



1. Introduction

Construction and renovation projects can have a significant negative impact on indoor environmental quality (IEQ) through the introduction of pollutants such as particulates, offensive odors, toxic chemical vapors, microbial, and combustion products. These contaminants may be entrained into the building heating ventilation and air conditioning (HVAC) systems and be transported to contiguous areas, subsequently affect populations beyond the immediate project area.

Pre-planning efforts that anticipate potential impacts on IEQ and specify adequate control strategies prior to a project should be viewed as an essential step to completing a project on time and within budget. As part of these efforts, the Project Managers should indicate appropriate project specification for maintaining adequate IEQ during and after construction, ensure review and selection of appropriate materials, adapt a proactive communication strategy to allay concerns and implement commissioning procedures that specifies re-occupancy criteria at project completion.

A. Purpose

The purpose of the document is to provide project managers with guidance on how to minimize the negative impact of construction projects on IEQ during construction and renovation projects.

B. Scope

These guidelines apply to all construction, demolition, and renovation projects at KSU campus buildings.

C. Acronyms and Definitions

EHS – Environmental Health and Safety

HVAC – Heating Ventilation and Air Conditioning

IEQ – Indoor Environmental Quality

PPE – Personal protective equipment

Project personnel – Persons engaged in construction activities either as employees of KSU or as contractors/third parties acting on behalf of KSU.

SDS – Safety data sheet

VOCs – Volatile organic compounds

2. Responsibilities

A. Project Manager

Project managers have the following responsibilities under these guidelines:

- Conduct a pre-construction review to identify the potential impact of the construction project on IEQ and develop control strategies.

- Incorporate IEQ goals and control strategies into the bid and project documents.
- Brief affected parties before and during construction and renovation activities of potential impacts they may have on IEQ and steps to be taken to reduce these impacts.
- Notify building occupants of any scheduled HVAC outages and non-scheduled outages when they are discovered.

B. Environmental Health and Safety Department

The Environmental Health and Safety (EHS) Department has the following responsibilities under these guidelines:

- Work with project manager to conduct pre-construction review and design feasible strategies to control potential IEQ impacts.
- Conduct IEQ monitoring during the project work, as necessary.
- Issue a “Stop Work” order if the IEQ of the project space or contiguous spaces is adversely affected by the construction project.

C. Project Personnel

Project personnel have the following responsibilities under these guidelines:

- Comply with the applicable KSU’s health and safety requirements as well as applicable federal, state, and local regulations.
- Implement control strategies, including engineering controls, to eliminate or minimize the impact of contraction activities on IEQ in the building subject to construction work or nearby buildings.
- Maintain acceptable IEQ within the space or contiguous spaces where the construction project is occurring.
- Provide all safety and personal protective equipment (PPE) required to complete the contracted scope of work – PPE must meet or exceed the requirements of the appropriate governmental regulatory agency.

3. Guidelines

A. Pre-Planning

Planning by project managers can lead to successful control of potential pollutants, allay concerns, and maintain occupant comfort during and after construction activities. During pre-planning, some key factors to assess include:

- Types of dusts or odors produced from:
 - Material being demolished
 - Products used in construction
 - Equipment used in construction
- Presence of pollutants that are a recognized hazard, as evidenced by the safety data sheet (SDS).
- Times and locations where occupants are most likely to encounter airborne pollutants.
- The expected amount and duration of exposure occupants may have to the pollutants.
- General safety and hygiene (i.e., keeping hallways and exits unobstructed).

As specific details of the project become clear, pollutant control methods can be tailored to the project. Specific control measures may involve:

- Protection of the HVAC system
- Control of the pollutant source
- Interruption of the pollutant pathway (plastic sheeting barriers, etc.)
- Housekeeping
- Scheduling considerations

B. Occupant Notification

Notifying area occupants of the proposed work, work schedule, and a description of the type of inconvenience it may cause is critical to the success of most projects. Specifically, occupants should be advised of potential odors, noise, dust generation, etc., well in advance of work so that individuals with pre-existing medical conditions can make alternate arrangements or go on a modified work schedule.

C. Pollution Control

Prior to commencement of work, project personnel should be made familiar with KSU's emergency procedures, and other safety regulations. Project personnel should wear appropriate PPE.

1. HVAC Protection

Where feasible, the HVAC system should be shut down for the duration of the demolition project. All return air openings within the designated work area should be sealed with 6-mil polyethylene sheeting and secured with duct tape.

When total HVAC isolation is not feasible, filter media with MERV of 8 should be used at each return grill. The filters should be frequently inspected during the project and replaced as needed.

The mechanical room must not be used to store construction or waste materials.

2. Source Control

All surfaces to be disturbed should be misted with water to minimize airborne dust. When possible, products emitting lower amounts of odor or volatile organic compounds (VOC's) should be used. If feasible, electric-powered equipment should be used in lieu of gasoline-powered equipment.

3. Pollutant Pathway Interruption

All return air openings within the designated work area should be sealed with 6-mil fire resistant polyethylene sheeting and duct tape to ensure contaminants do not enter the HVAC system.

Establish a complete physical isolation of the construction zone polyethylene sheeting of appropriate thickness.

The floor within the enclosure should be covered with one layer of 6-mil polyethylene sheeting. Each layer should be taped at all edges. All carpeting must be protected from contamination during construction unless new carpeting will be installed.

Adequate exhaust ventilation should be established to maintain a negative pressure differential between the work area and adjacent areas of the building (0.02 to 0.04 w.g). The established

negative pressure should be monitored to ensure the containment remains under negative pressure. EHS may be contacted to provide this service.

As far as practicable, negative pressure ventilation units should be exhausted to the outside of the building. Careful installation and daily inspections should be performed to ensure exhausted contaminants do not re-enter the building through open windows or the air intake of the HVAC system and the ducts do not release construction debris into uncontaminated areas of the building.

The negative pressure systems should continuously operate while work is in progress. Damage and defects in the enclosure system are to be repaired immediately upon discovery.

Maintain the occupied spaces under positive pressure relative to the outside.

4. Housekeeping

After completion of the work, the entire work area (including walls, ceilings, floors, and other work surfaces) should be cleaned and vacuumed. All surfaces should be free from visible construction debris and dust.

5. Scheduling

Depending on the expected impact, some projects should be scheduled off-hours. If this is not feasible, a buffer zone should be established around the work area where no building occupants are permitted. Building occupants should not be allowed to remain in the area where construction activities are in progress.

6. Re-Occupancy Criteria/Commissioning

Prior to reoccupation of the project area, the worksite should be cleaned until there is no visible haze in the air and no settled dust is found on surfaces – there should be low to no detectable odors upon re-occupancy.

The HVAC system should be restored to good operating conditions when odors and visible emissions have dissipated or otherwise been eliminated.

	What specific construction activities are likely to be source of chemical (vapor, odor, gases) or physical (dust, noise) pollutants?
	What occupied areas can potentially be affected by pollutants from the project activities?
	Are there especially susceptible occupants (elderly, asthmatic, pre-existing condition <i>etc.</i>) in affected areas?
	Have control options been identified and available control measures assessed?

Appendix

Pre-Planning Assessment Checklist