# Edge Treatment at Inland Water Sites

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 water's edge.

The balustrade or fencing will require regular maintenance and inspection; it will be subject to vandalism; and it will usually remain scale able. 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.

## Consistency

An inconsistent treatment may well be counterproductive 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 from promenades.

## Banding

### Band 1

Water less than .5m in depth, providing an ornamental function Solid, well defined edge e.g. coping stone. Minimal height above water surface the edge may be stepped, allowing gradual approach to the water. The treatment is distinctive in that there is no fencing

### 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 balustrade is required to

guide users and identify the edge. The site is unlikely to be directly accessible to unaccompanied young children. The treatment is post and chain or similar balustrades

**Band 3**

Deep water Solid, well defined 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 Ladders should be installed at 50m intervals

**Band 4**

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

**Specification**

The minimum recommended post height is 1100mm, with 1500mm spaced centres. However, other specifications are not in use with 2.0m and 2.4m centres.

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 a maximum sag to heights of 300mm and 700mm, and average heights of 350mm and 750mm.

**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 either 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:

Hand rails or a suitable hand grip should be provided on the quayside. The foot of the ladder should extend 1.0m below the water level 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 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. The treatment is balustrade at least a metre high. Vertical railings, or alternatives which are difficult to climb are appropriate, without 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.

## Specification

The minimum height of vertical rail fencing should be 1.1 metres from finished ground level. Posts should be installed at maximum centres of 2000mm, with vertical rail infill at 100mm centres to discourage climbing. Recommended design including: loading specifications are detailed in BS6180:1982.

The gap between the finished ground level and the bottom horizontal rail should be a maximum of 100mm.

If the balustrade is installed too far away from the edge, the remaining margin may invite access. Specification 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.

The optimum recommended distance of the fence from the quay edge should be 300mm. The maximum distance of the balustrade from the edge should be 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.