C A S E S T U D Y

Indoor Environmental Health Quality Management by Saniservice

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The Swiss Concept of Indoor Environments

INDOOR SCIENCES

By Saniservice

This case study provides a comprehensive analysis of how Saniservice successfully resolved severe indoor air quality issues in a five-bedroom villa located in Jumeirah Golf Estate. The client, Mr. S. Firaz, sought assistance after his children experienced persistent health problems linked to environmental contamination. Through advanced diagnostic testing, rigorous remediation, and innovative preventive measures, Saniservice transformed the indoor environment into a safe and healthy space. This report includes detailed methodologies, results, and visual evidence of measurable improvements.

Introduction

Background

Indoor air quality is a critical factor in maintaining health and well-being, especially for children and individuals with pre-existing conditions. Poor air quality caused by mold contamination and airborne mycotoxins can lead to significant health issues. In this case, Mr. S. Firaz faced such challenges when his two children began experiencing chronic health problems—one with severe allergic reactions and the other with persistent coughing.

After consulting an allergist/immunologist, it was suggested that environmental factors might be contributing to their symptoms. Acting on this advice, Mr. Firaz initially engaged a general AC cleaning company to address potential indoor air quality concerns. However, despite their efforts, the children's symptoms persisted.

Frustrated by the lack of improvement, Mr. Firaz turned to Saniservice for a more specialized solution. Saniservice proposed advanced testing to diagnose the root causes of contamination and implemented a holistic remediation plan to restore healthy indoor conditions.

Objectives

The primary objectives of this case study are:

1. To document the diagnostic methodologies employed by Saniservice.
2. To detail the remediation process based on industry standards.
3. To evaluate measurable improvements in indoor air quality post-intervention.
4. To highlight the importance of preventive measures for long-term environmental health.

Diagnostic Testing and Initial Findings

ERMI Testing: Methodology and Results

The Environmental Relative Moldiness Index (ERMI) test is a DNA-based analytical method designed to quantify mold contamination within indoor environments. Dust samples were collected from various surfaces in the villa using sterile Swiffer cloths as per ERMI guidelines. These samples were analyzed in a specialized laboratory using quantitative polymerase chain reaction (qPCR) techniques to identify mold species and calculate an ERMI score.

The ERMI test revealed significant mold contamination with an elevated score of 8.2. Two specific species—*Aspergillus flavus* and *Aspergillus niger*—were identified as dominant contaminants. Both species are known producers of harmful mycotoxins.

Mycotoxin Testing: Methodology and Results

Mycotoxins are toxic secondary metabolites produced by certain molds that can either become airborne or adhere to dust particles within an indoor environment. To assess mycotoxin levels in the villa, air samples were collected using high-efficiency particulate air (HEPA) filters attached to specialized sampling pumps. The collected particulates were analyzed for specific mycotoxins using liquid chromatography-mass spectrometry (LC-MS).

The results indicated alarmingly high concentrations of:

- **Aflatoxin B1:** 120 parts per billion (ppb)
- **Ochratoxin A:** 90 ppb

These levels significantly exceeded safe thresholds established by environmental health standards.

AC System Inspection

A detailed inspection of the villa's air conditioning system revealed critical oversights by the previous cleaning company:

- While ducts and vents had been superficially cleaned, key components such as AC coils, drainage pans, and blowers remained heavily contaminated with mold.
- The presence of microbial growth within these components contributed to continuous recirculation of spores and toxins throughout the villa.

Structural Assessment

Further investigation identified water intrusion on a bathroom wall adjacent to the children's bedroom. Moisture accumulation had led to black mold growth under skirting boards—a hidden source of contamination that exacerbated indoor air quality issues.

Remediation Process

Mold Remediation Based on IICRC Guidelines

Saniservice conducted mold remediation in strict accordance with the Institute of Inspection Cleaning and Restoration Certification (IICRC) S520 Standard for Professional Mold Remediation:

1. **Containment:** Affected areas were isolated using polyethylene sheeting to prevent cross-contamination during remediation.
2. **Removal:** Mold-infested materials, including sections of drywall and skirting boards, were carefully removed and disposed of following hazardous waste protocols.
3. **Cleaning:** Surfaces were cleaned using HEPA vacuuming followed by wet wiping with antimicrobial solutions.

4. **Drying:** Industrial-grade dehumidifiers were employed to eliminate residual moisture from affected areas.
5. **Preventive Coating:** A proprietary anti-mold coating was applied to remediated surfaces to inhibit future fungal growth.

Comprehensive AC System Cleaning

Saniservice implemented a deep-cleaning protocol for the air conditioning system:

- Components such as blowers, drainage trays, and coils were dismantled for thorough cleaning.
- High-pressure steam cleaning combined with hospital-grade disinfectants was used to eradicate microbial contamination.
- The entire system was reassembled after ensuring all components were free from mold and debris.

Post-Intervention Testing

Results

Follow-up testing confirmed complete elimination of contaminants:

- **Aflatoxin B1:** Reduced from 120 ppb to undetectable levels.
- **Ochratoxin A:** Reduced from 90 ppb to undetectable levels.

The table below summarizes these findings:

Mycotoxin	Before Intervention (ppb)	After Intervention (ppb)
Aflatoxin B1	120	<1.0 (Not Detected)
Ochratoxin A	90	<1.0 (Not Detected)

Figure 1: Comparison of Indoor Environmental Quality Before and After Saniservice Intervention
This graph illustrates the drastic reduction in mycotoxin levels following Saniservice's intervention:

- **Aflatoxin B1**: Initially measured at 120 ppb, reduced to undetectable levels post-remediation.
- **Ochratoxin A**: Initially measured at 90 ppb, reduced to undetectable levels post-remediation.

Preventive Measures

Installation of Anti-Mold Air Sanitation System

To address potential persistence of airborne mycotoxins even after remediation, Saniservice installed an Anti-Mold Air Sanitation System in the children's bedroom. This system employs advanced photocatalytic oxidation (PCO) technology combined with HEPA filtration to:

- Neutralize residual mycotoxins that may become airborne during normal household activities.
- Prevent future contamination by continuously sanitizing indoor air.

Discussion

Persistence of Mycotoxins After Mold Remediation

While mold colonies can be effectively removed through remediation, mycotoxins may persist in dust or adhere to surfaces even after visible contamination is eliminated. These toxins can become aerosolized during routine activities such as vacuuming or walking on carpets, posing ongoing health risks.

By incorporating an Anti-Mold Air Sanitation System into its solution package, Saniservice addressed this often-overlooked aspect of indoor environmental health management. This proactive measure ensured that Mr. Firaz's children were protected from any lingering toxins while preventing future contamination.

Conclusion

This case study highlights the critical role of comprehensive diagnostics and targeted interventions in resolving complex indoor air quality challenges. By employing advanced testing methodologies, adhering to industry-standard remediation practices, and implementing innovative preventive measures, Saniservice successfully transformed a contaminated living space into a safe and healthy environment for its occupants.

For homeowners facing similar challenges, this case underscores the importance of engaging specialized services capable of addressing both immediate concerns and long-term risks. As

demonstrated by this intervention at Jumeirah Golf Estate, Saniservice sets a benchmark for excellence in indoor environmental health quality management.

This detailed case study demonstrates how measurable improvements in environmental conditions correlate directly with enhanced occupant health outcomes—a testament to Saniservice's expertise in delivering effective solutions for complex environmental challenges.

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