APPENDIX C – IAQ DURING NON-UAO RENOVATION AND CONSTRUCTION PROJECTS IN OCCUPIED BUILDINGS

General Air Quality Specifications

- Develop a site-specific plan to control demolition and reconstruction materials in renovation areas as guided by the ‘Air Quality Considerations’ below.
- Identify the specific air quality measures needed for the renovation project, including appropriate performance metrics.
- Require each prime contractor to designate an air quality representative to manage air quality issues.
- Specify conditions that would require an emergency response, such as asbestos release or a major water loss.

Air Quality Considerations

- Schedule renovation work during periods of low building occupancy when possible.
- Isolate work areas from occupied areas using critical barriers, air pressure control and high-efficiency particulate air (HEPA) filtration.
- Minimize the number of building penetrations necessary for entry into the renovation area. Choose the penetration sites carefully to minimize the potential for occupant exposure.
- Modify HVAC operations according to specifications of University Environmental Health and Safety and IU staff engineers prior to and during renovation activities to ensure isolation of renovation areas from occupied spaces.
- Maintain an adequate unoccupied buffer zone around renovation areas according to design specifications. This may require temporarily relocating building occupants in the immediate vicinity of renovation areas.
- Increase housekeeping activities in adjacent occupied areas during renovation activities that create dust.

Work Practice Measures for Air Quality Assurance

- Employ local exhaust when dust, hazardous vapors, fumes, or gases are generated. If local exhaust is not feasible, portable air cleaning devices (such as the use of HEPA-filtration) may be used.
- Minimize dust generation by using wet methods for cutting or sanding.
- Locate dumpsters for debris away from operating HVAC outdoor air intakes and exterior doors to occupied areas when possible.

Specific Control Measures for HVAC Protection

- Ventilation shall be provided in order to maintain a negative pressure in all areas of occupied buildings where there is potential for dust contaminant generation from a construction project. The contained area shall be kept under negative pressure relative to the surrounding areas by the use of HEPA filtered negative air machine(s). A minimum of -.02 column inches of water pressure differential, relative to outside pressure, shall be maintained within the work area as evidenced by manometer measurements provided by the contractor on a continuous basis.
- Construction documents shall specify modifications required to existing mechanical systems or temporary equipment to be installed to properly ventilate the affected building areas.
- Construction documents shall include temporary ductwork layouts (as necessary) as well as sizing and specifications of fans.
• Contractors shall not make design decisions for temporary ventilation of occupied areas of buildings.
• Isolate portions of the HVAC system that may become contaminated from renovation activities as specified by consulting and IU staff engineers.
• Seal return air grills in renovation areas.
• Upgrade filtration efficiency in the HVAC systems that could be affected during renovation (if possible) as directed by specifications.

Specific Housekeeping Measures for Air Quality Assurance
• Identify the route(s) for removing construction debris from the building.
• Identify traffic routes for renovation workers within the building, using pathways away from occupied spaces if possible.
• Identify specific locations within buildings that contractors may use, including restrooms (if appropriate).
• Eliminate demolition/renovation debris by bagging on site and/or the use of covered wheelbarrows or cart to transport debris to containers outside of the building.
• Contractors shall clean areas inside of construction exits to minimize dirt and debris from entering occupied spaces in the building.
• Contractors shall clean occupied areas adjacent to renovation site (such as hallways) if construction debris or soil has caused an area to be notably dirtier than other similarly occupied areas.
• Place walk-off mats at all entrances and exits from the renovation area. These mats must be regularly cleaned or replaced to minimize migration of dust from the project site.

Specific Control Measures for Painting Occupied Areas
• Schedule work during evening hours or periods of low building occupancy.
• Use low odor/ low VOC products.
• Provide IUEHS copies of Safety Data Sheets for all products being used.
• Provide ventilation in the area. If necessary, maintain a negative pressure in all areas being painted.
• Collaborate with Facilities Services and/or Physical Plant for the respective campus to adjust the air handler settings so paint fumes are not redistributed into the occupied spaces.

Roof Leaks, Pipe Breaks and other Water Losses caused by Renovation Contractors
• Contractors are responsible for all water losses inside buildings that happen as a result of their renovation activity.
• Contractors shall inform Facilities Services and/or Physical Plant for the respective campus of all water losses that occur due to construction activities.
• Facilities Services and/or Physical Plant for the respective campus will manage the water remediation process and be reimbursed by contractor for all expenses involved with the remediation.
• Only University-approved contractors will be employed for water remediation.
• Water must be removed and damaged building materials must be dried effectively within 24-hours or replaced as necessary.
Outdoor Work with Hazardous or Odorous Materials near Air Intakes

- Locate portable toilets away from air intakes.
- Use or application of chemical/odorous materials shall be located at least 25 feet away from all outside air intakes (if feasible).
- When work including chemical/odorous materials must be done at or near air intakes, outside air intake should be minimized or the task should be performed when the building is not occupied (such as evenings or weekends).
- For long-term projects that use chemicals or produce combustion exhaust near air intakes, install charcoal filters in the air handling units serving the occupied space of the building.

Measures for Maintaining Good Air Quality

- Discuss air quality issues at regularly-scheduled construction meetings. The contractor indoor air quality representative needs to be included in these meetings.
- Monitor renovation activities carefully to ensure that all work conforms to the stated air quality control measures.
- Monitor pressurization at project sites, using a pressure monitoring device, to ensure that proper isolation and ventilation is in effect.
- Monitor for visible or odorous airborne contaminants in adjacent occupied areas.
- Promptly respond to occupant complaints in order to resolve issues that involve contractor work activities.

Measures for Enforcement of Air Quality Assurance

- Contractors are responsible for meeting all specifications involved in maintaining acceptable air quality for building occupants and the IU Construction Manager for the project will be responsible for daily contract compliance associated with air quality.
- Contractors shall coordinate with the University Architect's Office, Construction Management for the respective campus, and University Environmental Health and Safety for any variations to the specifications or circumstances outside of their control involving air quality in occupied buildings.
- If an acceptable air quality condition is not maintained by contractors IUEHS may halt construction operations until suitable measures have been taken to restore acceptable air quality for building occupants.