GUIDANCE NOTES - CONTAMINATED SITES

INTRODUCTION

It is becoming more common for redevelopment to be carried out on sites where the previous usage has left some form of contamination. The following are some of the industries, which were or are large-scale producers of contamination:

1. Asbestos;
2. Chemical and allied products;
3. Dock areas;
4. Explosives;
5. Gas works;
6. Metal smelting, refining, treatment and finishing;
7. Mining and extraction;
8. Oil production and storage;
9. Paints and graphics;
10. Pharmaceuticals;
11. Pesticides;
12. Railway storage areas and yards;
13. Scrap yards;
14. Sewage works;
15. Steelworks;
16. Tanning and associated trades;
17. Waste disposal;
18. Wood treatment and preservatives.

Each contaminated site shall be individually surveyed and assessed and safe working procedures drawn up for the specific hazards of that site. These safe systems shall include:

MINIMISING OF EXPOSURE

There are a number of techniques that can be used. These consist of:

1. Placing a barrier layer of material, if specified, as soon as possible;
2. Avoiding entry, where possible, below the ground level by designing foundations, drainage and other services so that the work can be performed from above ground or near the surface;
3. Providing suitable protective clothing for all exposed person;
4. Providing adequate washing and changing facilities;
5. Locating stores and offices away from the contaminated area to reduce the numbers of those at risk;
6. Instructing all personnel on the dangers from the contamination on site;
7. Programming the ground works, where possible, so that they are not carried out in dusty conditions, or damping down the area to prevent or reduce the dust;
8. Prohibiting smoking, eating and drinking on the site.

There are also specific precautions that are necessary for the handling of certain substances, such as asbestos and lead and the relevant section of this manual shall be consulted.

Where any doubt is experienced as to the method of minimising or reducing exposure expert advice shall be taken.

TOXIC OR HARMFUL GASES

If entry into trenches over 1.5m deep cannot be avoided, the following procedures shall be adopted on all sites where toxic or harmful gases are present:

1. A permit to work system shall be established;
2. The area shall be ventilated;
3. Monitoring for gases shall be carried out;
4. Protective clothing and breathing apparatus shall be provided where required;
5. Rescue equipment shall be provided.

Reference shall be made to the sections titled “Confined Spaces” and “Permits to Work”.

CONTAMINATED BUILDINGS

Where contaminated buildings are on site, they shall be cleaned of contamination prior to any other work commencing within the buildings.

CONTAINMENT OF CONTAMINATION

Where the dust from the site is likely to be contaminated, dust monitoring and wetting down of the site shall be carried out.

The site boundary shall be located, where possible, at a sufficient distance from the source of the contamination to ensure that contamination leaving the site is at acceptable levels.

Vehicles, which may be contaminated, shall be washed down before leaving the site.

MONITORING OF EMPLOYEES

If employees are likely to be absorbing any of the chemicals on site, an occupational physician, as recommended by the Employment Medical Advisory Service, shall carry out medical examinations. All records of these medicals shall be confidential and copies shall be forwarded to EMAS for retention on their data bank.

AUTHORITIES AND ADVISORY BODIES

Prior to work commencing on a contaminated site the following authorities and/or advisory bodies shall be consulted, where appropriate:

1. Health and Safety Executive;
2. Local Authority Environmental Health Department;
3. Local Authority Waste Disposal Department;
4. Interdepartmental Committee of the Redevelopment of Contaminated Land, Department of the Environment, 43 Marsham Street, London SW1 3PY.

DANGEROUS GOODS SAFETY ADVISER

Depending on what type and quantity of contamination is in the soil that is being removed from site the carrier may have to employ the services of a dangerous goods safety adviser if they do not have one appointed in house.

PRECAUTIONS TO BE ADOPTED BY SITE PERSONNEL

In order to reduce the risk of contact with the contamination on site, all site personnel should adopt the following precautions:

1. Wear suitable PPE including respirator to BS EN 149, chemical goggles to BS EN 166/b5 and impervious gloves, disposable overalls etc.
2. Ensure scrupulous personal hygiene.
3. Operatives must wash prior to eating, drinking, smoking or going to the toilet.
4. Operatives must decontaminate (change clothes and wash) prior to coming into contact with others.
5. Overalls to be considered as contaminated waste.

GUIDANCE NOTES - HAZARDOUS SUBSTANCES (CONSTRUCTION)

INTRODUCTION

Hazards in the construction industry can be divided into two main areas, “Physical Hazards” and “Health Hazards”. This section looks at the health hazards from situations in which internal damage to employees can be caused, involving, for example, disorder or malfunction of the lungs, stomach, ear or brain.

HAZARDOUS DUSTS, FUMES, GASES AND VAPOURS

In the construction industry, substances harmful by inhalation are usually in the form of dusts, fumes, gases or vapours.

It should be noted that smoking increases the health risks associated with inhalation hazards. This has particular importance where there is a risk of lung disease or cancer. Active measures shall be taken to promote awareness of this fact to all levels of employees.

It is a legal requirement under the Control of Substances Hazardous to Health Regulations to assess the extent of the risk prior to permitting anyone to enter or work in an area where such hazards exist. For example an assessment may reveal that it is necessary to provide adequate natural ventilation, however, in many cases, the assessment will initially have led to an evaluation of both the amount and concentration of the hazardous substance present in the atmosphere, which in turn would have resulted in implementing controls for entry into the area, the provision of forced ventilation and/or extraction, the monitoring of the atmosphere and the provision and use of respiratory protection.

In a confined space an assessment of the oxygen content to ensure that the oxygen levels are within the range of 18% to 21.5% and the possibility of the atmosphere being explosive or flammable shall be carried out.

Entry into any area where the atmosphere is unsafe shall be strictly controlled and supervised, and the necessary safety precautions shall be laid down and strictly complied with.

If, after all reasonably practicable steps have been taken to ensure adequate ventilation, the hazard still exists; the use of respirators or breathing apparatus shall be necessary. The type of respiratory protective equipment (RPE) required needs careful evaluation if the correct and most cost-effective choice is to be made. Respirators shall not be worn in oxygen deficient areas; only breathing apparatus that are self contained or fed by an airline shall be used.

The Certificate of Approval, issued annually by the Health and Safety Executive, lists the types of RPE approved for use in conjunction with specific legislation, such as the Regulations applicable to lead and asbestos. The types of RPE available may be suitable for the filtration of a variety of substances - the suitability shall be checked with the manufacturers or suppliers of the equipment.

Adequate instruction and training shall be given to all those required to use RPE, both in use, hazards and rescue procedures.

All dusts, gases and fumes shall be regarded as hazardous to health until such time as evidence to the contrary is provided.

Most of the damage and toxic effects take place once the dusts, etc., reach the deep lung spaces and those particles that are small enough to reach these areas are regarded as "respirable" dusts. Airborne dusts that do not contain substances recognised as being hazardous to health are regarded as "nuisance" dusts.

Dusty conditions are common on construction sites especially in dry and windy conditions, and when the operations involve blasting, excavating, plastering, batching, crushing, demolition and the cutting or breaking of materials. Where possible the dusts shall be cleaned up as they are created and dust-inhibiting measures, such as damping down surfaces, vacuum cleaning and the exhaust ventilation of power tools, shall be taken.

Typical dangerous dusts found on construction sites are:

Asbestos

In demolition and refurbishment, old asbestos in the form of lagging, sprayed coatings and insulation boarding (including old ceiling tiles) are often encountered. Asbestos cement products are frequently used in new construction as well as being found in older buildings.

There are two main safety hazards associated with asbestos:

1. Asbestosis: This may result from working with all types of asbestos. It is a chronic industrial lung disease, slow in onset leading to increasing breathing difficulties and eventual respiratory disablement. It is dose related and results from a long exposure,
2. Mesothelioma: This is resulting from the inhalation of asbestos. This is a specific and serious form of cancer only found after exposure to asbestos and affects either the lining of the lung cavity or the abdominal wall.

Hardwood Dust

This is caused through sawing, routing, moulding, carving and sanding.

The hazards associated with this form of dust are dermatitis, asthma, skin irritation and severe irritation to the eyes and respiratory system.

When this causes a problem, adequate ventilation must be provided and gloves worn to prevent skin irritation.

Man-Made Mineral Fibres

These fibres are widely found in use as a replacement for asbestos and in the form of fibreglass insulation in lofts and other areas.

There is, at present, little evidence to indicate that these fibres are a cause of cancer, nevertheless their inhalation is to be avoided. All the fibres can result in dermatitis.

Typically the precautions entail the wearing of tightly woven Terylene, or similar, overalls, impervious gloves and Approved respirators.

Plaster, Mortar and Cement

Cementitious materials contain lime. When dry, this affects the respiratory system, as well as causing burns to the eyes and skin. Where dust is present dust respirators shall be used along with eye protection and the skin shall be protected.

When wet the skin shall be protected either by gloves or with the use of barrier creams.

Silica and Quartz Dust

Large quantities of silica bearing rocks are crushed for the production of aggregates to make concrete. There are hazards, not only in the crushing operation, but also in the batching of the aggregates, the abrasive cleaning of buildings and the drilling or scabbling of concrete.

The major hazard is that of silicosis, the effects of which are the same as asbestosis. The precautions to be taken are, where appropriate, the use of “wet” methods of work, total enclosure of the work area, exhaust ventilation, RPE and the segregation of other workers.

The majority of gases and vapours have a toxic effect and inhalation usually results in rapid absorption into the blood stream. Others may have the effect of reducing the percentage of the oxygen in the atmosphere, producing the effect of suffocation.

All construction workers are exposed to exhaust gases from vehicles and machinery. Generally these gases are only dangerous in confined spaces, such as tunnels, sewers and manholes - however, they can be of nuisance value. Oil mists can also be created by the exhaust of pneumatic tools and can build up in a confined space or poorly ventilated area and can cause nausea.

The use of chemicals with potential toxic properties is increasing in construction. Solvent fumes can be given off by drying paint, lacquers and adhesives. They are frequently heavier than air and can build up in confined spaces, displacing the oxygen. Polymer resins give off styrene and glues and foams can give off isocyanates.
Some of those commonly encountered on construction sites are:

Isocyanates

These are used in adhesives, insulation foams, paints and varnishes. The most hazardous operation involving isocyanates is the spraying of foam compounds in which isocyanates are present.

They act as an irritant to the respiratory tract and may cause sensitisation (leading to asthma), dermatitis and damage to the eyes.

The precautions include the wearing of protective clothing, to prevent skin contact, the provision of exhaust ventilation and, where necessary, the provision of full face breathing apparatus.

Liquefied Petroleum Gases

Though we are usually well aware of the hazards connected with LPG it is not usually appreciated that the use of LPG space heaters in confined areas can, without adequate ventilation, cause a deficiency of oxygen in the atmosphere, resulting in asphyxiation. Propane and butane have a narcotic effect as well as presenting a risk of explosion.

When using LPG there shall be adequate high and low level ventilation, some equipment must be fitted with an individual flue.

Solvents

Solvents normally give off vapours and can be flammable and explosive. These are frequently found in paints, adhesives, paint strippers, varnishes, mastics, surface coatings etc. The inhalation or absorption through the skin of solvents can result in impaired judgement, excitement, dizziness, followed by confusion and unconsciousness. Various long-term effects may follow. Other effects can be skin irritation and headaches. The risk is greater when the solvents are used in confined spaces or poorly ventilated areas. Contact with the skin can also result in dermatitis.

Whilst in use the area shall be well ventilated, if in a confined space air monitoring shall be carried out and breathing apparatus must be used. Skin contact shall be avoided and impervious clothing is to be worn where appropriate. Smoking, eating and drinking are prohibited in the working area and good personal hygiene practices shall be followed.

SUBSTANCES HAZARDOUS IN CONTACT WITH THE SKIN AND MUCOUS MEMBRANES

Many fumes and dusts can be harmful in contact with the skin and mucous membranes (e.g. eyes and nasal passages). There are also many equally harmful chemical based products.

The most common hazard in the industry is occupational dermatitis. Occupational dermatitis is neither infectious nor contagious, but will continue for as long as the sufferer is in contact with the offending substance and often long after. If a person is allergic to the substance it is not safe for him to handle that substance at any time.

There is a great difference in people's reactions to substances - the number of different materials known to cause dermatitis runs into hundreds. The following list includes some of those most commonly found on site:

1. Pitch, tar and bitumen;
2. Brick, stone and plaster dust;
3. Cement;
4. Paints, lacquers, stains and varnishes;
5. Woods;
6. Epoxy resins;
7. Acrylic and formaldehyde resins;
8. Chromates present in primer paints, cement, etc.;
9. Petrol, thinners, white spirit, etc. and
10. Acids, alkalis.

It is not possible to give a detailed list of the causes and effects due to the large number of materials concerned and the different reactions shown by people to these materials.

The incidence of occupational dermatitis can be reduced on sites by the provision of protective clothing to prevent contact with the material, personal hygiene to remove the material from the hands once contact has been made and by the provision of commercial barrier creams.

SUBSTANCES HAZARDOUS BY INGESTION

The hazards of such substances are not always obvious and poisoning still occurs on construction sites. In the majority of cases the hazard shall be eliminated or reduced by one or more of the following:

1. Using substitute materials which are safer or less toxic;
2. Ensuring that employees are aware of the hazard when using substances;
3. Establishing, and instructing employees on, the safe system of use of toxic substances;
4. Ensuring that all substances are correctly and clearly labelled;
5. Prohibiting drinking, eating and smoking in areas where toxic substances are stored or used;
6. Promotion of a personal hygiene programme and health education;
7. Provision of the correct personal protective equipment and ensuring its use.

GUIDANCE NOTES - SOLVENT CLEANING FLUIDS & ADHESIVES

INTRODUCTION

Solvents can have serious, even lethal, effects on workers' health. Some are also flammable and explosive. Proper handling is essential to avoid risks, particularly in confined spaces.

Solvents are liquids commonly found in paints, paint strippers, lacquers, varnishes, mastics, glues, surface coatings and in thinners and other associated cleaning materials.

Manufacturer's labels and data sheets give specific health and safety precautions for using, transporting and storing their products. These are to be read carefully and the manufacturer's instructions followed.

All such substances are subject to the COSHH Regulations and suitable assessments of the hazard involved be made. The findings of those assessments are to be followed and those operatives who may be affected informed of the findings.

HEALTH EFFECTS

Serious health effects can result from even a short period of exposure to high concentrations of solvents or from longer periods exposed to low concentrations.

Solvents enter the body by:

1. inhalation of vapour or mist. This is always possible where solvents are handled. Deliberate abuse of solvents, e.g. "glue sniffing", has lead to a number of deaths of those taking part in this activity.

2. ingestion (swallowing) of solvents. Deliberate ingestion is rare, however, accidental ingestion of solvents on contaminated foods, etc., can occur.

3. skin contact. Some solvents are absorbed through the skin with effects similar to those experienced with inhalation. With many solvents, skin contact can result in dermatitis.

The common symptoms that occur with exposure to solvents are:

1. Stinging eyes;

2. Nose irritation;

3. Headache.

More serious symptoms include:

1. Initial excitement;

2. Impaired judgement;

3. Dizziness.

Followed by:

1. Confusion;

2. Sleepiness;

3. Unconsciousness.

Various long-term effects can follow.

PRECAUTIONS

Avoid the inhalation of vapours and be alert to the possible abuse of solvent-based products by other employees.

The inhalation risk is greatest when solvents are used in confined spaces. Natural ventilation should be utilised, where possible, by opening any doors and windows. If this is insufficient, forced ventilation is to be supplied.

To prevent the ingestion of solvents, they are not to be placed or left in any drinks container or other unmarked or incorrectly marked containers. After handling solvents, hands must to be washed, especially prior to the consumption of any food stuffs or smoking.

Avoid skin contact with solvents, they are never to be used to clean the hands or skin. Where large amounts of solvents are being used, impervious clothing will be provided.

The carrying of cigarettes in any work area where solvents are being used is forbidden.

Should any one feel that they have been over-exposed to solvents they are to seek medical attention immediately.

STORAGE

Materials containing solvents are to be stored, in a dry, cool and well ventilated area and sealed in their original containers. Smoking is prohibited in this area.

PROTECTION

Where it is practical to do so, operatives will wear impervious gloves and goggles or eye shields, whilst using solvent based materials.

FIRST AID TREATMENT

The following is the basic first aid treatment for solvent exposure:-

1. eyes:- wash copiously with running water and seek medical attention;

2. skin:- wash with soap and water and apply hand cream, if a rash develops, seek medical attention;

3. swallowing:- wash out mouth with water and seek medical attention immediately;

4. inhalation:- remove the affected person to the open air and seek medical attention.

GUIDANCE NOTES - SPRAY PAINTING

INTRODUCTION

The hazards from this type of painting are potential irritation of the eyes and respiratory system and dermatitis. Therefore, protective equipment as detailed shall be provided to, and worn by, all operators who are involved in or working near paint spraying.

EYE PROTECTION

Goggles or face shields, manufactured to BS EN 166, shall be supplied and worn at all times whilst spray painting or working adjacent to spray painting.

The goggles or face shields are to be kept clean; all paint splashes being removed with soap and water. The use of solvent will, generally, damage eye protection.

RESPIRATORY PROTECTION

Respiratory protection, in the form of facemasks, shall be provided and is to be worn whilst spray painting or working adjacent to spray painting. These facemasks shall take the form of disposable cup masks or respirators with disposable cartridges.

When spraying in a confined area positive ventilation, or self-contained or air line fed breathing apparatus, shall be provided. Self contained or air-fed breathing apparatus shall only be worn by persons trained and competent to do so.

PROTECTIVE CLOTHING

Protective clothing, in the form of coveralls, shall be provided and worn, whilst spray painting. These shall be regularly cleaned and shall be replaced as and when necessary.

SKIN PROTECTION

Gloves or barrier creams are to be used whilst spray painting.

Barrier creams are to be applied before work starts and reapplied after washing.

SPILLAGE

All spillage of paint is to be cleaned up immediately, using clean cloths and water or thinners. On no account is any spillage to be allowed to dry.

SPRAYING EQUIPMENT

If compressors are used to supply air for spraying they are to comply with the requirements as detailed in the section “Compressors and Pneumatic Tools”.

If electrically operated paint sprayers or portable electric hand tools are used, they are to conform to the requirements as detailed in the section “Electrically Operated Tools”.

FIRST AID

Eye wash bottles, containing sterile eye wash solution, are to be available whenever spray painting is undertaken. If paint enters the eyes, they are to be washed immediately with copious amounts of eyewash. Medical attention is to be immediately sought, if the paint cannot be removed easily. Details of the paint and thinners used are to be given to the medical practitioner.

GUIDANCE NOTES – BIOLOGICAL HAZARDS/NEEDLES & SHARPS

BIOLOGICAL HAZARDS

Biologically hazardous agents are living micro-organisms capable of causing disease or harm.

Pathogenic micro-organisms have special adaptations allowing them to colonise a host and cause disease. Other organisms are opportunist pathogens and are able to cause disease in debilitated hosts or those with immune deficiencies.

The occupational acquired infections which are normally associated with discarded needles and sharps are Hepatitis B and HIV infections.

Control of Exposure

Where employees are exposed to discarded needles and sharps or other material that may be contaminated with human secretions, the following precautions must be adopted:

1. Keep cuts and abrasions covered with an impervious dressing;
2. Wear heavy duty, impervious gloves to protect the hands whilst collecting the sharps, etc;
3. Segregate the needles and sharps from other rubbish in a disposable plastic container;
4. Dispose of the container and its contents by contacting the local authority's Environmental Health Department;
5. Ensure a strict hygiene culture is enforced prior to eating, drinking, smoking, etc.

First Aid

If discarded needles and sharps are found accidentally, then work in that area is to be suspended until the debris has been cleared. Should a worker receive a cut or puncture wound from a needle or sharp, then he is to inform his Medical Practitioner at the earliest opportunity.

Information and Training

Where work is to be carried out in an area known to be contaminated with discarded needles and sharps, then all employees are to be made aware of the precautions to be adopted and the potential hazards associated with this kind of debris.

AIDS

AIDS (Acquired Immune Deficiency Syndrome) is a disease caused by a virus that attacks the body's defence system, allowing illnesses and infections, which would not otherwise have occurred, to develop. The virus can be transmitted by injection or inoculation with infected blood.

The disease is not transmitted by normal social contact and, normally, the AIDS virus survives only for a very short period outside the body.

Where there is a risk of contamination, heavy-duty gloves and overalls should be worn as protection against cuts; suspected items should be removed by tongs and placed in puncture proof bins for disposal.

The COSHH Regulations require employers to ensure that exposure of employees to substances hazardous to health is either prevented or, if this is not reasonably practicable, adequately controlled.