

HEALTH AND SAFETY.



TUNBRIDGE WELLS ROOFING LTD



Work on Roofs

Working on roofs gives rise to a substantial number of fatal and serious accidents each year. In fact almost one in five construction deaths occur on roof works. Over a typical three year period, eighty people were killed in falls from fragile roofs or from roof edges. Most of these accidents could have been prevented by the identification of hazards and by the provision and proper use of readily available equipment.

As a high risk activity it is important that any roof work operation is pre-planned. As falls are the major cause of accidents, precautions must be taken either to prevent a person from falling or if this is not practical to prevent the fall leading to serious injury.

The particular hazard of each job and the best means of overcoming them, must be considered so that a safe method of work can be established. In complex jobs it may be appropriate for a detailed written method statement to be prepared. The system of work should take into account not only persons involved in the work but others who might be affected such as employees of other contractors and members of the public.

Roof work includes not only its original construction, but also its maintenance, such as replacing sheet or tiles, chimney repairs and gutter cleaning. Maintenance is often carried out by persons with little experience of roof work, which makes it all the more important for a safe system of work to be established and followed.

Ladders

Ladders should be placed at an angle about 75 degrees to the horizontal i.e.. about one metre out for every four meters in height. They must be long enough for the job extending to a height of one metre and fifty millimeters above the landing place, unless there is an alternative hand hold. A ladder should be secured as near as practicable to its upper resting place or where this is not possible or near its base. Care must be taken to ensure that the support for the top of the ladder is strong enough to withstand the thrust imposed.

Tower Scaffolds

The height of a tower's working platform in relation to the width of the base is critical. For proprietary towers, manufacturers instructions must be strictly followed. Such recommended safe ratios will not apply if the tower is exposed to more than light winds, in which case physical ties must be used. Mobile towers must have wheels which are positively secured to the upright and each wheel should have a locking device to be applied when the tower is stationary. Towers should be moved only by pushing or pulling of the base and never when a person is on the scaffold.

Independent Scaffolds

In addition to providing access and a working platform around the edge of a roof, scaffolding may also be used to prevent falls of persons and materials from the edge of a roof and , if specifically allocated, to provide a storage area for materials. If specific areas have not been provided, do not store materials on a scaffold as they prevent safe passage around the working area and pose a serious trip hazard.!

Flat Roofs:

Roofs with a pitch of less than ten degrees may be considered to be flat. Toe boards at least 150 millimeters high and guard rails not more than 765 millimeters above the top of toe boards and 910 millimeters to 1.150 meters above roof level are required at any point where a person could fall more than two meters. Where it is necessary for a person to kneel or crouch near the edge of a roof an intermediate guard rail should be provided unless other precautions such as the use of a safety harness are taken.

On a larger roof where work does not have to be carried out at or near the edge a simple barrier consisting of cross scaffold tubes supporting a tubing guard rail may be used to limit the extent of the working area. Such barriers should be positioned at least two meters from the edge and work should be closely supervised to ensure that persons do not go outside the designated area.

All openings in roofs must be protected by guard rails or toe boards or by substantial covers which must either be fixed or suitably marked, for example, hole below. It is strongly recommended that covers are both fixed and marked.

Roof Ladders

On most sloping roofs, suitable roof ladders or crawling boards are essential. For minor maintenance work or inspection, where work is of a short duration and protection is not provided, roof ladders should always be used

Roof ladders and crawling boards should also be purposely made for the job and should not be made up from odd timber on site. They should be strong enough to support persons when spanning across these supports of the roof covering and should be secured or so positioned as to prevent movement. The anchorage on the top of the ladder should not rely on the ridge capping. Which may break away from the ridge or in the case of half round ridge tiles prevent an anchor board from getting a good grip. The anchorage should wherever possible bear on the opposite slope by means of a properly designed and manufactured ridge iron or be secured by other means such as a rope.

Non Fragile Industrial Roofs

A significant number of accidents occur during the fixing of non-fragile industrial roof sheeting.

Falls from these and gable ends of the building should be prevented by the provision of suitable guard rails and where there is no suitable existing upstand, toe boards. If gutters are used for access before decking is laid, guard rail protection should be provided.

Falls can occur at the leading edge created during sheet laying and the feasibility of using safety nets throughout the operation should be carefully considered.

Where the continuous use of safety nets is not practicable, steps must be taken to minimize the risk of falls by planning a system of work which avoids the need to leave or step out over an unprotected area. This may entail the provision of a suitable working platform on the purlins and or the use of safety harnesses attached to suitable anchorages for certain stages of the operation.

Light weight staging's can be used to provide protection at the leading edge while work is done on the decked area. They can also be used to help prevent the need to lean or step out over an unprotected area. Care must be taken in the positioning of staging's so that they do not dangerously overhang their support. Consideration must also be given to the means of moving staging's as the work progresses. Proprietary purling trolley devices are available which enable staging's to be moved along the purling and to be joined end to end. Where staging's are used as a walkway or as a working platform, guard rails and toe boards must be fixed at the edge away from the roof decking, staging should also be secured against the risk of tipping if a person leans on the guard rail. Working platforms must be at least 600 millimeters wide.

Non fragile industrial roofs often contain a fragile component such as a rooflight and these should be covered, or protected by suitable barriers during planning operations.

Materials should be transferred to the roof by a suitable mechanical handling device, such as an inclined hoist. The stacking of materials on a roof before work starts should be avoided as it causes access problems and could overload the structure. If materials have to be stacked on the roof, a working platform should be provided to allow unloading and handling to be carried out safely.

Fragile Roofs

Falls through fragile roofing material are one of the major causes of fatal accidents in the construction industry. It is a particular problem in maintenance work where over one quarter of deaths arise from this cause.

Before any roof is used as a means of access or as a place of work during any operation, whether construction, repair, maintenance or demolition, it is essential to identify parts covered with fragile material and decide on the precautions to be taken.

The appearance of some roof coverings is misleading and can give a false sense of security to those who are walking on or passing across them. Although such coverings may be capable of carrying significant distributed loads and appear solid they will not in fact carry a concentrated load such as that applied by the heel of the person walking, or by a person stumbling and falling. For example, asbestos and non-asbestos cement sheeting, unless reinforced and of sufficient thickness is liable to shatter without warning under a person's weight. Any sheeting may become more brittle with age, chemical or environmental attack and even corrugated steel sheet will become fragile due to rust. There is a mistaken belief that on a fragile roof is safe to work along the line of a roof bolt above the purlins, in reality this is akin to walking a tight rope and one false step or loss of balance can lead to disaster.

The following are some of the materials which have been classified as fragile under drop tests carried out by the health and safety executive to simulate the impact of the human body.

[It should be noted that the tests were carried out on new sheets]. They are asbestos and non asbestos cement sheets below nine millimeters in thickness, asbestos and non asbestos cement sheets, sprayed with polyurethane foam insulation, 38 to 50 millimeters thick, profiled acrylic sheet, 3 millimeters thick, plain and wide PVC sheeting, flat or profiled, 2 to 3 millimeters thick, single PVC sheet, curved in section, 4 millimeters thick, Square pyramid PVC roof flight, 600 by 600 millimeters on plan, 2 millimeters thick, Asbestos cement reinforced with glass fibre mats, curved in section, 9 millimeters thick, Chipboard non structural grade or where affected by water, 19 millimeters thick, Wood wall cement sheets and slabs, 15 millimeters thick or below, Bitumen impregnated compressed fibre board, 20 millimeters thick.

Problems can also arise where a non-fragile roof has been repaired with fragile material which may not easily be recognized under paint or tar coating. Plastic roof lights may similarly be disguised by age or paint and it is important that these points are borne in mind by persons carrying out roof surveys.

On roofs covered by fragile material roof ladders or crawling boards must be used. The number of boards or ladders required will depend on the nature of work and the type of roof and access to it and the number of persons carrying out the work. A person must never have to step onto a fragile roof to move a board or ladder, an absolute minimum of two boards or ladders should be provided but more will normally be required. Scaffold boards are sometimes used as crawling boards, but they are liable to rock if laid along roof corrugations or on projecting bolts and they are normally only 225 millimeters wide. If scaffold boards are used, there must be a sufficient number to provide safe access and they should be secured against movement. Purpose made staging's or roof ladders are therefore preferred.

During the laying of fragile roof sheets, staging's positioned in front of the leading edge can provide protection against falls. The planned method of work should cover the way in which such staging's are used and moved. A system where bolts can be used from above should be used where possible.

Where a valley or parapet gutter of a fragile roof is used for access, protection against falling through the fragile material must be provided. This may be achieved by means of rows of scaffold board supported by pieces of timber or, alternatively, the use of a safety harness connected to a taught wire system, might be considered. Where access is needed on a regular basis, the installation of a permanent means of protection should be considered.

Any fragile roof, except where the material consists wholly of glass must have warning notices prominently and permanently displayed at the approaches to the roof. Such notices are available from safety sign suppliers.

Protection of the Public

Members of the public must be protected from the hazards of any falling material during roof work operations. This may entail the provision of brick guards, fans or other similar precautions. It may also be necessary to lay sheeting or boarding to prevent material falling through gaps in the working platform, or between the working platform and the building. Barriers at ground level may also be necessary. Particularly stringent precautions should be taken where children are at risk.

Waste materials should be lowered in skips or baskets or disposed of through enclosed debris chutes. The practice of throwing such material from the roof or scaffold must be strictly Prohibited.

ESSENTIAL PRACTICES FOR EVERY CONTRACT

Before each contact starts and before each shift starts the following considerations should be made,

Check the COSHH statement for the material being used and the specific risk assessment for the contract you are on.

- a. Requirements for roof edge protection.
- b. Safe use of scaffolding and mobile towers.
 - c. Working on fragile roofs.
 - d. Precautions at the leading edge.
 - e. Means of access to roofs.
- f. Safe use of safety harnesses, belts and mats.
 - g. Use of lifting appliances.
 - h. Safe working with LPG and bitumen.
- i. Relevant legislation and employees responsibilities. Health risks, for example, asbestos, dermatitis etc.

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Asbestos

Asbestos is a name used to describe a group of silicates which occur naturally in fibrous form. It was first used in Finland about 2500 BC to strengthen clay pots, historically appears in indestructible woven shrouds for preserving the ashes of the famous, and served as lamp wicks through the ages up to the present day and currently has many uses in various branches of the construction industry.

Types of Asbestos

1. Chrysotile

A fine common silk, silky white grey fibre known as white asbestos.

2. Crocidolite

A straight flexible blue fibre known as blue asbestos.

3. Amosite

A straight brittle grey brown fibre known as brown asbestos.

4. Anthophyllite

A brittle white brown fibre.

By far the commonest type of asbestos is Chrysotile, which accounts for approximately 90% of the total produced annually and which is widely used in the production of asbestos cement sheeting, pipes, flooring tiles and asbestos woven products.

The input of Crocidolite, blue asbestos in its raw state has been banned since 1970 but this type of asbestos, accepted as being the most hazardous, is present in many existing buildings and installations as thermal insulation or spray coatings.

Amosite is used in the production of asbestos insulation board which is widely used where thermal insulation and fire protection are important.

Anthophyllite is not widely used in the construction industry, although it may be present mixed with other types. It is usually difficult to determine from its Colour which form of asbestos is present in the manufactured product and it should be pointed out that Crocidolite cannot always be identified by its blue Colour because of the browning effect of heat. The only certain method is to have the material analyzed.

Medical Affects of Asbestos

It is now universally agreed that exposure to asbestos fibers can, in certain circumstances, lead to three diseases, asbestosis, lung cancer and mesothelioma.

Identifying asbestos

Your manager will have conducted an inspection of the area prior to starting work and will advise of any known areas of asbestos. However it is possible that one or more of the above types of asbestos may be within the structure you are working on ! If you are in any doubt of the uncovered material you are to stop work immediately and contact your manager, advise any other manager or operative on site of your suspicions. Do not re-start work until the suspect material has been identified and you have been given the permission to do so !

It can certainly also cause a group of benign conditions of the pleura and it may cause a group of other cancers, including cancer of the larynx, gastro intestinal tract and kidney.

Information on the incidence of these diseases is limited and complicated by the possibility of misdiagnosis and by the difficulty of establishing a link with occupational exposure to asbestos, particularly in the case of lung cancer. In 1981 the latest year which figures are available, the number of death certificates mentioning the cause of death most certainly related to asbestos were as follows.

Medical affects of Asbestos

1. Asbestosis with lung cancer 79 cases.
2. Asbestosis with mesothelioma 131 cases.
3. Asbestosis alone or with another disease 60 cases.
Total asbestosis 270 cases.
1. Mesothelioma of the Pleura 296 cases.
2. Mesothelioma of Peritonium 22 cases.
3. Mesothelioma of the Pleura and Peritonium 5 cases.
4. Mesothelioma, site not specified 122 cases.
Total cases 445.

SITE PRACTICES

Working in Partially Occupied Buildings and Adjacent to the General Public

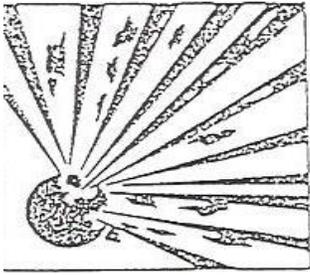
In refurbishing dust is a major problem. Dust has accumulated behind false ceilings, behind plaster work and under floorboards for many years and when these areas are disturbed the air is filled with dust. This dust should not only be cleaned up regularly to ensure reasonable working platforms for our own operatives but it should be ensured that any screens adjacent to the occupied area are sufficient to safeguard the general public from the airborne dust. Under certain circumstances it may be possible to spray a fine mist onto the area of dust / debris either prior to or during removal or in the area of cutting . However it is essential that you obtain approval from the supervisor / manager / site manager prior to this as a risk of electrocution may exist !

Apart from vandalism of our own work, the theft of tools and material, children can easily injure or kill themselves whilst “playing “on an unattended site. Always ensure all tools are removed from site at the end of each shift. Never leave materials perched precariously or in a place where the risk of falling or injury to others exists. Do not leave the access ladder to the scaffold on site at the end of any shift.

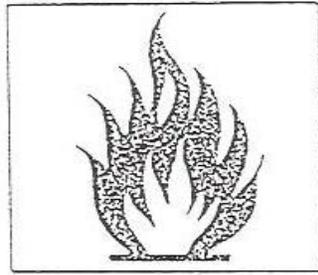
It becomes the responsibility of everyone on the site from the manager including the safety officer to every operative to ensure that all properties are secured nightly.

Some types of contract provide many problems from the aspect of welfare and security and these are the single house conversion where the houses contained in the contract are in the same general area, but are actually a number of individual small jobs grouped together under one contract. It is particularly important on this type of contract that effective security is placed at front doors ladder access to scaffolding and windows as it is important that sites are maintained secure at night .

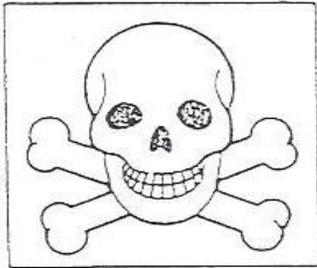
HAZARD SYMBOLS



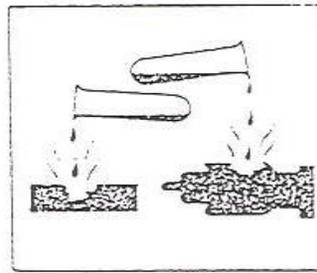
EXPLOSIVE



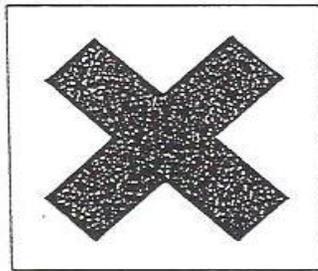
HIGHLY
FLAMMABLE



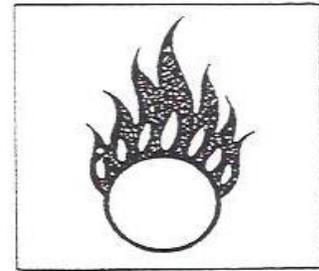
TOXIC



CORROSIVE



IRRITANT



OXIDIZING

Control of Substances Hazardous to Health

Following the issue of an EEC Directive in 1980 entitled Protection of Workers from the Risks related to Chemical, Physical and Biological Agents at Work, the members of the community have been charged with developing an infrastructure to protect workers against occupational hazards.

Since then, a number of new Directives have been issued relating to the registration of new chemicals, their appropriate classification and labeling, together with guidelines on protection of workers against specific hazards namely asbestos and lead.

Although specific guidelines on materials and processes will continue to be released where necessary, the UK have extended current legislation relating to Health and Safety at Work with the introduction of the Control of Substances Hazardous to Health (COSHH) Regulations.

In the tradition of all regulations issued in this area, the regulations are accompanied by an approved Code of Practice and a series of booklets giving more specific advice on a particular section of the regulations.

What is it?

The COSHH Regulations are based on occupational hygiene principles which aim to prevent disease or ill health resulting from exposure to materials at work.

1. Assess the risk to health arising from work and what precautions are needed.
2. Introduce appropriate measures to prevent or control the risk.
3. Ensure that control measures are used and that equipment is properly maintained and procedures observed.
4. Where necessary, monitor the exposure of the workers and carry out an appropriate form of surveillance of their health.
5. Inform, instruct and train employees about the risks and the precautions to be taken.

What does it cover?

It does not cover asbestos, lead, materials producing ionising radiation's, substances below ground in mines, substances hazardous solely by virtue of their flammable or explosive properties or if they are at high or low temperature or high pressure. It does cover substances hazardous to health listed in

Part One A1 of the approved list of the classification, Packaging and Labeling of Dangerous Substances Regulations 1984. Namely those substances and materials listed as very toxic, corrosive, harmful or irritant, including mixtures of compounds and preparations containing these substances.

All those substances listed in Guidance Note EH40, those substances that have been awarded a maximum exposure limit or occupational exposure standard. Micro-organisms.

Substantial quantities of dust defined as a concentration greater than 10 milligrams per cubic meter of total exhalable dust or 5 milligrams per cubic meter of reciprocal dust where there is no indication of a need for a lower level.

Any material, mixture or compound used at work, or arising from work activities which can harm people's health.

Who does it affect?

Employers. Self-employed persons. Employees. Other persons on the premises, contractors and sub-contractors. Other persons likely to be affected by work, general public. Contractors, sub-contractors and self-employed persons all have duties of employers under the regulations.

All regulations and code of practices came into effect on 1 October 1989. The regulations appertaining to assessments were not enforced until 1 January 1990.

Any exemptions?

Ministry of Defence only where there is a direct supervision, this does not include contractors or sub-contractors. In a government emergency.

Where the Health and Safety Executive deem its relevant exemption can cover person or persons and substance or substances over a specified period of time and for specific regulations.

Application to the Construction Industry

The construction industry uses daily a wide variety of substances, compounds, materials and preparations to construct and refurbish a variety of buildings and structures.

Such materials may be used as liquids, gases or solids and when used may generate dusts, gases and vapours. The materials, when solid, may present negligible hazards, when grounded to dust or respirable size, may be very hazardous, for example, grinding or cutting hard cement. Many materials may contain impurities which present a greater hazard than substances they contaminate, for example, crystalline silica is often present in minerals which would otherwise present little or no hazard. Some substances have a fibrous form which may present a potentially serious hazard to health if the fibers are of a certain shape for example glass fibers or mineral wool.

Materials when added together or present in the same working environment can combine to present a greater hazardous material for example acids and nitrates, nitrous fumes, or when inside the body have a combined effect so as to create a greater health risk for example asbestos and smoking, ethanol and xylene.

However, some materials are known to cause a health risk but the causative agent is not known, for example, byssinosis from cotton dust. In some cases disease is linked with a certain type of employment but the exact level of substance when the disease is induced is not known. Here levels are arrived at through previous experience within industry and animal studies.

Health Hazards in Construction

The Control of Substances Hazardous to Health Regulations 1995 covers prohibitions relating to certain substances, assessments of health risk created by work involving hazardous substances, use of control measures, maintenance, examination and testing of control measures, monitoring exposure of the work place, health surveillance, information, training and instruction.

Not all hazardous substances are covered by the C.O.S.H.H. Regulations, the most common of these being asbestos, lead and ionising radiations. These substances are the subject of specific regulations. Many of the materials used on site are potentially dangerous. Those given here are some of the most common. If there is any doubt about the constituents or the hazards of the new substance or one which has lost its original labels the advice of either your supervisor ; manager ; site manager or a site Health and safety adviser should be requested. They are empowered to give without divulging trade secrets all necessary information about the hazards of a substance and precautions that should be taken, the following are

- A. Cadmium Dust or fumes** welding, brazing, soldering, heating Cadmium plated steel.
Hazards Cadmium poisoning. Sudden onset, vomiting, shortness of breath, weakness, emphysema long term.

Precautions , Exhaust ventilation. Personal hygiene, no eating, drinking or smoking on the job.

B LEAD

Dust fumes, cutting, burning old structures covered with lead prima. Demolition workers particularly at risk, welding, soldering.

Hazards Lead poisoning gradual onset, anemia, fatigue, muscle weakness, systemic poisoning.

Precautions Total enclosure, protective clothing which does not hold dust. Good personal hygiene, no eating, drinking or smoking on the job.

C Silica Hazards Precautions

D Carbon Monoxide Hazards Precautions

E ZINC Hazards Precautions

Dust, abrasive cleaning of stone structures, tunneling in slate and other silica bearing rocks, polishing and grinding granite, terrazzo etc.

Silicosis. Insidious onset. Increasing breathing difficulty leading to eventual respiratory disablement.

Wet methods. Total enclosure. Exhaust ventilation.

Gas fumes combustion in confined spaces, engines of site vehicles. CO poisoning. Sudden onset.

Drowsiness, loss of muscular control, vomiting, unconsciousness.

Ventilation, especially in excavations and confined spaces.

Fumes, welding.

Metal fume fever. Flu like illness. Ventilation at source, protective clothing. or smoking on the job.

Personal hygiene, no eating drinking

Summary of Safety Requirements: -

DO NOT SMOKE [or allow others to smoke] when in or near, the working area!

Make a visual check of the scaffolding you are to be using. If you feel anything is not safe, report it immediately. Do not start work until YOU are satisfied that the scaffolding is safe.

Wear hard hats, Steel toe caped boots and high visibility jackets at all times.

Avoid placing your face / eyes close to the working area as small pieces of steel ; resin; timber etc may be thrown out; splash or be thrown out from the working area. If in a confined area or any risk of the above hazards use goggles!

Use gloves when handling Sheets and flashings, resins, tiles, tanalised timber etc...

Ensure no other trades / public has access to areas where you are working. This item usually falls in the remit of the main contractor, however You are responsible for the health and safety of yourself and others!. . Advise the agent at the beginning of each day where You will be working and ensure the necessary precautions have been taken! and the area has been tapped off with red/white tape if you or the agent thinks this is applicable!

Ensure all waste products are disposed of carefully. Remember the sharp section of steel; timber; glass etc can hurt other people!

Wash hands at the end of each working session.

Store unused material in a safe area that will not cause inconvenience or pose a danger to others.

If working platforms are to be supplied by the Main contractor. Ensure that these comply with the requirements of safe working heights / base dimensions. Check with your manager if in doubt.

If applicable, obtain, before each days work, a “Permit to work “; this is supplied by the site agent. Obtain this immediately on arrival on site! . Record any delay in obtaining this item.

- x. Ladders and scaffolding are always an area with potential hazards. Check these carefully. Do not use if you are not sure.
- xi Rubbish and debris on scaffolding and around your working area is a hazard to you and others. Dispose of your refuse into the skips provided by the main contractor. Report other trade rubbish to site agent or your supervisor / manager
- xii Falling items. Do not drop or throw items from scaffolding or roof. Check with the site agent or your manager if guards and green debris netting are required.
- xiii Use the access platforms and towers provided .. If it is a confined site some areas may be difficult to access. Take every precaution to ensure safe footing at all times.
- xiv Ensure no other trades are working adjacent to you that may be exposed to any risk from tools you are using, i.e. electric saws, grinders etc.
- xv. Read the “COSHH” documents. Carry out the recommendations contained with these.