INLAND WATERWAYS ASSOCIATION

GUIDANCE NOTE

Personal Protective Equipment

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INTRODUCTION

Restoration sites are dangerous places. Some hazards will remain after collective control measures have been put in place. In this situation personal protective equipment (PPE) will be required by your volunteers. Restoration groups and WRG have site rules that require all volunteers to wear certain PPE at all times to provide a basic level of protection against the most common hazards. When carrying out a risk assessment PPE should be considered as a last resort, elimination or control of the risk should be considered first.

PPE is any item of equipment or clothing that is used or worn to reduce the risk to a volunteer from a hazard to their health or safety indicated by the finding in a risk assessment.

One sub-group of PPE is respiratory protective equipment (RPE) which is designed to protect the wearer against respiratory hazards, such as dust and fumes.

Examples of PPE include:

Safety helmets

Gloves

High-visibility vests

Eye protection

Protective clothing

Ear protection

Dust masks

Safety footwear

Common situations on restoration sites which might require specific additional PPE provision include:

1. To prevent or arrest falls (e.g harnesses and lanyards).

2. To enable a person in distress to be rescued from a confined space (eg rescue harness or escape RPE).

3. To enable someone who has fallen into water to stay afloat and be rescued (eg lifejackets).

The selection of PPE must comply with the Personal Protective Equipment at Work Regulations. It must be selected by a competent person who can identify the most suitable PPE that will be effective against the hazards present and be CE marked, which shows the product meets the EU health, safety or environment requirements. The competent person may need to work in conjunction with suppliers. Failure of, or the wrong type of PPE could expose the user to the possibility of occupational ill health, serious injury or death.

PPE must be used correctly and properly maintained and stored to remain effective. Volunteers may need to be trained in the correct use of PPE and training should include the method of inspection and identification of faults. PPE should be inspected before use. When there are changes in equipment, methods or materials being used, the PPE required should also be reviewed.

Site leaders must set an example by wearing correct PPE, as well as monitoring its use by others. PPE signs can be used as a reminder.

Hired equipment should be provided with a sticker with a pictogram showing what PPE is to be worn.

PERSONAL PROTECTIVE EQUIPMENT AT WORK REGULATIONS (1992)

The regulations cover the suitability, provision, maintenance, instruction and use of PPE.

The following regulations have requirements for protection against specific hazards:

1. The Ionising Radiation Regulations.
2. The Control of Lead at Work Regulations.
3. The Control of Asbestos Regulations.
4. The Control of Substances Hazardous to Health Regulations.
5. The Control of Noise at Work Regulations.

Where work is carried out under the above regulations any PPE must be provided to meet the requirements of the respective set of regulations.

Where a risk assessment identifies a risk that cannot be adequately controlled by other means, the regulations require the employer to provide suitable PPE and ensure it is used correctly and cared for by employees.

Restoration groups and other organisations would take on the role of employer, in these regulations, but may decide to consider volunteers as labour-only employees. This should be documented in the construction phase plan (Project Plan), refer to the guidance note on Preparing the Project Plan. This would mean that volunteers could be asked to supply some items of PPE themselves, such as safety footwear.

The regulations specify the detailed requirements for the risk assessment, which must be carried out by a competent person. PPE may only be used as a **last resort** after all other means of eliminating or controlling the risk have been considered. The restoration group must take into account the hazard that the PPE is being used to protect against and ensure it will fit the wearer and allow them to work safely. Where more than one type of PPE is to be used together the restoration group must ensure that the items of PPE are compatible and do not affect the performance of each other.

When PPE is provided, volunteers must be given adequate and appropriate information, instruction and training to understand the risks being protected against, the purpose of the PPE and the way in which it is to be used. Volunteers must use the PPE properly and clean and return it to storage after use. There must be a procedure in place for reporting any loss or defects to PPE.

The Personal Protective Equipment at Work (Amendment) Regulations (2022) (PPE 22)

On 6th April 2022 these regulations amend the PPE 1992 regulations. The regulations extend the duties and responsibilities of restoration groups to 'Limb (b) workers'. The Employment Rights Act 1996's definition of a worker has 2 limbs:

1. Limb (a) describes those with a contract of employment. This group are employees under the Health and Safety at Work etc Act 1974.
2. Limb (b) describes workers who generally have a more casual employment relationship and work under a contract for service, but who are told what to do and how to do it. Volunteers are included in this group.

The term 'employee', above, can include those who are paid and those who work voluntarily for no reward.

PPE will be deemed to comply with the regulations if:

1. It is appropriate for the risks involved and the conditions of exposure.
2. When it takes into account the ergonomic requirements and state of health of the user.
3. When it can fit the wearer properly, if necessary after adjustment.
4. As far as practicable, when it effectively prevents or adequately controls exposure to risk without increasing the overall risk.
5. When it complies with any relevant European Regulation or Directive by carrying a CE mark.

The restoration group must assess the suitability of the PPE and review the risk assessment if the PPE is found to be unsuitable. The assessment must also take account of the surroundings, site conditions and additional hazards, such as noise, dust, fumes, falling objects.

USING PERSONAL PROTECTIVE EQUIPMENT

There is a temptation to ignore the need for PPE and the protection it gives because 'the job will only take a minute...', but that minute may be all the time it takes to kill or injure someone.

Organisations are likely to be more successful in getting volunteers to use PPE if the volunteers are involved in its selection. PPE may be cumbersome and uncomfortable and the cheapest may not be the most suitable for the wearer. For this reason it may not be used, exposing the volunteer to the hazard.

For all PPE a satisfactory and comfortable fit is essential and will be used more willingly. Good quality PPE lasts longer and may prove to be more cost effective than continually replacing cheaper, poorer quality equipment. If volunteers wear spectacles, then PPE masks, googles or safety glasses will need to be of a special type. If they have a beard and have to wear respiratory equipment, can they obtain a suitable seal?

Manufacturers and suppliers have a statutory duty to provide information regarding the performance characteristics of the PPE products they manufacture or sell. Site leaders should consult this information to ensure that only products that comply with the relevant regulations are made available to volunteers.

Site leaders must ensure volunteers understand:

1. **Why** is the PPE needed?
2. **What** will be the implications of not wearing it?
3. **Who** is going to provide PPE?
4. **Who** will provide training and supervision on its use?
5. **How** is it fitted or adjusted?
6. **When** must it be worn?

When volunteers are required to wear more than one item of PPE at the same time, they must be compatible to all remain effective.

All PPE should be CE marked in accordance with the PPE regulations. It is recommended that PPE is only purchased from reputable suppliers.

Head protection

It is a requirement to wear head protection (industrial safety helmets or bump caps) on all building and construction sites, unless there is no risk of head injury either by falling objects or by banging the head. It is recommended that helmets with kite marks are used and have a date of production. Helmets that become damaged or show signs of wear should be replaced.

Safety helmets are designed to offer a level of protection if worn correctly. Helmets should not be worn back to front unless the cradle is reversible. Some solvents in paints, adhesives and markers can reduce the strength of the plastic. Volunteers should be discouraged from marking or decorating helmets other than with official stickers.

Chinstraps should be used when work involves leaning over an exposed edge. A helmet that has fallen from a height onto a hard surface may have suffered damage that will affect its structural integrity. A replacement helmet should be obtained.

Many safety helmets have features that enable compatibility with ear defenders or can be fitted with a face shield.

Bump caps could be used where the risk assessment identifies a low level of risk and protect the wearer from bumping their head. They do not offer adequate protection from falling objects.

Practicing members of the Sikh faith are exempt from wearing a safety helmet whilst wearing a turban.

e Some safety helmets are equipped with a visor that can be dropped down over the eyes.

Foot protection

Properly selected foot protection with steel toecaps and mid-soles can protect the feet against dropped objects and penetration of upward pointing objects, such as nails and glass. They can also be oil and slip resistant.

Foot protection comes in many types and styles:

1. Safety trainers; offer good grip on sloping and slippery surfaces and offer more comfort and are more suited to trades who repeatedly kneel and bend their feet.
2. Safety wellington boots; are essential in preventing cement burns when volunteers have to stand in wet concrete.
3. Safety boots; provide the required protection with steel toecaps and midsole. Ankle support is important in the prevention of injuries resulting from walking on uneven surfaces.

Manufacturers offer advice on the most suitable footwear for specific hazards.

High-visibility clothing

Hi-vis clothing is necessary where there is a risk that volunteers are not easily seen by others. A wide range of clothing is available as hi-vis such as vests, coats, fleeces, polo-shirts, trousers and overalls. The risk assessment will determine the level of visibility required, but all hi-vis clothing should be manufactured to BS EN 471.

Three types of hi-vis clothing:

1. **Class 1 – low visibility.**
2. **Class 2 – medium visibility**; when working on class A and B roads and on sites with moving plant or vehicles.
3. **Class 3 – high visibility**; when working on or near dual carriageways with a speed limit of more than 50mph and high risk areas such as airports, highway maintenance and railways.

Weather appropriate clothing

Clothing that is designed to protect the wearer against cold and / or wet weather is classified as PPE.

Examples are:

1. Padded and / or waterproof jackets equipped with a hood to incorporate a safety helmet.
2. Padded and / or waterproof leggings.
3. Suitable footwear.
4. Thermally protective gloves.

Hearing protection

Excessive noise from construction activity and equipment can cause permanent hearing damage, annoyance, loss of concentration and disrupted communication and may lead to an increased risk of accidents, refer to the guidance note on Noise. Often PPE is the only way to **reduce exposure** to noise due to the practicalities of working on a construction site. Hearing protection blocks out hazardous noise, but will only be effective if worn correctly. Hearing protection must comply with British and European standards and must be CE marked. Hearing protection brings its own risks of making communication more difficult.

The selection of hearing protection should be carried out by a competent person and should consider the type and performance. There are two basic types:

1. **Earplugs** take many forms, such as foam plugs, soft plastic valves and re-usable banded plugs. As earplugs have to be handled to be fitted in the ear, banded earplugs may be better suited to dirty environments, as less handling is needed, though generally in-ear plugs perform better. Fitting is critical and if not worn correctly will reduce their performance.
   - ► Disposable ear plugs are made of fine mineral fibre and must be inserted correctly. Once removed, they should not be reused and should only be handled with clean hands. Instruction is needed to ensure the plugs are inserted deeply enough, a poorly fitted earplug offers little protection to noise.
   - ► Reusable earplugs are made of rubber or plastic and must be a good fit. They need regular and careful washing. Instruction for use should be given by a competent person. They should only be handled with clean hands.
   - ► Moulded earplugs are individual moulded earplugs to the shape of the ear. They can be more expensive initially, but will provide an improved level of hearing protection.
2. **Ear defenders** cover the whole of the ear and make a seal against the side of the head. They can be overhead banded, helmet mounted or contain radio and communication devices. They are more visible so site leaders can see that they are being used correctly. They can be worn with safety glasses, but a check needs to be made to ensure the seal to the side of the head is not affected by the thickness or position of the side arm to the safety glasses. Other considerations concerning ear defenders:
   - ► They become sweaty and if not regularly cleaned become unhygienic.
   - ► They are more substantial, but do not necessarily give better performance than in-ear plugs.
   - ► The performance can be compromised by wearing them over glasses or long hair.
   - ► They must be stored properly.
   - ► It is possible to wear earphones under them to listen to music. This practice is dangerous and can be distracting and mask awareness of the environment.

Factors to be considered when choosing ear protection:

1. Suitability of types of protection for the work being carried out.
2. Noise reduction (attenuation) offered by the protector.
3. Compatibility with other safety equipment.
4. Pattern of the noise exposure.
5. The need to communicate with others and hear warning sounds.
6. Environmental factors (such as heat, humidity, dust and dirt).
7. Cost of maintenance.
8. Comfort and user preference.
9. Medical disorders suffered by the wearer.

Three types of data may be supplied, each with varying degrees of complexity:

1. Single number rating (SNR); a single number that represents the amount of noise reduction against a single noise source.
2. High, medium, low (HML); represents the noise reduction at high, medium and low frequencies and requires some indication of the frequency spectrum of the noise source.
3. Octave band method; applies to noise attenuation for each octave frequency and requires detailed information about the frequency spectrum.

The SNR is most commonly used to select the correct protection as it just requires the SNR number to be subtracted from the measured broad-band noise level from the activity.

Eye protection

A person's eyes are very vulnerable and an accident or injury can change that person's life. Eye injuries can be prevented by wearing the correct type of eye protection. The protection must conform to the approved specification and includes goggles, visors, spectacles, face screens and shields fixed to equipment.

All types of eye protection must meet the requirements of British and European Standard specifications and:

1. Suit the type of work or risk involved, including resistance to impact, heat, dust and chemical penetration.
2. Suit the user to ensure minimum discomfort and ease of movement.
3. Be marked to identify their type and suitability.
4. Be kept clean and disinfected.

Activities such as grinding, welding, cutting, hammering and handling chemicals run the risk of eye injury. This includes stone and brick cutting and drilling using mechanised equipment or hand tools and handling lime and cement. The risks include impact of solids, ingress of liquid, gas or dust, splashes of hot metal, exposure to glare, splashes of wet concrete or mortar. The risk assessment should identify the hazards and the correct eye protection to be provided.

General purpose safety glasses do not offer protection against lasers which are used for surveying. All lasers should comply with BS EN 60825-1. Class 1 or 2 lasers are preferred on construction sites as they represent the lowest risk of eye injury. Laser hazards should be identified with signs and barriers. The human blink reflex offers some protection, but eye damage can result from staring directly into the beam.

Some restoration sites make the wearing of eye protection mandatory due to the activities being carried out, such as brick laying and pointing, mixing and placing concrete and mortar. Safety glasses are acceptable for general use. Special safety glasses can be worn over spectacles. Some volunteers may use prescription safety glasses. Safety glasses can be tinted to reduce glare.

Some activities require the use of specialist eye protection, for example goggles to keep out dust when using a brick saw or angle grinder, a face screen when using a chainsaw or brush cutter, welding goggles or face screens when welding or hot cutting metals.

Gloves

They need to be selected carefully for a particular hazard.

Manufacturer's charts should be followed when selecting gloves as indicated in the table.

INDUSTRIAL GLOVES – TYPES AND USES

Hazard	Recommended Type
Acids, concrete/brick stain removers, solvents and alkalis.	Neoprene, nitrile, PVC or rubber.
Esters, ethers, ketones (mastic, sealers), aldehydes and petroleum based products.	Medium and heavyweight rubber, neoprene, nitrile or PVC.
High and low temperatures.	Nitrile, PVC or medium and heavyweight rubber.
Abrasion, unloading bricks and blocks and general materials, gardening.	Rubber, nitrile, PVC, neoprene or chrome leather with reinforced palm.
Bitumen, hot work or similar.	Asbestos substitute or Nomex.

Respiratory Protective Equipment

Visible dusts (cement, plaster, wood, MDF, stone, silica, fillers and plastics) are commonly recognised as a potential health hazard, but dust that is too fine to be seen also causes health issues that can take many years to manifest (scarring and cancer within the lungs). Fumes (from solvents, paints and adhesives) can have serious health implications. It is not always reasonably practicable to eliminate respiratory hazards. Refer to the guidance note on Dust & Fumes (Respiratory Hazards).

Under PPE regulations an assessment must be made to determine when RPE is required and what type is appropriate for controlling exposure to the substance.

Choice of RPE will depend on a number of interacting factors:

1. The nature of the hazards and materials.
2. The measure of dust concentrations.
3. The period of exposure.
4. If working outdoors, the prevailing weather conditions.
5. Suitability for each user (field of vision, provision for communication and the need to move in cramped or difficult places).

Manufacturers assign a protection factor to their RPE which indicates the expected level of performance of the equipment. For example, for half face masks:

1. FFP1 or P1 low efficiency device offering protection factor 4.
2. FFP2 or P2 medium efficiency device offering protection factor 10.
3. FFP3 or P3 high efficiency device offering protection factor 20.

A protection factor relates the concentration of dust outside the mask compared to inside it. For a P2 mask for every 10 particles outside the mask, it is predicted one will penetrate it. To select the mask, it is necessary to know the concentration and the Workplace Exposure Limit (WEL) for that substance. Refer to the guidance note on Control of Substances Hazardous to Health.

It is recognised good practice to use RPE with an FFP3 rating to protect against dust created when cutting concrete, bricks etc even when wet cutting, which removes around 60 – 75% of airborne particles.

The types of respiratory devices approved for use are:

1. Disposable half mask respirators.
2. Reusable half mask respirators.
3. Powered respirators.
4. Ventilated visors and ventilated helmet respirators.
5. Air-fed breathing apparatus.
6. Self-contained breathing apparatus.

The performance of tight-fitting RPE is dependent on achieving a good contact between the wearer's skin and the face seal of the face piece. The shape and size of the face means that one type or size of RPE would not suit everybody and several different designs may be required. Facial hair in the region of the seal will significantly reduce the protection provided.

Training volunteers in the correct use of RPE is essential before first use and should be repeated at suitable intervals.

Training should cover:

1. Why RPE is necessary.
2. The hazards, risks and effects of exposure.
3. The responsibilities of the volunteers.
4. Where and how to clean the RPE and store it.
5. How to report defects in the RPE or any other problem with it.
6. How to wear and check the RPE correctly.
7. How the RPE works.
8. Why face-fit testing might be necessary.
9. What maintenance is required.
10. What RPE is to be provided.
11. Use and misuse of RPE.

Both the restoration group and volunteer have a duty to ensure that RPE is used correctly and stored correctly after use. Non-disposable RPE should be thoroughly examined and tested at appropriate intervals. Disposable RPE should be used for one working shift and then disposed.

Hot Works

Tasks such as welding and grinding require specialist PPE to protect skin from sparks and burns.

Vibration

Retro-fit products are available which reduce the amount of vibration but only those approved by the machine manufacturers should be used. Anti-vibration gloves do not protect against all vibration because the materials are tested from vibration related conditions by one direction and vibration occurs in three directions. They offer some benefit in keeping the hands warm.

Fall Protection

Personal fall protection, such as a safety harness, fall-arrest or restraint lanyard and inertia reel fall-arrest block, are also classed as PPE. An additional consideration for this type of equipment is the prompt rescue of anyone who has fallen and is suspended in a harness. Refer to the guidance note on Working at Height.

HAND & SKIN PROTECTION

The most practical way of limiting contact between the skin and other substances is to use protective clothing and other PPE. Protective clothing includes gloves, overalls, eye protectors, aprons, boots and leggings.

To be effective protective clothing must:

1. Be the right size.
2. Be fit for the purpose.
3. Be maintained in good condition.
4. Be cleaned regularly and stored carefully when not in use.

Cuts & Abrasions

Occur during manual handling of objects with sharp corners or rough surfaces when not wearing appropriate gloves. Repetitive manual handling increases the risk. Cuts and abrasions make the skin more vulnerable to absorbing harmful substances. Gloves with cut-proof material, such as Kevlar, are available when handling objects with sharp edges (glass and sheet metal components). Worn-out gloves should be thrown away.

Barrier Substances

Only offer limited protection where the skin is exposed to certain harmful substances. They must be applied before starting work and washed off after each spell of work. Water soluble barrier creams are not suitable for wet works.

Hygiene

Damage to skin can be reduced through maintaining basic personal cleanliness, providing and making use of washing facilities. Volunteers should also be encouraged to change out of work clothes as soon as possible.

Skin Cleansers

May be required when soap and water are not adequate to restore the skin to its natural state, such as to remove insoluble barrier substances. Some skin cleansers require additional moisturisers.

First Aid

The slightest cut or abrasion may admit infection, so it is important to treat them at once. Adequate first aid facilities should be provided for the type of work being undertaken.

Educating Volunteers in Risk Prevention

Volunteers are more likely to cooperate in taking preventative measures if they understand the causes and consequences of dermatitis. Volunteers should be encouraged to check their skin regularly and site leaders should also carry out checks for signs of dermatitis. The work place, work methods and precautionary procedures adopted should be reviewed regularly to minimise the risk of dermatitis and other skin complaints. More information is contained in the guidance note on Control of Substances Hazardous to Health.

Protection from Sun Exposure

Ultraviolet rays in sunlight cause skin damage, in the short-term blistering and peeling and in the long-term speeding up of aging of the skin (making it leathery and mottled) and increase the chance of developing skin cancer. Some medicines and contact with chemicals, such as bitumens, can make the skin more sensitive to sunlight.

Protection to exposure to the sun can be provided by covering with clothing and wearing a hat or the use of appropriate sun screen lotions.

Skin types and the effects of strong sunlight:

1. Type 1 - white skin, never tans, always burns. Often a person has red or fair hair, blue eyes, pale skin and freckles.
2. Type 2 - white skin, burns easily, but may tan eventually. Person may have fair hair, blue eyes and freckles.
3. Type 3 - white skin, tans easily and burns rarely. Person has dark hair and eyes and slightly darker skin.
4. Type 4 - white skin, never burns always tans. Person has dark hair, eyes and skin.
5. Type 5 - brown skin.
6. Type 6 - black skin.

Volunteers with skin types 1 & 2 must take extra care to avoid strong sushine, or cover up and wear a hat. Volunteers with skin types 3 & 4 should still take care in strong sunshine. Volunteers with skin types 5 & 6 are still at risk of skin cancer and can darken or burn in stronger sunlight.

USEFUL RESOURCES:

HSE Guidance

Personal Protective Equipment at Work Regulations

HSE guide to PPE regulations

HSE Skin at work

HSG53 Respiratory protective equipment at work

The Personal Protective Equipment at Work (Amendment) Regulations

Sign up to read the full Practical Restoration Handbook and supporting resources here: waterways.org.uk/practicalrestorationhandbook

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INLAND WATERWAYS ASSOCIATION

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