23. Guidance Note. Safety in Fieldwork - Natural Environment Research Council
26. "Earthmoving on Open Archaeological sites" F.Prior The Institute of Field Archaeologists Technical Paper No 4
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FURTHER INFORMATION
1. Safety in Outdoor pursuits - Department of Education and Science
2. A code of Geological Field Work - Geologists Association
3. Code of Practice for Scientific Diving Natural Environment Research Council
5. The British Sub-Aqua Club Manual
6. "Mountain Safety Basic precautions" - Climber and Rambler
7. Safety on Mountains - British Mountaineering Council (Page 11 details Naismith's rule, advisable for route planning)
8. Mountaineering from Hill-Walking to Alpine Climbing Alan Blacklaw (Penguin Books)
9. Be expert with Map and Compass Bjorn Kjellstrom, Scribner 1976
12. Safety and Health in Building and Civil Engineering I.L.O
13. Safety in Small Craft - Department of Trade
14. Safety Code - Department of Trade
15. First Aid - St Andrews Ambulance Association
16. FSC 34 First Aid - Forestry Commission
17. Mountain Leadership - Eric Langmuir - Scottish Sports Council (The Official Handbook of the Mountain Leader Training Boards, very good for British conditions)
20. "Exhaustion - Exposure" - Dr J.Ogilvie (the best treatise for the layman) Climber and Rambler vol. 16, Nos. 19 and 20, Sept and Oct 1977
21. Mountain Navigation - Peter Cliff - Cordee 2
b) At or near a quarry
c) Whilst driving
d) With the antenna less than 15cm from your face
INDIVIDUAL RESPONSIBILITIES FOR SAFETY

Employees Responsibilities
It is the duty of all personnel, under the Health and Safety at Work Act etc 1974, to take reasonable care for the health and safety of him/herself and other persons who may be affected by his/her acts or omissions at work. He must also co-operate with the Director regarding any duty or requirement imposed on the Director or any other person by or under any of the relevant statutory provisions so far as it is necessary to enable that duty or requirement to be performed or complied with. N.B. Any personnel contravening a relevant statutory provision may be prosecuted in a Sheriff Court (Scotland) or Magistrates' Court.

All personnel taking part in field work have a responsibility to adhere to sensible standards of behaviour. Personnel should be aware that fieldwork activities have inherent hazards which staff members minimise with appropriate safety precautions. However, the potential dangers make it imperative that personnel co-operate by behaving responsibly in order to reduce the risk of accidents. They are specifically advised to:

- Obey all safety instructions given by management or supervisors. Anyone not conforming to the standards required may be dismissed from the field project.
- Stay with the workforce, except by clear arrangement with the supervisors and observe instructions for reporting after completion of work.
- Report any personal injury or illness using the accident book (copies kept in company vehicles and in the office)
- Wear adequate clothing and footwear for the type of weather and terrain likely to be encountered.
- The Company will refuse to allow ill-equipped personnel on its field projects, since it has responsibility to ensure that personnel observe the provisions regarding personal safety.

Note that unpaid employees (‘volunteers’) are classed as employees for legal purposes.

This rescue call has the merit of being widely known in Britain: 
\[\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(dot, dot, dot, dash, dash, dash, dot, dot, dot)}\]
Sent either visually (torch flashes) or audibly (whistle blasts)

Land Weather Forecasts – Radio 4 Longwave and VHF
(Usually)
Mon-Fri 0010 0655 0755 0857 1255 1755 2229
Sat 0010 0655 0755 0857 1255 1755 2158
Sun 0010 0655 0755 0855 1255 1755 2158

Using CB or Radio

Read the License - this details conditions of use

Operation
- *Listen* with the squelch control turned fully down, before you transmit.
- Keep conversations short.

Choice of Channel/Emergencies and Assistance
On all channels, give priority to calls for help
- Leave *Channel 9* clear for emergencies
- If a call for help on *Channel 9* elicits no response, try either *Channel 14* or *Channel 19*.
- If you hear a call for help, respond only if no regular volunteer monitor answers.
- CB is not a substitute for the 999 telephone service ashore or VHF radio channel 16 afloat. There is no official organisation for monitoring CB.

Safety
- Never erect or use an antenna underneath or near an overhead power line. This can be fatal.
- If an antenna is to be mounted on a vehicle, note the risk identified above.
- Do not transmit:
  a) When fuel/other explosives are in the open
<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pair scissors</td>
<td></td>
<td>Safety pins (various)</td>
</tr>
<tr>
<td>1 pair forceps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 roll 1/2 inch elastoplast</td>
<td></td>
<td>Cotton wool</td>
</tr>
<tr>
<td>1 bottle TCP or equivalent</td>
<td></td>
<td>Gauze (2mm)</td>
</tr>
<tr>
<td>2 blankets</td>
<td></td>
<td>Tissues/paper towels</td>
</tr>
<tr>
<td>1 pkt strip dressing</td>
<td></td>
<td>Box dumb-bell non-stretch sutures</td>
</tr>
<tr>
<td>1 large, 2 medium burn dressings</td>
<td></td>
<td>Triangular bandage</td>
</tr>
<tr>
<td>25 anti-histamine tablets</td>
<td></td>
<td>1 tube bland anti-septic cream</td>
</tr>
<tr>
<td>Bottle eye wash</td>
<td></td>
<td>25 anti-histamine tablets</td>
</tr>
<tr>
<td>Bottle sterilised water</td>
<td></td>
<td>4 sterilised eye pads</td>
</tr>
</tbody>
</table>

**MISCELLANEOUS INFORMATION**

**International Distress Codes**
The international distress signals are:
- Six torch flashes, whistles, blasts or waves of a light coloured cloth. If using a torch, remember to vary the direction it is pointed in.
- one minute pause
- Another six blasts, flashes, etc, repeat *ad lib* (when in distress, do not exhaust yourself)

- The Answering call is:
- Three flashes/blasts etc, repeated after one minute.

**S.O.S.**

In later sections to this code, the Company makes recommendations about the safety precautions to be taken on specific field activities. It is important, however, that irrespective of the activity, certain basic rules should be observed.

**BASIC SAFETY PROVISIONS**
- The likely safety problems or risks should be identified through the Company’s Risk Assessment Form and discussed and the nature, purpose and aim of the field project clearly understood by all concerned.
- All work should be planned carefully, considering experience and training of those involved and the nature of the terrain or excavation site. Care should be taken not to over-estimate what can be achieved.
- Personnel should indicate any physical handicap (e.g. asthma, epilepsy, allergies, diabetes etc.) so that the appropriate precautions may be taken. The Company will supply a standard form for all employees which details any illnesses/allergies and blood group, as well as containing contact details in case of emergencies. This information will form an on-site register.
- All members of the party should know what to do in the event of an accident or emergency and a first-aid kit should always be carried.
- The personal equipment and clothing of all participants should be suitable for all weather conditions, terrain etc., likely to be met during the work.
- Special care should be taken on old army ranges or practice grounds. No explosives, detonators etc., found on sites should be touched. Any found should be reported to the immediate supervisor at once.
- Always ensure that the permission of the land owner or official department has been sought before entering any area. Do not use railways as footpaths.
- Personnel must never work alone without the prior permission of management staff, and after ensuring that their immediate supervisor knows their whereabouts and intended time spent away from the main group.
Anti-Tetanus Injections
All work involving the use of tools on an outdoor site carries the risk of minor cuts and scratches which can result in infection or tetanus. Tetanus (lockjaw) is always serious, sometimes fatal. It is the responsibility of the individual to ensure that they are fully inoculated against Tetanus before undertaking any fieldwork. Anti-tetanus injections can be obtained from one's own General Practitioner.

Clothing
All specialist protective gear (e.g. hardhats, safety goggles, high-visibility vests) will be provided where appropriate. It is, however, the individual's responsibility to ensure that he/she is adequately clad (this extending to head- and foot-gear) in relation to (a) the project location and the season and (b) the work to be accomplished. Individuals are also responsible for the care of their issued safety equipment and reporting loss or damage immediately to a supervisor.

Field work usually involves long periods of time away from the base. All workers must ensure, in advance, that suitable clothing and changes of clothing are available at the time of the proposed field work and that they are in good condition. There are four main functions for protective clothing:
- To combat exposure due to adverse weather conditions;
- To protect from physical and chemical hazards;
- To combat biological hazards;
- To act as a high-visibility marker whether in rescue scenarios, when working in an area with heavy plant operating, or when working in a potentially hazardous environment such as grouse moors or old army ranges. It is easy for supervisors and rescue parties to monitor the movement/whereabouts of employees if they are wearing distinctive clothing. In these cases bright yellow or orange clothing is most visible.

Exposure

Health Hazards
Important preparations for fieldwork abroad include medical prophylaxis and provision of medical supplies, both for protection and emergencies.

Particular care should be taken to avoid hazards and dangers arising from poisonous flora and fauna, and poisonous chemicals, such as poison baits and pesticide sprays, etc., used on agricultural land.

All members of a field team should have filled in a form giving details of any physical handicap such as asthma, epilepsy, etc., so that appropriate precautions may be taken and medical supplies carried.

First Aid Kit – Suggested Contents
What follows is not to be considered definitive due to the wide variety of fieldwork undertaken, and this should be considered during the preparation stages of a project. All accidents, injuries and sickness should be entered - and the treatment given - in a Medical Record Book as a safeguard in the case of subsequent complications.
• Pinch casualty’s nostrils and draw chin forward to open mouth.
• Take a moderately deep breath and breathe steadily into casualty’s mouth (chest will rise).
• Lift your head and allow casualty to exhale (see chest deflate).
• Repeat your inspiration and breathing into casualty’s mouth at about 6-8 times per minute.
• Continue until casualty resumes breathing unaided.
• Place casualty in the Recovery position and treat as an unconscious casualty.

General Provision
The main potential hazards in field work are exposure, accident, weather, carelessness and misfortune. If the recommendations of this Code are followed only the latter should be of consequence. However, even the effects of misfortune may be less severe as a result of careful forethought.

The following recommendations represent minimum information and a guide to action required prior to the commencement of field work.

• The party leader must ensure that all participating personnel know emergency procedures. The risk assessment should include the name(s) of participating members with first aid training, the location of the nearest telephone and the name, locations and telephone numbers of the nearest doctor and hospital casualty unit.
• The party leader should establish that those participating on the course do not suffer from any illness or a medical condition that could expose them or others to undue risk during the course. Examples of such conditions include chronic asthma, epilepsy, certain heart conditions, pregnancy (for some types of field work), and certain types of diabetes.
• All personnel involved in fieldwork should be immunised against tetanus. For some overseas visits, valid immunization against other diseases which might

If precautions are not taken, then poor weather can mean physical discomfort, disorientation, panic, exhaustion and even serious medical repercussions. As a general rule, warm, windproof and waterproof clothing should be worn with adequate protection for head, ankles, wrists and hands where heat loss is greatest. British weather is unpredictable and the effects of wind are of considerable importance, often being under-estimated, particularly around coastal and highland/upland areas.

Generally, the principal of layering should be observed when dressing against the elements, as wearing a number of thin layers each serving different purposes (insulation, windproof, waterproof) allows for much greater control over body temperature. In warm dry weather it is advisable to carry lightweight waterproofs as a standby but not to wear them as this can cause a build up of perspiration. For work that requires long periods of inactivity such as using a Total Station it is essential that extra provision of clothing is made.

Special Conditions
When working in water a wet suit or preferably a dry suit is mandatory. Whilst anoraks offer good protection for most conditions, hoods and loose draw-strings can become hazards (e.g. when working with machinery). In hot weather, adequate protection must be used - ie. Sunglasses, hats and sunblock of a factor appropriate to the weather and individual.

Head
In cold weather conditions a large proportion of body heat can be lost through the head and this fact must be considered in preparing for any fieldwork. It is equally important to protect the head and eyes to avoid sunstroke.

Safety Helmets
Wear an approved safety helmet when visiting quarries, cliffs, deep trenches, mines, forestry operations or where there is a risk from falling objects. These are classed as specialist protective equipment and will be supplied when working in the
above conditions. It is a statutory obligation to do so when visiting working quarries, mines and buildings. Hard hats must be worn when working at levels 4 feet/1.2m below the surrounding surface. Hard hats must be worn when working in areas with operating machinery.

Body
Woollen garments give the greatest protection under an outer waterproof covering. Any loose strings, pockets, hoods etc., should be neatly secured. Outer wear should have at least one pocket containing a torch, map, compass and whistle.

Hands
Gloves are a necessity on site when working in adverse weather conditions or with materials that should not be handled by bare skin. In some circumstances (e.g. using equipment such as a Total Station, drawing plans/sections) it may be more useful to wear no gloves or fingerless gloves, but a pair should be carried nevertheless. It is also advisable to use chrome leather gloves or the equivalent when dealing with fencing materials or plant materials with thorns or sharp edges. Cuts can lead to tetanus infection.

Legs
Jeans or denim trousers are usually unsuitable for fieldwork as they can become cold, heavy and inflexible when wet, though hard wearing trousers are advisable due to the significant amount of archaeology that is conducted in a kneeling position. Waterproof trousers are necessary in some conditions as they provide both a waterproof and a windproof layer in one. It is important that they are not worn for a prolonged period of time however as they can trap perspiration making the under-trousers damp and clammy.

Feet
Boots with strengthened toe caps are often necessary where heavy equipment is being used or where digging/picking is taking place. In general boots with good depth of tread that support the ankle are best, especially on rocky surfaces where degree of shock. Water displaces the insulation layer of air between the body and clothing and may lead to hypothermia. Immersion in water below about 22 degrees C accompanied by physical effort is likely to increase the net heat losses from the body, as can winds or wet clothing. It is important to avoid total immersion (unless diving) and to keep clothing dry and windproof.

General Notes on Casualties
If immediate danger threatens, remove the casualty carefully to a safer place. Do not expose yourself to the danger and thereby risk becoming a second casualty. If the person's clothing is on fire, roll the casualty on the ground in a coat or fire blanket, etc. Get help at once.

Priorities
Breathing
If the casualty is not breathing, start mouth-to-mouth respiration at once (see method below).
Bleeding
If bleeding is severe, apply direct pressure on the wound to stop bleeding, using hands, pads, dressings, etc. If the bleeding is from a limb, elevate it 10"-12" to reduce the blood flow. Do not use a tourniquet.
Shock
Keep the casualty quiet, reassured and comfortable. Keep the casualty warm, but do not overheat. Do not give food or drink to persons who might need subsequent medical treatment as this can cause complications.

Mouth-to-mouth Respiration
- Lie casualty flat if possible.
- Ensure no obstructions are in the mouth.
- Ease constrictions at neck, chest, and waist.
- Place rolled jacket or pad under shoulders to arch the neck.
Hypothermia - a major Hazard
Hypothermia is caused by the exposure of the body to progressive cooling as a result of severe weather conditions. It can occur at any time on the hills or seas of Britain and anywhere during the winter months. Unless the symptoms are recognised and preventative action taken immediately Hypothermia can result in death.

The symptoms are:
- A slowing down of pace, sometimes alternating with sudden outbursts of energy.
- Aggressive responses.
- Abnormality of vision, stumbling and slurring of speech
- Shivering and tiredness
- If the victim is urged to greater effort or left unprotected, the consequences can be serious.

Action to be taken:
- Stop and find the best available shelter out of the wind.
- Insulate the casualty against further heat loss until help can be contacted. Use additional clothing (even over wet garments), or a large plastic bag (a survival bag) which should be pulled up over the victim and tied at the neck.
- Get help quickly.
- It is recommended that if at all possible a warm sweet drink be given to the victim.
- Under no circumstances should alcoholic beverages be given.

Some field studies are carried out on water where similar severe exposure can be experienced. The temperature of open waters in and around Britain is rarely high enough to be sure that total immersion will not be accompanied by some slippery and sharp surfaces can be very dangerous. For some types of fieldwork (e.g. fieldwalking) a good pair of Wellington boots are preferable due to the terrain and amount of walking involved. As a general rule never work barefoot, even on apparently smooth sand that can hide potential dangers (e.g. broken glass and shell fragments). There can be instances however where the fragile nature of the archaeology requires work barefoot in a designated area. In these circumstances, the Site Director will make the decision and inform all staff of any extra health and safety issues which arise. Wear a double layer of woollen socks wherever possible to prevent blisters. Sports shoes are unsuitable for the vast majority of archaeological work, although soft, unpatterned soled shoes are sometimes required for excavation work.

Eyes
In any situation where there is a danger from chemicals, dust, flying splinters of rock or wood, eyes must be protected by safety goggles or a face mask to the approved British Standard. A face shield is necessary when using certain sprays. This is classed as specialist equipment and will be supplied in the necessary circumstances.

Ears
Where noisy machinery is in operation, hearing protection may be required. Do not wear personal stereo equipment in any circumstances as an inability to hear approaching dangers or instructions may be very hazardous.
ANTICIPATION OF ACCIDENTS

General Procedures
At the commencement of fieldwork the following information must be collected and made available to members of the field crew. These are all covered in the Company’s standard risk assessment form completed before any large project.

- Location of nearest public telephones.
- Telephone numbers of emergency services, nearest Accident and Emergency Unit and local doctor.
- List of members of field crew with First Aid experience. A qualified “first- aider at work” should always be present. Transport should always be available for the transference of an injured person to hospital, to a GP, or to the injured party’s home as the situation requires.

Safety and Fire Fighting Equipment
All personnel in the field should have access to:

- An adequately maintained First Aid kit (usually kept in the site vehicle).
- Adequately maintained Fire fighting equipment, (especially necessary if working near any inflammable chemicals).

Procedures for the Prevention of Accidents
It is the responsibility of all supervising staff to ensure appropriate safety procedures and safety audits are conducted to minimise the risk of accident.

Management and supervisors must:

- Ensure that all personnel on site are adequately informed of any hazards they are likely to encounter in the course of their work. This is dealt with through use of the Company’s standard form risk assessment which should be circulated to all concerned parties before the commencement of fieldwork.
- Ensure that all persons know the location and correct usage of fire fighting equipment.

ACCIDENTS AND FIRST AID

Procedures in the Event of an Accident
In case of an accident, the following procedure generally should be followed:

- Ensure that there is no immediate danger to others.
- First aid should be given to the injured as soon as possible.
- The injured person should be made as comfortable as possible. Care should be taken to provide adequate insulation from the ground and spare clothing and sleeping bags etc., should be used to protect the extremities of the injured. If the injured person cannot be moved to shelter, a shelter should be built around them.
- If assistance is required, then the police should be informed from the nearest telephone.
- Avoid moving the injured person unless absolutely necessary and even then it is preferable to be moving them only a short distance to better shelter or to ease their comfort. In the event of serious accident or injury, do not hesitate to abandon equipment. Never leave an injured person, unless this is unavoidable. If so, mark the position by laying out equipment.

Whoever reports the accident (ideally more than one person) should stay by the telephone in case further information is required and to guide rescuers to the scene of the accident. The following information should be given to the police or the rescue party:

- position of injured (grid reference and nearest main feature)
- number of injured
- nature of injuries
- time of accident
- is the injured likely to be moved from this place
- If so, by what route
- does the injured need a stretcher?
- leader’s name
main group. Roping up the party is a sensible precaution.

**Personnel:**
- Must follow the instructions of the leader.
- Must not leave main groups unless with express permission of leaders.

**Personnel working alone or in small parties**
Most provisions are applicable for independent fieldwork.

In Addition:
- Leave word with the local police or coastguard about your route and your likely times of arrival and departure.
- Know the international distress signal and have in your possession a means of delivering it, e.g. whistle, torch.
- Never go alone into areas known to contain quicksand or onto cliffs.

- Investigate all incidents as promptly as possible to ascertain the cause and prevent a recurrence.
- Ensure that adequate supervision is always available, especially when younger or inexperienced workers are on site.
- Ensure that safety procedures are adhered to and that all equipment is serviceable and correctly used; and that all safety devices are properly fitted and maintained.
- Individual responsibilities with regard to safety on any field project should be clearly designated and delegated as appropriate.

**Reporting of Accidents**
All incidents should be reported to an immediate supervisor or the Site Manager. All projects should maintain an Accident Book and each section must be completed in full at the time of the accident. This gives details of the time and place of the accident, who was involved, how it happened, and the names of any witnesses.

**Insurance**
- All staff and volunteers are covered by the Company’s Professional Indemnity and Employer’s Liability policies.
- Students and volunteers are covered by the Public Liability section of the Company’s Insurance Policy, in relation to activities which might occur during the normal course of field work. Instances in which injury occurs outwith the field study e.g., during leisure time, will require to be dealt with on their individual merits.
- Staff may wish to take out Personal Accident Insurance Cover.
- Contractors: management should ensure that contractors working on sites have adequate public liability insurance: £1M is suggested.
FIELDWORK - GENERAL

British Environments
The object of this section is to give precautionary information to be noted by people engaged in fieldwork.

Awareness of the weather is a key factor in fieldwork as it can change quickly at any time of year, but the severity of the changes is greatest between September and April. A blizzard can destroy even well trodden tracks, while mist at any time can be a hazard in a number of ways.

It is essential that equipment on-site can cope with any kind of weather and can also cope with the problem of survival when an individual is immobilised by weather or injury.

Avoid work near cliffs or on bogs if you are not accompanied.

Hazardous Environments: Smoking
Do not smoke in environments (e.g. woodland) where it would be hazardous to do so. It should be noted that ARS Ltd runs a no-smoking policy within the workplace as stipulated in the Staff Handbook.

Safety Factors and Recommendations
- **Footwear and Clothing**: See previous section
- **Food**: A substantial breakfast and evening meal are essential and these should be hot. A nutritious lunch should be carried and eaten as should a hot drink in a vacuum flask. In addition emergency rations consisting of high calorific value foods (e.g. chocolate) should be carried.
- **Individual First Aid Kit**: As a minimum this should contain bandage, dressing, elastoplast, aspirin or similar and antiseptic cream. In summer insect repellent and sun burn cream should also be included. In winter "glacier" cream is useful.
- **Map and Compass**: The personnel on a project should all have basic map-reading and compass skills and a topographic map covering the area of the site
- All members of the party must be equipped with vapour and sealed electric safety lamps with reserves, suitable clothing, and food, where necessary.
- For pitches, everyone must have a whistle and use the standard code - one blast, stop; two blasts, haul in; three blasts, pay out.
- Cleated boots must not be worn if a rope ladder is to be used in the cave.
- Leave no litter in caves.
- Cave diving is a highly hazardous operation requiring specialist equipment and training and on no account should be attempted without the advice and presence of experienced cave divers.
- Beware of any special safety risks - gases, flooding.

Beaches and Cliffs

**Party Leaders or Supervisors:**
- Should do all possible to check in advance for potential hazards along the route. A reconnaissance trip is strongly advised, especially to look for areas of quicksand or unstable cliff.
- Should know signs of hypothermia and exhaustion and be familiar with treatment. Remember an open beach on a windy day may be almost as severe an environment as a mountain top might be in spring or summer.
- Must check local tidal conditions, especially time of high tide and tidal range.
- Make sure personnel are properly clad with waterproof and strong footwear and, if working near cliffs, approved safety helmets.
- When working on cliffs, make sure personnel adhere to instructions.
- Ensure, especially if working on mud flats or salt marshes, that personnel do not wander away from the
sections of the Diving Operations at Work Regulations 1998, unless specific exemptions have been granted.

Caves/Old Mine Workings
As with all fieldwork in extraordinary conditions, the standard codes of good and safe practice apply in cave archaeology. The most important additional point to note is that the excavation of a deposit in a cave could change the whole structural stability of the work area.

It will be assumed here that all cave work will be performed by small groups. Individuals must not enter caves alone under any circumstances.

- Before entering a cave, carry out research on the cave system with particular reference to areas of danger or difficulty and obtain a plan whenever practical.
- Under no circumstances attempt to explore a cave system which is considered to be of a difficulty greater than that previously achieved by a majority of the party.
- Caves opening into active quarries are extremely hazardous and unstable and on no account should be entered.
- Caving in systems adjacent to active quarries carries the additional risk of collapse following blasting due to ground shock waves. Consultation with quarry managers as to blasting times is strongly advised - and entry into such systems timed accordingly.
- A party leader must be designated and this leader must be an experienced caver.
- Always leave word where you are going and your anticipated time of return.
- No member of any party should enter a cave unless wearing an approved safety helmet.
- Ensure that you have the necessary equipment for special difficulties known to exist in the cave and check that it is in good working condition before entering the cave.

should be available. In Britain the 1:50,000 and 1:25,000 O.S. Maps are recommended for general navigation. A good compass ("Silva" type is recommended as this incorporates romer scales) and the knowledge to use it are essential. It is essential that you familiarise yourself with the orientation of the major geography of the area prior to fieldwork. Check the date of publication of the map and the current magnetic variation from grid north. The magnetic variation is necessary to convert magnetic bearings to grid bearings and vice versa.

- **Survival Blanket:** It is highly advisable that a survival blanket is carried in case of accident and immobilization. As well as providing protection from the environment, the blanket can be used as a high visibility aid to attract attention if stranded.
- **Planning:** All personnel should know the safety procedures in case of an emergency on-site and this should be outlined in the risk assessment alongside the potential risks for a major incident. When working away from a base you must leave details of the route to and from the working area, grid references to the working area and the estimated time of return to either site or the off-site accommodation. While working in or intending to traverse areas of deep snow or potentially unstable material e.g. peat, special planning and precautions may be necessary; wherever possible local expert knowledge of the terrain and conditions should be sought. In such circumstances, solo work should never be allowed.
- **Weather:** As a further addition to the general planning, it is important to arrange to be aware of prevailing weather conditions throughout the project, especially when working in remote or exposed areas. In extreme weather conditions such as blizzards or thick mist, return to a safer position by the shortest safe route.
- **Additional Material:** It is always advisable to carry matches and in some remote areas it may also be important to include flares in the project equipment.
Equipment Checklist
• Map
• Compass
• Whistle
• Survival Blanket
• First Aid Kit
• Mobile Phone
• Emergency Food
• Matches

Health Considerations and Hazardous Environments
It is important that employees are aware of the possible ailments and adverse effects caused by exposure:
Hypothermia is the loss of body core temperature in very cold, windy or wet conditions.
Heat exhaustion
Sun-stroke
Dehydration

Be especially aware and careful in the following environments:
• River Crossing: If in an extreme situation it becomes necessary to cross any watercourse then spend time assessing the safest and shallowest place to cross. Avoid crossing rivers other than by bridges and fords if at all possible.
• Rock Climbing: Only to be undertaken by experienced rock-climbers with all safety equipment fully checked.
• Load Carrying: If there is equipment to be carried then this should be kept as light as possible and distributed as evenly as physical fitness allows through any team members. Twenty kilograms is an advisable maximum if it is to be carried all day. Carried loads should be worn high on the back and as close to the body as possible (most modern rucksacks are designed to allow this in a comfortable position and also have a waist strap to provide extra balance). When packing, ensure that the load is evenly distributed and balanced.
• Camping: By necessity, some archaeological work is conducted with camping as the most convenient form which a large group is to go underwater, this should only be permitted if there is no doubt that every member of the party is qualified to the standards indicated below.
• No-one should be permitted to dive unless they are fully qualified as specified in Health and Safety Executive relevant publications.
• A fully-kitted diver should be available on the surface as standby cover. Someone on the surface should be capable of kiss-of-life and other appropriate revival techniques.
• At least one member of the dive party must be qualified in lifesaving and artificial respiration.
• All equipment should be checked immediately prior to the commencement of the dive. If any equipment is not in good working condition, the dive must not proceed.
• Where low pressure airlines are being used, a third person must be in charge of maintaining the air pump fuel levels etc. That person must be briefed on emergency procedures in the event of pump failure.
• All divers must wear adjustable buoyancy life-jackets.
• Diving or repeat diving to a depth that requires decompression stops must not be carried out unless a decompression chamber is available at the surface.
• At least one person on the surface must know where to contact the nearest decompression chamber and medical assistance.
• Always seek permission before diving within harbour limits or in private water, or where access to the water is over private land.
• All intending divers must be fully conversant with The British Sub-Aqua Club Manual and the Code of Practice for Scientific Diving.
• All divers operating from craft should have an agreed system with the boats crew for diving and getting on board the craft as well as for emergency circumstances.
• A diving log must be maintained.
• Notwithstanding the above points, no dive should take place without complying fully with the relevant
situation where they are needed. (Beware of the kick-back from hand flares in case the second one lands in the boat).

**Capsize**
If you capsize the boat away from the shore, stay with the boat. Do not exercise to keep warm as this increases the heat loss and wastes energy, increasing the effects of hypothermia. A whistle on a lifejacket could be useful. The risk of capsze increases if the craft is being used as a platform for diving.

**Fog**
If fog is approaching, or haze thickening, a compass bearing should be taken on some mark, in case visibility decreases further. If caught in fog, keep engine down so that you can hear more clearly. A small pressurised can fog horn, or a mouth operated plate layers type horn should be carried. This could be useful at any time to attract attention if you need help (dot dot dot - dash dash dash = I require assistance)

**Anchor**
The anchor warp should be stored in such a way that it goes out cleanly and there must be enough chain between it and the anchor to ensure that it will lie the correct way. Check that the other end is tied on.

**Conclusion**
It is easy to get into a hazardous situation in a boat, but this need not matter if sensible precautions are taken beforehand and proper safety items are carried. Sunshine and good conditions can breed carelessness and it pays to be always looking about.

**Diving (Sub-Aqua)**
- It will be assumed throughout this section that diving is a small group activity. Should a situation arise in

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**Tripping, Slipping and Falling**
Archaeological sites can be hazardous places by their very nature despite all efforts to minimise risk. The most common risk to safety is simply tripping or falling, especially in wet conditions. Every effort should be made to prevent this where possible including erecting handrails or other such aids if possible, but ultimately it is the responsibility of the individual to conduct themselves in such a way that prevents this happening. The best way to control this hazard is to ensure that the site is kept tidy and free of rubbish.

The cardinal rules are:
- Look where you are going
- Keep planks free of mud especially when they are wet
- Watch out for obstacles and extra slippery areas
- Move with care and never run
- Pay particular attention to the position of the site datum pegs, surveying tripods and other "fixed points" around the site.

As a general point, extreme care should be taken when walking around the site to avoid disturbing section lines, marker pegs, grid strings, tags, etc.

**Section and Soil Collapse**
An integral part of excavation involves working in trenches in close proximity to standing sections and baulks, which can be unstable. If shoring is necessary on deep trenches then this should be constructed in a safe manner and all personnel on
site should be aware of changes in safety procedures associated with working in this environment.

A serious danger of working in a narrow-sided trench is that a worker can become engulfed rapidly if the section collapses. The basic rule is that trenches should never be narrower than one-and-a-half times their maximum depth in section. A water-logged or flooded trench is even less structurally sound. Pumping may keep a cutting "dry" but it can also cause a flow of water into the excavation which may cause the soil to run. Any trench which contained standing water should not be entered until it is deemed safe.

A further danger is soil collapse due to heavy weight (e.g. machinery, barrow runs, spoil heaps, etc.) too close to trench edges. It is the responsibility of all on site to understand this and ensure that it does not happen.

If working in a trench where you are not visible (either due to the trench being deeper than a standing height or deeper than a kneeling person) safety helmets must be worn. Hard hats are mandatory on most urban sites, especially where masonry can fall from trench sides, but it is advisable to wear a safety helmet on any site where flying chippings or stones from tools can occur. Safety helmets are supplied by the Company and must be issued whenever conditions require them, or on demand.

No-one should ever work alone on an excavation. No-one should ever go into a deep cutting or trench where soil collapse is even remotely possible, unless there are other people near by and there is an escape route for speedy evacuation. Always work within sight of at least one other person.

People should refrain from sitting on, or walking near, the edge of baulks - which can result in section collapse. This is both a safety measure and also a note for good practice, as a destroyed section causes loss of archaeological information.

Remember that a machine-cut trench is inherently less stable than a hand-cut trench.

Lifejackets
Ability to swim is not a substitute for a life-jacket. Orally, or part orally, inflated lifejackets should be avoided. It is very difficult, and for some people impossible, to inflate an empty lifejacket in the water. Immersion in UK waters causes a certain amount of shock anyway and people sometimes land in the water as the result of an accident of some kind, when they may be stunned or unconscious through a knock on the head. They will be unable to inflate such a lifejacket fully at a time when they need it most.

A lifejacket made to B.S. 3595 and having an inherent buoyancy of at least 115 N (351bf) should be used even if it causes some slight impairment of the ability to carry out work.

Lifejackets are often subjected to hard wear and tear and should be regularly inspected. The use of covers recommended by some manufacturers should be considered.

Equipment
Before each trip, a checklist should be used to establish the presence and good condition of items affecting safety. The list should contain most of the following:
Lifejackets, oars and rowlocks, anchor and warp, flares, bailer, fire extinguisher, tools, spare shear-pin or spring and split pin, spare plugs, compass, first aid kit, sea anchor and long line, large torch and spare bulb, horn, spare fuel, paddle, bellows or inflator, loudhailer, marine radio, emergency transmitter, log book. The spare spark plugs and flares must be stored in separate watertight containers.

Distress Signals
Small boats on the sea should carry 2 red hand flares and 2 orange smoke signals. They should be renewed every year. The previous year’s ones can be carried as a back-up. They should be easily accessible to numb fingers. It is easier to read and get familiar with the instructions beforehand than in a
**Tides and Local Hazards**

It is imperative when going on the sea to know about tides and the times of their movements. Even where a boat can be put into the water at any state of the tide, the direction of tide flow along the coast will depend on whether it is rising or falling.

There is a period of slack water at the end of each ebb and flow. The range of the tide between each low and high water varies. Every fifteen days there are Spring tides giving the highest high tides and the lowest low tides. In between these periods are the neap tides giving the tides of least range. From day to day tides run about an hour later.

Tide tables give the times of high and low water for each day of the year. They also give the highest level of each tide. This is because the depths on charts give the lowest level the tide is likely to go (Chart Datum) and the height of the tide must be added to get the true depth. This can be very useful when collecting specimens etc., as, for example, one can work out when, and for how long, a tidal strip will be exposed.

Whenever possible consult local boat owners for advice about local hazards, such as submerged rocks, and for other useful information.

**Clothing**

Adequate clothing is dealt with above, but it should be remembered that it is always colder on water and allowance made for this.

The effects of hypothermia mentioned below are less obvious if a person affected is sitting still in a boat and the only signs may be listlessness and lack of co-ordination.

Good waterproof clothing should be worn, including headgear, as this will usually be necessary to keep out the wind. Nobody should be allowed to go out in a boat unless properly clothed in the opinion of the person in command.

Where possible, the edges of trenches more than 2 metres deep should be protected with substantial barriers where people are liable to fall into them.

**Hygiene**

Soap and water should be available, otherwise a waterless skin cleanser and paper towels. Cleansing is essential before eating or after attending to personal needs. This cannot be overstated.

**Disruption of Services**

Prior to the start of any project, the project staff should be aware of any service cables/pipes that run anywhere near the proposed area of excavation and that the correct authorities have been consulted well in advance. Note that the Health and Safety Executive regard the striking of underground services as an extremely serious issue.

**Dangerous Buildings**

Whenever a Site Supervisor has reason to doubt the safety of a standing structure to be visited, he/she should:
- Instruct other project members not to enter the structure, or such part of it as is considered unsafe (which should be cordoned off).
- Restrict survey to the exterior.

**Archaeological Excreta**

Archaeological remains of excreta should not be disturbed more than necessary; appropriate clothing must be worn and face masks may be necessary. Particular attention should be paid to personal hygiene.

**Asbestos**

Specialist advice should be sought in advance of work if contamination by asbestos dust is anticipated.
Conclusions
Accidents are commonly caused by one or more of the following:
- Carelessness
- Over-estimation of physical and technical ability
- Lack of observation
- Insufficient knowledge and planning
- Failure to act in time either as a group or individually
- Acting unpredictably.

Weather Forecasts
The best forecasts on radio for work afloat are on Radio 4. The country is divided into areas e.g. Forth, Tyne, Dogger, Humber etc., and details of wind direction and strength are given. A more detailed forecast can be obtained from the Met. Office and information on sea conditions from the local Coastguard.

It is useful, if listening to Inshore Shipping forecasts, to know the meaning of the Beaufort Wind Scale numbers; and to write down the forecasts for the appropriate sea areas. Even in ideal weather it is sensible before going on the sea to find out whether any change is likely.

- **Shipping Forecasts**
  (a) Radio 4 200 KHz; 1500 M
  Throughout the week: 0033, 0555, 1355, 1750.
  (b) Telephone forecasts are available from Marinecall; the number is listed in the front of telephone directories.

- **Gale Warnings**
  These will be announced at programme junctions following their issue and following the next news bulletin on the hour.

- **Inshore Water Forecasts**
  Radio 3 1215 KHz, 247 m
  Throughout the week: 0655
  Radio 4 longwave
  Throughout the week: 0038

Insurance
Employer's liability insurance may need to be extended to cover marine craft. Directors should ensure that hired boats have adequate insurance cover.
• All baggage not in constant use during the flight must be stored in the luggage compartment.
• Any member of the flight crew or passenger with grounds for believing that conditions are likely to be unsafe has the right to decline to take part in a sortie, or, during a flight, to insist that the aircraft returns to base.

Boats
Safety in marine Archaeology is of even greater importance than on land, as the risks of severe injury or death are much greater in the event of an accident. Even if all safety procedures are observed, there is still a real risk of exposure, severely magnified in the adverse weather conditions common in a British coastal/maritime environment.

All equipment must be of a high quality, especially important if using inflatables within a rocky littoral environment. With regards to boats, it is key to note that strength and construction is of far greater importance than speed in working vessels.

An experienced person should always be in charge of the party in tidal waters and, even in fresh water, solo work should be discouraged. No person should be allowed to go out in a boat without, at the least, preliminary instruction in basic boatmanship. Everyone involved in a project should be absolutely clear on the hierarchy of command when working on a boat or coastal environment.

Before each trip a notice should be left with some responsible person at the office or base, giving details of persons, destination or work area, time of departure and expected time of return. This is best prepared on a standard form giving other information such as a description of the boat for use in case of emergency.

All project members should have read the Seaway Code, which is available free from the Coastguard or the Board of

FIELDWORK – PERSONNEL

Group Fieldwork
The following information everyone on-site should be aware of, and should be outlined in the risk assessment and discussed before the commencement of fieldwork:

• Emergency procedures in the event of extreme weather
• Designated gathering points
• Distress signals
• Which personnel have first aid experience
• Which personnel have maps, compasses etc.

Never use safety equipment (e.g. whistles) for any purpose other than that for which it is intended.

When using radios, walkie-talkies or similar:
Only use for the intended purpose as with other equipment (e.g. conveying surveying information) in order to leave the wavelength as free as possible for emergency use. Remember that the effectiveness of walkie-talkies is likely to decrease significantly when you do not have line-of-sight to your interlocutor and/or in adverse weather conditions.

Walkie-Talkies should never be relied upon to ensure the safety of a group or individual, a fully charged mobile phone must also be carried.

Walkie-Talkies should not be used in any area where they could interfere with other radio signals and cause a hazard, such as in proximity to an operational quarry, without prior permission.

Solo Fieldwork
In the event that solo fieldwork has to be undertaken, then all the precautions relating to group fieldwork apply to an even greater degree. The Company provides health and safety guidelines for solo work detailing emergency procedures and the basic emergency equipment that is to be carried:
Extra Precautions:
- All solo fieldworkers should leave information with their immediate supervisor outlining:
  - The area of operations (whether specific grid reference or an area depending on the nature of the solo work).
  - The intended route to and from the place of work
  - The estimated timescale of the work and the intended time of return.
  - If all precautions have been taken and you are confident that you will be safe even in the scenario of an accident, then do not become lax in safety because of this.
- If injured and immobilised then immediately put on all spare clothing and use your survival bag. Summon aid by distress signals if unable to call on mobile phone. Keep calm. Lay out your equipment, especially high visibility clothing in a prominent position to attract attention. Move to keep warm if possible, but do not stray from the position you have marked.

The role of the supervisor
It is the supervisors’ duty to inform personnel of foreseeable hazards related to the fieldwork stage of a project and should ensure:
- That the staff concerned are familiar with this code and the specific risk assessment for each project.
- That the work is designed and conducted in a way which minimises potential risks as far as is possible.
- No person may "swing" a propeller for the purpose of starting an aircraft’s engines unless he has received instruction in the appropriate procedures by an authorised official of the airport or club and under no circumstances when there is no pilot at the controls, nor when the aircraft is not adequately chocked. Individuals are reminded that where impulse magnetos are fitted the slightest movement of the propeller can cause an engine to fire.
- Passengers allocated a front seat in a dual-control aircraft should under no circumstances interfere with hand or foot controls, or any other switches or controls located on or above the control panel or on the control console. Even when engaged in aerial photography, the front seat passenger must wear at least a lap safety belt.
- Members of the party must not smoke in the aircraft except with the permission of the pilot-in-charge, and must observe the no-smoking regulations in any refuelling zone.
- Members of the party should be advised to wear cotton or woollen clothing, rather than materials made from artificial fibres, in accordance with recommendations made by the Board of Trade, in order to reduce the dangers of burns in the event of fire. Sunglasses or goggles are advisable to protect the eyes, especially when photographing with windows open, or when flying in open-cockpit aircraft. Balaclavas and insulating jackets are recommended for winter flying.
- All passengers should be familiar with the emergency procedures related to the particular aircraft in which they are flying.
- If the aircraft is being used for oblique aerial photography, other passengers should be forewarned of the nature of the activity.
- The pilot-in-charge's command must be obeyed.
- When the pilot holds a Private Pilot's license (PPL), no payment may be made in respect of the flight by any other person or body, even towards the direct operating costs.
SPECIAL ENVIRONMENTS

Light aircraft and Flying
These notes refer to safety on aerial reconnaissance flights with small groups of personnel.

Party Leader or Supervisor
- All flights must be organised through reputable flying clubs or flying groups.
- All personnel must be made aware of the insurance situation concerning the flight activity and where liability lies in case of accident.
- The leader must ensure that all personnel adhere to the rules of the flight group or club. This may involve signing up to the club for short term membership to avoid the need to be classed as ‘fare-paying passengers’.
- The leader must also check with the club or group as to the provision of safety equipment, especially if the extra equipment is required, e.g. lifejackets during a flight over water, and that members of the party are familiar with their use.

Personnel
- Must follow the instructions of the Party Leader, pilot-in-charge, Chief Flying Instructor or his delegated deputy, or any other authorised officer of the airport.
- Must in no circumstances enter hangars or any other restricted airport buildings or walk across runways without the express permission of an authorised officer of the airport or flying club.
- Must not touch, move or otherwise interfere with any aircraft or equipment unless expressly authorised by an officer of the airport or club.

In addition:
- All members of the party must be aware and keep clear of aircraft propellers, jet engines or exhaust vents, particularly on approaching or alighting from aircraft.

FIELDWORK – EQUIPMENT AND MACHINERY

The following notes are intended as a general guide to be modified according to circumstances. All sites pose particular safety hazards to a lesser or greater degree and it will often prove necessary to supplement the following guidelines in practice.

The Correct Use of Tools
The majority of tools used in excavation have the potential to be very dangerous if wielded without due care and attention, and also if not maintained correctly. It is the responsibility of a nominated member of staff to ensure that all tools are in good condition and safe to use, but it is the responsibility of all staff on site to ensure that any faulty tools are noted and returned to storage.

The following are three basic rules, of which the first is the most important and can be considered a useful maxim for all on-site safety.
- Always be aware of what and who is around you when using tools.
- Never lift a tool above your head when using it. This action is only used for splitting rocks and other extreme measures and should only be conducted by those experienced in those methods.
- Never work with any tool with a split shaft or with a head which has worked loose.

It is assumed that any employees on-site who are unfamiliar with any of the tools used will be trained in the correct and safe usage.

It is important from both the perspectives of safety and maintaining a tidy and ordered site that any tools are returned into the tool store after they have been used and that they are still in a good condition and as clean as possible.

Buckets and wheelbarrows must be emptied and overturned and tools stacked neatly at tea breaks and lunch break. This is
particularly important in the case of bladed tools which can spring up if trod on or cause worse injury if fallen on.

It is important to reiterate here the importance of heavy-duty steel toe-capped footwear when working with tools such as mattocks, spades and picks.

At the end of the day all tools must be cleaned and returned to the tool store for tidy stacking.

Day Clothing
It is good practice to carry a small day-sack on site in which extra clothing/waterproofs can be carried along with lunch, changes of footwear and any emergency equipment if you are working away from the main site.
As well as these basic items, knee pads are advisable when working in gravelly or other uncomfortable conditions.

Use of Electronic Distance Measuring Equipment
Any equipment incorporating lasers must conform to the appropriate British Standard (BS 4803).

Lifting, Carrying and Throwing
Injuries from lifting and carrying fall into three common categories:

- Workers straining themselves when lifting heavy and unwieldy loads (e.g. large stones etc.) resulting in some form of back injury or hernia.
- Workers injuring their hands and fingers by trapping them under heavy loads
- Workers injuring their feet and legs when heavy loads are clumsily dropped

There is a correct procedure for lifting.

- Never try to build too big a load for one person.
- As a general rule lift with your legs and not with your back.
- Where necessary use gloves and safety boots.

- It is the Project Manager’s responsibility to ensure that any vehicle taken out of the United Kingdom complies with the standards of the countries through which it will travel with respect to insurance, condition and equipment. In much of Europe, vehicles built with more than 9 seats (even if these seats have been removed) are classed as buses; and special regulations apply.
- Drivers should wear sensible footwear for driving and not on-site heavy duty footwear.
- Seat belts must be worn at all times.
- Vehicles used on fieldwork should always be parked so as not to be a hazard to the other road users and so that the least damage possible will arise in the event of brake failure. Vehicles should never be parked within 2m of any excavation. Vehicles must not be parked in areas where there is possible danger from falling rocks or trees. Care on foreshores or by rivers should be taken to ensure parked vehicles will not be flooded by the tide or a sudden rise in water level. Vehicles should not be driven on to sand or mud or any surface where there is a danger of becoming stuck. When visiting active quarries, drive and park only in specified areas.
- No appliances incorporating naked flames, such as stoves or lamps, should be lit or used within 10m of any vehicle.
- Company vehicles should only be driven by personnel acting with the prior consent of the Project Manager; this permission will be granted only when the driver concerned has been adequately familiarized with all the vehicle controls and the location of the first aid kit and fire extinguisher (which should be carried in all vehicles) and is known to have the requisite level of experience.
TRANSPORT

Vehicles
The transport of personnel and equipment to and from site and accommodation should be conducted in as safe a manner as possible. The following stipulations should be complied with at all times, irrespective of the ownership of the vehicles used.

- The supervisory staff should be aware of the travel arrangements made by every member of staff, both before initial assembly, and subsequently at the start of each working day. Staff members must be aware of how to contact the group leader or deputy in the event of unavoidable changes in transport plans.
- Employees must not undertake solo transport across rough terrain, especially if adverse weather conditions are likely.
- In the event that it is necessary to use public transport, then all equipment should be stored safely and carefully, and comply with any rules imposed by the form of travel.
- All vehicles should be in a safe and roadworthy condition and this should be constantly monitored throughout the project.
- All materials and equipment carried are to be stowed in a safe fashion for both routine transport and in an emergency. Under no circumstances should a vehicle be overloaded. All goods should be packed in a safe and secure fashion. Goods projecting at front or rear should be appropriately marked, preferably with a red flag. All material carried on a roof rack must be securely attached.
- All chemicals carried must be packed in such a way that they could not cause injury in the event of an accident, and must be clearly labelled.
- Drivers of private vehicles should establish that their insurance cover is valid under all conditions for which their vehicle is to be employed. This is particularly essential overseas.
- Drivers should be aware of the dangers associated with fatigue while driving and take sensible preventative measures.

- Where a load is too big for one person, and a team effort is needed, make sure that everyone knows exactly what the aim is, and is capable of doing it. When two or more people are lifting and carrying a heavy load there must be no misunderstandings, and no weak links.
- Appropriate wooden or canvas stretchers should be used wherever possible.

Throwing tools or materials of any kind is absolutely forbidden at all times.

The Use of Ladders
Ladders must be used at all times for access to and from excavations more than 1 m deep. Ladders can be dangerous, both from ladder slipping, and user slipping. Make sure that all ladders are at the correct angle (ie. vertical when you face up the rungs and at about 75 degrees or one in four as it leans against the section or wall). Do not stand a ladder on a slippery or unstable surface, and make sure that it is the correct length for the job. Ladders must extend at least 3' 6" above platform or ground level and must be made firm at the top. Report any damage to a ladder immediately to the Site Supervisor.

In wet weather take extra care not to slip off the rungs. Always keep a firm grip on the ladder and never attempt to carry heavy tools when using it. Never lean tools or other possible hazards against a ladder.

When using ladders as a photographic tower, always ensure that they are weighted on the opposite side to the photographer by another worker, in order to provide stability.

Hoists, Pulleys, Scaffolding and Photographic Towers
If using a hoist or pulley to remove spoil and stones from a deep excavation, workers loading the bucket or barrow, and guiding its ascent or descent, must wear safety helmets, and must stand as far back as practical during the operation.
Buckets and barrows must not be overloaded and must be prevented from swinging and striking the sides of the trench.

Only a person who is thoroughly familiar with all aspects of operating a power hoist will be allowed to use it, and then only with the express permission of the Site Supervisor.

Scaffolding, used to support a hoist or pulley, or used for any other purposes (e.g. as a photographic tower) must only be erected by suitably experienced and competent staff, and should be inspected by a competent person in accordance with the Construction Regulations (1961-1966) (Regulations subordinate to the Factories Act, 1961).

No-one will be allowed to use such scaffolding except those responsible for it, and those delegated by the Site Supervisor for specific tasks. The Site Supervisor is also responsible for a regular inspection of the ground and section immediately below a scaffolding structure, and for seeing that any sign of a developing weakness is immediately dealt with.

Any signs of weakness noted by others must be directly reported to the Site Supervisor. Ladders used in association with scaffolding towers should be securely attached. Scaffolding towers pose particular hazards during erection and dismantling. Persons involved in these duties must wear protective head-gear; and no-one else should work within an area of diameter equal to one-and-a-half times the height of the tower. The same rule-of-thumb applies to towers which are being moved.

Scaffolding constructions should never be left unattended in an incomplete state.

Access to scaffolding should be as difficult as is possible when sites are unattended. All scaffolding structures should be either

- Securely fixed to a standing building or
- If free-standing, should be securely guyed with angle-irons and hawses or equivalent. They should be fitted with hand-rails and toe-boards.

- Chemicals which are toxic, corrosive or inflammable (including fuel) should not be decanted in, or within 10m of, any vehicle.
- Particular attention should be paid to classification, packaging, labelling and radioactive substances. The appropriate regulations are:
  - The Classification, Packaging and Labelling of Dangerous Substances Regulations, 1984.
  - Guidance on the Control of Substances Hazardous to Health Regulations 1988
• Trailer type with petrol or diesel-fuelled engines, driving a dynamo for the production of electricity, or,
• Small hand portable petrol-engined units driving a dynamo as above.

The trailer type generators have movable side coverings to keep the engine and generator dry. However, subject to dispersal of exhaust fumes, they are best used under limited cover e.g. a structure with open sides and a roof. This makes for greater safety when doing essential maintenance in wet weather. The small generators should always be used under cover in uncertain weather conditions, again making certain that exhaust fumes can be dispersed.

Electricity, however generated, can be lethal.
• Never work on a generator with the engine running.
• Never connect, or disconnect, the distribution cable with the engine running.
• Always site the machine on a dry level place to minimise possibilities of shock.
• Always keep spare fuel at a safe distance from the equipment, since generators can spark.
• Keep the distribution cable raised above ground level, where possible, so that it is visible, and avoid running over it with vehicles.
• Always switch off the engine before refuelling.

Use of Metal Detectors
Note that, under the Ancient Monuments and Archaeological Areas Act 1979, as amended by the National Heritage Act 1983, specific permission for the use of such equipment must be given, even in cases where permission to excavate has been granted.

Field Laboratories
• Particular care should be taken with respect to toxic fumes and the risk of fire.

All equipment of the above kinds should be clearly labelled with the weight of their maximum safe loading capacity and this must not be exceeded in any circumstance. Shearlegs etc should be tested by qualified engineers.

Machinery and Heavy Plant
Only the contractor's staff may operate heavy plant and machinery, with the exception of self-drive mini-diggers. It is strongly advised that the Project Manager ensures that the contractor to be employed has Public Liability Insurance. Although not a legal requirement, it is in the interests of all members of the excavation team.

The basic rule on a site, whenever a machine is operating, is for everyone to keep well away. Similarly all visitors must be excluded from the site while machinery is being used.

The one exception to this rule is the presence of a "banksman" who stands at a safe vantage point to assist the operator and watch for important features. The "banksman" also watches for unforeseen hazards in the ground. There must be a clear hand-signal code understood with the machine operator to transmit instructions. All workers close by must wear a safety helmet.

Only persons specifically nominated by the Site Supervisor may work within the boom length or cab height of any working machine (any machine with its engine running).

Never work behind a working machine.
• Persons working with machines should always be visible to the driver.
• It is inevitable that material close to the bucket will need to be inspected closely by the person supervising machines. It is therefore ESSENTIAL that the driver realizes what you are doing BEFORE you do it.
• No personnel should stand on or near dumper runs.
• Supervisory staff responsible for directing machinery should pay particular attention to keeping equipment
well away from areas of potential collapse as noted above.

Particular attention should be paid
• If there are overhead cables.
• If underground service cabling or pipes are anticipated.

**Tipper Lorries and Spoil Removal**
Any extra heavy plant such as tipper lorries are normally of a substantial size and require a significant space to manoeuvre and awareness from those around them. The basic rules to always consider are to give the machinery more than enough space and to not operate or interfere with it unless qualified to do so.

In order to avoid accidents in blind areas, the Site Supervisor will be responsible for detailing one person to assist the lorry driver from a safe vantage point. His duties will include watching the blind area behind the lorry for hazards, and keeping other people away. As with a machine excavator and the ‘banksman’, an agreed code of signals is essential.

**Spoil Dumps**
The by-products of excavation should be deposited in stable dumps at a safe distance from the excavation areas and not in positions likely to cause other hazards.

**Back-Filling**
Particular care should be taken in back-filling a site
• To keep machinery and personnel safely apart
• To leave the site in a safe condition
• To retain topsoil separately for final replacement as topsoil.
• To leave the site in a condition acceptable to the landowner and/or his tenant.

**Disposal of Noxious Substances**
The product of chemical toilets and any other chemical wastes should be disposed of with due regard to hygiene and to pollution risks. Reference should be made to the *Control of Substances Hazardous to Health Regulations* (1988), covered in more detail under laboratory regulations. Plastic products should be discarded with due regard to livestock.

**Fire Risk and Chemicals**
• Adequate safeguards should be taken when using naked flames in combustible temporary buildings.
• Litter should be placed in receptacles provided.
• Care should be taken over the disposal of cigarette butts.

**Electrical Equipment**
Where electrical equipment is used on site, the following rules should be observed:
• Equipment is adequately insulated.
• Equipment is disconnected when not in use.
• Equipment is well-maintained and in safe condition.
• OFF/ON switches are clearly marked.
• Circuit breakers, conforming to the appropriate British Standard, should be used. There must be earth leakage current breakers or residual current circuit breakers. If a mains electrical supply is available, the circuit breaker may be installed at the point-of-entry of the supply to cover the entire system.
• Whenever possible electrical equipment on site should be of a type operated at low voltage - 115, 50 or 12V.
• Note that the Employers Liability (Defective Equipment) Act 1969 makes the employer primarily responsible for employees’ deaths or injuries caused by defects in machinery.

**Generators**
Usually generators are: