

## Construction in Healthcare Facilities

### Short description

This section outlines the requirements to effectively conduct construction activities in healthcare facilities.

### Contact person

Andrew Richardson

Name

770-613-2999

Phone number

HSEQ

Functional Department

arichardson@cce-inc.com

Email address

### Responsible

Brent LeVander

Name

HSEQ

Functional Department

### Approval

Geoff Preisman

Name

President and CEO

Title

## Content

|       |                                                                                   |    |
|-------|-----------------------------------------------------------------------------------|----|
| 1     | Objective and area of application.....                                            | 3  |
| 2     | Superior and additional applicable documents.....                                 | 3  |
| 3     | Definitions.....                                                                  | 4  |
| 4     | Pre-Construction Risk Assessment (PCRA).....                                      | 4  |
| 5     | Centennial Continuum of Care.....                                                 | 5  |
| 5.1   | Centennial Continuum of Care (3C's) Orientation.....                              | 5  |
| 5.2   | Infection Control Risk Assessment (ICRA).....                                     | 5  |
| 5.2.1 | ICRA design.....                                                                  | 6  |
| 5.2.2 | ICRA construction planning.....                                                   | 6  |
| 5.2.3 | Infection control mitigation.....                                                 | 6  |
| 5.2.4 | ICRA matrix step 1.....                                                           | 7  |
| 5.2.5 | ICRA matrix step 2.....                                                           | 8  |
| 5.2.6 | ICRA matrix step 3.....                                                           | 9  |
| 5.2   | Interim Life Safety Measures (ILSM)/ Alternative Life Safety Measures (ALSM)..... | 11 |
| 5.3   | Dust mitigation.....                                                              | 12 |
| 6     | Training.....                                                                     | 12 |
| 7     | Amendment history.....                                                            | 13 |
| 8     | Appendix.....                                                                     | 13 |

## **1 Objective and area of application**

It is recognized that construction and renovation activities have the potential to impact patient care processes within the healthcare environment. The purpose of this section is to identify potential risks through the Pre-Construction Risk Assessment (PCRA) process, or other owner required process, that may arise from construction activities in healthcare facilities and to adequately develop risk mitigation strategies to minimize this risk and the potential hazards.

For example, improper ventilation design or maintenance has been associated with opportunistic infections in immune-compromised patients in a healthcare environment. Patients are often more sensitive to noise, vibrations, fungal organisms and dust typically disturbed by construction activity.

Elements to be considered in this PCRA process include, but are not limited to:

- Interim Life Safety Measures (ILSM)
- Infection Control Risk Assessment (ICRA)
- Utility interruptions/impacts
- Noise
- Vibration
- Environmental service impact
- Design and function of the new structure or area
- Assessment of environmental risks for airborne disease and opportunities for prevention
- Dust and moisture during construction, renovation or repairs

## **2 Superior and additional applicable documents**

1000\_GP\_11\_01\_en\_6.0 Global Policy on Health, Safety, Environment/Sustainability and Quality (HSEQ)

NFPA 101- Life Safety Code

NFPA 99- Healthcare Facilities

This section of the HSEQ Manual applies to all Centennial employees and subcontractors who are performing work in Centennial facilities and project sites. There may be more stringent requirements than this section as defined by specific State, local or contract specific requirements. If there is a conflict between this section and other applicable regulations, the more stringent will apply.

### 3 Definitions

The following definitions of terms are important for an understanding of this section.

| Term                 | Definition                                                                                                                                                                                       |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Centennial           | All Centennial employees, joint venture employees, subcontractors and business partners                                                                                                          |
| APIC                 | Association for Professionals in Infection Control and Epidemiology                                                                                                                              |
| ASHE                 | American Society for Healthcare Engineering                                                                                                                                                      |
| HEPA                 | High-efficiency particulate air                                                                                                                                                                  |
| HEPA vacuum          | A vacuum cleaner which has been designed with a HEPA filter as the last filtration stage. A HEPA filter is a filter that is capable of capturing particles of 0.3 microns with 99.97% efficiency |
| HSEQ                 | Health, Safety, Environment and Quality                                                                                                                                                          |
| ICRA                 | Infection Control Risk Assessment                                                                                                                                                                |
| ILSM                 | Interim Life Safety Measures                                                                                                                                                                     |
| Negative air machine | HEPA filter equipped negative air machines that provide roughing filters, primary filters, and HEPA final filters, with a rating of 200 to 2000 cubic feet per minute (CFM).                     |
| NFPA                 | National Fire Protection Agency                                                                                                                                                                  |
| PCRA                 | Pre-Construction Risk Assessment                                                                                                                                                                 |

### 4 Pre-Construction Risk Assessment (PCRA)

A PCRA shall be conducted before any work commences in a healthcare facility (Appendix 1). If identified as necessary during the PCRA, an ICRA and/or ILSM must also be completed before work commences on project. Centennial employees and subcontractors working at a healthcare facility or other care facility where occupied by patients shall comply with the PCRA findings and are required to implement all controls and provision specified on the PCRA with no exceptions.

In many of the healthcare facilities where we work there is already an established procedure on how to administer the PCRA process. In this case we will follow the facilities' processes to include usage of their ICRA and ILSM forms.

The subcontractor's competent person must conduct frequent inspections in accordance with HSEQ Manual section 7 (Inspection, Surveillance, Audit and Monitoring) on each project site and observe potential health/safety hazards, and develop an Activity Hazard Analysis (AHA) for the elimination or reduction of risk, which may include the following elements:

- Removing the hazard when discovered
- Guarding against the hazard as required by the PCRA, ICRA and ILSM
- Providing personal protective equipment and enforcing its use

- Training employees and lower tier contractors in safe work practices and elements of the Centennial Continuum of Care
- Communicating newly identified risk to the healthcare facility management
- Communicating any changes in demolition, construction, or renovation due to unforeseen circumstances or conditions

## **5 Centennial Continuum of Care (3C's)**

### **5.1 Centennial Continuum of Care (3C's) orientation**

The purpose of the Centennial Continuum of Care (3C's) orientation is to provide awareness to all employees and subcontractor employees regarding specific health and safety hazards that may be present on healthcare project sites. This orientation is administered by a Centennial Project Safety Officer or Project Safety Manager and may be accomplished either in a local office or on the project site and must be renewed annually. To verify that subcontractor personnel have been orientated, a hardhat sticker is issued and displayed once the 3C's orientation is completed. Centennial uses a color system for the hard hat stickers to track when new subcontractor HSEQ orientations were administered. The color of the hard hat stickers are changed each year.

Specific topics covered in the 3C's orientation include but are not limited to:

- Centennial site specific safety rules
- Progressive disciplinary procedures
- Infection Control Risk Assessment (ICRA)
- Interim/Alternative Life Safety Measures (ILSM/ALSM)
- Four leading causes of fatalities in construction
- Health hazards
  - Asbestos
  - Lead
  - Biohazards
  - Healthcare related chemicals and substances
  - Radioactive
  - Silica
  - Polychlorinated biphenyls (PCBs)
  - Mold
- Fire protection
- Hazard communication
- Incident reporting and investigation

### **5.2 Infection Control Risk Assessment (ICRA)**

An ICRA shall be conducted before initiating repairs, demolition, construction and/or renovation activities in a healthcare facility. The ICRA will identify potential exposures of susceptible patients to dust and moisture and determine the need for dust and moisture containment measures. This assessment centers on the type and extent of the construction or repairs in the work area but may also need to include adjacent patient care areas, supply storage, and areas on levels above and below the proposed project site(s). Many healthcare facilities have an ICRA already developed and this should be used in most cases.

The ICRA is a multidisciplinary, organizational, documented process that:

- Focuses on reduction of risk from infection
- Acts through phases of facility planning, design, construction, renovation and facility maintenance
- Coordinates and weighs knowledge about infection, infectious agents, and the specific jobsite in coordination with the healthcare environment
- Anticipate potential patient impacts

#### 5.2.1 ICRA design

The design phase of the ICRA requires extensive pre-planning for construction activities conducted within or on healthcare facilities.

Considerations include, but are not limited to:

- Number, location, and type of airborne infection isolation and protective environment rooms
- Location of special ventilation and filtration such as emergency department waiting and intake areas
- Air handling and ventilation needs in:
  - o Surgical service areas
  - o Airborne infection isolation and protective environment rooms
  - o Laboratories
  - o Local exhaust systems for hazardous agents
  - o Other special areas
- Water systems to limit waterborne pathogens
- Finishes and surfaces

#### 5.2.2 ICRA construction planning

The ICRA considers the facility itself, its construction and project site area(s) anticipated to be potentially affected by construction and shall include consideration of the following:

- Impact of disrupting essential services to patients, facility employees and other potentially affected personnel
- Determination of the specific hazards and protection levels for each
- Location of patients who may be potentially susceptible to infection and increased risk
- Impact of potential utility outages or emergencies and protection of patients during planned or unplanned outages
- Movement of debris and construction materials
- Traffic flow
- Project site cleanup frequency and methods
- Assessment of external as well as internal construction activities

#### 5.2.3 Infection control risk mitigation

The mitigation recommendations from the ICRA shall address the following:

- Patient placement and relocation
- Work hours that may affect different groups of patients or staff

- Standards for barriers and other protective measures required to protect adjacent areas and susceptible patients from airborne contaminants
- Temporary provisions or phasing for construction or modification of heating, ventilating, air conditioning and water supply systems
- Protection from demolition
- Measures taken to train hospital staff, visitors and construction personnel in the specific tasks, activities and project site location(s) that may affect patients or others

The final phase of the ICRA includes specific inspection guidance of the facility for infection control measures and continuous monitoring of their effectiveness throughout the project to assure acceptable levels of infectious control during construction.

#### 5.2.4 ICRA matrix step 1

Use the table below to identify the type of the construction project.

| Construction and Renovation Risk Group Types |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction Type                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>A</b>                                     | <p>Inspections and non-invasive activities. Includes activities that do not generate dust or require cutting of walls, drilling, sanding or access to ceilings for other than visual inspections such as:</p> <ul style="list-style-type: none"> <li>▪ Removal of ceiling tiles for visual inspection limited to 1 tile per 50 Square feet.</li> <li>▪ Painting (but not sanding)</li> <li>▪ Wall covering, electrical trim work and/or minor plumbing</li> </ul>                                                                                                                                                                                                                               |
| <b>B</b>                                     | <p>Small scale, short duration activities, which will only create minimal dust. This includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>▪ Installation of telephone and computer cabling</li> <li>▪ Access to chase spaces</li> <li>▪ Cutting of walls or ceiling where dust migration can be controlled</li> </ul>                                                                                                                                                                                                                                                                                                                                                    |
| <b>C</b>                                     | <p>Any work which generates a moderate to high level of dust. Any work that requires demolition or removal of any fixed building components or assembly, any work with adhesives, paints, solvents, thinners or strong cleaners that takes more than one shift to complete. This includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>▪ Sanding of walls for painting or wall covering</li> <li>▪ Removal of floorcoverings, ceiling tiles and casework</li> <li>▪ New wall construction</li> <li>▪ Major duct work or electrical work above ceilings</li> <li>▪ Major cabling activities</li> <li>▪ Any activity which cannot be completed in a single shift</li> </ul> |
| <b>D</b>                                     | <p>Any project that requires major demolition and/or major reconstruction, extended over several days. This includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>▪ Activities which require consecutive work shifts</li> <li>▪ Heavy demolition or removal of a complete cabling system</li> <li>▪ New construction</li> </ul>                                                                                                                                                                                                                                                                                                                                           |

### 5.2.5 ICRA matrix step 2

Centennial will utilize the ICRA matrix promoted by the Association for Professionals in Infection Control and Epidemiology (APIC) and the American Society for Healthcare Engineering (ASHE) to categorize patients per group within a specific patient population. The development of the "patient risk groups" is quite relative and often determined by the specific healthcare facility and the criteria are dependent on the facility's composition and location of patients.

Use the table below to identify the patient of facility occupant risk group that will be affected.

| <b>Infection Control Risk Assessment (ICRA) Risk Groups</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Construction Type</b>                                    | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Group 1<br/>Lowest Risk</b>                              | <ul style="list-style-type: none"> <li>▪ Office areas</li> <li>▪ Lobbies</li> <li>▪ Non-patient corridors</li> <li>▪ Facility support</li> <li>▪ Non-patient care areas not included in groups 2, 3 and 4</li> </ul>                                                                                                                                                                                                                                       |
| <b>Group 2<br/>Medium Risk</b>                              | <ul style="list-style-type: none"> <li>▪ Patient care units not listed in groups 3 and 4</li> <li>▪ Admissions and public areas</li> <li>▪ Patient care lobbies and corridors</li> <li>▪ Cafeteria/kitchen</li> <li>▪ Cardiology</li> <li>▪ Echocardiography</li> <li>▪ Endoscopy</li> <li>▪ Nuclear medicine</li> <li>▪ Physical therapy</li> <li>▪ Respiratory therapy</li> </ul>                                                                        |
| <b>Group 3<br/>Medium-high Risk</b>                         | <ul style="list-style-type: none"> <li>▪ Emergency department</li> <li>▪ Radiation oncology</li> <li>▪ Laboratories</li> <li>▪ Newborn nursery</li> <li>▪ Dialysis units</li> <li>▪ Outpatient oncology areas</li> <li>▪ Radiation oncology</li> <li>▪ Labor and delivery</li> <li>▪ Critical care units</li> <li>▪ Outpatient surgery</li> <li>▪ Pediatrics</li> <li>▪ Pharmacy</li> <li>▪ Post anesthesia care unit</li> <li>▪ Surgical units</li> </ul> |
| <b>Group 4<br/>Highest Risk</b>                             | <ul style="list-style-type: none"> <li>▪ Operating rooms</li> <li>▪ PACU</li> <li>▪ Pre-op hold areas</li> <li>▪ Cardiac cath lab</li> <li>▪ Central sterile reprocessing</li> <li>▪ Birthing pavilion</li> <li>▪ Delivery operating rooms</li> <li>▪ Intensive care units</li> </ul>                                                                                                                                                                      |

|  |                                                                                                                                                                                                                                                                                                   |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>▪ Bone marrow transplant areas</li> <li>▪ Solid organ transplant areas</li> <li>▪ Pharmacy compounding areas</li> <li>▪ Negative pressure isolation rooms</li> <li>▪ Oncology</li> <li>▪ Other areas where surgical procedures may be performed</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 5.2.6 ICRA matrix step 3

Use the matrix below and table on the following page to match the patient risk group with the planned construction type to find the level of infection control activities required. Additionally, the matrix for identifying risks in the surrounding areas in relation to the area of work shall be completed. Surrounding areas (above, below, lateral, behind and in front) shall be assessed for risk group (lowest to highest [1-4]) as well as precaution class (I-IV).

| Patient Risk Group     | Construction Project Type |        |        |        |
|------------------------|---------------------------|--------|--------|--------|
|                        | Type A                    | Type B | Type C | Type D |
| Low Risk Group         | I                         | II     | II     | III/IV |
| Medium Risk Group      | I                         | II     | III    | IV     |
| Medium-High Risk Group | I                         | II     | III/IV | IV     |
| Highest Risk Group     | II                        | III/IV | III/IV | IV     |

| Description of Required Infection Control Precautions by Class |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Class of Infection Control                                     | During Construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Upon Completion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Class I</b>                                                 | <ul style="list-style-type: none"> <li>Execute work by methods to minimize dust from construction operations</li> <li>Immediately replace a ceiling tile displaced for visual inspection</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Clean up work area upon completion of task</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Class II</b>                                                | <ul style="list-style-type: none"> <li>Provide active means to prevent dust from dispersing into atmosphere</li> <li>Water mist work surfaces to control dust while cutting</li> <li>Seal unused doors with duct tape</li> <li>Block off and seal air vents</li> <li>Place dust mat at entrance and exit of work area</li> <li>Remove or isolate HVAC system in areas where work is being performed</li> </ul>                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>Wipe surfaces with cleaner or disinfectant</li> <li>Contain construction waste before transport in tightly covered containers</li> <li>Wet mop and or vacuum with HEPA filtered vacuum before leaving work area</li> <li>Upon completion, restore HVAC system where work was performed</li> </ul>                                                                                                                                                                                                                                                                              |
| <b>Class III</b>                                               | <ul style="list-style-type: none"> <li>Remove or isolate HVAC system in area where work is progressing to prevent contamination of duct system</li> <li>Complete all critical barriers (sheetrock, Correx, modular system, or fire-retardant plastic) to seal area from non-work areas or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum) before construction begins</li> <li>Maintain negative air pressure within work site utilizing HEPA equipped air filtration units</li> <li>Contain construction waste before transport in tightly covered containers</li> <li>Cover transport receptacles or carts</li> </ul>                                                                       | <ul style="list-style-type: none"> <li>Do not remove barriers from work area until completed project is inspected by the appropriate parties</li> <li>Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction</li> <li>Vacuum work area with HEPA filtered vacuums</li> <li>Wet mop area with cleaner/disinfectant</li> <li>Upon completion, restore HVAC</li> </ul>                                                                                                                                                                                                 |
| <b>Class IV</b>                                                | <ul style="list-style-type: none"> <li>Isolate HVAC system in area to prevent contamination of duct system</li> <li>Complete all critical barriers (sheetrock, Correx, modular system, or fire-retardant plastic) to seal area from non-work areas or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum) before construction begins</li> <li>Maintain negative air pressure within work site utilizing HEPA</li> <li>Seal holes, pipes, conduits and punctures</li> <li>Construct anteroom and require all personnel to pass through this room before leaving worksite or use disposable clothing</li> <li>All personnel use shoe covers that are changed each time the worker exits</li> </ul> | <ul style="list-style-type: none"> <li>Do not remove barriers from work area until completed project is inspected by the appropriate parties</li> <li>Remove barrier material carefully to minimize spreading of dirt and debris associated with construction</li> <li>Contain construction waste before transport in tightly covered containers</li> <li>Cover transport receptacles or carts. Tape covering unless solid lid</li> <li>Vacuum work area with HEPA filtered vacuums</li> <li>Wet mop area with cleaner/disinfectant</li> <li>Upon completion, restore HVAC system where work was performed</li> </ul> |

### 5.3 Interim Life Safety Measures (ILSM)/ Alternative Life Safety Measures (ALSM)

Construction or maintenance activities may have an impact on the life safety systems in the healthcare facility, thus requiring an interim plan to address the hazards created by the work activity. Interim Life Safety Measures (ILSM) or Alternative Life Safety Measures (ALSM) are health and safety measures that are put in place to protect the safety of patients, visitors, staff and other affected personnel who are occupying the facility.

This may include impact to the following life safety systems and components:

- Exit signs and pathways to an egress point
- Fire protection systems including smoke detectors
- Fire suppression
- Fire extinguishers and fire alarm systems
- Smoke barriers
- Emergency evacuation plans

The intent of the development of these interim measures is to provide a level of life safety comparable to that described in the National Fire Protection Association Life Safety Code (NFPA 101).

Life safety deficiencies of the healthcare facility shall be reviewed and assessed according to the degree that a particular deficiency affects the facility's overall fire safety features. ILSM/ALSM shall be coordinated by the Centennial project superintendent with coordination from the healthcare facilities management team and the local fire department (as necessary).

The life safety deficiencies can be categorized as follows:

- Level I - A deficiency or series of deficiencies that indicate a lack of proper maintenance of building components
- Level II - A deficiency or series of deficiencies that may threaten life, and its scope of deficiency is significant in a limited area
- Level III - A deficiency or deficiencies indicating pervasive life safety violation and the scope of deficiency is such that correction of the deficiencies will take significant periods of time

The criteria to evaluate construction deficiencies and to determine when and to what extent one or more measures are applicable or are appropriate for a particular construction project, phase of construction, or deficiency may include but not be limited to construction activities that:

- Alter or compromise the integrity of exit access, exit or exit discharge features
- Significantly compromise the integrity of the building's compartmentation features such as fire barriers, smoke barriers, floor slabs, corridor walls, etc.
- Impair the building's fire alarm, fire detection or fire suppression systems
- Involve temporary sources of ignition such as cutting, welding, torch operations or other "hot work" operations
- Involve the presence of large quantities of combustible or flammable materials and/or debris

## **5.4 Dust mitigation**

All possible efforts shall be made by subcontractors to limit the amount of dust created and released at the job site and in the surrounding areas. Dust from construction, demolition and/or renovation may contain bacteria, viruses, molds, spores, pathogens and various other items that have the potential to cause life threatening illness in a healthcare facility's immune compromised patients and shall be prevented or limited.

Dust mitigation activities include:

- Removing debris from site in clean covered bins
- Removing debris from site at specified times or specific routes if deemed necessary in the ICRA
- Use and regular replacement of adhesive walk off mats at entrances and exits to site
- Wet mopping or HEPA vacuuming area around entrance and exit of site as needed
- Water-misting work surfaces to control dust disturbance during work as needed
- Sealing all penetrations into/out of site (around piping and keep windows closed)
- Sealing all temporary partitions to prevent dust escape
- Wiping tools down before removal from site
- Planning ahead to limit number of entrances and exits from site
- Using negative air machines in high dust generating sites
- Removing dust from clothes before leaving site or using disposable garments that are removed prior to exiting the project site as needed

## **6 Training**

Due to the unique risk posed by construction work in healthcare facilities, all subcontractors shall complete the Centennial Continuum of Care Program in addition to the Centennial New Subcontractor Orientation Program as discussed in HSEQ Manual section 6 (HSEQ Risk Assessment and Operations).

The Centennial Continuum of Care program includes:

- Focus on the unique hazards of healthcare construction
- Infection Risk Control Assessment (ICRA)
- Interim life safety policies and procedures specific to the healthcare environment

## 7 Amendment history

| Date       | Version | Revised content                                                                                                                                                                                                                                                                                             |
|------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.04.2014 | 1.0     | Initial Preparation                                                                                                                                                                                                                                                                                         |
| 03.01.2015 | 1.1     | Addition of paragraph 5.1- Centennial Continuum of Care (3C's) orientation                                                                                                                                                                                                                                  |
| 12.06.2016 | 1.2     | Frequency for renewal of 3C's orientation updated to annual renewal                                                                                                                                                                                                                                         |
| 05.23.2017 | 1.3     | Revision to Appendix 19/1 PCRA and Paragraph 5.2.6 to include surrounding area risk                                                                                                                                                                                                                         |
| 01.01.2018 | 2.0     | Updates to Paragraph 2 Superior Documents to add the Group Policy and Global Standards, Paragraph 3 Definitions (Centennial), Paragraph 4 Pre-Construction Risk Assessment (client processes and forms), Paragraph 5.2 Infection Control Risk Assessment (client processes and forms) and Appendix 1 (logo) |
| 04.01.2021 | 2.1     | Updates to Paragraph 2 Superior Documents, Paragraph 5.1 to replace Mercury with Silica, Paragraph 5.2.6 to clarify barriers and Appendix 1.5 to replace Mercury with Silica                                                                                                                                |

## 8 Appendix

Appendix 1: Pre-Construction Risk Assessment (0206500\_CP\_11\_19\_en\_A1.5)

## Pre-Construction Risk Assessment

0206500\_CP\_11\_19\_en\_A1.5

*Instructions: Complete the Pre-Construction Risk Assessment form below. This form is required for all healthcare projects including, but not limited to, COMPASS Market Segment H (Healthcare) and VA (Veterans Affairs). Indicate your response using a Yes - No - N/A or check box format. If more explanation is required, use the spaces provided.*

### Project Information

|                         |                         |
|-------------------------|-------------------------|
| Project Title:          | Contract #:             |
| Project Location:       | Project Start Date:     |
| Project Duration:       | Project Manager:        |
| Project Superintendent: | Project Safety Officer: |
| Subcontractor(s):       |                         |

Scope of Work (brief description):

### Applicable Risk Assessment Elements

|                                             |                                 |
|---------------------------------------------|---------------------------------|
| Life safety code deficiencies (ILSM / ALSM) | Utility Interruptions / impacts |
| Air quality / pressure management (ICRA)    | Noise and vibration             |
| Environmental services requirements         | Security                        |
| Other safety hazards (explain):             |                                 |

*Note: attach a drawing showing the locations of the following: barrier type, entrances, negative air unit(s) and discharge and pressure monitor type*

### Life Safety Code / Fire Safety Deficiencies

|     |    |                                                                                                                                                     |
|-----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes | No | EXITS - Does the project have the potential of affecting a required exit or other means of egress?<br>If yes, identify interim measure to be taken: |
| Yes | No | EXITS - Would the affected exit be used by anyone other than construction staff?<br>If yes, identify interim measures to be taken:                  |
| Yes | No | EMERGENCY ACCESS - does the project have the potential for obstructing access?<br>If yes, identify interim measures to be taken:                    |

|     |    |                                                                                                                                                                                              |
|-----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes | No | EMERGENCY RESPONDERS - does the project have the potential for obstructing access of emergency response staff to the construction area? If yes, identify interim measures to be taken:       |
| Yes | No | FIRE PROTECTION - will the project activity affect the fire detection system? If yes, identify interim measures to be taken:                                                                 |
| Yes | No | FIRE PROTECTION - will the project activity require additional fire fighting equipment? If yes, identify interim measures to be taken:                                                       |
| Yes | No | FIRE RESPONSE TRAINING - does the project activity require that staff receive additional fire fighting equipment training? If yes, identify interim measures to be taken:                    |
| Yes | No | COMBUSTIBLE LOAD - will the project require the storage of flammable or combustible material(s)? If yes, identify interim measures to be taken:                                              |
| Yes | No | TEMPORARY PARTITIONS - will the project require temporary partitions? (partitions are to be smoke tight and of limited combustible materials) If yes, identify interim measures to be taken: |
| Yes | No | FIRE DRILLS - does the project warrant additional fire drills? If yes, identify interim measures to be taken:                                                                                |
| Yes | No | IMPACT ON RATED STRUCTURES - will project plans/activities affect structural features impacting fire protection such as rated doors or walls? If yes, identify interim measures to be taken: |
| Yes | No | HAZARD SURVEILLANCE - will the project require increased hazard surveillance inspections? If yes, identify interim measures to be taken:                                                     |

Indicate inspection frequency:                      Daily                      Weekly                      Monthly

|     |    |                                                                                                                                                                                      |
|-----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes | No | HOT WORK - Is hot work to be conducted in support of the project?<br>If yes, identify interim measures to be taken:                                                                  |
| Yes | No | ENERGIZED WORK - energized work to be conducted in support of the project? If yes, please submit a completed Energized Work Permit and Job Planning/Briefing Checklist for approval. |
| Yes | No | AREA POSTING - Interim/Alternative Life Safety Measures sign posting required in the area?<br>If yes, identify interim measures to be taken:                                         |
| Yes | No | FIRE/SMOKE WALL PENETRATION - will project plans/activities compromise fire/smoke wall?<br>If yes, identify interim measures to be taken:                                            |

FIRE WATCH - In addition, regardless of project involvement, any time the fire detection or suppression system or a portion of it is impaired or shut down for more than 4 hours in a 24 hour period, the authority having jurisdiction shall be notified and the building shall be evacuated or an approved fire watch shall be provided for all parties left unprotected by the shutdown until the fire alarm system has been returned to service. (NFPA 101-2012 9.6.1.6)

A fire watch should at least involve some special action beyond normal staffing, such as assigning an additional security guard(s) to walk the areas affected. Such individuals should be specially trained in fire prevention and in occupant and fire department notifications techniques and they should understand the particular fire safety situation for public education purposes. (NFPA 101-2012 A.9.6.1.6)

### Infection Control Risk Assessment

*Construction / Renovation Activity / Risk Group Worksheet - Indicate the type of work involved by placing a check mark next to the applicable response:*

**Type A** (Inspections and Non-invasive activities) - Includes activities that do not generate dust or require cutting of wall, drilling, sanding or access to ceilings other than for visual inspection such as:

|     |    |                                                                                                              |
|-----|----|--------------------------------------------------------------------------------------------------------------|
| Yes | No | Removal of ceiling tiles for visual inspection (1 tile per 50 SF)                                            |
| Yes | No | Painting (but not sanding)                                                                                   |
| Yes | No | Wall covering, electrical trim work, minor plumbing and other activities applicable to the definition above. |

**Type B** (Small scale, short duration activities which will only create minimal dust) - Includes, but is not limited to:

|     |    |                                                                   |
|-----|----|-------------------------------------------------------------------|
| Yes | No | Installation of telephone and computer cabling                    |
| Yes | No | Access to chase spaces                                            |
| Yes | No | Cutting of wall or ceiling where dust migration can be controlled |

**Type C** (Any work which generates a moderate to high level of dust. Any work that requires demolition or removal of any fixed building components or assemblies, any work with adhesives, paints, solvents, thinners and strong cleaners, any work that takes more than one shift to complete). Includes but is not limited to:

|     |    |                                                                   |
|-----|----|-------------------------------------------------------------------|
| Yes | No | Sanding of wall for painting or wall covering                     |
| Yes | No | Removal of floor coverings, ceiling tiles and casework            |
| Yes | No | New wall construction                                             |
| Yes | No | Minor ductwork or electrical work above ceilings                  |
| Yes | No | Major cabling activities                                          |
| Yes | No | Any activity which cannot be completed within a single work shift |

**Type D** (Any project that requires major demolition and/or major re-construction, extended over several days). Includes but is not limited to:

|     |    |                                                                   |
|-----|----|-------------------------------------------------------------------|
| Yes | No | Minor ductwork or electrical work above ceilings                  |
| Yes | No | Major cabling activities                                          |
| Yes | No | Any activity which cannot be completed within a single work shift |

*Construction / Renovation Activity / Risk Group Worksheet - Indicate the type of work involved by placing a check mark next to the applicable response:*

**Group 1 - Lowest risk group**

|     |    |                                                         |
|-----|----|---------------------------------------------------------|
| Yes | No | Office areas, lobbies, non-patient corridors            |
| Yes | No | Facility support (i.e. Engineering, Housekeeping, etc.) |
| Yes | No | Non-patient care areas not included in groups 2, 3 or 4 |

**Group 2 - Medium risk group**

|     |    |                                               |     |    |                     |
|-----|----|-----------------------------------------------|-----|----|---------------------|
| Yes | No | Patient care units not listed in group 3 or 4 | Yes | No | Echocardiography    |
| Yes | No | Admissions and public areas                   | Yes | No | Endoscopy           |
| Yes | No | Patient care lobbies and corridors            | Yes | No | Nuclear medicine    |
| Yes | No | Cafeteria/kitchen                             | Yes | No | Physical therapy    |
| Yes | No | Cardiology                                    | Yes | No | Respiratory therapy |

**Group 3 - Medium-High risk group**

|     |    |                           |     |    |                           |
|-----|----|---------------------------|-----|----|---------------------------|
| Yes | No | Emergency Department      | Yes | No | Labor and Delivery        |
| Yes | No | Radiation Oncology        | Yes | No | Critical Care Units       |
| Yes | No | Laboratories              | Yes | No | Outpatient Surgery        |
| Yes | No | Newborn Nursery           | Yes | No | Pediatrics                |
| Yes | No | Dialysis units            | Yes | No | Pharmacy                  |
| Yes | No | Outpatient Oncology areas | Yes | No | Post Anesthesia Care Unit |
|     |    |                           | Yes | No | Surgical Units            |

**Group 4 - Highest risk group**

|     |    |                                                                                                          |     |    |                                  |
|-----|----|----------------------------------------------------------------------------------------------------------|-----|----|----------------------------------|
| Yes | No | Operating Rooms/PACU/Pre-op Hold Areas                                                                   | Yes | No | Pharmacy Compounding Area        |
| Yes | No | Cardiac Cath Lab                                                                                         | Yes | No | Neg Pressure Isolation Room      |
| Yes | No | Central Sterile Reprocessing                                                                             | Yes | No | Oncology                         |
| Yes | No | Birthing Pavilion & Delivery Operating Rooms                                                             | Yes | No | Intensive Care Units (incl PICU) |
| Yes | No | Intensive Care Units (incl: PICU)                                                                        | Yes | No | Bone Marrow Transplant           |
| Yes | No | Other areas where invasive surgical procedures may be done, ED Trauma Room, Clinic Procedure Rooms, etc. | Yes | No | Solid Organ Transplant Areas     |

Please circle or check the appropriate construction / renovation class:

| Patient Risk Group | Construction Type A | Construction Type B | Construction Type C | Construction Type D |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Low Risk Group     | I                   | II                  | II                  | III / IV            |
| Med Risk Group     | I                   | II                  | III                 | IV                  |
| High Risk Group    | I                   | II                  | III / IV            | IV                  |
| Highest Risk Group | II                  | III / IV            | III / IV            | IV                  |

Identify surrounding areas in relation to the area of work, assessing potential impact.

|                                      | Above | Below | Lateral | Lateral | Behind | Front |
|--------------------------------------|-------|-------|---------|---------|--------|-------|
| Identify Risk Group (Low to Highest) |       |       |         |         |        |       |
| Identify Precaution Class (I to IV)  |       |       |         |         |        |       |

Precautions to consider. Indicate all that are applicable:

**Class I****Prior to beginning work**

Communicate work details with owner's representative

**During work**

Execute work by methods to minimize raising dust from construction operations

**Upon completion of work**

Immediately replace a ceiling tile displaced for visual inspection

Wet mop and/or vacuum before leaving the work area

**Other** (explain):

**Class II****Prior to beginning work**

Seal unused doors with duct tape, post signage (to ensure doors are kept closed)

Block off and seal local supply air vents

Provide filtration at local exhaust or return openings to prevent duct contamination

Place dust mat at entrance and exit of work area(s)

Establish travel routes for workers, materials and debris

Re-route staff and patient traffic around the controlled work area

**During Work**

Provide active means to prevent air-borne dust from dispersing into atmosphere

Water mist work surfaces as necessary to control dust while cutting

Contain construction waste before and during transport in covered containers

**Other (explain):**

**Class III (in addition to items identified for Class I & II work)****Prior to beginning work**

Isolate HVAC sys in work area to prevent contamination of the duct system

Contain the work area with dust barriers

Construct 1-hour rated sheetrock air-tight dust barriers

Construct sheetrock air-tight barriers

Construct poly air-tight barriers

Work will be completed within a control cube

Maintain negative air pressure within work area

6 air exchanges per hour non-critical      12 air exchanges per hour critical

Air to be discharged outside of the building

Air will be re-circulated outside of the contained work area/within the building using HEPA filtration

Provide critical power circuits for negative air equipment in the event of a power loss

Provide visual indication of negative pressure

Post ICRA worksheets, controls list and contact information at work entrance

Review site conditions with Owner PM, Safety, Engineering and/or Infection Control Staff

**During Work**

Clean waste containers, including wheel, prior to leaving the work area

Monitor and record negative pressure readings daily

Inspect dust barriers daily, record condition

New ventilation sys are to be protected from construction dust until work is completed

**Upon Completion of Work**

Do not remove barriers from work area until completed project is thoroughly cleaned by Environmental Services Department

Review site conditions with Owner PM, Safety, Engineering and/or Infection Control Staff before removing dust barriers

Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction

**Other (explain):**

**Class IV (in addition to items identified for Class I, II & III work)**

**Prior to beginning work**

Construct anteroom and require all personnel to pass through this room as they enter and leave the work area. Anteroom will have a negative pressure relationship to the non-construction, adjacent areas.

Staff will be vacuumed clean prior to leaving the anteroom

Staff will wear cloth or paper coveralls that are removed each time they exit the work site

All personnel entering work site are required to wear shoe covers

**During Work**

Provide visual indication of negative pressure (manometer readings recorded)

**Upon Completion of Work** *(no additional requirements)*

**Other (explain):**

|                                       |
|---------------------------------------|
| <b>Utility Interruption / Impacts</b> |
|---------------------------------------|

During the course of the project activities, are any of the following items likely to be interrupted or impacted in any area outside of the designated work area? (choose all that apply. If left blank, then No or N/A is implied):

|                    |                            |                |
|--------------------|----------------------------|----------------|
| Water supply       | Oxygen                     | Fire Sprinkler |
| Sewer service      | Nurse call system          | Fire Alarm     |
| Roof / Storm Drain | Building automation system | Steam          |
| Normal power       | Pneumatic tube system      | Chilled water  |
| Emergency power    | Overhead paging system     | Natural gas    |
| Ventilation system | Medical gas/vacuum         | Elevator(s)    |
| Medical air        | Other (explain):           |                |

For any of the systems where interruptions are foreseen, please explain the steps which will be taken to mitigate the impacts (use space below):

Document any preventative measures taken to insure that no unplanned interruption will occur (use space below):

## Noise and Vibration Assessment

List any activities that will generate noise and/or vibration likely to be disruptive (use space below):

Time / Duration:

List mitigation strategies (use space below):

## Environmental

Person(s) responsible for daily cleaning inside the work area:

Yes      No      Is terminal cleaning required at the end of the day? If yes, list person(s) responsible below:

Yes      No      Are there any special needs required for terminal cleaning at the end of each project? If yes, use space below to explain:

## Security

Will personnel be working in a security sensitive area? (if yes, check all that apply below. If left blank, No or N/A is implied)

Women's services (OB, L&D, Nursery)

Cashier's office

Emergency department

Radiation area

Psychiatry

IT control room

Medical records

Key control area

Pharmacy

Other (list):

Additional recommendations to reduce/mitigate risk for this work (use space below):

## Safety Hazards

Provide a list of any hazardous materials / chemicals used or stored within the project area (use space below):

|     |    |                                                                                                                                                                                |
|-----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes | No | Is the work likely to generate any noxious or unusual odors? (if yes, use space below to explain steps / controls that will be implemented to control or minimize the impact): |
|-----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|     |    |                                                                                                                                                                                                 |
|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yes | No | Are there any known contaminants? (if yes, place a check mark next the known or suspected contaminate and explain steps / controls that will be implemented to control or minimize the impact): |
|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                     |                                              |
|---------------------|----------------------------------------------|
| <b>Contaminate:</b> | <b>Steps to minimize / eliminate impact:</b> |
|---------------------|----------------------------------------------|

Asbestos

Lead

Mold

Radioactive

Biohazards

Chemicals

Silica

Polychlorinated Biphenyls

Other (explain):

Does the planned work include any of the following? (if yes, place a check mark next the activity and explain the steps or controls that will be implemented to mitigate the risks involved. OK to reference a supplemental plan such as "confined space plan" / "fall protection plan" / etc.):

Confined space entry

Lock out tag out

Scaffolding

Fall Protection

Energized work

Excavation / protective systems

Cranes or hoisting equipment

Interruption of normal pedestrian  
/ vehicle traffic

Other (explain):

### **Additional Comments**

List any additional comments / concerns (use space below):

### **Review / Approval (signature required)**

Project Manager: (printed)

Signature

Date:

Project Safety Officer: (printed)

Signature

Date: