

July 4, 2009

## Indoor Air Quality Baseline Audit Report – Happy Building

An indoor air quality (IAQ) baseline audit was performed on June 4, 2009 at the Happy Building, in Erwinna, Pennsylvania to identify and remedy any potential indoor air quality problems.

### Background

The project team assigned one of their team members, Mr. Met, as the IAQ manager to conduct the audit and to be responsible for communicating IAQ-related issues with building occupants. Given that Mr. Met is working on the Happy Building's Building Operational Reports, it was natural for him to manage the IAQ audits as well. Mr. Met reviewed the modules of EPA's "Indoor Air Quality Building Education and Assessment Model (I-BEAM)," including:

- Fundamentals of IAQ in Buildings
- Diagnosing and Solving Problems
- Renovation and New Construction
- Managing for Indoor Air Quality
- Training Supervisors and Staff
- Establishing Written Plans and Protocols
- Establishing a Communications Program.

### Audit Procedure

After completing the education modules, Mr. Met conducted the baseline audit. Over the course of several hours, the manager reviewed the conditions of Happy Building's building exterior, HVAC systems, and indoor spaces. The audit criteria were adopted directly from the most relevant I-BEAM forms. The inspection focused on visual, auditory, and olfactory assessments of the building systems. Some mechanical inspections recommended by I-BEAM are covered by the building's Preventive Maintenance program and therefore were not duplicated during the IAQ audit.

The building exterior portion of the audit focused on:

- identifying flaws in the building shell
- problems with outdoor air intake and dampers in air handling units (AHU)
- general odors or pollutants emitted from outdoor sources

The HVAC component of the audit was the lengthiest and assessed:

- the mixing plenum and dampers in AHU
- filters
- cooling coils and condensate pans in AHU
- mechanical room
- air ducts and air plenums
- diffusers, grilles, and registers
- fans and fan chambers
- exhaust fans in special use areas
- terminal boxes
- fan coil unit, unit ventilator and induction units
- boiler
- chiller
- condensing equipment (cooling tower)
- elevator and stairwells

- the air compressor and pneumatic system

The indoor space portion highlighted general conditions, such as:

- air quality and flow
- thermal comfort
- lighting quality
- acoustics
- humidity
- floor and ceiling quality
- furnishings

Subsequent to the baseline audit, Mr. Met will reinspect the building exterior, HVAC systems, and indoor spaces on a quarterly basis to monitor the status of documented problems and evaluate new IAQ issues. The first ongoing audit will be conducted on November 5<sup>th</sup> 2009. The initial audit template was modified for these follow-up inspections.

### Results

The building shell, outdoor air intakes and dampers at AHU are well kempt and pollutants and unwanted air cannot infiltrate the building. In addition, there are no immediate exterior sources of pollution that will affect indoor air quality.

A handful of problems were found and all can be remedied at no or low cost within 60 days.

**Log of Problems and Remediation**

Date of Report	IAQ Problem	Remedy	Date Remedied
July 4, 2009	Excessive dirt/dust on several filters in air handling units	Replace filters	July 15, 2009
July 4, 2009	Clutter, including paint cans and tools, was found in the mechanical rooms	Remove clutter	July 7, 2009
July 4, 2009	Gaskets loose on door in boiler room	Replace temporary door	Replacement planned for July 15, 2009
July 4, 2009	Several ceiling tiles have stains	Replace all stained ceiling tiles immediately	July 7, 2009

Aside from these minor and easily-remedied issues, the IAQ systems were in very good shape and there were no abnormal noises or odors found. The equipment and indoor and exterior spaces were free of algae, mold and other pollutants.

### Communicating with Building Occupants

Happy Building uses a very simple and effective system for monitoring occupant air quality complaints. Occupants file complaints through the electronic work order system and safety observation program on the employee intranet. The system allows occupants to include details of the problems and even pictures or supporting documentation. Operating engineers complete the work orders in a timely manner, and employees can track the progress in solving the issue they reported. After they are remedied, every work order and IAQ complaint is electronically archived and accessible to all employees.