



## Environmental and Heritage Conservation Services

Environmental Building Solutions Ltd. provides independent scientific advice and analysis on building health problems, occupational hygiene, environmental monitoring, fungal, insect pest and damp problems in buildings, museums, bridges, ships, jetties and other landmarks. The services offered include:

### **Timber Decay and Stone Deterioration:**

Non-destructive Investigation, analysis and environmental control of dry rot, wet rots and wood boring insects and deterioration of stonework.

### **Damp Condensation and Moisture:**

Detection, analysis and advice on environmental management of rising damp, penetrating damp and condensation.

### **Mould Growth:**

Investigation, analysis, monitoring and environmental remediation of moulds.

### **Building Health:**

Sick building syndrome, allergy problems, legionella, mould, lighting, indoor air quality, and advice on the management of building health problems.

### **Occupational Hygiene:**

Dust, fumes, gases and vapours monitoring, noise and vibration monitoring, testing of local exhaust ventilation equipment, COSHH audits, staff training.

### **Environmental Monitoring:**

Monitoring of airborne pollution, monitoring of environmental noise and vibration, contaminated land sampling and analysis, air and water quality control.

### **Pest Management:**

Investigation of pest problems both inside and outside the building environment including e.g. pigeons, cockroaches, Pharaoh's ants.

### **Conservation Science & Environmental Monitoring:**

Short term and long term conservation monitoring and control of environmental conditions in buildings after fire, flood and general neglect supported by computer simulation/modelling tools.

### **Research & Development:**

Research into environmental monitoring and computer simulation/modelling techniques, building health, moulds, moisture and decay of building materials.

### **Litigation:**

A dedicated service for litigation matters covering environmental health, occupational hygiene, analysis of building defects, timber decay, mould and indoor air quality and preparation of independent reports and expert witness work

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## **Occupational Hygiene Services**

Environmental Building Solutions Ltd. provides independent scientific advice and analysis on occupational hygiene, health problems and environmental monitoring in workplace, commercial and industrial environments. The services offered include:

### **Occupational Hygiene**

Monitoring of airborne concentrations of dusts, fumes and gases in the workplace to assess compliance with the requirements of the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Evaluation of results and practical advice on any remedial actions necessary

### **Anthrax Management**

Advice and practical help in assessing the risks associated with anthrax contamination of animal hair in building fabrics. Building surveys to determine levels of contamination and advice for subsequent management of risks.

### **Local Exhaust Ventilation**

Measurement of the efficiency of local exhaust ventilation systems to ensure effective operation in accordance with the requirements of HS(G) 54 "Maintenance, Examination and Testing of Local Exhaust Ventilation"

### **Contaminated Land Assessment**

Comprehensive advice and investigation ranging from an initial desktop review of the site history to a full sampling and analysis study to assess contamination and the likely environmental impact associated.

### **Environmental Noise & Noise at Work**

Measurement of noise exposure in the workplace, to assess compliance with present and impending legislation. Advice and assistance to reduce noise levels provide appropriate hearing protection and safeguard the hearing of employees. Measurement of ambient noise levels for a variety of purposes such as nuisance assessment, preparation of planning applications or selection of control measures.

### **Air Quality Monitoring**

Comprehensive monitoring service for a range of contaminants to assess the acceptability of the environment for the particular situation. This may include perimeter monitoring to assess the likely impact of fugitive emissions from process sites, or the impact of engine exhaust emissions from transport systems.

### **Research & Development:**

Research and development work into occupational hygiene, environmental monitoring and indoor air quality.

### **Litigation:**

A dedicated service for litigation matters covering environmental health, occupational hygiene, mould and indoor air quality and preparation of independent reports and expert witness work

## Property Care

EBS has wide ranging experience in the conservation and preservation of buildings and offers expert multi-disciplinary advice supported by laboratory and computing facilities.

EBS approaches the control of timber decay organisms by the management of the building environment. This enables EBS to recommend the most up-to-date and cost effective conservation and preservation techniques.

Examples of the services offered are given below.

- Investigation into causes of decay of building materials, contents and Decorations
- Analysis of timber decay infestations, such as dry rot (*Serpula lacrymans*), wet rots, woodworm (*Anobium punctatum*), wood boring weevils and death watch beetle (*Xestobium rufovillosum*)
- Damp and decay analysis involving investigation of rising damp, penetrating damp, and damp proof courses
- Advice on insect and pest management
- Prevention of stone decay
- Preservation of wall paintings, books, museum and gallery specimens
- Non-destructive inspection techniques
- Inspection, ecology, monitoring and environmental control of decay organisms
- Monitoring the drying out of buildings after fire and water damage
- Advice on refurbishment of buildings after fire damage
- Conservation and preservation of historic Buildings

EBS offers advice on legal issues and an expert witness service in litigation cases in the above issues

# Environmental Monitoring – Sustainable Solutions to Conservation

Environmental Building Solutions Ltd. provides independent scientific advice and analysis on the environmental risk assessment, conservation and monitoring of historic buildings their structure, environments and contents.

EBS has wide ranging experience in long term monitoring, stabilisation and control of environmental conditions in buildings after fire, flood and chronic water ingress due to general neglect.

EBS environmental monitoring services include Weather Stations, Internal, External, Fabric and material monitoring, Environmental Data loggers, Moisture Profiling and Mapping.

Measured parameters include UV, Lux Levels, Temperature, Humidity, Dew Point, Vapour Pressure, mortar sample analysis, moisture content of timber and masonry.

Data from both short term and long term monitoring is analysed and can be used by EBS, where necessary to recommend a range of measures, which can be implemented to achieve optimum environmental conditions.

This could include installation of a permanent monitoring system by an independent company, if necessary to link up with the BMS system, which could alter the environment within the building. This is particularly applicable in historic buildings, Museum and Galleries, Castles, Libraries and Archives.

Current Projects Includes

- Cardiff Castle, Cardiff, Wales
- Farmleigh House, Dublin, Ireland
- Mont Orgueil Castle, Jersey, Channel Islands
- National Library of Scotland, Edinburgh, Scotland
- Dover Castle, Dover
- Crown Prosecution Services Head Quarters, London
- Royal William Yard, Plymouth

Environmental monitoring allows for a cost-effective, long-term holistic solutions to environmental stabilisation of the historic fabric and contents.

# Building Biology and Environmental Health Problems in Buildings

EBS provides expertise in the investigation of sick buildings by carrying out surveys on internal and external environmental conditions as follows.

## Indoor Environment

- materials - formaldehyde, solvents, mineral fibres and pesticides
- construction - airtightness and energy conservation vs ventilation for occupants and fabric
- services and controls - thermal comfort, air conditioning, and control of indoor micro climate
- spatial arrangement - building layouts, ceiling heights and volume of space per occupant
- occupants - occupant activities, moisture and pollutants
- lighting levels, noise, radon

## Outdoor Environment

- global pollution - SO<sub>x</sub>, CO<sub>x</sub>, NO<sub>x</sub>, O<sub>3</sub>, CFC emissions and pesticide residues, natural hazards - radon

## Environmental Health Surveys

- management - advice on stress and illnesses in the built environment
- medical - human defence mechanisms; enzyme detoxification, immune and physiological responses
- psychology - psychological, perceptual and behavioural aspects of the built environment

## Health, Hygiene and the Environment

- management of insect pests in domestic, office and industrial premises
- environmental effects of pesticides
- management of structural-threatening insect pests
- assessment of biological and chemical health hazards in buildings
- management of house dust mite, fungi and mould infestations and allergy problems in buildings, epidemiology and environmental assessment

EBS offers advice on legal issues and an expert witness service in litigation cases in the above issues.

## **Environmental Remediation of Moulds, Mites and Environmental Health Surveys**

Environmental Building Solutions Ltd (EBS), provides independent scientific advice and analysis on biological contaminants in buildings.

The investigation, analysis, identification and remediation of environmental health problems caused by biological contaminants require a multidisciplinary approach. It combines the skills of experienced building mycologists and pathologists, environmental health scientists, and specialists in the environmental monitoring of condensation, moisture and damp in the building fabric. EBS has in-house scientists and specialists in these fields.

A thorough knowledge of the biology, ecology, physiology and epidemiology of moulds and mites is a pre-requisite for an accurate assessment of the problem in the indoor environment. A complete house dust mite, mycoflora and environmental investigation is carried out using air samplers and a range of hand held instrumentation and equipment. This is then followed by laboratory analysis to identify and count microbial contaminants.

EBS approaches the control of moulds and mites in buildings by the management of the building environment. The infestation is controlled by an environmental micron high degree filtration system. This system removes 99.76% of fungal spores from the affected areas. The micron filtration system is tested to the IEC 312 filtration standard.

A technical report is prepared to identify whether the premises are prejudicial to health or not.

Detailed recommendations and specifications can be provided for the long-term solution of any problems discovered.