECU will be used while conducting tasks other than visual observation, the person within the ECU will vacuum or wet-wipe visibly dusting and dirty surfaces above the ceiling where the work will be conducted. The cleaning of dirt and debris within the ceiling space will be conducted prior to any other work tasks. The purpose of cleaning the ceiling space is to prevent the unnecessary dislodging of dust and debris that may fall onto the worker or within the ECU.
- Whenever personnel working within the ECU must exit the unit, they will always thoroughly vacuum themselves, (shoulders to shoes), using the HEPA filtered vacuum.
- All waste materials will be placed into a trash container that can be tightly sealed. Plastic waste bags are acceptable.
- A spotter will be positioned outside the ECU to direct pedestrian traffic around the unit and support the personnel working inside the unit
- When working in controlled environments (i.e. operating areas, sterile processing, etc.) don and doff protective clothing in accordance with hospital policy.

### **Post-use Instructions:**

- At the end of the work tasks, and prior to exiting the unit, personnel will clean all equipment used within the unit.
- The cleaning of the unit's interior and personnel will take place in the following order. The negative air machine shall remain on during the listed cleaning tasks.
  - Vacuum ladders, waste containers, tools and all other equipment.
  - Vacuum personnel within the unit, shoulders to shoes.
  - Vacuum all interior surfaces of the unit. Pay particular attention to the portholes for the electrical cords and negative air machine inlet collar.
  - Wet-wipe or vacuum the HEPA filtered vacuum, including the vacuum hose and electrical cord.
- Drop the containment walls.
- Turn off and disconnect the negative air machine.
- Close the top of the unit.
- Unplug the electrical cord and wipe clean.
- Inspect the unit for damage, and if necessary, repair per manufacturer's instructions.

#### Storage:

- ECU's shall be stored in clean and dry locations, and not subject to damage from near-by construction materials, outdoor weather conditions, or sunlight.
- Both inlet and outlet ports on the negative air machine should be covered to protect the cleanliness of the machine's interior.



Improper placement under ceiling tile





## Cutting opening into ceiling tile







## A Medical Center Infection Control Commissioning Plan Date

The purpose of this document is to present the Infection Control Commissioning Plan for the Medical Center Renovation Project.

#### Definitions

- 1. Above Ceiling Construction Clean above ceiling surfaces are free from non-adhered substances and debris
- 2. Clean Construction Protocols construction cleaning protocols established in the *Clean Construction Protocols* document referenced below. The protocols dictate infection control requirements for different construction activities conducted within the renovation space and will be implemented according to the turnover schedule.
- 3. Daily Clean cleaning of floors and horizontal surfaces using MEDICAL CENTER and EPA approved disinfectants. During transition into the new facility, daily clean will also include equipment, furniture, etc. as these items are moved into rooms and corridors. Daily clean is performed by MEDICAL CENTER EVS.
- 4. Preliminary Air Monitoring an evaluation of air quality using instruments that count particles of various size distributions in a given volume of air.
- 5. Red Line Protocols the adherence to hygienic and infection prevention practices and procedures in patient care areas and support areas as if patients are occupying designated red line areas/departments
- Single Terminal Clean cleaning by physical removal of visible soil from objects and surfaces and disinfection by eliminating many or all pathogenic microorganisms using MEDICAL CENTER and EPA approved disinfectants. Single terminal clean (1xT) is performed by MEDICAL CENTER Environmental Services (EVS).
- 7. Triple Terminal Clean conducting a Single Terminal Clean on all surfaces three sequential times. Triple terminal clean (3xT) is performed by MEDICAL CENTER EVS.
- 8. Viable Air Monitoring an evaluation of air quality to determine the concentration of viable fungal spores enumerated and identified to the species levels for *Aspergillus* or other select fungi to the species level.

#### Conditions

- Air handling systems will be fully operational prior to implementation of red line protocols.
- Final HEPA filters will be installed in designated air handling units prior to commencing terminal cleaning.
- Daily and Terminal cleaning will be implemented according to an established turnover schedule agreed upon by MEDICAL CENTER Construction Coordinator, Infection Preventionist, EVS Supervisor and Contractor.
- Particle counting and/or viable air monitoring strategy will be prepared by industrial hygiene contractor and MEDICAL CENTER Infection Preventionist and will occur per the turnover schedule. It should be noted that air monitoring must begin after implementation of red line protocols and triple terminal cleaning.
- Two weeks will be allowed to remediate any air quality issues identified by air

monitoring.

• Construction or rework performed after terminal cleaning will be performed in accordance with Clean Construction Protocols and/or Infection Control Risk Assessment (ICRA) and approval of a Method of Procedure (MOP) as required by MEDICAL CENTER.

#### **Reference Documents**

- Infection Control Commissioning Support Document and Appendices
- Infection Control Commissioning Cleaning and Disinfection
- Cleaning Instructions for Wipe-Down Stations
- Infection Control Commissioning Air Monitoring Strategy

# Infection Control Commissioning Support Document

#### Ventilation System - Air Handling Units X, Y

1. System Commissioning

Have the systems been formally commissioned and independently witnessed?	AHU#	YES	NO
	Х		
	Y		
-			

Name of independent body:

Date of commissioning:

Do the drainage systems on the air handling unit comply with design criteria? Yes \_\_\_\_\_

No \_\_\_\_

Do volumetric airflow, air exchange rates and pressure differentials comply with design criteria?

- Yes \_\_\_\_
- No \_\_\_\_

Commissioning Agent responsible party

Print Name

Signature

Date

2. Ventilation System Hygiene

Were all systems installed following clean duct protocols, including factory sealed, protected in transit, protected during storage, cleaned on-site during installation, protected after installation?	AHU#	YES	NO
	Х		
	Y		

Departure from clean duct protocol (describe in detail):

General Contractor confirms that the contract work listed above has been completed as described.

General Contractor responsible party			
	Print Name	Signature	Date

## 3. Level of filtration fitted to the air handling units

Air Handing Unit X					
Filter Stage	Manufacturer	MERV#	Model #		
Primary					
Secondary					
Proper seating and fitting of all filters YES D NO D					
Filter bank and housing is air-tight YES D NO D					

Outside air inlet shaft is clean and free from standing water  $YES \square NO \square$ 

Air Handing Unit Y				
Filter Stage	Manufacturer	MERV#	Model #	
Primary				
Secondary				
Proper seating a	nd fitting of all filters		YES 🗆 NO 🗆	
Filter bank and h	nousing is air-tight		YES 🗆 NO 🗆	
Outside air inlet	Outside air inlet shaft is clean and free from standing water			
Commissioning Age	ent			
	Print Name	Signature	Date	
General Contractor General Contractor responsible party	confirms that the contract work listed	above has been o	completed.	
	Print Name	Signature	Date	

Room/Space Hygiene

1.	Above Ceiling Construction Cle	ean				
Above ceiling construction clean conducted in XXXX				YES 🗆	NO 🗆	
Ab	ove ceiling construction clean do	ocuments attached in App	endix			
2.	Room/Space Construction Clea	an				
Ro	om/space construction clean cor	nducted in XXXX		YES 🗆	NO 🗆	
Ro	om/space construction clean do	cuments attached in Appe	endix			
3.	MEDICAL CENTER EVS Termina	I and Daily Clean				
MEDICAL CENTER Environmental Services has conducted terminal, daily and triple- terminal clean in XXXX				YES 🗆	NO 🗆	
All cleaning was conducted in accordance with the <i>Infection Control Commissioning</i> – <i>Cleaning and Disinfection</i> protocols?			YES 🗆	NO 🗆		
MEDICAL CENTER Environmental Services cleaning supervised by:						
ME par	DICAL CENTER responsible ty Pri	int Name	 Signature	 Date		

### Equipment Decontamination

Equipment decontamination means that all equipment placed into the below listed areas was transferred, clean and disinfected per attached protocols.

1.	Patient Rooms -	XXXX

All equipment and materials that were moved into patient rooms were moved and	YES 🗆	NO 🗆
cleaned per MEDICAL CENTER protocols		
Move and clean dates:		
Supervised by:		

2. Medical Supply Rooms – XXXX

All equipment and materials that were moved into medical supply rooms were	YES 🗆	NO 🗆
moved and cleaned per MEDICAL CENTER protocols		
Move and clean dates:		
Supervised by:		

3. Nourishment Rooms – XXXX

All equipment and materials that were moved into Nourishment Rooms were moved YES $\square$	NO 🗆
and cleaned per MEDICAL CENTER protocols	
Move and clean dates:	
Supervised by:	

MEDICAL CENTER responsible party

Print Name	Signature	Date
	-0	

# TURNOVER SEQUENCE for Medium/Low Risk Areas STEP-BY-STEP PROCEDURE

Step	Date/Time Start	Date/Time Complete	Description	Action By	Completed
1			Plumbing tie-ins complete; plumbing disinfection performed	MEP	
2			Daily water flush	GC	
3			All supply and return air grills are securely covered. HEPA filtered negative air is still depressurizing the work area.	GC	
4			Perform and complete a detailed construction clean – remove dust and debris from ALL surfaces	GC	
5			Infection Prevention inspection	IP	
6			EVS performs a triple terminal clean	EVS	
7			Infection prevention inspection	IP	
8			Barriers are removed, negative air machines off, plastic over supply and return grills is removed.	GC	
9			EVS performs terminal clean.	EVS	
10			Testing, adjusting and balancing can occur. ICRA needed for access above the ceiling.	MEP	
11			EVS performs daily terminal clean each day to the date of first patient occupancy	EVS	
12			TAB and Commissioning complete	GC	
13			CO awarded	GC	
14			Daily water flush to the date of first patient occupancy	EVS	

# TURNOVER SEQUENCE for Operating Rooms STEP-BY-STEP PROCEDURE

Step	Date/Time Start	Date/Time Complete	Description	Action By	Completed
1			Plumbing tie-ins complete; plumbing disinfection performed	MEP	
2			Daily water flush	GC	
3			All supply and return air grills are securely covered. HEPA filtered negative air is still depressurizing the work area.	GC	
4			Perform and complete a detailed construction clean – remove dust and debris from ALL surfaces	GC	
5			Infection Prevention inspection	IP	
6			EVS performs a triple terminal clean	EVS	
7			Clean AHU, install new pre and final filters		
8			Infection Prevention inspection of AHU and supply air diffusers in OR – after completion of final filter installation	IP	
9			Conditioned supply air on; work area depressurized using construction exhaust; return air grills filtered; return air exhausted at the AHU	GC	
10			GE install equipment with access to above ceiling	Vendor	
11			GE out of ceiling	Vendor	
12			EVS terminal clean followed by daily terminal cleaning to the date of first patient occupancy	EVS	
13			IP inspection of AHU, supply air diffusers and all work area	IP	
14			Particle counting monitoring and viable samples in all work areas – if acceptable, perform terminal clean and remove barriers (return air functional/exhaust air removed)	IP	
15			EVS to perform terminal clean after barriers down	EVS	
16			Testing, adjusting and balancing can occur. ICRA needed for access above the ceiling.	MEP	
17			TAB and Commissioning complete	GC	
18			CO awarded	GC	
19			Daily water flush to the date of first patient occupancy	EVS	

