

Industrial Hygiene Case Study: Decontamination of Sick Building at Maryland State Highway Administration, Annapolis Engineering Office

Objective:

To identify, manage, and oversee the decontamination of fecal bacteria and mold contamination in the office spaces of the Maryland State Highway Administration (SHA) Annapolis Engineering Office. The goal was to ensure the safety of employees by eliminating the contaminants, repairing the affected areas, and reconstructing the office spaces to restore a healthy work environment.

Scope of Service:

KES was contracted by the Maryland State Highway Administration (SHA) to address and remediate serious indoor environmental quality (IEQ) issues within the Annapolis Engineering Office. The building had been suffering from a range of issues that contributed to it being identified as a "sick building," including the presence of fecal bacteria and mold contamination. KES was tasked with managing the decontamination process and overseeing the necessary reconstruction to restore the office space to a safe and healthy environment for employees.

Key Services Provided:

1. Initial Assessment and Hazard Identification:

- KES conducted a thorough inspection of the Annapolis Engineering Office to identify the sources and extent of contamination.
- The assessment revealed significant fecal bacteria and mold growth in several office areas, including high-traffic spaces such as the bathrooms, HVAC ducts, and areas with water damage due to leaks and poor ventilation.

2. Environmental Sampling and Analysis:

- Air and surface samples were collected to assess the levels of mold spores and fecal bacteria throughout the building. KES utilized both qualitative and quantitative methods to assess contamination levels.
- The results confirmed the presence of high levels of mold in several areas and fecal bacteria in bathrooms and HVAC systems, posing a significant health risk to employees.

3. Development of Decontamination and Remediation Plan:

- Based on the findings, KES developed a comprehensive decontamination and remediation plan that addressed the removal of mold, bacteria, and the underlying causes of contamination.

- The plan included recommendations for cleaning, disinfection, structural repairs, and air quality improvements to ensure long-term prevention of further contamination.

4. Decontamination and Mold Remediation:

- KES supervised the removal of mold and bacteria from the affected areas using proper containment methods to prevent cross-contamination. Work areas were isolated with plastic sheeting, negative air pressure systems were used to control air flow, and HEPA filtration units were employed to remove airborne particles.
- A combination of chemical cleaning agents and specialized HEPA vacuums was used to safely remove mold from surfaces. Fecal bacteria were neutralized through appropriate disinfectant treatments.

5. HVAC System Cleaning and Decontamination:

- Given the discovery of fecal bacteria in the HVAC system, KES managed the cleaning and decontamination of ducts and ventilation equipment. The system was thoroughly cleaned, sanitized, and inspected to ensure that no contamination remained in the air distribution system.
- Air filtration units were upgraded to improve ventilation and ensure the long-term air quality of the office spaces.

6. Structural Repairs and Reconstruction:

- After decontaminating and cleaning the affected areas, KES worked with construction teams to address the structural damage caused by water infiltration and mold growth. This included repairing damaged walls, flooring, and ceilings, and improving the facility's waterproofing to prevent future issues.
- Areas affected by water damage were reconstructed, ensuring that any structural weaknesses were corrected to avoid recurring moisture-related problems.

7. Air Quality Monitoring and Clearance Testing:

- After the remediation work was completed, KES conducted air quality monitoring and clearance testing to ensure that mold and fecal bacteria levels had been reduced to safe, non-detectable levels.
- Air sampling and surface wipe testing were performed to confirm that all contaminants had been successfully removed from the building.

8. Employee Safety and Communication:

- Throughout the process, KES worked closely with SHA management to ensure the safety of employees and minimize disruptions. Work was scheduled in phases to ensure that employees were not exposed to any airborne contaminants during remediation.
- KES provided regular updates to staff about the progress of the decontamination efforts and implemented a communication plan to keep employees informed about the steps being taken to improve their work environment.

Project Activities and Response Efforts:

1. Initial Investigation and Identification of Contamination:

- KES started the project by conducting a walk-through of the building to identify the sources of contamination and assess the severity of the issue. The presence of visible mold in several locations, coupled with reports of musty odors and employee complaints about respiratory symptoms, led to a detailed investigation into potential bacterial and fungal contamination.
- Fecal bacteria were identified in the restrooms and HVAC systems, while mold growth was found in areas with poor ventilation and water damage.

2. Containment and Isolation of Affected Areas:

- To protect employees and prevent the spread of contaminants, KES supervised the installation of physical barriers around the affected areas. These included using plastic sheeting to seal off work zones and setting up negative air pressure containment to keep mold spores and bacteria from entering uncontaminated areas.
- Additionally, air scrubbers with HEPA filters were placed throughout the building to capture airborne contaminants during the remediation process.

3. Mold and Bacteria Remediation:

- KES utilized proven mold remediation methods, including the use of fungicides and antimicrobial agents, to eliminate mold growth. In areas with significant water damage, materials such as drywall, carpet, and ceiling tiles were removed and replaced.
- For fecal bacteria, KES employed hospital-grade disinfectants and cleaning protocols to ensure that all surfaces, including high-touch areas such as doorknobs and light switches, were properly sanitized.

4. HVAC System Decontamination:

- KES focused on thoroughly cleaning the HVAC system to ensure that no mold spores or bacteria remained within the ducts. This included the removal of contaminated duct insulation, cleaning ductwork with specialized equipment, and replacing air filters with high-efficiency models to improve the air quality in the office.

5. Reconstruction and Long-Term Prevention:

- Once the mold and bacteria had been eliminated, KES worked with construction teams to address any structural damage caused by water leaks and mold growth. This involved repairing and replacing affected walls, flooring, and ceilings.

- The facility's moisture control systems were improved to reduce the risk of future mold growth. This included installing new vapor barriers, improving drainage around the building's foundation, and ensuring that ventilation systems were functioning optimally.

6. Final Clearance and Testing:

- Once all remediation and reconstruction work was complete, KES conducted a final round of air and surface sampling. The results indicated that bacterial and mold levels were well within acceptable limits, and the building passed all clearance criteria.
- Post-remediation air quality tests confirmed that the environment was safe for employees to return to work without risk of exposure to harmful contaminants.

7. Employee Health and Safety Considerations:

- KES implemented a clear health and safety plan, which included personal protective equipment (PPE) for workers during the decontamination process, as well as a plan for employees to return to the building once clearance testing had been passed.
 - KES also provided guidelines for maintaining a healthy work environment in the future, including recommendations for improving ventilation, moisture control, and routine cleaning to prevent similar issues from arising again.
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Program Results and Impact:

1. Successful Remediation of Contaminants:

- The decontamination of mold and fecal bacteria was carried out successfully, with no detectable levels of contaminants remaining in the building after remediation. The air quality was significantly improved, and the office environment was restored to a safe and healthy state.

2. Employee Health and Safety Restored:

- Employees were able to return to a much healthier working environment, free from the health hazards posed by mold and fecal bacteria. Reports of respiratory symptoms and discomfort among workers were significantly reduced following the remediation.

3. Long-Term Preventative Measures:

- By addressing the root causes of the contamination, such as water infiltration and poor ventilation, KES helped SHA ensure that the building would remain a safe work environment for employees in the long term. Improvements to the HVAC

system, moisture control, and building reconstruction will help prevent future contamination.

4. Compliance and Regulatory Assurance:

- KES ensured that all remediation efforts complied with federal and local environmental health regulations, including OSHA's standards for indoor air quality and mold remediation protocols.
- Clearance testing demonstrated full compliance with health and safety standards, assuring SHA that the building was safe for occupancy.

Conclusion:

KES's successful remediation of the sick building at the Maryland State Highway Administration Annapolis Engineering Office significantly improved the health and safety of the work environment. By identifying the sources of mold and fecal bacteria, managing the decontamination process, and overseeing the reconstruction efforts, KES ensured that employees could return to a clean, safe, and healthy office space. The project's success highlights KES's expertise in managing complex environmental health issues and providing long-term solutions for workplace safety.