



**INLAND
WATERWAYS**
ASSOCIATION

GUIDANCE NOTE

*Working Near
Water*



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INTRODUCTION

Many canal restoration projects will be carried out in dry conditions and will not see water until the work is complete. But some restoration work will be done close to significant bodies of water, possibly behind stop planks or dams. A partially restored canal channel could become flooded after heavy rain.

There are different ways restoration work could involve water which have different hazards and risks. Small bodies of water, including puddles in the bottom of a channel carry risk of disease or may obscure a trip hazard. Deeper/larger bodies of water carry risk of drowning or of cold/hypothermia. Moving water, e.g. a river, particularly if there are weirs, or water flowing through paddle culverts in a lock, is where there is a risk of being carried by currents. Tidal conditions are rare, but can affect the timing of work and access to carry out the work.

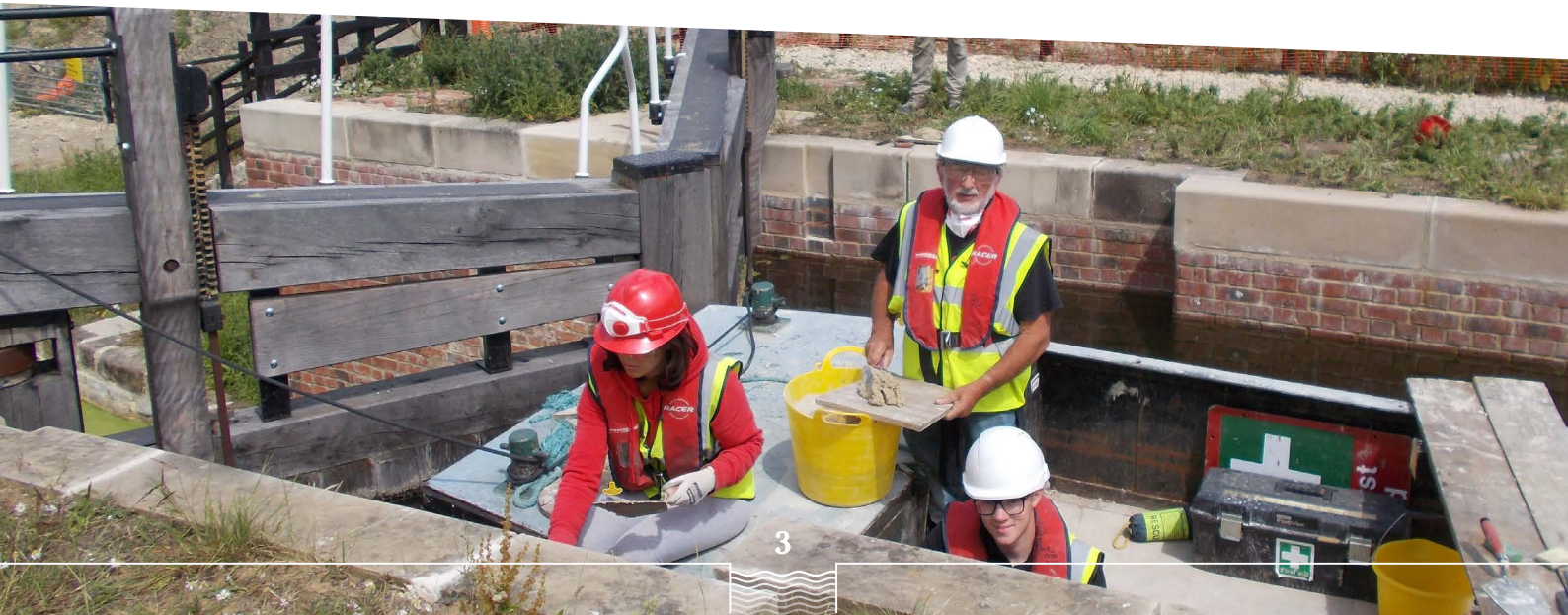
Restoration work could involve installing temporary works to control water and may require volunteers to work in the water. Appropriate clothing including the use of safety wellington boots or waders may be required. When standing in water you should not let the volunteers suffer from cold.

When working near (within one metre), on or over a body of water of any size, steps must be taken to stop anyone falling into it, or if they do, making sure that they will not come to harm and can be rescued quickly. In addition to looking after volunteers you need to take into consideration the safety of members of the public including those using a waterway.

Your welfare facilities will need to be able to cope with extra hand cleaning, drying clothes, changing out of wet clothing and may need to include showers. There is a risk that tools will get dropped into the water and will need to be replaced.



When working near water it is essential that a safe system of work is in place, with personal buoyancy equipment used where necessary and adequate training for volunteers.



DANGERS OF WORKING NEAR WATER

The ultimate danger from working near water is drowning. This can be caused by several factors, which are dangers in themselves:

- ① Shock of sudden immersion in cold water.
- ② Weight of waterlogged clothing and/or equipment.
- ③ Incapacity following injury after striking an object during the fall or in the water.
- ④ Fatigue or hypothermia where rescue is not immediate.
- ⑤ Being swept away by strong currents, waves, tidal action and swell from passing boat traffic.
- ⑥ Falling into water when unconscious, the water can be shallow.

Health issues include Leptospirosis from infected rats and digestive illness from swallowing contaminated water, i.e. natural organisms, chemicals and diesel oil. These illnesses can be picked up from standing water on site, such as puddles as well as from water in the main waterway channel.

Leptospirosis is a form of bacterial infection, also known as Weil's Disease. It is carried by animals, most commonly rats and cattle. The bacteria can enter through breaks in the skin, such as scratches or cuts or through the lining of the mouth and nose after contact with urine - contaminated water which can often be found in ditches, slow flowing rivers and derelict canals.

First symptoms are flu-like, with headaches and chills. Later symptoms can be vomiting, muscle pains, ultimately jaundice and kidney failure. It begins as a mild illness, which can be cured if treated early. If left untreated, the disease becomes more serious and can be fatal.

Other dangers include electrocution from the immersion of power tools or cables, handles of tools becoming slippery when wet and damage to the environment due to release of pollutants or contamination with waste. Flowing water could undermine earth dams or destabilise working platforms.

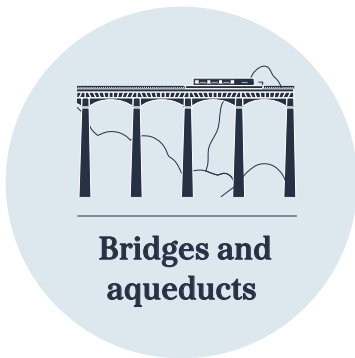
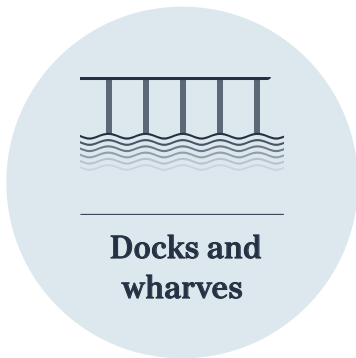
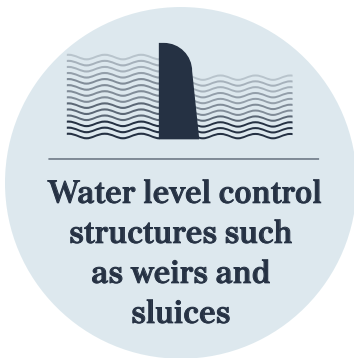
Possible causes of immersion into water are:

- ① Falling into water from height, such as a quayside, bank or a working platform over water.
- ② Slips, trips and falls from a low level, particularly during adverse weather.
- ③ Being knocked over by moving objects, vehicles or persons.
- ④ Loss of balance at a water edge due to high winds, sudden boat movement, over reaching.
- ⑤ Failure or absence of edge protection.
- ⑥ Failure or absence of fall prevention equipment.
- ⑦ Floating platforms or vessels sinking due to being overloaded or being disturbed by tidal or wave action from passing vessels or not secured properly.
- ⑧ Failure of plant or equipment falling into water.
- ⑨ Collapse of a water edge due to overloading by plant and equipment.
- ⑩ Failure of plant or equipment falling into water or collapse of a water edge due to overloading by plant and equipment.



- 11 Failure of a temporary dam or inundation due to overtopping following heavy rain.
- 12 Flooding of the site, due to adverse weather conditions, with the flood water hiding obstructions and holes.
- 13 Using waders in deep water and getting feet stuck in submerged mud.
- 14 Being unaware of the water edge due to concentrating on the work task or having your back to the water.

AREAS WHERE RISKS ARE LIKELY TO BE ENCOUNTERED INCLUDE:



ASSESSING THE RISK

The risks from working near, on or over water need to be managed and a risk assessment, method statement and rescue plan must be produced. Working over water will often also involve working at height so the risks from both hazards need to be managed. Refer to the guidance note on Working at Height.

When considering the risk associated with working near water the first consideration should be whether it is possible to eliminate the water hazard by doing the work another way. For example, could some of the work be done away from water, such as off-site fabrication.

Another consideration when working near water is whether carrying out the work at a different time of year would reduce the risk. For instance, working on a weir structure during the summer months when the water flow over the weir is likely to be less.

Whenever reasonably practicable, fixed edge protection should be provided to prevent people and plant from falling into the water. This could include a low level barrier to prevent plant operating too close to a weak or unsupported edge.



WORKING SAFELY NEAR WATER

Here are some examples of where you may find yourself working near water and how to carry out the work safely:

1 Behind a cofferdam

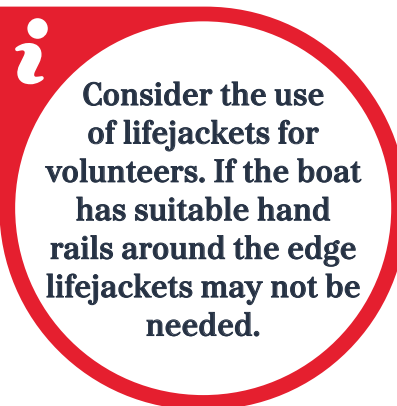
A cofferdam could be a set of stop planks, a fabric dam, a sheet piled structure or an earth bund used to dam a watercourse. The cofferdam should be designed with sufficient freeboard (height above the level of the water) to allow the water level to rise in the event of heavy rain. The cofferdam should be properly designed and installed by competent people and may need the water face to be sealed with polythene sheeting. An earth bund should be designed to allow for the weight of plant that will be using it. Plant movements will weaken the earth bund.

Once the cofferdam is in place and the water is removed behind it, inspect the cofferdam for leakage and distress. The inspection should be carried out by a competent person with knowledge, training and experience of such inspections. Only after the cofferdam has been inspected can volunteers be allowed to work behind it. Inspections should be repeated at the start of every day and after any weather event that might have led to any instability. It is important to monitor the weather forecast for heavy rain which could cause the dam to overtop or flood the working area. Water pumping must be set up to control leakage through the cofferdam or from groundwater seeping into the working area.

2 Working from a boat or floating platform

We will use the term 'boat' in this section, but the content applies equally to floating platforms. Ensure you have a competent helmsman to manoeuvre the boat into position. Once the boat has been moved to the work area ensure it is securely moored and take account of any possible changes in water level, particularly in tidal situations. Make sure the access

onto and around the boat is suitable for the activities being carried out. It may be necessary to load the boat with materials and volunteers before moving it into position. When moving around the boat do not use narrow edges, such as gunwales. On steps down into the hold of the boat it may be necessary to face the steps. Any steps within the boat should be kept clear, clean and ideally have a non-slip surface. The boat will be less stable than on land due to the buoyancy, making slips, trips and falls more likely. You should be aware of the boat movement and the risk of hands getting trapped between the boat and a structure.



3 Working from a scaffold over water

In some situations a scaffold may be set up to allow work to be carried out to a structure above the water level, such as work to the walls in a lock chamber that is still in water. The scaffold may have been set up in the dry and then allowed to flood or it may have been set up in shallow water. Attempts should be made to keep the work area free of water so that the entire scaffold can be inspected daily. The base of the scaffold must be set up on a sound footing. When erecting the scaffold make sure it is close to the working area with a minimal gap between the scaffold and structure. The recommended gap is 225mm maximum. Inspections of the scaffold will only cover the section above the water.



The scaffold should have adequate handrails and toe boards to prevent volunteers and materials dropping into the water. The access onto the scaffold from the bank should be adequate to allow volunteers, materials and tools to be loaded onto it.

4 Inspection of waterway structures

When carrying out an inspection of a structure alongside water, such as lock chambers or towpath walls try to view it from the opposite bank to avoid having to lean over the water. It is recommended that life jackets are worn when closer than 1m to the water's edge. Natural towpath edges may be covered in vegetation which hides the actual edge and in wet weather they may become slippery. The use of a camera on a selfie stick can be useful to inspect a waterside structure or the underside of a bridge.

5 Working on or from a towpath

When working on a towpath try to keep away from the water edge. Consider the need for wearing lifejackets in your risk assessment. When working on the front (water) verge face the water as much as possible. The condition of the verge can change with changing weather conditions, becoming slippery when wet or frozen. If you are using plant on a towpath make sure that you assess the towpath wall to ensure the plant will not overload it. If you don't know the strength of the towpath wall, the rule of thumb is to assume a safe distance using the 45 degree rule, i.e. the safe distance back from the edge is equal to the depth of the water. Ensure that there is room for the plant to turn or make sure any reversing is controlled by a banksman.

6

Installing piling to a waters edge

Piling to a towpath or other water edge should be carried out with a work boat or floating platform in support. The work boat will need to be securely moored at the work location and will be moved as the piling progresses. The activity will require some leaning over the water. It is recommended that lifejackets are worn. If using a piling gate, it should include a walkway with handrail and suitable access from the bank.

7

Working in a flooded 'dry' canal channel

When restoring a canal channel, heavy rain may cause local flooding within the channel making pedestrian access impossible and preventing work continuing. Flood water will need to be pumped out before work can resume. The location of the pumps must allow suitable and safe access to them and their hoses to enable safe operation. Obstructions and voids underwater may be hidden so extra care will be needed. Consider where water is discharged to avoiding flooding other areas or causing a nuisance to neighbours.



There is a greater risk of slips, trips and falls during pedestrian access through flood water because of hidden obstructions and voids. Plant access may be compromised if the depth of water is not known.



8 Environmental considerations

When working near water there is a greater risk of polluting a watercourse with construction materials. Extra care will be needed not to drop mortar when bricklaying or repointing. The arisings from cleaning out brick joints or from rubbing down flaking paint may need to be collected.

Storage of pollutants, such as fuel and oil will need to be considered. Plant and equipment will need to be inspected for leaks and static equipment may need to be stood on a plant nappy.



Wash water from concrete and mortar mixing should be collected and not allowed to enter a watercourse. When setting up pumping from a flooded site the pump discharge may need to flow over an area of grass before entering a watercourse to prevent pollution with silt.

LIFEJACKETS & THROW LINES

Lifejackets should be selected for their suitability to the wearer and type of work being carried out. Lifejackets must be made to the relevant British Standard and have been obtained from a reputable supplier.

The primary aim of a lifejacket is to support an unconscious person face upwards in the water. Inflation of the lifejacket should be by means of a CO₂ cartridge, activated manually or automatically. Automatic inflation is preferable because it will inflate within seconds on contact with water and an unconscious person will be turned face upwards. With manually operated inflation the wearer must be able to locate and pull the toggle. Also during normal wear there is a chance of catching the toggle, leading to accidental inflation.

Lifejackets that are inflated by mouth after entry into the water should be avoided. Ideally lifejackets should be fitted with a crotch strap to avoid the lifejacket riding up over the head.

Where there is a risk of entry into water, rescue equipment should be available to quickly remove the person from the water.

Throw lines are easy to handle and can be thrown with accuracy to a person who has fallen into water. They should be thrown underarm towards and in front of the person.



Lifebuoys with a rope attached have limitations because they can only be thrown a short distance, six to eight metres and then with little accuracy. Handling up to 30 metres of rope may present problems.

CARE OF LIFEJACKETS

Volunteers must be trained to carry out pre-wear checks each time an item of personal buoyancy equipment is used.

Pre-wear checks of a life jacket should be carried out in accordance with the manufacturer's instructions and will include visual checks to ensure:

- 1 The firing mechanism has not been activated.
- 2 The automatic firing capsule and gas cylinder are correctly screwed in place.
- 3 There are no signs of corrosion, cracks or dents in the gas cylinder or automatic firing capsule.
- 4 Unwanted movement within the firing mechanism (creepage) has not occurred. Some automatic inflation mechanisms have colour coded indicators to show when compression of the spring has been lost. Those that don't have such indicators will need careful inspection to judge whether the spring has lost compression. Examination of the piston or other visible component may also show creepage has happened.
- 5 Whistle and light, when fitted, are in position.
- 6 Oral inflation tube is capped.
- 7 Straps and main body of the jacket are not worn or damaged.
- 8 Inflation bladder is correctly packed ensuring that Velcro is fastened and the manual inflation lanyard is accessible.

If any faults are found, the lifejacket should not be used and should be clearly labelled to indicate the fault. It should be returned to the manufacturer to be replaced.

Servicing of lifejackets must be carried out in accordance with the manufacturer's instructions, in addition to pre-wear checks. The inspection interval is dependent on the frequency of use and the harshness of the environment that the lifejackets are being used in. The maximum period between services is 2 years.

Inspection and testing must be carried out by those competent in recognising defects and the remedial action being taken. It is usually carried out by the manufacturer or their appointed agents. Records must be kept of all inspections and repairs carried out.

Testing the air-tightness of the lifejacket involves orally inflating the lifejacket and leaving it overnight (or submerging it in water) to check for leaks. The automatic inflation mechanism must be dismantled to make a detailed examination of its condition.



As part of the maintenance inspection, further checks are:

- ① All screw threads must be examined for signs of rust. Rust can lead to problems in locating the cocking cap or keeping the gas cylinder in the correct position.
- ② The gas cylinder must be examined for corrosion, cracks, dents and other defects. Particular attention must be paid to the cylinder cap as any indentations could mean that the automatic firing mechanism has fired but failed to pierce the cylinder. If this is the case, the reason for activation and the cause of failure needs to be identified and recorded.
- ③ The cylinder fitting and groove of the firing pin must be checked to ensure that they are free from dirt.
- ④ The automatic inflation mechanism must be operated manually (with the gas cylinder removed) to ensure that it operates smoothly and there is no obstruction to the movement of the pin that prevents it piercing the cylinder. The firing pin must be checked to ensure that it is sharp.
- ⑤ The salt or paper ring must be inspected for any cracking, dissolving or tearing that has taken place since the last inspection.
- ⑥ Where fitted, the rubber 'O' ring must be inspected for damage and that it is correctly seated.
- ⑦ The mechanism must be checked for signs of creepage.

Personal buoyancy equipment must be stored in dry conditions when not in use. Exposure to damp, humid conditions can lead to deterioration in the automatic inflation mechanism, known as creepage. This has potential to lead to the failure of the pin to pierce the carbon dioxide gas cylinder.

Advice on storing lifejackets:

- ① Do not hang lifejackets in contact with wet oilskins or other damp clothing, make sure there is enough space around them to allow the air to circulate.
- ② If a lifejacket is wet, unpack it and leave it to dry out on a hanger.
- ③ Do not store lifejackets close to or directly above heat sources (such as convection heaters, radiators or in direct sunlight).
- ④ To prevent water getting into the automatic inflation mechanism, do not store wet lifejackets upside down or laying flat.



Where damage to a personal buoyancy device is discovered, unless it is to be discarded or replaced, it should be returned to the manufacturer for repair. Local repairs should not be attempted.



Once the inspection is complete, the lifejacket should be reassembled according to the manufacturer's instructions.

RESCUE PLAN

The rescue plan should also take into account how a person will be removed from the water onto dry land. In some circumstances a safety/rescue boat may be an appropriate means of rescuing anybody falling into the water.

Should somebody need to be rescued, the location of the rescue point must be selected so that the rescuer is not put at risk. Use a dry level surface away from muddy banks or an unprotected edge. Ideally the casualty would be moved to a safe point of egress from the water, such as a beach area or ladder.

Prepare your rescue plan to show the rescue point and the location of the throw line or lifebuoy. The plan should include how and who would raise the alarm. Make your volunteers aware of the rescue plan.

In a situation where a safety/rescue boat is required, make sure you have a trained helmsman available at all times work is being carried out. The boat should be moored so that it is easily accessible. The mooring should be designed to allow for the transfer of a casualty. Alternatively, the boat needs to be able to reach somewhere where it is possible to safely transfer a casualty.



USEFUL RESOURCES:

[Canal and River Trust Working on or near water video](#)

[Personal buoyancy equipment](#)

[Weil's disease](#)

[Floating excavator](#)

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



Historic England

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