

The Royal Society for the Prevention of Accidents



Water and Leisure Report

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A Report for Leeds City Council

Part (1) Generic Water Safety Assessment (safety case) for areas of open water

Part (2) Specific Site Reports:

- (A) Wharfe Meadows Park, Otley (Fast flowing river in an urban environment)**
- (B) Roundhay Park (Lakes in an urban environment)**

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Part (1) – Generic Water Safety Assessment (Safety Case) for Areas of Open Water

1. Introduction and Terms of Reference

This report was commissioned by Leeds City Council (LCC) to provide generic guidance on a water safety strategy for two distinctly different areas of open water within City Councils areas of responsibility.

Firstly the review has considered the water safety arrangements for Wharfe Meadows Park Otley as an example of a park comprising of a pedestrian and cycle park along side the River Wharfe used as a pedestrian thoroughfare particularly by school children. The river has historically been particularly prone to flooding, the effects of which severely compromise the safety of the public using this walkway.

Secondly the review considers Roundhay Park as an example of easily accessible lakes within a popular City Centre Park. Roundhay Park (among other sites of open water) was reviewed by the RoSPA consultant in 2005. The opportunity was taken on this visit to review these recommendations again and to assess the implementation of the recommendations by LCC.

This report follows a comprehensive review of the water safety arrangements around these areas of open water and the potential impact on public safety and the moral and legal responsibilities of the Council in the light of recent court judgements and accident investigations.

The report presents two water safety strategies as well as specific prioritised recommendations to risks identified on these sites.

The recommendations which follow are formulated upon current best practice based on RoSPA's publication 'Safety at Inland Water Sites – Operational Guidelines' and 'Managing Visitor Safety in the Countryside - principles and practice' VSCG Books.

In carrying out this safety review RoSPA would point out that audits and reviews are by nature a sampling exercise, therefore the reviewer cannot guarantee to identify all safety hazards around the development. Opinion is formed by a review of the site therefore absence of comment on any issue should not be taken to imply that the areas of open water are completely safe. It is therefore implicit in these recommendations that LCC keep the safe operating procedures and risk control arrangements under review.

2. Summary of Hazard and Risk

Areas of open water can create a danger to any person walking alongside them and the three main risks associated with the hazard are:

- Drowning through immersion.
- Physical injury.
- Health problems associated with untreated or polluted water.

Drowning

This can occur from either accidentally falling into or deliberately accessing the water and usually arises from one or more of the following factors:

- Uninformed or unrestricted access to the water hazard
- Ignorance, disregard or misjudgement of the danger
- Lack of supervision
- Inability of the victim to cope (or be rescued) once in danger

Although each of these above may be a contributory factor, the major cause of potential danger on any site will be *ignorance or misjudgement of the danger*.

Physical injury

This is likely to be caused by wet and slippery conditions whereby injuries are caused by falls, slips, trips and entrapment.

Potential poor water quality associated health issues

Water can both contain contaminants such as pollutants and toxins that cause ill health, and be the medium to promote the spreading of bacteria that causes disease and infections. Blue green algae toxins, leptospirosis, cryptosporidium and e-coli are some examples.

The hazards of the river have the potential to promote a risk to persons using the adjacent pathways. In addition, water, water-based activity machinery and weirs fascinate young children in particular whose natural curiosity can lead them into danger. Furthermore, employees can also be at risk carrying out maintenance work on waterside machinery, as can adults accessing the docks and during the hours of darkness.

3. Existing Management of the Risk

Water hazards when risk assessed are usually controlled by:

- Physical features to deny or control access, such as barriers or gates.
- Education to raise awareness of the dangers by providing information through signage, leaflets, etc.
- Supervision having a physical presence on site.
- By having in place agreed operational procedures such as formal written Normal Operational Procedures (NOP's) and having an Emergency Action Plan (EAP) and, when appropriate, rescue equipment deemed necessary.

A risk assessment review can be used to determine what should be done, but in itself it can be only part of a total assessment strategy. The conducting of such by LCC only ensures that they have a full understanding of the hazards and risks, which are the basic premise of why a risk assessment should be carried out. The risk assessment strategy should highlight the need for documentation such as NOP or EAP, formal supervision or information dissemination arrangements.

The starting point to establish a safe site is to develop a **safety management system**. This is based upon acknowledged good practice and design principals as contained in, for example, HSE publication (HSG 65) '*Successful Health and Safety Management*', BSI (BS 8800,1966) '*Guide to Occupational Health and Safety Management Systems*'.

Both these documents stress that the key to adopting a planned approach to safety management lies in developing an effective approach to risk assessment. At present, there is a requirement under legislation to carry out risk assessments but there is no statutory requirement to put in place specific controls such as fences and rescue equipment although this is implicit in the management regulations.

4. Legal Responsibilities

Various pieces of legislation place statutory duties on the site owners of inland water sites, or the person responsible for the site, to provide for the safety and the well being of visitors, which **includes employees and members of the public. The consultant has highlighted those issues, which directly relate to the site-specific recommendations, which follow later in the report.**

Both statute and common law have a relevance to the operation of inland waters.

Statutory Health and Safety Requirements

Health and Safety at Work Act 1974: This is an enabling act with the aim of securing health and safety in the work place. Regulations made under the Act place more specific duties on employers than employees. **Section Three of the 1974 Act** specifically requires every employer to ensure, so far as is reasonably practicable, that he/she takes the necessary steps to ensure the **safety of non-employees affected by his/her activities.**

The Management of Health and Safety at Work Regulations 1999 (previously 1992): These were made under the 1974 Act. They require that health and safety be suitably managed so as to control risks effectively and present no harm to people.

The regulations require that an adequate and suitable assessments of work related hazards should be carried out to determine the preventative and protective steps that must be taken.

They also require employers to have access to competent advice, to monitor and review their systems, to have emergency procedures and to provide information and training. **They have major implications for the many inland open water sites operators whose activities have a bearing on the public as well as employee safety.**

The Health and Safety (First Aid) Regulations 1981: These were also made under the 1974 Act, and are mainly concerned with the provision of first aid for employees. The regulations set out the range of numbers and training of first-aiders, and the type of equipment that should be provided.

Public Health Act 1936: This is an enabling law offering local authorities the power to regulate water users (for example, to prohibit swimming).

Occupiers' Liability Acts 1957 and 1984. This states that the occupier must take reasonable steps to ensure the safety of visitors to his/her land or premises. This duty is particularly onerous where children are concerned. The occupier owes the duty of care not only to visitors but also to trespassers as well. The earlier Act deals with "visitors" and the later Act deals with "trespassers".

The Occupiers' Liability Act 1957 provides:

- "(2) The common duty of care is a duty to take such care as in all the circumstances of the case is reasonable to see that the visitor will be reasonably safe in using the premises for the purpose for which he was invited or permitted by the occupier to be there.
- (3) The circumstances relevant for the present purpose include the degree of care and of want of care which ordinarily would be looked for in such a visitor, so that (for example) in proper cases –
- a) an occupier must be prepared for children to be less careful than adults: and
 - b) an occupier may expect that a person, in the exercise of his calling, will appreciate and guard against any special risks ordinarily incident to it, so far as the occupier leaves him free to do so.
- (4) In determining whether the occupier of the premises has discharged the common duty of care to a visitor, regard is to be had to all the circumstances, so that (for example) –
- a) where damage is caused to a visitor by a danger of which he had been warned by the occupier, the warning is not to be treated without more as absolving the occupier from liability, unless in all the circumstances it was enough to enable the visitor to be reasonably safe; and
 - b) where damage is caused to a visitor by a danger due to the faulty execution of any work or construction, maintenance or repair by an independent contractor employed by the occupier, the occupier is not to be treated without more as answerable for the danger if in all the circumstances he had acted reasonably in entrusting the work to an independent contractor and had taken such steps (if any) as he reasonably ought in order to satisfy himself that the contractor was competent and that the work had been properly done.
- (5) The common duty of care does not impose on an occupier any obligation to a visitor in respect of risks willingly accepted as his by the visitor (the question whether a risk was so accepted to be decided on the same principles as in other cases in which one person owes a duty of care to another)".

The Occupiers Liability Act 1984 provides :

- "1(3) An occupier of premises owes a duty to another (not being his visitor) in respect of any such risk as is referred to in the sub-section (1) above. If –
- a) he is aware of the danger or has reasonable grounds to believe that it exists;
 - b) he knows or has reasonable grounds to believe that the other is in the vicinity of the danger concerned (or that he may come into the vicinity of the danger) (in either case, whether he has lawful authority for being in that vicinity or not); and
 - c) the risk is one against which, in all the circumstances of the case, he may reasonably be expected to offer the other some protection.

- (4) Where, by virtue of this section, an occupier of premises owes a duty to another in respect of such a risk the duty is to take such care as is reasonable in all the circumstances of the case to see that he does not suffer injury on the premises by reason of the danger concerned.
- (5) Any duty owed by virtue of this section in respect of a risk may, in an appropriate case, be discharged, by taking such steps as are reasonable in the circumstances of the case to give warning of the danger concerned or to discourage persons from incurring the risk.
- (6) No duty is owed by virtue of this section to any person in respect of risks willingly accepted as his by that person (the question of whether a risk was so accepted to be decided on the same principles as in other cases in which one person owes a duty of care to another)."

The Health and Safety (Safety Signs and Signals) Regulations 1996: This implements European Directive 92/58/EEC that came into force in April 1996. This standardises safety signs throughout member states of the European Union. The regulations require employers to use safety signs where there is a significant risk to health and safety of their employees that has not been avoided or controlled by the methods required under other relevant law, provided use of a sign can help reduce the risk.

In implementing the signage requirements identified required by this report, you should also be aware that a new BSI standard has been developed specific to water safety signs. The standard BS 5499-11:2002 was published on 29/07/2002.

RoSPA recommends that any new signs should conform to this standard in the future and that a review of existing signage is carried out. Those that are in need of repair or have poor legibility/clarity of image should be replaced straight away and all others should be subject to programme of replacement. The period of time for such replacement should be 'reasonable' in terms of overall cost against the safety gain or imperative. Overall it would not be unreasonable to expect that all signs should also comply with this new standard within a two-year period (this estimation could be modified by future court actions arising from signage issues).

Other Occupational Health and Safety Duties

Operators to whom the 1974 Act applies also have various duties, including the recording, notification and investigation of accidents to the enforcing authority (e.g. HSE or local authority environmental health departments.) Where a member of the public has drowned or has been taken to hospital for medical treatment, i.e. following a near drowning incident, the appropriate enforcing authority must be notified.

Common Law Duty of Care

Although there is a lack of legislation in this area, responsible bodies do have powers to effect preventative measures and the site owner must ensure that all facilities and equipment are suitable and safe to use. Under common law, liability to negligence may arise from the breach of fundamental duty, known as a 'duty of care'. The duty is described as follows, and applies to members of the public as well as operators:

'To take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to cause injury to your neighbour'.

The duty specified to take reasonable care. This can be defined as 'what the reasonable man/woman would have foreseen as being necessary'. A certain level of risk is acceptable and it is expected that safety measures will be applied 'as far as is reasonably practicable'. In other words, practicable measures have to be technically feasible, and costs in time, money and effort are reasonable.

In the case of safe management of inland water sites, **the duty of care means that the burden of taking adequate precautions falls on the site operator. A risk assessment of the facility and equipment should be undertaken and appropriate safety measure adopted.** A normal operating procedures (NOP) document, together with an emergency action plan, should be completed and then monitored and reviewed at regular intervals. Before devising a water safety strategy hazards must be identified, risk determined, and findings recorded. This is a legal requirement under the Management of Health and Safety Regulations 1999. **The duty of care is extended to protect people even from their own ill-judgement or wilful abuse of facility or equipment.**

5. Implications of Recent Court Cases

Although many court cases are relevant to site operators they do not give specific requirements of what has to be done in terms of controlling hazards on any particular body of water. The Tomlinson case and other more recent cases have centred on the issue of liability rather than others factors so they will always be limited in determining what must be done at any particular site or within a water safety strategy.

This strategy should include and define what the overall strategy to protect the public is. Recent cases that have gone to the courts appear to be promoting the idea that individuals do have a significant responsibility for their own actions providing that they have suitable and sufficient information to make their own risk assessments, thus they have the ability to make an informed choice about their behaviour.

The 'Tomlinson' case was taken under the occupier's duty of care to visitors to the site including trespassers and the relevant sections of the Occupiers Liability Act applied.

The circumstances related to a trespasser who broke into Local Authority owned land and dived into a lake occasioning a serious neck injury. Signage and fencing were in place, however a recent safety audit had identified that this was inadequate and the Council had been recommended to make improvements, which they had not done due to fiscal restraints.

The judgement in the litigant's favour rested upon the following factors:

- Where the risk is open to the public and you take active measures to encourage visitors, your safety measures must be particularly effective.
- Where the risk is in a remote area and numbers of visitors are few, your safety arrangements can reflect this reduced pressure from the public.
- The Judgement expected that a Local Authority should have adequate financial resources to implement safety recommendations and not to do so was no defence.

This was a very unusual case and legal opinion is that these particular sets of circumstances are unlikely to occur again. It was also interesting that the award to the litigant was reduced by two thirds due to his wilful neglect for his own safety.

5.1 Tomlinson; Explanation Note on its Relevance

This particular judgement was subsequently overturned at the House of Lords on the basis that this particular person's injury was purely as a result of his own disregard for his safety and that it would have occurred in this instance irrespective of what the landowner had or hadn't done. However if the circumstances were different i.e. it was a child that accidentally fell in and not deliberate access the result would not have been reversed. Once you are aware of any weaknesses in your water safety protection system you need to take reasonable and practical steps to address them.

The basis of **your** defence against any litigation will be effective risk assessment and implementation of control measures, e.g. band four fencing, life saving equipment (*not applicable in this case*), signage and regular site monitoring. In the RoSPA consultant's the adoption of the following arrangements and prioritised proposals for improvement, based upon a risk assessment, take account of increased public access to the basins both from residents and visitors. This should provide you with an adequate defence as well as meeting your moral obligation to the residents and persons that visit your site.

6. Risk Assessments

Under the management arrangements for the Health and Safety at Work Act, you should develop risk assessments for the site that cover:

- *The work of the employees who may visit the site.*
- *The inherent risks posed to employees, contractors, visitors, adjacent residents and others that may visit the site from time to time.*
- *It is recommended that specific risk assessments be made to cover the use of the River and public access to the cycle way. These risk assessments should cover access to the water's edge by large numbers of people who are likely to be in the vicinity and, **additionally, any temporary waterside events**. Control measures should include access to the edge and prohibition, signage, lifesaving equipment (*not applicable in this case*) and emergency response plans.*
- *It is recommended that you have in place a strategy to deal with ice and flooding.*

Risk assessments and any control measures should be documented and reviewed at least once a year or after any safety critical event.

6.1 Management of the Risk and Site Monitoring

You should give particular attention to the following:

- *It is recommended that you have well documented procedures for hazard spotting and actively monitor the site to ensure that the safety features are working.*
- *All accidents and near misses should be recorded and analysed to monitor that the control mechanisms for identified risks are working.*
- *Develop contingency plans with particular relevance to site access for the emergency services in the advent of an injury or water accident.*

6.2 Edge Protection and Exclusion: Generic Issues

Whilst the profile and the nature of the water's edge is a fundamental factor in addressing the risk, improving the edge by exclusion or other measures will not address all of the safety issues. Protective measures should be supplemented by the correct management procedures, the circulation of information, supervision and surveillance (where appropriate) and signage.

Unsupervised open water can present a high level of risk due to the nature and use of the adjacent walk and cycle ways. In reviewing the existing level of protection to the waters edge for both these locations, the RoSPA consultant comments as follows, using for ease of identification RoSPA's banding system.

- When considering the level of waterside edge protection it is recommended that a holistic approach is taken, considering the nature of the edge and the type of use and potential use the walkways path will be put to.
- Fast flowing rivers can, in spate or higher conditions can be deep (for example) and may also be abounded by high walls. Falling into the river could potentially be fatal and self-rescue would be difficult. Experience demonstrates that in urban areas the only practical solution to address this risk is to position '*band four fencing*' which will provide exclusion from the water's edge.
- On the other hand lakes particularly where they are easily assed by the public, can attract swimmers during hot weather who may be completely unaware of the risks of deep water and the potential for thermal inversion (differences in temperature of the water at various depths).
- '*Band four fencing*' should meet all the normal standards as laid down in the building regulations, regarding height, spacing of railings and non-climb design (see *Appendix Two, edge protection for urban water sites-band four fencing*).
- *Vertical railings have been traditionally chosen to fulfil this role, but in recent years alternatives have been designed (to RoSPA's approval) which still meet these criteria. Horizontal railings can be effective, (as used on the Thames Embankment, Millennium Bridge, Chatham Maritime and Gunwharf Quays, Portsmouth Harbour) if the fence as a whole is cantilevered inward toward the top.*
- Band four fencing should also be positioned where there are specific hazards (weirs, pinch points culverts etc), along otherwise unprotected water's edge.

6.3 Signage: Generic Issues

As part of the overall safety strategy, the following measures should be undertaken to improve and ensure greater awareness of the potential dangers of the water.

- **Multi signs (Emergency Points)** should be provided at key entrances to the sites and strategic positions i.e. car parks.
- *These signs should utilise pictograms to indicate safety messages relating to the danger of the water i.e.*
 - *Your location*
 - *Do not enter the water*
 - *No Swimming*
 - *Keep children under supervision*
 - *Action to be taken in an emergency*
 - *Examples of safety signage to be found at the location*
 - *Location of the nearest telephone and security office*

- *You should consider targeting the adjacent residential areas with specific water safety information such as a leaflet campaign advising of the water risk and the need to keep young children under supervision.*
- Space should also be provided for the positioning of temporary notices:

'Dangerous - Ice take care!'

'Footpath and surrounds flooded - take care!'

Please note that the integrity of the signage should be checked on a regular basis and documentary evidence retained.

6.4 Public Rescue Equipment: Generic Issues

The consultant has in certain areas recommended a high level of edge protection, where additionally life saving equipment is recommended; it should meet with the following criteria:

- *It is recommended that you incorporate safety signage and lifesaving equipment into a combined position known as a **safety point**.*
- ***Life rings** should be considered where there is a substantial drop into deep water whereas **throw lines** should be considered for all other locations.*
- ***The safety point** should repeat the messages found on the **multi point (Emergency Point)** at the entrance (see above).*
- *The positioning of the **safety point** (where recommended) should meet the criteria that a visitor can see one from whatever location they are at the risk.*
- *All **safety points** should be identified by a number and checked on a **weekly** basis and documentary evidence retained of this check.*
- *Safety points should be positioned in dedicated containers, which can be accessed by the disabled as well as children and be visible at night.*
- *The 'Perry lines' within the ring should be regularly checked for damage by ultra violet light.*
- *The length of the rescue line should be relevant to the length of drop into the water. (i.e. not too short!)*

6.5 Water Quality: Generic Issues

Although there is no legal requirement to carry out water quality testing it would be advisable to do this initially to determine the current position of the water and then periodically in the future. It is equally important to monitor other factors that could affect water quality.

Letospirosis (Weil's Disease is a form of this) is found around water and is spread by rats. Although it is not possible to test water for its presence meaningfully, rats should be discouraged from the site and pest control measures introduced as required. Litter, debris and other material likely to provide shelter and food for rats should be removed regularly and action taken if it is found to be the case.

Part (2) A – Wharfe Meadows, Titty Bottle and Manor Parks

1. Site Specific Recommendations

The following recommendations follow a comprehensive site inspection by the RoSPA consultant. As discussed earlier in the report the recommendations are made to facilitate LCC in meeting their legal obligations and in particular those items that have been highlighted in Section 4 '*Legal Responsibilities*'.

You will need to have a documented prioritised schedule as to how you propose to implement the control measures raised.

1.1 Summary of Rationale for Recommendations

RoSPA visited the site in the autumn and subsequently came up with a clear solution to the considerable water safety hazard viewed on site, that primarily being the presence of large steep weir that is found within the site, this weir which is 75m long and has a fall of 5-6m on the downstream side is little more than 20m downstream from the wildfowl feeding area that is popular within the park. In any raised water levels this weir would be very dangerous, which lead the consultant to suggest linking up the existing fencing that was onsite. RoSPA would never usually recommend the fencing off of waterways, but due to the presence of such a large and potentially dangerous weir we felt that this time some edge protection was required to stop deliberate access to the weir and protect those that accidentally fall in from being swept over the weir.

The initial suggestion for fencing is for the same hip/waist high 1.1m bow topped ornamental Victorian park fencing that is along the walkway by the children's playground downstream of the weir, together with gates within the design for controlled access to the river. This open design fencing would not preclude the feeding of water fowl nor present such a challenge that youths would endanger themselves by getting over it, any design would need to allow for access and egress at the stepped down area.

Public rescue equipment was felt to be of little effect on this site as it was explained that there had been difficulties in ensuring it was in place when needed and at this site particularly, those untrained in using throws lines and life rings would be particularly at risk themselves when attempting to use them. All too often the, would be rescuer becomes a casualty themselves. The original solution was then one that was clear, simple and unambiguous one that would be effective in times of flood, the edge of the river would be visible, and the strategy for public safety was not reliant on signage and public rescue equipment.

It is very difficult to use the history of the site to always determine the level of risk and so come up with sensible balanced control measures. There is no very recent record of any children drowning at the site and inland water site drownings that repeatedly occur at the same site are very rare, however RoSPA drowning statistics show that between 1989 and 2006 there were 25 fatalities in the River Wharfe of which 6 where in and around Otley. There are more than 350 inland water site related fatalities each year in the UK, that's one a day and the majority will occur at virgin sites i.e. that's the first time its happened here and often then steps are taken to try to prevent further fatalities. A number of people have drowned in the River Wharf both upstream and down stream of the Park and because no records are kept we have no idea of the number of near misses and serious incidents there might have been at this site.

In defending RoSPA's decision we are a water safety department with considerable knowledge and expertise and have visited thousands of inland water sites in the UK and our consultancy advice is backed up by our unrivalled analysis of drowning incidents in the UK. RoSPA with the RLSS and the newly created National Water Safety Forum produce the only reliable drowning data in the UK and so understand fully the issues around water safety.

The difficulty in assessing this site is that the River Wharf, a typical Yorkshire river draining the limestone and in places grit stone Pennines and dales, is subject to substantial variances in flow and height. During the summer in periods of dry settled weather, the flow will be such that relatively only a trickle will be going over the weir and the historical hiring of rowing boats shows that the weir creates almost a pool upstream, which apart from the depth would be relatively benign. A completely different scenario can be found during the winter when the whole of the lawned area adjacent to the steps can be flooded when the river is running 2m or 3m higher and flowing at up to 10mph or more.

Site Visit Observations 8/03/2007

The river, as a result of the heavy rain of last week end, was running at a medium level but meant that at the base of the steps the river was about 750mm in depth shelving off quite quickly to over 2m and was flowing at about 5 mph and throughout the 3 hours that I there, the park was very popular with parents with young children and toddlers feeding the wildfowl, some parents stayed at the top of the steps some went further down, some parents held their toddlers or kept their children in arms reach, others didn't, reinforcing my opinion that they were not really aware of the hazards on site.

1.2 Subsequent Recommendations

Edge protection

Edge protection is required and signage can be used to support water safety. This is an urban site and those that access the site from the playground and downstream expect the path to be a significant distance away from the water and where it is adjacent to the water it is currently fenced, we always strive to be consistent in our approach either there is open access or not, compromises and a mixed approach send out mixed safety messages. Tourists and those not familiar with the site would not be aware that when turning around the bend they would currently be met with an absence of fencing up to and beyond the weir.

A option version for an aesthetically more acceptable design to edge protection, would involve the positioning of fence lines along the existing low wall/coping stone top and encouraging the main pedestrian flow through the park where possible on pathways away from the waters edge. This design would allow for easier egress for canoeists so that they can get out of the river upstream and portage around the weir. There would still be a fence and the main walkway would be back from the river for those who do not want to expose themselves to the river and those that do make a conscious decision to do so by going to the stepped area aware of the hazard. This version would allow emergency and rescue service vehicles and watercraft to access the stepped area.

The specific location and detailing of the fencing and gates can be seen in the annotated photographs and site plans. The fencing would need to be a non-climb design such that already exists on site, the bow topped fencing meets the requirement. It is designed to stop deliberate access from those of 8 years and younger and accidental access by older children and adults.

The rest of the walkway up to the concrete pad should be protected by urban bow top fencing again with suitable signage (this bow top fencing will link with the existing fencing). This level of fencing should be enhanced by a 2-meter area of untrimmed vegetation to discourage access to the waters edge up to the white bridge.

It is recommended that you verify the condition of the fencing on this bridge, where it crosses the river, and take any necessary remedial measures

Rescue Equipment

In view of the recommended level of edge protection - urban bow top and the identified likely hood of vandalism to rescue equipment the consultant does not in this case recommend the provision of rescue equipment.

- *All evidence of previous lifesaving (now defunct) equipment including housings and posts should be removed.*

Consideration should be given to enhancing staff training to cover land based rescue techniques, especially if they are subsequently equipped with throw lines / reach poles.

Signage and Information Provision

Location and distribution as per the LCC risk assessment plan, however signage is now elevated in terms of its priority within the overall water safety strategy and when deciding on the specific location reference should be made to the guidance supplied and that it conforms to the relevant BSI standards. It is essential that adults and those supervising young children are aware of the hazard on site, can make an informed choice and know what to do in an emergency.

- *It is recommended that '**Multi points**' (see generic recommendations in section 6.3 above) be positioned at either end of the walkway. Positioned so the public can see them as the access the walkway.*
- *Repeat '**nag sign**'s should be positioned at regular intervals along the Urban Bow top fencing. (See recommendations for signage for **safety points** in section 6.3 above, although as previously recommended life saving equipment will not be provided)*
- *In view of the importance of this signage in the implementation of your 'safety case' you will need to make specific arrangements to ensure the signs are as vandal proof as possible.*
- *You should make regular inspections of both the signage and the fencing and carry sufficient spares to address any issuers identified.*

- *It is important that these inspections visits are documented and any remedial measures with close out actions are recorded.*
- *It is recommended that you provide water safety advice to the fishermen on the annual and day tickets.*

Additional Health and Safety Considerations

The following Health and Safety measures are considered necessary for the overall safety management of the park:

In terms of emergency conditions and incident response it is essential that you liase with both the Environment Agency, the Emergency Services particularly the Fire and Rescue Service and the Councils own Civil Emergency Planning Department about incident response and planning. This could mean that, as part of your flood contingency planning you might need to develop a procedure to close the park. It would be useful to make these organisations aware of your water safety strategy for Wharfe Meadows Park.

- *Where staff operate under 'lone working' conditions it is recommended that they carry throw lines and radios, and are appropriately trained to use these, and importantly recognise their limitations.*
- *It is recommended that you develop a 'Special events 'risk assessment for the Boxing Day swim.*

1.3 Titty Bottle Park

- *It is recommended that you take action to cut the trees over hanging the river, which act as a magnet to children to climb over the water.*

1.4 Manor Grath Park

- *It is recommended that you allow for a two-meter area of un-strimmed vegetation at the water edge.*
- *It is recommended that a 'Safety Point' (without a life-ring) be positioned at a central location at the waters edge.*

Part (2) B – Roundhay Park - Lakes in an Urban Park

1. Upper Lake - Roundhay Park

Reference should be made to the detailed specifications for safety measures in Section 6 of this report and the appendices.

- *It is recommended that 'Emergency Points' be positioned at the main entrances to the site to alert visitors to the specific risks on site and the control measures in place to mitigate these risks.*
- *The consultant was concerned about the steep embankment leading down to the water side (as discussed at the time of the inspection) and recommends that chicane type railings be positioned to arrest an out of control cyclist or mother with a buggy.*
- *Where desire lines have created gaps in the natural edge protection it is recommended that the edge protection be reinstated (where deemed necessary by the risk assessment) by the planting of hostile vegetation.*
- *The position where the water flows in from the upper lake should be protected by band four fencing that should be curled around at the edges to children or youths getting in front of the fencing. Your attention is also drawn to the need to have the fencing as near the edge as possible. Additionally it is recommended that hazard signage conforming to the new BSI for water safety signage indicate 'Deep drop - Danger Keep out'.*
- *In view of the nature of the water hazard it is recommended that the life saving points be turned in to safety points. It is also considered that 'throw lines' are more appropriate to the risk and should replace the existing life rings. Although this is a Priority item it is considered that the existing life rings be provided with lines to enable a rescue to be affected. The signage on the safety points should include 'No swimming - No diving'.*
- *In reviewing the positioning of your safety points it is recommended that you adopt the criteria that one can be seen from whatever location a person is standing on the waters edge.*
- *It is recommended that a safety point with a throw line be located at the boating platform and that an additional second rail be installed in the fencing to prevent young children getting through the barrier. Signage should also indicate 'No Swimming - No Diving'.*
- *Where necessary it is recommended that action is taken to trim the branches overhanging the lake to facilitate better observation, clear lines to use life saving equipment and to prevent youth climbing out over the water.*
- *Where the pathway is very close to the water's edge it is recommend that hostile vegetation be planted to identify the water's edge.*
- *Where benches are provided it is recommended that these do not compromise the recommended width of the pathway of 1 metre. Good practice dictates that benches are set back from the pathway so as not to force pedestrians or, in particular, parents with buggies, too close to the water's edge.*
- *When reviewing edge protection it is good practice to protect both sides of a bridge with band four fencing, curled at the edge to prevent access along the sides. It is recommended that you review the bridges around this lake with this criterion in mind.*
- *Finally, wild fowl (in particular ducks and geese) are compromising the edge gradients at certain positions around the lake (see Section 5 edge gradients). It is recommended that action be taken to reprofile this edge where appropriate to 1:3.*

2. Waterloo Lake

Reference should be made to the detailed specifications for safety measures in Section 6 of this report.

- *It is recommended that you progressively introduce safety points with throw lines across this site.*
- *It is recommended that an additional safety point be located at the disabled access ramp.*
- *It is recommended that band four-edge protection is installed around the fishing pegs and that hazard signage identifies the deep water.*
- *It is recommended that the head wall (where the stream enters the lake) be protected by band four fencing and that suitable hazard warnings identify the risk.*
- *It is recommended that band four fencing protect the sides of the bridge.*
- *It is considered to be good practice to provide a third rail or mesh infill 150 mm from the ground height where fencing is provided to prevent young children from accessing the water through this exposed gap.*
- *Wild life (in particular ducks and geese) is compromising the edge gradients at certain positions around the lake (see Section 6 edge gradients). It is recommended that action be taken to reprofile this edge where appropriate to 1:3.*
- *Where necessary it is recommended that action is taken to trim the branches overhanging the lake to facilitate better observation, clear lines to use life saving equipment and to prevent youths climbing out over the water.*
- *If in the future a boat club or franchised operation for boat hire is in operation, it is recommended that you review these operations, particularly in view of the City Councils' responsibility under Section Three of the HSWA.*
- *In considering suitable locations for 'No swimming' signage it is recommended that these could be located on posts in the water to reduce the possibility of vandalism or removal to a minimum. However this action must take into account the balance of risks, e.g. that this may encourage members of the public to swim out to the sign and the identified risks to staff in installing the signage.*
- *Where the City Council is deliberately pursuing a policy of access for disabled persons to the water, it is recommended that you consider tactile edging to the water to provide an additional safe guard to their security.*
- *It is recommended that suitable signage prohibit the launching of boats from the slipway adjacent to the sluice.*

Royal Society for the Prevention of Accidents

Peter MacGregor for the 3.11.2006

Revision by Peter Cornall 8.03.2007

Site Risk Assessments

General notes to accompany Risk Assessments

Members of the Water Safety Incident Group (Denise Preston, Sean Flesher, Chris Ingham), Chris Lenton-Cliffe, Phil Staniforth and Peter Cornall, Head of Water Safety for RoSPA visited the site on Friday 30th March 2007 to discuss and draft the risk assessments for Wharfemeadows Park, Tittybottle Park and Manor Park.

There is a considerable water safety hazard, primarily being the presence of the large steep weir that has a fall of 5 – 6m on the downstream side and is little more than 20m downstream from the wildfowl feeding area that is popular in the park. Existing controls on site include two warning signs in Wharfemeadows Park and one in Manor Park stating 'this river is dangerous – keep out.' One of the signs had been graffitied out. There were two posts along the river bank that used to house liferings, both the housing and ring had been stolen. An ornamental bow top fence has been erected on the river bank adjacent to the playground to prevent children slipping down the bank at this point.

At the time of the visit there were two 9 year old children playing in the river below the level of the weir. Their clothes had been left by the warning sign. There was also a young child (toddler) leaning over the low wall unsupervised by the accompanying carer. Officers who know the site are aware that young people jump and dive off the river bank into the water at various points above the weir particularly during summer and that children regularly walk along the low wall top creating a genuine slip or trip hazard from the unprotected edge into the river. The RoSPA representative stated that there had been 25 known drownings in the River Wharfe.

It is recommended that multi-points safety signage be positioned at all main park entrances, positioned so the public can see them as they access the park. Repeat nag signs should be positioned at regular intervals along the water front. All signage will conform to 'The Health and Safety (safety Signs and Signals) Regulations 1996' and BS 5499.

The low wall along the unprotected river edge in Wharfemeadows Park and Tittybottle Park is a slip and/or trip hazard for children and young people. The low wall and the drop into the river would make rescue difficult. The suggestion is to install to a height of 1.1m bow topped ornamental Victorian style fencing along the low wall top from the road bridge to the playground in Wharfemeadows Park and along the complete length in Tittybottle Park.

Consideration was given to an alternative fence line running along the main park path from Bridge Street to Farnley Lane. On evaluation of the risk assessment this did not reduce the potential hazard and risk rating of children and young people slipping / tripping from the wall top into the river.

The riverside steps are a popular area for visitors to feed the birds. There is a potential for children, young people and old people to accidentally slip or trip into the water. There are two known incidents from this site. In May 2004 a young child with a fishing net slipped into the water and was rescued by a passer by. There were no known injuries. In March 2006 an old lady slipped into the water and again had to be rescued. The lady had to be taken to hospital and died a few months later. The lady's daughter suggests that this was the primary cause of her death. The group discussed this and felt that the steps did not require fencing as there was a high likelihood that anybody falling into the water at this point could easily be rescued. Suggested controls at this point are to install warning signs on the steps, highlight the step edge and undertake repairs to the steps. The rationale for the steps was considered and as there is future potential to reintroduce boating on the river and that they are a major feature of the park a decision to retain the steps was made.

Access to 'holbeck' will be controlled by the installation of drop gates and ornamental band 4 fencing. Signage (pictograms) should be placed on these gates – Danger Keep Out.

Because of the high numbers of children using this area it was agreed to continue the line of band 4 fencing in front of the playground along the water's edge up to the concrete pad at the top of the rise.

Along the rest of the river bank down to the white bridge and along the river bank in Manor Park it was agreed to establish a 2m area of untrimmed vegetation at the bank edge.

At the base of the white bridge the concrete plinths supporting the bridge were a potential slip/trip hazard into the river, therefore this area will be protected by ornamental band 4 bow top fencing.

Public rescue equipment was thought to be of little effect as there had been difficulties in ensuring it was in place when needed and those untrained in using throw lines and life rings would be particularly at risk themselves when attempting to use them.

According to the Environment Agency information the River Wharfe has at the upstream end of the landing station at Wharfemeadows Park a 20% chance that the river will reach or exceed the banking at this point. This means that on average the banking level will be reached or exceeded once in any 5 year period. Data obtained from the Environment Agency from 2004 to date indicates that the river has exceeded the river bank above the weir on two occasions (10/08/04 and 08/01/05). The difficulty here is to predict flood situations and be able to effectively close the park in event of a flood. This is difficult because the river has substantial variances in flow and height, there are many entrances to the park and resources may not be available at the right time to implement physical actions on the ground. Therefore it was agreed that the solution is to make the edge of the river visible by the installation of the fencing along the wall top. Although there is no fencing on the steps area the line of the fence either side clearly defines the bank at this point.

RISK ASSESSMENT FORM

C O N S E Q U E N C E	RISK RATING MATRIX	LIKELIHOOD			
		Probable (A)	Possible (B)	Remote / Unlikely (C)	Improbable / Negligible(D)
	Fatal injuries (4) Permanent Environmental Effect	High (4A)	High (4B)	Medium (4C)	Low (4D)
	Major Injuries (3) Major Environmental Effect	High (3A)	High (3B)	Medium (3C)	Low (3D)
	Minor Injuries (2) Minor Environmental Effect	Medium (2A)	Medium (2B)	Low (2C)	Low (2D)
	Negligible Injuries (1) Negligible Environmental Effect	Low (1A)	Low (1B)	Low (1C)	Low (1D)

ACTIVITY / LOCATION: Manor Park water safety (see accompanying plan)

HAZARD	EFFECT	RISK RATING	CONTROL (Reference to other documents, codes of practice, Department Rules, Divisional Rules etc. if relevant)	RESPONSIBILITY (preferably named individual or job title)	RESIDUAL RISK RATING
Unprotected water edge (G to H).	Trips into water Injury / Drowning (all persons especially young and old persons)	4B	Create 2m strip of untrimmed vegetation to define river bank edge.	Interdepartmental Water Safety Group	4D
Access to unprotected water's edge for fishing.	Otley Angling Club members and associated visitors	4B	Write to club providing water safety advise and a recommendation that they provide the same advise to members and visitors on day tickets and/or annual year books.	Chief Recreation Officer	4C
Unprotected water's edge.	Injury / Drowning (all persons especially visitors)	4B	Install and maintain multi-point safety signage at main park entrances. Installation of nag signs at regular intervals.	Chief Recreation Officer	4C
Intentional access to waters edge and entry into river.	Injury / Drowning (all persons especially visitors)	4B	Install and maintain multi-safety signage at main park entrances. Installation of nag signs at regular intervals.	Chief Recreation Officer	4C

Assessment by (Print Name) Signature Date

Review date (if applicable)

Note: Any assessments carried out for expectant mothers and young persons etc must be in conjunction with Health and Safety Manager

RISK ASSESSMENT FORM

C O N S E Q U E N C E	RISK RATING MATRIX	LIKELIHOOD			
		Probable (A)	Possible (B)	Remote / Unlikely (C)	Improbable / Negligible(D)
	Fatal injuries (4) Permanent Environmental Effect	High (4A)	High (4B)	Medium (4C)	Low (4D)
	Major Injuries (3) Major Environmental Effect	High (3A)	High (3B)	Medium (3C)	Low (3D)
	Minor Injuries (2) Minor Environmental Effect	Medium (2A)	Medium (2B)	Low (2C)	Low (2D)
	Negligible Injuries (1) Negligible Environmental Effect	Low (1A)	Low (1B)	Low (1C)	Low (1D)

ACTIVITY / LOCATION: Tittybottle Park water safety (see accompanying plan)

HAZARD	EFFECT	RISK RATING	CONTROL (Reference to other documents, codes of practice, Department Rules, Divisional Rules etc. if relevant)	RESPONSIBILITY (preferably named individual or job title)	RESIDUAL RISK RATING
Low wall adjacent to path and water's edge (see plan H to I).	Trips / Falls into river. Injury / drowning (all persons)	4B	Installation and maintenance of ornamental bow top fencing along wall top.	Chief Recreation Officer	4D
Intentional access to waters edge and entry into river.	Injury / Drowning (all persons especially visitors)	4B	Install and maintain multi-point safety signage at main park entrances. Installation of nag signs at regular intervals.	Chief Recreation Officer	4C

Assessment by (Print Name) Signature Date

Review date (if applicable)

Note: Any assessments carried out for expectant mothers and young persons etc must be in conjunction with Health and Safety Manager

RISK ASSESSMENT FORM

CONSEQUENCE	RISK RATING MATRIX	LIKELIHOOD			
		Probable (A)	Possible (B)	Remote / Unlikely (C)	Improbable / Negligible(D)
	Fatal injuries (4)/ Permanent Environmental Effect	High (4A)	High (4B)	Medium (4C)	Low (4D)
	Major Injuries (3)/ Major Environmental Effect	High (3A)	High (3B)	Medium (3C)	Low (3D)
	Minor Injuries (2)/ Minor Environmental Effect	Medium (2A)	Medium (2B)	Low (2C)	Low (2D)
Negligible Injuries (1)/ Negligible Environmental Effect	Low (1A)	Low (1B)	Low (1C)	Low (1D)	

ACTIVITY / LOCATION: Wharfemeadows Park water safety (see accompanying plan)

HAZARD	EFFECT	RISK RATING	CONTROL	RESPONSIBILITY	RESIDUAL RISK RATING
Low Wall by unprotected water's edge adjacent to path (see plan A to B and C to D)	Trips / Falls into river or rocks on river bed. Injury / drowning (all persons)	4B	Install and maintain ornamental bow top fencing along wall top.	Chief Recreation Officer	4D
Unprotected water's edge near to children's playground (see plan D to E)	Falls into river Injury / drowning (all persons particularly children and young people)	4B	Install and maintain ornamental bow top fencing along path edge.	Chief Recreation Officer	4D
Unprotected water's edge at base of white bridge (see plan F to G)	Trips / Falls into river. Injury / Drowning (all persons)	4B	Install and maintain ornamental bow top fencing at base of white bridge.	Chief Recreation Officer	4D
Unprotected access into 'holbeck.'	Trips / Falls. Injury / Drowning (all persons)	4B	Install and maintain of drop gates together with ornamental band 4 bow top fencing either side of inlet.	Chief Recreation Officer	4D
Steps down to water's edge (see plan B to C)	Trips into water Injury / immersion (all persons especially young and old persons)	3B	Install and maintain warning signs on steps. Highlight step edge and undertake repairs to steps.	Chief Recreation Officer	3C
Access to unprotected water's edge for fishing.	Trips into water. (Otley Angling Club members and associated visitors.)	4B	Write to club providing water safety advise and a recommendation that they provide the same advise to members and visitors on day tickets and/or annual year books.	Chief Recreation Officer	4C

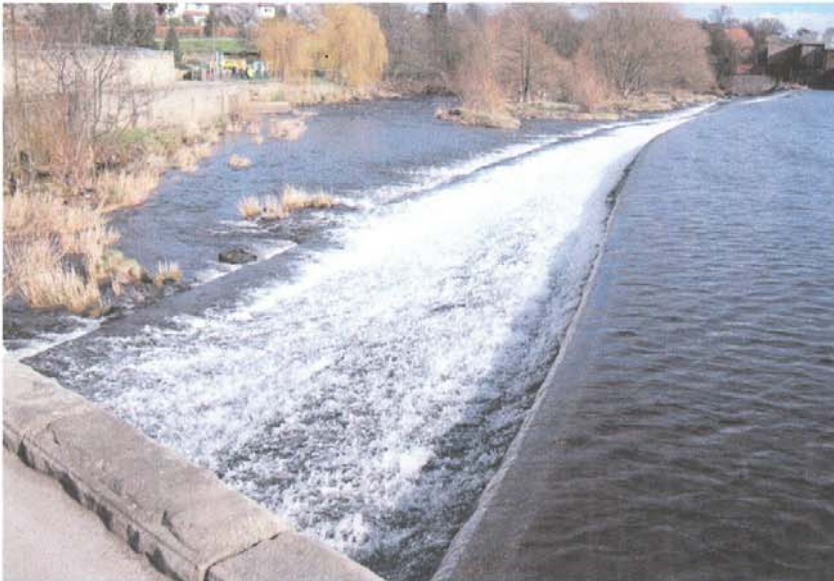
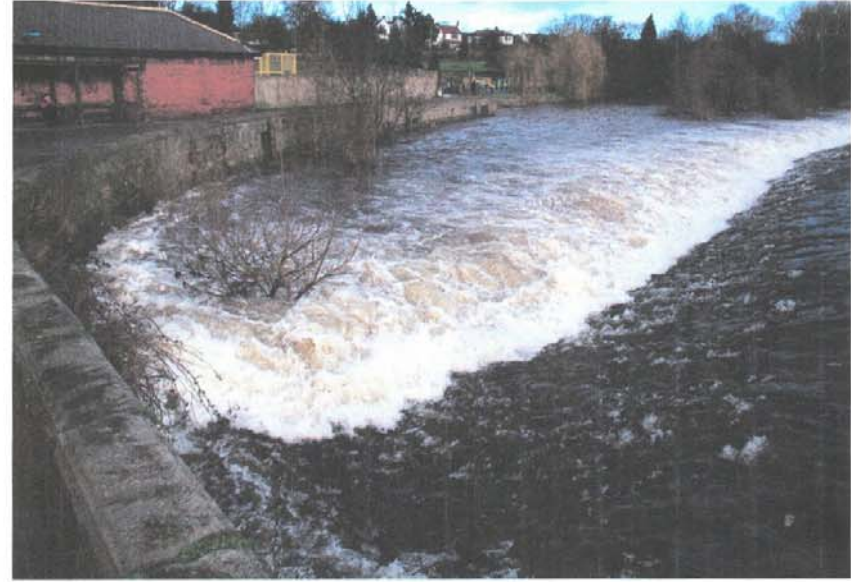
RISK ASSESSMENT FORM- Cont'd

ACTIVITY / LOCATION: Wharfemeadows Park water safety (see accompanying plan)					
HAZARD	EFFECT	RISK RATING	CONTROL	RESPONSIBILITY	RESIDUAL RISK RATING
Unprotected water's edge (see plan E to F).	Trips into water / Injury (all persons especially young and old persons)	4B	Create 2m strip of untrimmed vegetation to define river bank edge and prevent unintentional access.	Chief Recreation Officer	4D
Intentional access to waters edge and entry into river.	Injury / Drowning (all persons especially visitors)	4B	Install and maintain multi-point safety and information signage at main park entrances. Installation of nag signs at regular intervals.	Chief Recreation Officer	4C
Unprotected water's edge.	Injury / Drowning (all persons especially visitors)	4B	Install and maintain multi-point safety and information signage at main park entrances. Installation of nag signs at regular intervals.	Chief Recreation Officer	4C
Flooding of the river into park creating an indistinguishable river edge.	Injury / Drowning (all persons especially visitors)	4B	Installation and maintenance of ornamental bow top fencing and signage to define water's edge.	Chief Recreation Officer	4C
Assessment by (Print Name) Signature Date Review date (if applicable) ...12 months or whenever change to stock management policy..... Note: Any assessments carried out for expectant mothers and young persons etc must be in conjunction with Health and Safety Manager					

Titty Bottle Park Fencing



Wharfe Meadows Park Weir in Low and High Water Levels



Fence Details Around 'Holbeck' Sluice & Weir



Extension to Existing Fencing Around and Leading up to the Children's Playground



Wharf Meadows Park Fence Detail



uu Entrance Sign (1)

Welcome to Wharfe Meadows Park

In an emergency please call 999

**The nearest public phone box
is on the corner of**

Location information

**Please report any damage or incidents to the Leeds City
Council on 01XX XXX XXXX or email XXX@XXXX.XXX**

Entrance Sign (2)

Please keep to designated pathways & do not enter the water



Parents are reminded to supervise their children at all times

Nag Sign



Signage Information

The provision of signage information is a key tool for any landowner in ensuring that they fully discharge their duty of care to the public. Warnings and safety information are an important part of any risk management strategy, whether reinforcing other control measures or standing alone as the key means of protection.

Great care must be given to the extent and type of messages given to visitors. There is a fine balance to be struck between ensuring that visitors are informed about the hazards on a site and the need to preserve the essential nature of that environment.

It is worth stressing that the level of information required on site will depend upon a number of factors, including the complexity of the site and the type of users expected on site. The application of signage as a risk control measure should take consider each location on an individual basis, using a risk assessment framework.

The following document looks at the general principles behind safety signs in an inland context.

Information in Context

The first consideration of a strategy for accident prevention should always be to try to remove the hazard completely. If this is not practicable, reasonable steps should be taken to reduce the level of risk. The provision of information is extremely important where it is difficult to control risk adequately by other means.

In the open water environment it is totally impractical and unreasonable to deny access or provide supervision along every water's edge. A balanced approach is required using a package of preventive measures, underpinned by a comprehensive information-giving strategy.

Safety Signs and Notices

Specifications

The Health and Safety (Safety Signs and Signals) Regulations 1996 apply to employers and their employees. They do not place any duty on the employer to provide signs to warn other people (e.g. visitors) of risks to their health and safety. However under Section 3 of the Health and Safety at Work etc. Act 1974 many operators do have duties regarding the health and safety of non-employees. The Regulations and accompanying guidance can be helpful in meeting these general duties.

The Regulations specify the colourings and marking needed for safety signs, and are consistent with British Standard 5378: 1980. Wherever possible, pictograms should be incorporated to provide clear, sharp messages people of all nationalities.

In 1988 RoSPA's National Water Safety Committee approved a range of pictogram

Signage Information

signs for water safety which comply with BS 5378 and these are now commonly seen at all types of water venues across the country. These signs have formed the basis of the new Standard BS5499: 2002 *Part 11 Water Safety Signs*. Images or signs that are not covered by the standard can be designed but should conform to BS 5499-6:2002 *Design of graphical symbols for use in safety signs – Requirements*.

RoSPA recommends that any new signage should conform British Standard 5499-11: 2002 in the future and that a regular review of existing signage is carried out.

Prohibition

Red background, white text

Prohibition information. The most common will be 'No Swimming' and 'No Diving'.



Hazard

Yellow background, black text

Warning information, particularly regarding hazards such as strong currents, shallow or deep water.



Mandatory

Blue background, white text

Mandatory information, for instance, 'lifejackets must be worn'.



Information

White background, black text

All other information that relates to safety messages given.



Safe Condition

Green background, white text

Includes information regarding the location of first aid and emergency telephones.



Placement & use of signage

Appropriate placement and use of signage is key to conveying the right message to the right people. Too much information and signage can prove counter productive, and in many cases will undermine the benefits of visiting open spaces.

The correct application of signage will be achieved only by undertaking a site risk assessment exercise, with due consideration to the following factors:

- Activities occurring on site
- Ease of site access
- Extent of the hazard(s) on the site
- Extent visitors are invited / encouraged onto the site
- Formal control / management on the site
- Heritage and other considerations (AONB, SSSI)
- Hinterland activity and local populations (schools, young families)
- Nature of the site (duck pond v. local park v. country park v. national park)
- Number of visitors
- Site incident history
- Size of site

When choosing and installing signs, the needs of disabled people will need to be considered, and attention given to height/angle, text size, colour contrast and, possibly, tactile properties.

Access Signs and Multiboards

Types of signs

There are several different levels of safety signs available to the operator - primary access, secondary access, and nag signs. These three levels of signage should be adequate to meet the needs of all UK sites. The individual signs will be explored in further detail later.

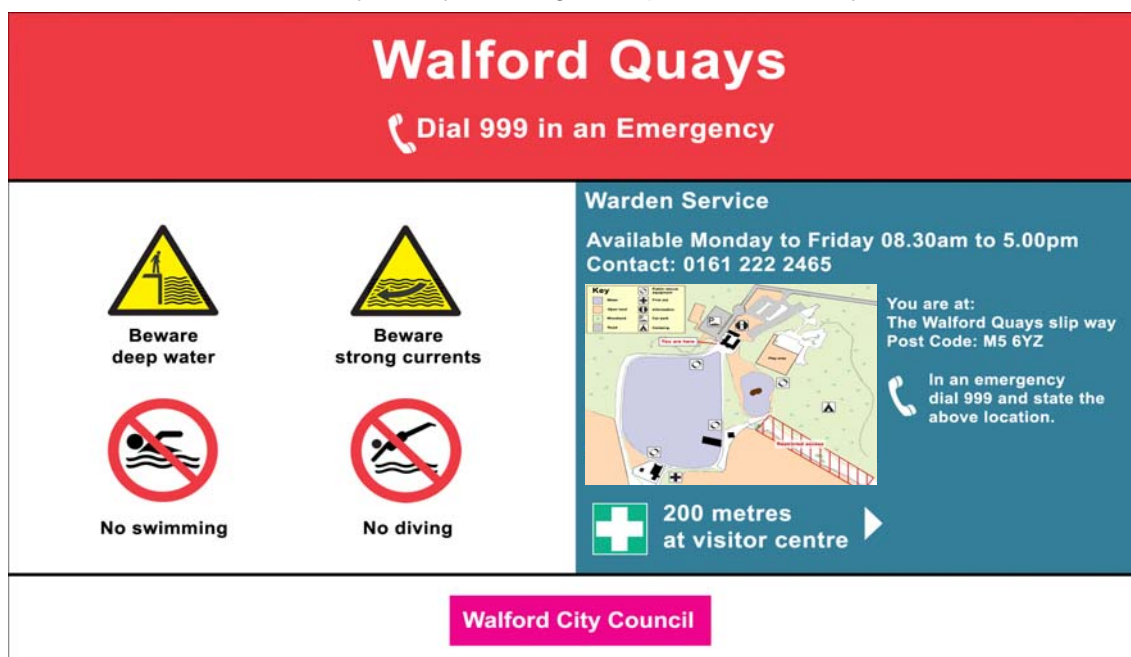
Location

The location and type of signage will ultimately depend upon the outcome of the risk assessment and the factors listed above, but there should be a reasonable amount of consistency in the placement of signs and type of signage used. The table below provides example locations of appropriate placement for each of the signage types.

Primary access signs	Secondary access signs	Nag signs
Main site access points	Main entrance point to the water	Pinch points on site
Car Parks	Major site junctions	Key hazard determined on site
Main collection points	Congregation points	

Primary access signs

A primary access sign is the main sign that will be viewed by the majority of visitors on site. It can have several key safety messages as part of the safety information board.



The logical place for the display of safety primary access boards and signs is at principal access points to sites such as main entrances and visitors' car parks, where the maximum number of visitors will view the information.

The following information should be on the board:

1. Site name
2. Emergency instruction: "Dial 999 in an emergency"
3. Main hazard and prohibition symbols and supplementary text
4. Details of site supervision services and contact details
5. Location and Postcode (needs to be understood by local emergency services)
6. Site map showing, rescue equipment, first aid and supervisory help, telephones
7. Organisational logos.

Most sites will only have one or two primary access signs (in line with the number of 'main' entrances). The information on these boards can also be combined with rescue equipment to create 'safety points' if appropriate to the site. The images below outline the main information required on a primary access sign.



Primary access sign
(Prohibition based)



Safety point
(Combined safety information & rescue equipment)

Where a lot of information is to be displayed on a multi-board it should be divided up into categories and each section should use the appropriate colour scheme detailed above. Plans of the site should show the location of first aid facilities and emergency telephones if present, and identify unsafe, inaccessible or prohibited access etc.

General safety advice should be displayed at these points, e.g. *'Parents are reminded to supervise their children at all times'*, and *'Lifejackets must be worn during all on-water activities'*.

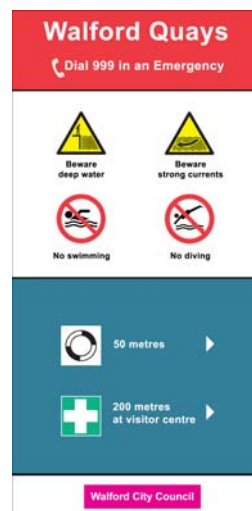
The extent of any supervision/ranger patrol can also be outlined here.

The information given should be short and to the point, and where possible in pictorial fashion, otherwise it can easily be overlooked. Safety information should always be displayed separately from that relating to environmental or site interpretation signs, such as the location of toilets, refreshments etc.

Secondary Access Signs

Specific signs should be considered at particular hazard spots. These are usually placed closer to the main body of water or congregation point on site, normally these locations typically will be:

- Main entrance point to the water body
- Major site junctions
- Congregation points



Example – Secondary access sign

A 'beach' area traditionally popular for swimming, a point where a path passes close to deep water, an area that attracts a concentration of people, such as a picnic spot or viewing platform, are all examples of locations that will need special consideration.

On site many of these characteristics will be found at the same place, which could mean that only one secondary access sign needs placing. Again this sign can be combined with rescue equipment to form a safety point (as above).

The board should hold the following information:

1. Site name
2. Emergency instruction: "Dial 999 in an emergency"
3. Main hazard and prohibition symbols and supplementary text
4. Location and Postcode (needs to be understood by local emergency services)
5. Symbol direction and distance of rescue equipment
6. Symbol direction and distance of first aid provision
7. Details of site supervision services and contact details
8. Organisational logos.

These signs will help reinforce the safety messages already disseminated at access points.

Nag Signs

In addition to the information provided at principal access points, provision should be made to repeat the message along routes adjacent to the water's edge.

These are repeat messages, small reinforcement messages of key hazard or prohibition messages given previously on the primary or secondary signs. They should relate directly to the hazard they are in close proximity to, and be predominantly symbol-based messages, with reinforcing text.

They are normally located next to the hazard, at places where visitors are most likely to access to water. These could be (for example):

- Pinch points on walkways/paths
- Jetties / platforms
- Bridges where jumping occurs
- Viewing platforms
- Weirs
- Other key hazards determined on site



There will be many locations on site where nag signs can be placed, however it is crucial that only the key locations are signed. Too many nag signs will have a detrimental effect on the overall message. The nag sign should include the following information:

1. Site name
2. Main hazard and prohibition messages
3. Organisational logo (possibly, if not detracting from main message)



Example – warning & prohibition ‘nag’ signs

The Royal Society for the Prevention of Accidents

RoSPA House, Edgbaston Park, 353 Bristol Road, Birmingham B5 7ST.

Telephone: 0121 248 2000 Fax: 0121 248 2001 www.rospa.co.uk Registered Charity No: 207823

Time expired signs, vandalism and replacement

Signs that are in need of repair or have poor legibility/clarity of image should be replaced straight away and all others should be subject to programmed replacement.

The period of time for such replacement should be 'reasonable' in terms of overall cost against the safety gain or imperative. Overall it should not be unreasonable to expect that all signs should also comply with this new standard within a five-year period. (This estimation could be modified by future court actions arising from signage issues).

Operators should bear in mind however, that notices, particularly when they are first installed, are more likely to be susceptible to vandalism than those already in place. Newly installed notices will, therefore, require a stringent inspection regime and a ready stock of replacement notices should be available.

Literature Dissemination

At a large water-based facility or seaside resort, where different activities take place and visitors pass through a control point, it is recommended that leaflets/handouts are distributed on arrival to inform them of the facilities, activities etc. These leaflets should contain prioritised safety messages that relate directly to the location in question. At smaller non-commercial facilities this may not be a practical measure.

Educational Awareness

The most effective method of promoting water safety is through community education. It is in this way that people's perceptions of the dangers in and around open water can be challenged and their awareness of the risks raised.

This can be achieved through talks to groups and schools, information sheets and posters, leaflets, videos etc. Involving the local community and encouraging the perception of a site as a recreational asset for them will engender a healthy relationship with the operator. This may help establish an informal network for the reporting of anti-social behaviour or potential danger points/areas.

Community education is of great importance where a water site is close to dwellings. In these areas the presence of young unaccompanied children at the site increases.

Size Guidelines

- Important information should be prominent
- Break up text, using symbols, captions photos
- Use clear titles and captions to focus attention on information categories
- Use lower case – it is easier to read
- Use plain type faces (ideally a Sans Serif font)
- Print text at legible sizes, using an appropriate colour

Viewing distance (m)	1.2	1.8	9	18
Height of Letters (mm)	12	16	63	100
Indication: (not to scale)	Aaa	Aaa	Aaa	Aaa

Lettering type	Type size (mm)	
Titles (mm)	21 - 25	60 - 72 pt
Subtitles (mm)	14 - 17	40 - 48 pt
Main text (mm)	9	24 pt
Captions (mm)	6	18 pt

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National Water Safety Signs

Prohibition

Prohibition Signs tell you not to do something. Black and Red on White.

	No swimming		No motorised craft
	No sunbathing		No water skiing
	No diving		No sub-aqua equipment
	No sailing		No wind surfing
	No rowing		No fishing

Hazard

Hazard Signs warn of potential hazards. Black on Yellow.

	Beware - drowning area		Beware - strong currents
	Beware - thin ice		Beware - water skiing area
	Beware - sailing area		Beware - surfboarding area
	Beware - slippery		Beware - step water
	Beware - wind surfing area		Beware - shallow water
	Beware - washing area		Beware - sudden dip

Mandatory

Mandatory Signs give instructions to do something. White on Blue.

Information

Information Signs give general information. Black on White.

These are not safety signs but give general information. Black on White.

Information

Swimming area

Spooking area

Fishing area

Sub-aqua area

BSI Business Information

The National Water Safety Signs are based on the BSI standard BS5499:2002 Part 11 Water Safety Signs

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Risk Control for Inland Water Sites

Introduction

The first consideration in a strategy for accident prevention is always to try to remove, or separate, the public from the hazard. At sites such as water treatment plant, where only authorised visitors are permitted, complete restrictions are necessary. However, at many inland water sites, it would be neither practical, reasonable nor desirable to attempt to prevent drowning by denying access to water, or by providing supervision along every waters edge. Open water, like our road network, is an integral part of our environment with which we must learn to live safely, whilst those in positions of responsibility play their part in controlling the risk to a reasonably practicable level.

Where access restriction is not appropriate, steps must be taken to control risk to an acceptable level using the risk assessment process described above and identifying appropriate risk control measures, some of which are outlined below. It is important that operators responsible for adjacent sites (e.g. sections of riverside), do, where possible co-operate in the task to ensure consistency for visitors passing between sites.

Edge Protection

Whilst the profile and nature of the water's edge is a fundamental factor in risk, addressing the edge in isolation will not address all the safety issues. Protective measures should always be supplemented by adequate information and warnings; education of visitors; and, where appropriate, rescue equipment and supervision. Some physical measures to prevent public access are outlined below.

Grading

One critical feature of all water edges affecting the outcome of accidental entry into the water from the bank, is the gradient above and below the water line. Research undertaken by the RLSS UK in the 1980s ("Drownings in the British Isles" 1982, 1983), demonstrates that many people who drown, do so in water which is near their own standing depth. Maintaining or regaining standing balance whilst 'in their depth' is very difficult for weak or non-swimmers.

Therefore, where risk is considered to be high, but an open aspect to the water is required, it is preferable to maintain a gentle underwater gradient from the edge. This should be such as to allow a person to stand with their head above water, at a distance of two body lengths from the shore. This section of shallow water will provide protection from the deep water. Grading above and below the water line, can, at some locations, successfully control the risk of falling in.

It is recommended therefore, that shallow water (less than 0.66m) should extend a minimum of 2M from the water edge, via a 1:3 gradient, and a further protective margin of 1:75m with depths from 0.65m to 1.36m via a 1:2.5 gradient.

Planting

In addition, or as an alternative to grading, and where access to the water's edge is required, but either a steep gradient (falling risk) or very shallow gradient (swimming temptation) exists, the planting of bankside or emergent marginal aquatic vegetation, particularly with sharp foliage, can provide adequate yet aesthetic protection, with additional environmental benefits. Mud at the water's edge is also unappealing and acts as a deterrent.

Suitable plants which will deter access to the water include:

Emergent Planting

Phragmites australis

Typha angustifolia

Carex riparia

Scirpus lacustris

Iris pseudacorus

Inhospitable Planting

Salix spp - Willow

Prunus spinosa - Blackthorn

Crataegus manogyna - Hawthorn

Rubus fruticosus - Bramble

Rosa Canina - Dogrose

Footpaths

A further protective measure (where public rights of way permit), is to define footpaths away from the water's edge, creating a 'margin' of vegetation between the two. This option is particularly appropriate where views over the water feature are required, and the natural beauty of the site is to be retained. Where a particular section of water has been assessed as higher risk, the footpath can lead visitors away from the water altogether. Alternatively, where risk is deemed low, due perhaps to the shallow depth of the water, (as found at some duck ponds for instance), a painted yellow line can be a useful means of clearly defining the boundary between path and water.

Fencing

In some circumstances, where the risk is high due to the nature of the edge, the hinterland activity or a combination of the two, then fencing may be necessary.

The level of assessed risk will affect the choice of barrier. At low risk sites, the function of the barrier might be merely to 'deflect' the public from the water's edge, therefore a post and chain or a single rustic rail might be adequate.

Where overall risk is identified as moderate but where a particularly sensitive location is identified i.e. deep water or pinch points, a section of more substantial fencing may be required.

A high level of risk may lead to the installation of balustrade, combined with warning signs, to exclude members of the public from gaining access to the waters edge.

The balustrade or fencing will require regular maintenance and inspection, it may be subject to vandalism, and it will usually remain scaleable. The effect of barrier erection on other user groups, such as boaters, will also have to be taken into account, to ensure that landing points are provided and that there is no risk of crushing.

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Report Appendix

Barrier, post and railing systems for water side edge protection

In some circumstances, where the risk is high due to the nature of the edge, the hinterland activity, the danger someone might get into if they enter the water/fall from height or a combination of the three, then fencing may be necessary.

The level of assessed risk will affect the choice of barrier. At low risk sites, the function of the barrier might be merely to 'deflect' the public from the water's edge; therefore a post and chain or a single rustic rail might be adequate.

Where overall risk is identified as moderate but where a particularly sensitive location is identified i.e. deep water or pinch points, a section of more substantial fencing may be required.

A high level of risk may lead to the installation of balustrade, combined with warning signs, to exclude members of the public from gaining access to the water's edge.

The balustrade or fencing will require regular maintenance and inspection; it will be subject to vandalism; and it will usually remain scaleable. The effect of barrier erection on other user groups, those legitimately on or in the water, such as boaters, will also have to be taken into account, to ensure that landing points and emergency access are provided and that there is no risk of crushing.

Consistency

An inconsistent treatment may well be counter-productive in terms of accident prevention. It is therefore essential that the response to hazards and conditions is uniform.

Consistency can be attained by the use of an edge treatment classification where the response to a hazard can be banded.

To achieve consistency, an edge-banding guide has been devised specifically to respond to the conditions at urban docks, canals, riversides and sea front promenades.

Banding

The RoSPA banding guide provides a framework to assist operators in developing a consistent response to certain levels of risk presented in an urban waterside environment.

The banding defines the degree of risk present at the location not the specific edge treatment or control measure required. Consideration to hinterland activity and the age of those exposed will be as important as the depth of water and the height the edge is above the surface. Young children being present at the site may require access denial fencing typically a band 4-risk solution at a site where in other circumstances it would not be required.

Band 1

- Water less than 500 mm in depth, usually providing an ornamental function.
- Minimal height above water surface. The edge may be stepped, allowing a gradual approach to the water.

Specification and materials

The treatment is distinctive in that there is no fencing. A distinctive solid edge however must be defined. This can be achieved through the use of a coping stone, rumble strip, cobbled edge and can be highlighted with a painted line. Sometimes it can be supported by the use of bollards. The demarcation in itself should not provide a trip hazard.



Band 1 solution - Well defined edge using a coping stone plus bollards

Band 2

- The water will exceed approximately 0.5m in depth.
- The edge is well-defined and solid and not more than approximately two metres above the surface.
- This band may include footbridges or pinch points in Band 1 areas, where balustrading is required to guide users and identify the edge.
- The site is unlikely to be directly accessible to unaccompanied young children.

Specification and materials

Common and suitable treatments are bollards and chain, posts and rail or similar balustrades made from cast iron and stainless steels. Plastic covered alloy posts are now also available. Low walls made of either concrete and masonry with or without rails can also be used.

Positioning

If the barrier is too far from the edge and allows or invites access to the haven/margin on the other side, it loses its integrity and becomes ineffective. RoSPA recommends that the barrier be as close to edge as secure fixing allows an optimum distance would be 300mm, with it never more than 500mm in normal circumstances. Specific exceptions can be allowed in respect of limited runs of balustrade being stepped back, e.g. to form angling bays for the disabled, to avoid capstans etc. If for working purposes the barrier has to be further back than this the adoption of cobbles, rumble strip type surfaces to discourage access should be considered. If walls either of concrete or masonry are used or partially used to form the barrier, it is important that the top of the wall does not provide either easy access or a feature to sit on or walk along the top off an angular or rounded coping will often deter such activity.

Band 3

- Deep water

- Solid, well define edge.
- Unlikely to be adjacent to dwellings, bridges, weirs and cuts.
- Other contributory factors may include the usual presence of people, walking or seated.
- The treatment is bollard/post and chain (or rail) supported by ladders and grab chains on the wall of the feature, and rescue equipment on the promenade.

The presence of an attraction, such as water sport event would temporarily require an upgrade from a Band 3 to Band 4.



Band 3 solution-Horizontal Rail and rescue equipment



Band 3 solution-Double chain and post with rescue equipment and escape ladders

Specification

Solutions to band 3 are similar to band 2 but with an increased height requirement e.g. a single post and rail or bollard and chain becomes a double or triple. The minimum recommended post height is 1100mm, with 1500mm spaced centres. However, other specifications in use are with 2.0m and 2.4m centres.

If chains are used the amount of 'sag' throughout each length of chain should not compromise the effectiveness of the barrier. It is recommended that the 'sag' of the chains should be 50-100mm.

Where the post is 1100mm high, the suggested spacing of chains from ground level is 400mm and 800mm, allowing maximum sag to heights of 300mm and 700mm, and average heights of 350mm and 750mm.

Positioning

This is the same as bands 2 and 4.

Grab Chains

Handholds should be made available in Band 3 type areas, to provide a potential casualty support until assistance arrives, or to enable the casualty to reach access ladders without relying solely on their swimming ability.

An optimum length of chain should be available just above, on, or just below the surface. A distressed, shocked casualty, if required to raise their arms above head height is likely to submerge. To maintain an effective 'grab' opportunity, the following guidelines should be used:

- Each length of chain should be permanently fixed to the quayside by an eye bolt and ring
- Fixing rings should be installed at 300mm above the water level, at 6.0m intervals
- The catenary of chains should fall approximately 300mm below the water level

Where the water level fluctuates a compromise, or a revised system will be necessary.

Access/Egress Ladders

Where the level of assessed risk indicates the installation of ladders is necessary, the following guidelines should be used:

- Handrails or a suitable handgrip should be provided on the quayside.
- The foot of the ladder should extend 1.0m below the water level.
- Ladders should be installed at 50m intervals

Deep water, plus one or more additional hazards such as being unusually high above the water. The water itself may not only be deep, but fast flowing and especially dangerous.

Band 4

- Band 4 will usually be required in order to directly deny access, either because of the extreme danger, or because of the concentration of people near the hazard.
- Vulnerable groups such as the elderly and young children should be protected by Band 4, especially on or near structures, well-used public access points, dwelling, pubs, shops, schools etc.
- If the treatment is balustrading it should be at least a metre high and be difficult to climb, are appropriate, e.g without easily reached horizontal footholds.
- Because Band 4 treatment is essentially based on an exclusion principle, rescue equipment is not often necessary. The 'exclusion' factor also denies would-be rescuers from easy access.

Hazard warning notices to promote safety awareness are still important within this band.



Band 4 solution-Vertical rail



Band 4-Roll over top and pre-tensioned cable solution

Specification

Although there is no standard or requirement that relates specifically to water edge protection barriers it is important that specifications for water edge treatments relate to something and recommendations are achievable in practice. There are some standards and guidance that can be used and current barrier, balustrade and fence designs are available that meet those requirements. RoSPA's recommendations on design are based on the Building Regulations 1991 'Protection from falling, collision and impact (1998 edition) part K2 and K3 and BS6180: 1995 Code of Practice for Barriers in and about buildings. These documents give the requirements and loading specifications for such barriers.

Different loading requirements are required for pedestrian and vehicle areas for example a typical post and rail design with a 1500mm centre that is finished 1100mm above ground level is required to cope with loading of $<0.74\text{KN/m}$ pedestrians and $<1.5\text{KN/M}$ vehicles.

RoSPA, therefore recommends that the minimum height of fencing should be 1.1 metres from finished ground level. Posts should be installed at 1500mm to 2400 mm centres with a maximum centre of 2000mm for vertical designs. If used vertical rail infill should be at 100mm centres to discourage climbing. The gap between the finished ground level and the bottom

horizontal rail should be a maximum of 100mm. Alternatives to vertical railed barriers can only be recommended if they meet the specifications contained within the guidance quoted and if they fulfil the requirement for discouraging climbing. Pre-tensioned stainless steel cabling instead of solid horizontal bars, fine mesh or solid panel infill, roll over top rails and the inward canting of the barrier can all contribute to making the barrier less easy to climb.

Materials

Cast iron posts are suitable for pedestrian areas and non-vehicle control environments. Anti ram raid and traffic control posts should be cast in ductile iron or other materials that can cope with vehicle impact. As already mentioned stainless steel, metal mesh, glass and steel cabling can all be suitable materials as long as they meet the safety requirements. Consideration needs to be given to maintenance and environment issues: such as increased corrosion due to salt water/marine conditions, whether the design copes with flood water, over topping with high tides/waves and entrapping debris and litter.

Positioning

This is the same as bands 2 and 3. The optimum recommended distance of the fence from the quay edge should be 300mm or less so as not to create a 'haven' on the other side. The maximum distance of the balustrade from the edge should be no more than 500mm.

Where a physical barrier is deemed essential due to the level of risk, but where standard fencing would be aesthetically detrimental to the environment, adequate protection can be achieved through sensitive design and choice of construction materials.

