

A guide to

coastal
public rescue
equipment



Lifeboats

Contents

| | |
|--|-----------|
| Foreword | 3 |
| Acknowledgements | 4 |
| Preface | 5 |
| Introduction | 7 |
| How this guide was researched | 8 |
| Getting started | 10 |
| How to use this document | 13 |
| Understanding coastal environments | 14 |
| Understanding beaches | 16 |
| Understanding rocky coasts | 19 |
| Understanding tidal inlets and estuaries | 20 |
| Understanding man-made coasts | 21 |
| Risk management for PRE | 22 |
| Selecting public rescue equipment | 24 |
| PRE for beaches | 26 |
| PRE for rocky coasts, tidal inlets and estuaries | 28 |
| PRE for man-made coasts | 30 |
| Emergency communications | 32 |
| Locating PRE and communications | 34 |
| Additional information | 40 |
| Signs and user information | 42 |
| PRE housing | 44 |
| Maintenance | 46 |
| Reducing vandalism | 47 |
| Useful reading | 48 |
| Inside back cover | |
| Useful contacts | |

Foreword

With the UK having some of Europe's finest beaches, and with increasing access to other parts of the coast, it is unsurprising that millions of people enjoy the UK coastline every year. However, with an increasing trend for recreational activity on our beaches and inshore waters, UK maritime rescue services have never been so busy helping people in difficulty.

Therefore, we are delighted that the RNLI, working closely with members of the National Water Safety Forum and other safety organisations, has produced this guide for coastal public rescue equipment (PRE): guidance that beach operators have requested to help manage their beaches safely.

Historically, there have been no standards and very little guidance for PRE to help coastal managers determine and plan their PRE requirements. As a result, much of the PRE found on beaches has probably not been fit for purpose.

The aim of this guide is to help beach operators make better-informed decisions about their PRE requirements that result from a risk assessment. As well as specifications for PRE, the guide includes other important aspects of PRE, such as emergency communications, most suitable PRE locations, maintenance solutions, auditing tools and frequency of checks, PRE signage, user-instruction information and ways to reduce vandalism and theft.

This guide is the first of its kind, not only in the UK, but worldwide. With credible and robust research, this guide is in a position to set a world benchmark for coastal public rescue equipment.

We therefore welcome and fully endorse this guide and commend all those that were involved in making it happen.

Michael Vlasto OBE

Chairman, National Water Safety Forum
Operations Director, Royal National Lifeboat Institution

Peter Dymond

Chief Coastguard, Maritime and Coastguard Agency

Tom Mullarkey MBE

Chief Executive, Royal Society for the Prevention of Accidents

Acknowledgements

The following organisations have had key roles in the compilation of this guide; without them it would not have been possible:



RoSPA, *David Walker*
(The Royal Society for the Prevention of Accidents)



University Wales Institute Cardiff, *John Keevill*



RLSS UK, *Cliff Nelson*
(The Royal Life Saving Society UK)



University of Plymouth, *Tim Scott*

The following organisations are members of the Public Rescue Equipment working group and have played a vital role in establishing these guidelines:



MCA
(Maritime and Coastguard Agency)



Dorset Fire & Rescue Service



ENCAMS
(Environmental Campaigns)



SLSA GB
(The Surf Life Saving Association of Great Britain)



Carrick District Council



NWSF
(National Water Safety Forum)



NBSC
(National Beach Safety Council)

The RNLI would like to pay special thanks for the continued funding kindly donated by the Calouste Gulbenkian Foundation.

Supported by



CALOUSTE
GULBENKIAN
FOUNDATION

Preface

Over recent years beach owners and operators have been in doubt as to the most appropriate public rescue equipment (PRE) to be used at coastal locations. This has led to unsuitable equipment being installed and, in many cases, has been identified as a major factor contributing to deaths and injuries.

After the success of the document *A guide to beach safety signs, flags and symbols* released in 2005, the Royal National Lifeboat Institution (RNLI) has, for the first time, produced this guide to coastal PRE. With the backing and cooperation of key organisations concerned with safety, it attempts to consolidate any existing best practice guidelines as issued by these key organisations and other bodies.

An in-depth research programme has been completed looking at types of PRE and I hope this guide fulfils its aim of setting a standard for coastal PRE and provides beach owners and operators with sufficient information to enable them to set up effective rescue and communication devices on their beaches.

The benefits of standardising types of PRE are immeasurable but one thing is certain: our beaches will become safer as more operators adopt these standard measures. I strongly urge you to read and use this guide to help make all of our beaches safer places to visit.

Steve Wills
Beach Safety Manager RNLI
Chair of Public Rescue Equipment working group
May 2007

Disclaimer

The content of this document is for general guidance only. It represents best practice as at the date of publication and should not be considered as legal advice. Those using this guide should seek professional advice as and when necessary. The RNLI does not accept responsibility for any errors in this document.



Introduction

Public rescue equipment in coastal areas must be appropriate for the features and conditions of the coastline and water. The equipment should be easy to use by members of the public with minimal hesitation and without putting the safety of the rescuer at risk.

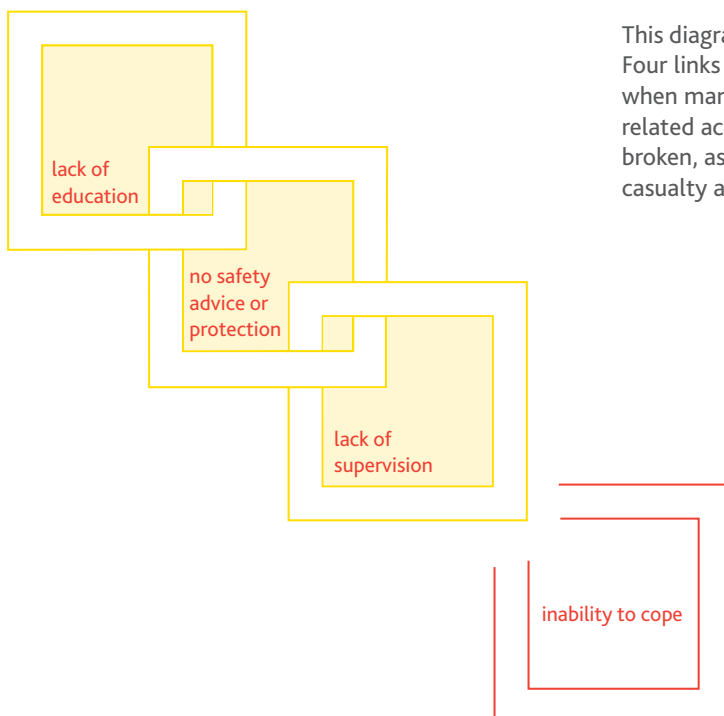
This guide is designed to help the reader select the most suitable solutions when managing PRE at a particular location. It is not only the type of PRE that is important, but also that it is positioned in the correct location and that maintenance and checking procedures are addressed and in place.

This guide also provides advice on emergency telephones and call points, auditing and locating methods such as information signs to advise the public where PRE is installed.

As with all beach management issues, decisions should be based upon a robust and regular risk assessment process. This guide is intended to help beach operators decide the PRE requirement only if a need is identified through a beach risk assessment.

Remember, in some cases the results of a risk assessment could indicate that PRE is not required, such as some very shallow shelving beaches or areas where historically no incidents have occurred. However, PRE requirements should never be looked at in isolation; there are other control measures available that may complement or indeed replace PRE, such as education, signage, zoning or lifeguard services.

The drowning chain



This diagram illustrates the drowning chain. Four links are shown, which should all be considered when managing strategies to reduce and prevent water-related accidents and deaths. The fourth link can be broken, as shown, when PRE is provided to give the casualty an ability to cope.

How this guide was researched

The RNLI, together with other water safety organisations as part of the PRE working group, undertook a detailed programme of research and testing to compile this guide.

Research and testing summary

In total, 35 PRE items from across the world were tested. Items included throw bags, life rings, frisbee devices, throwable lifejackets and gas-propelled lines.



A review of existing standards and background literature was carried out by the University Wales Institute Cardiff

Research was conducted on UK beach types and user definitions by the University of Plymouth

Supplier/maker information was gathered

Testing methodology and extensive survival tank tests conducted

One hundred lifeguard-operated PRE tests were carried out at three UK coastal locations

Five hundred public-operated PRE tests were carried out at six UK coastal locations

Emergency communication devices were researched

Stakeholders and industry feedback was gained



Primary research conclusions

- PRE that requires the rescuer to enter the water to reach a casualty should not be used, for example a personal flotation device with line attached.
- PRE should have inherent buoyancy to support an adult casualty whilst in water.
- PRE device should be retrievable once deployed and then reusable.
- The traditional large life ring is less effective when a rescuer is required to throw rather than lower the equipment to a casualty.
- Line should float and have a breaking strain of no less than 0.5 tonne.
- The line should be no longer than 25m plus any additional drop to the water.
- PRE should be of a weight that is not overly affected by wind conditions and should not present a danger to the casualty.
- Minimum instructions should be presented in order, to reduce confusion and deployment time.
- PRE is not a suitable control measure for some types of shallow shelving beaches.

Current standards and guidelines

There are several national, European and international standards and guidelines that relate to lifesaving appliances; please refer to 'Useful reading' on page 48 of this guide where you will find a list of relevant standards.



It is important to fully understand a coastal environment before thinking about which PRE to install: the features of the site will affect whether PRE is needed (not all sites are suitable for effective use of PRE), and which type of PRE will be most appropriate.

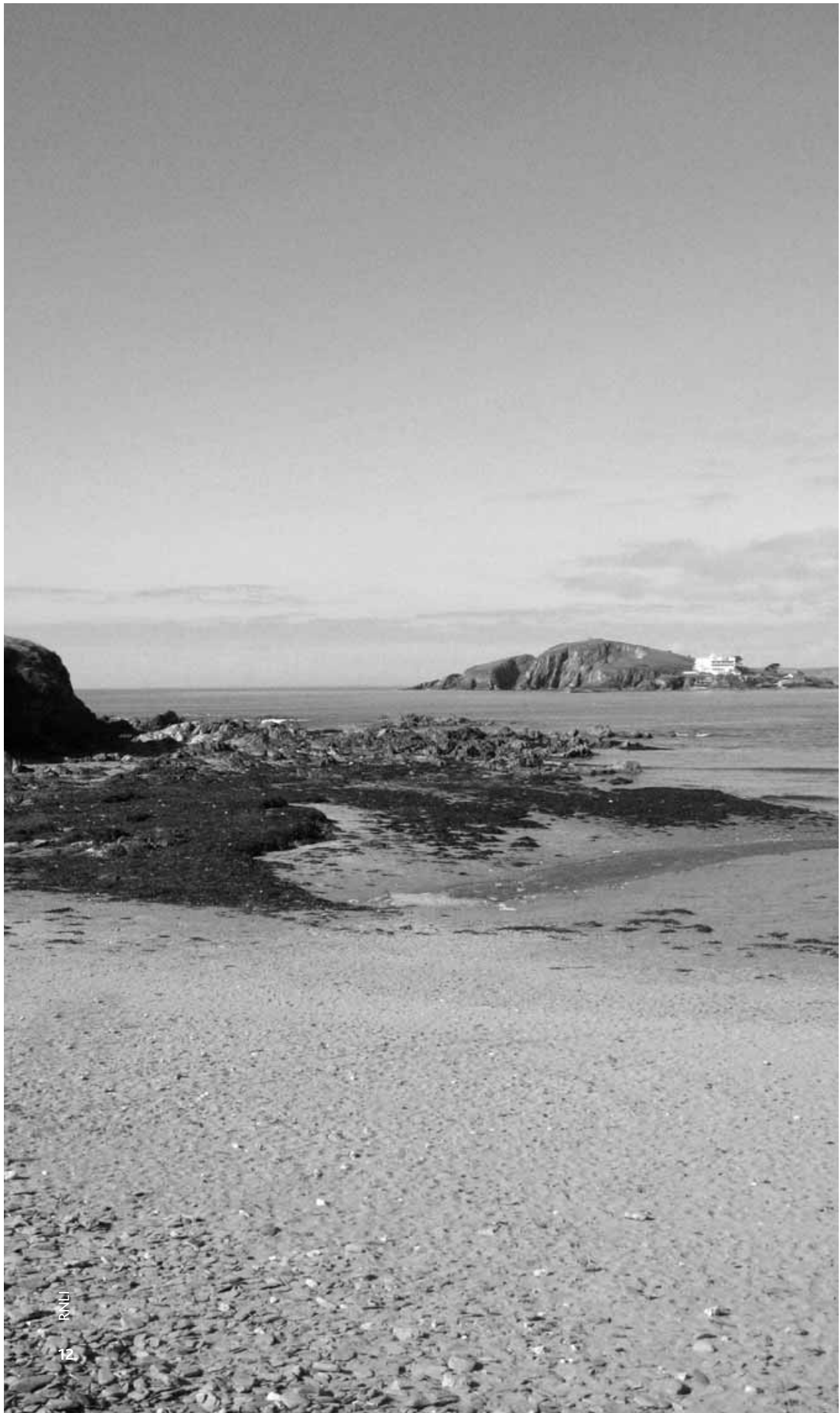
Public rescue equipment is installed in coastal areas to allow members of the public to perform a rescue when all other options are exhausted. It is strongly recommended that beach operators perform a full risk assessment to determine the best control measures needed at each coastal location.

The following pages will help you understand coastal environments and assist with assessing risks.



Getting started





How to use this document

This document should be used as a guide by beach operators when specifying and installing PRE and communication systems for coastal areas. You may find it useful to initially visit each coastal site to carry out a risk assessment that will help determine your PRE control measures. If you have any questions when using this guide or would like some further guidance please contact the RNLI, which will be happy to assist with your queries; contact details can be found on the inside back cover of this document.

Step 1: Understand coastal environments

Pages 14–21

Each coastal environment has different features that will in turn affect which type of PRE is most appropriate. A beach may also have different features depending on the state on the tide. A full understanding of coastal features should be gained before addressing on-site risks.

Step 2: Understand risk management and carry out a risk assessment

Pages 22–23

It is important to base your PRE requirements on a full beach risk assessment. If you are not familiar with beach risk assessments, please contact the RNLI, which is able to provide risk assessments free of charge. Please remember PRE is only part of a possible beach safety solution; other control methods should be considered to complement or replace PRE when undertaking a risk assessment.

Step 3: Select appropriate public rescue equipment

Pages 24–31

Should your risk assessment identify a need for PRE at your site, special consideration should be given to ensuring the most appropriate type of PRE is selected and installed. Coastal features will determine which type is appropriate.

Step 4: Select emergency communications

Pages 32–33

Emergency communications should form part of your PRE strategy; they should supplement general PRE such as life rings or throw bags. It is important to consider which type of emergency communication is appropriate for your site and where it will be located.

Step 5: Locate public rescue equipment and emergency communications

Pages 34–38

It is important that your PRE is sited at the correct location to ensure it can be recognised and deployed in an emergency. Your coastal risk assessment will help identify the most appropriate position to place your PRE and emergency communication.

Step 6: Consider information signs, equipment housing, maintenance and vandalism

Pages 40–47

You should ensure that all PRE is correctly signed, housed and maintained in order for it to be found and deployed effectively when required. It is also important that a regular checking system and anti-vandalism procedures are in place when developing your PRE management plans.

Understanding coastal environments

For ease of understanding, coastal areas have been grouped into four categories throughout this guide. They are as follows:

- beaches
- rocky coasts
- tidal inlets and estuaries
- man-made coasts.

It is appreciated that a coastal site may have features from more than one category; if this is the case please refer to all relevant categories throughout this guide to help you decide the PRE requirements.

The illustration opposite shows each of these coastal environments to help you determine which category/ies your site falls into.

It is important to identify the potential risks within your coastal environment before deciding if you need PRE and, if so, which PRE will be most appropriate. The following pages explain each category of coastal area and this information will help you carry out a risk assessment.

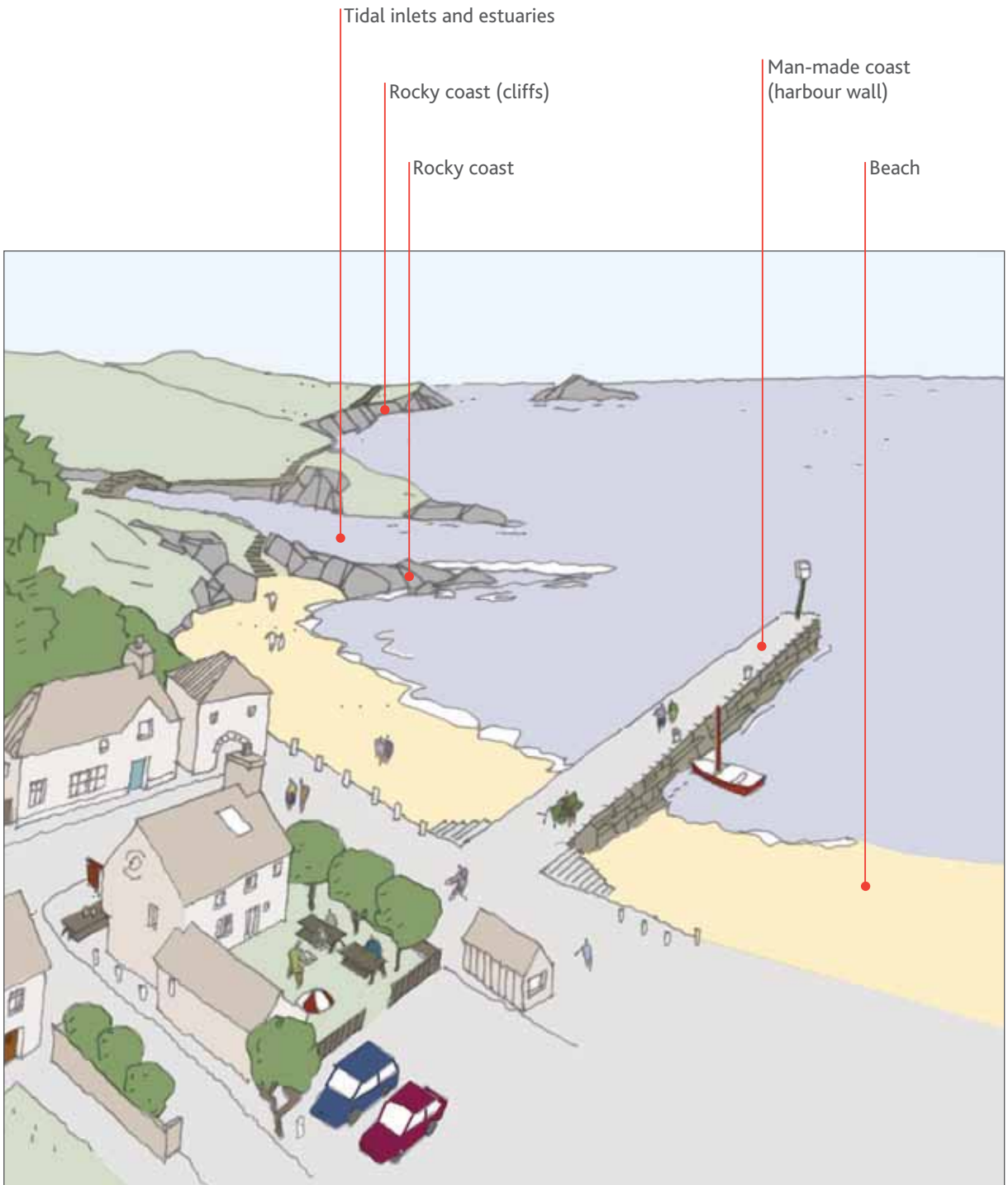


Illustration showing a variety of coastal environments

Understanding beaches

A beach is created when sediment gets deposited by waves on a shoreline; a beach can be created on any shoreline that is exposed to waves as long as there is a good supply of sediment.

A beach is defined as the area from where the waves first move sediment on the seabed to the maximum height of a shoreline during spring tide.

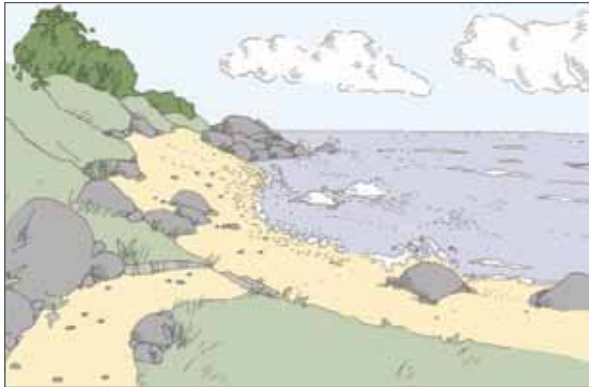
The opposite page describes typical beaches found along the UK shoreline; the descriptions given are very general and often a given beach will display characteristics of more than one beach type. It is also possible that from season to season, with changing wave conditions, beaches may display very different shapes and therefore different beach type characteristics. Please read the descriptions carefully: they will help you carry out a risk assessment, which will in turn help you determine the appropriate PRE needed.

Does your beach have any steep profiles?

When assessing a beach for PRE requirements, there is one especially important feature to consider, which is the presence of a steep beach profile within all or any section of the intertidal zone (the area of the beach that is submerged by the tide during some point within the tidal cycle).

A steep section of beach is defined as being any part of the intertidal zone that possesses a slope of 1:12 or steeper. This slope represents the steepness that will result in a person of average height being out of their depth within 25m of the shoreline.

Both modal and extreme storm sea levels must be taken into account (possibly researching historical storm sea levels) and you should consider that the level of spring high water can increase by more than 1m in certain areas during severe storms.



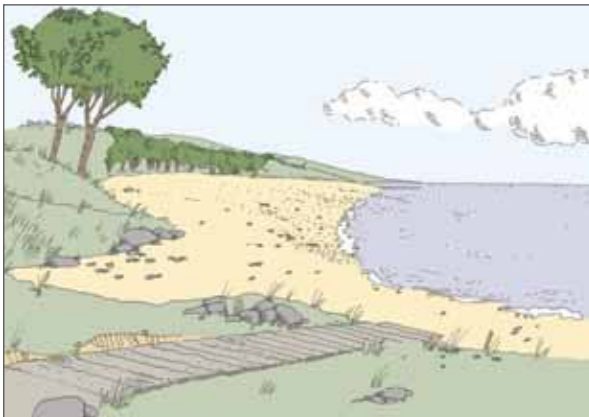
Steeply shelving beach

Also known as a reflective steep beach

Steeply shelving beaches are steep with a slope of at least 1:12 during the tidal cycle. They usually consist of coarse sand or gravel and have very short surf zones meaning the waves will usually break ferociously in a plunging or surging manner at the shoreline.

Slapton Sands in Devon is an example of a steeply shelving beach in the UK.

If steeply shelving beach sections exist then PRE is likely to be required. Please turn to page 27 to determine which type of PRE is suitable for steeply shelving beaches.



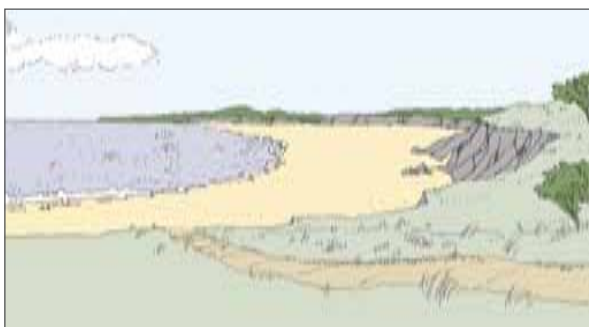
Medium shelving beach

Also known as a reflective/intermediate beach containing steep sections

Medium shelving beaches cover a wide variety of beach types. They will often have sand bars and rip current systems forming near the low tide position, and the high tide level will usually be steep and consist of coarse sand or gravel. These beaches are generally more dynamic and their shape will change, sometimes dramatically, throughout the seasons. They typically have a shorter surf zone than shallow shelving beaches and the waves will often be steeper and more plunging. They can also possess a wide, flat low tide beach area.

Examples of medium shelving beaches in the UK are Challaborough in Devon and Sandymouth in Cornwall.

If your beach falls into this category and steep beach sections exist then it is likely that PRE is required. Please continue to page 27 to determine which type of PRE is suitable for medium shelving beaches.



Shallow shelving beach

Also known as an intermediate/dissipative beach with no steep sections

Shallow shelving beaches are very flat with a wide surf zone and the waves are usually spilling in nature. No sections of the beach should have a slope greater than 1:12.

Examples of shallow shelving beaches in the UK are Perranporth in Cornwall and Saunton Sands in Devon.

If, after assessment, it is decided that your beach falls into this category, then PRE may not be appropriate for your beach environment. See page 26.

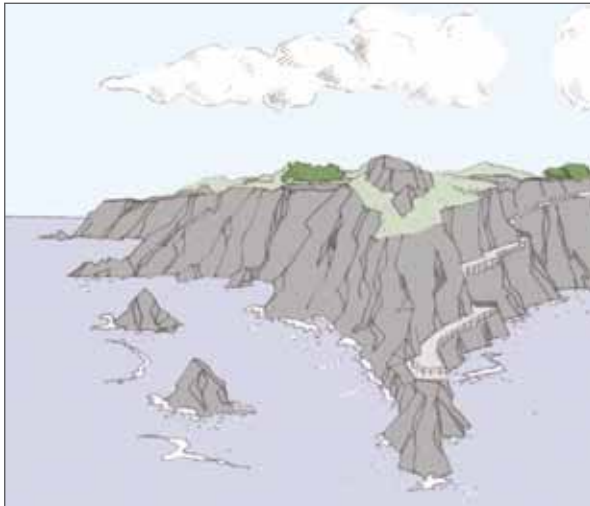


Understanding rocky coasts

Rocky coasts consist of any coastal environment where rock headlands, rock outcrops on a beach or cliffs reach to the shoreline.

Rocky coastlines take on either a steep or a gradual profile depending on the type of rock being eroded and the amount of wave energy acting on it. For example, resistant rock such as granite, combined with high-energy wind and wave activity, will display a steep profile, eroding uniformly, but very slowly. By contrast, where shale and other more easily eroded rock types are subjected to low-energy winds and waves, a more gradual slope forms from land to sea.

Rocky headlands are projections of land that form when certain types of rock in a cliff erode more slowly than others. Where this occurs, characteristic landforms develop in a fairly predictable sequence over a long period of time. Bays can be created when soft rock is eroded faster than more resistant rock.



Rocky coasts

A beach may fall into this category if at any time it is submerged at high water allowing the shoreline to interact with the cliff face creating a sheer drop into the water.

If the beach manager decides that they have a rocky coast environment within their coastal site then PRE may be required. Please refer to pages 28 and 29 to find out which PRE is appropriate for rocky coasts.

Understanding tidal inlets and estuaries

River and tidal inlets can be found along many sections of the UK coast. They vary in scale from small streams to large estuaries and tidal inlets, which can be more than 1km wide. For the purpose of the PRE assessment this environment takes on two main forms within the UK: tidal inlets and estuaries.

Tidal inlets and estuaries often occur within the same environment and, for the purpose of a PRE risk assessment, both represent similar hazards.

Fast-moving water is the principal hazard associated with tidal inlets and estuaries. It can cause water users to lose their footing and transport them to deeper water; currents can transport water users faster than they can swim. Also, the presence of an intertidal slope greater than 1:12 will result in a person of average height being out of their depth within 25m of the shoreline.

These environments are highly dynamic and currents can be controlled both by tidal movement and freshwater output of rivers, meaning hazards can vary vastly throughout the year.



Tidal inlets, within the context of PRE assessments, represent channels that act as a constriction to tidal movement such as a small entrance channel to an estuary due to a spit, sandbar or beach. This causes an increase in the flow speed of tidal currents within this channel.

Estuaries are typically the tidal mouth of a river where the river channel(s) meet the sea and are affected by sea water and tidal movement.

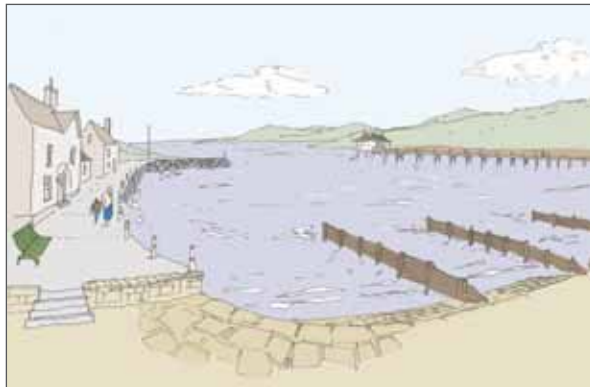
If the beach manager decides there is a tidal inlet or estuary within their coastal site then PRE may be required. Please refer to pages 28 and 29 for suitable PRE.

Understanding man-made coasts

Man-made coasts consist of any coastal environment where man-made structures are present at the shoreline and occupy a position within the intertidal zone (the area of the beach that is submerged by the tide during some point within the tidal cycle). These may occur in combination with any of the other coastal environments described in this guide.

With many man-made coastal structures, a near-vertical drop into the water is present. The critical parameter for determining if PRE is required is the presence of a steep slope within all or any section of the intertidal zone, including any areas affected by extreme storm sea levels. It is important to remember that extreme storm sea levels must be taken into account (possibly researching historical storm sea levels), as the level of spring high water can increase by more than 1m in certain areas during severe storms.

A PRE assessment must be made if a man-made coastal structure is adjudged to be within the intertidal zone including that affected by the extreme sea level range.



Harbour walls are any man-made construction in contact with the intertidal zone associated with a harbour.

Sea walls are designed to act as a barrier to the wave, usually employed as protection of a vulnerable area. They are often found lining the top of a beach, protecting an urban area or sensitive/valuable environment. Sea walls are usually made of solid concrete and characterised by a near-vertical drop into the water.

Breakwaters are designed to reduce wave energy approaching the coast. Usually constructed of rock or large lumps of concrete, they can be found in a variety of orientations. Sometimes they are detached from the shore during all tides, in which case they can be disregarded in respect to PRE assessments.

Groynes are designed to constrain the movement of sand along the coast; they are usually found on beaches at right angles to the shoreline. They can possess a vertical drop into deep water at all stages of the tide.

Jetties are designed to accommodate the movement of people and the mooring of boats. They are usually characterised by a vertical drop into deep water at their edges.

Piers are large coastal structures that protrude into the intertidal zone and are designed to accommodate a number of people. They often possess a large vertical drop into deep water at their edges.

If the beach manager decides that they have a man-made coast environment within their coastal site then it is likely that PRE will be required; pages 30 and 31 explain PRE suitable for man-made coasts.

Risk management for PRE

Managing risk in the coastal environment requires the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, treating and monitoring risk. PRE is only one of several control measures; risk assessment must take a holistic approach when determining the most effective actions and control measures to implement.

Key principles for coastal risk management

The following points summarise the rationale behind carrying out a risk assessment:

- provides the basis for a risk management plan
- improves safety and reduces the risk of death or injury at the site
- ensures the best use of resources and encourages effective management and cost effective operations
- reduces the potential for litigation stemming from accident and management practices
- provides guidance for the development of policies, procedures and practices.

Beach owners should consider the need for taking on formal advice if they feel they lack the expertise to conduct a risk assessment that meets the specific needs of the beach and coastal environment.

Advice from the World Health Organization

The World Health Organization offers the following advice in relation to the assessment of hazard and risk in its guidelines for safe recreational water environments (coastal and fresh waters):

- the assessment of hazard and risk informs the development of policies for controlling and managing risks to health and wellbeing in water recreation
- the assessment of a beach or water should take into account several key considerations:
 - the presence and nature of natural or artificial hazards
 - the severity of the hazard as related to health outcomes
 - the availability and applicability of remedial actions
 - the frequency and density of use
 - the level of development.

Advice from the Health and Safety Executive

The Health and Safety Executive has provided some guidance on practical risk assessments and also sets out a simple 5-step guide to conducting a risk assessment as follows:

- identify hazards
- decide who might be harmed and how
- evaluate risks, evaluate existing precautions and determine if more are required
- record findings
- review or establish a review process.

See [hse.gov.uk/risk](https://www.hse.gov.uk/risk) for more information.

Implementing PRE control measures

If your risk assessment process identifies PRE control measures that need improving or implementing, you will need to develop a plan for this. This plan should include time frames and responsibilities and it may involve a staged approach to improving controls. Maintenance of controls also needs to be included at this stage.

The opposite page provides some useful examples of the main causes and types of hazards associated with coastal environments.

Coastal hazards

Beach fronts can present the following hazards:

Steep cliffs
Unstable cliffs, rock falls and mud slides
Unsafe walkways and lookouts
Sudden drop-off or steep slopes
Rock shelves or reefs
River mouths

Beach profile features can present the following hazards:

Waves and tidal currents
Surf zone currents or rips
Headlands
Rock swimming and paddling pools
Groynes, jetties and piers
Pollution and litter

Man-made coastal structures can create the following conditions, which could be hazardous:

High energy wave breaking and strong currents
Vertical drop into deep water
Slippery surfaces

Activities

Beach and dune areas can attract the following activities, which could be hazardous:

Walking
Beach fishing
Beach games
Rock walking
Rock fishing
Climbing and bouldering

Swash and surf zones can attract the following activities, which could be hazardous:

Paddling
Wading
Swimming
Use of inflatables
Bodysurfing
Bodyboarding
Wave dodging
Cliff, rock or pier jumping
Surfing

Risk groups

Very young children

The very young (0–4 years) are the highest risk group for drowning in still-water environments. This group is vulnerable without constant adult supervision.

16–35 year olds

People in this age group, in particular young males, tend to participate both in more physical and more risk-taking activities. This risk-taking behaviour is often increased when there are groups involved.

Tourists, visitors and migrants

Tourists are usually unfamiliar with the local environment, often having little or no experience of coastal hazards.

Non-swimmers

Any non-swimmer is at risk in the water. Most non-swimmers enter deep water accidentally.

Behaviour

Alcohol use

Alcohol is linked to a high percentage of coastal incidents. Alcohol makes a person less aware of hazards and less capable of responding once in difficulty.

Controlled risk-taking behaviour

Controlled risk taking is associated with adventure. Extreme sports enthusiasts, who follow defined safety rules, tend to understand their own limits and those of their equipment. Controlled risk-taking behaviour lends itself to management through voluntary codes of practice.

Uncontrolled risk-taking behaviour

Uncontrolled risk takers fail to take appropriate precautions and often endanger themselves or others through ignorance or by committing acts of bravado. This behaviour is also strongly associated with alcohol use.

The following pages recommend the most effective type of PRE for each type of coastal environment. In summary, there are three types of PRE suggested for general public use: a small to medium-sized life ring; a throw line with flotation; and a large-sized life ring.



Selecting public rescue equipment



PRE for beaches

Shallow shelving beaches

See page 17 for description

PRE is not generally suitable for shallow shelving beaches where man-made or natural hazards/drops are not present during any tidal state. PRE has proven to be ineffective in areas where an adult is able to stand at any point within 25m of the shoreline and the gradient of the seabed or the beach is low and gentle.

If your beach risk assessment does identify a need for PRE it may be effective only for a short period of time. Where there is a significant tidal range, and the water's edge is only close to where the PRE is located for a limited time either side of high water, other control measures should be considered.

If PRE is required on any shallow shelving beaches in your area please refer to the PRE requirements for medium and/or steeply shelving beaches on page 27.

Medium and/or steeply shelving beaches

See page 17 for description

A small to medium-sized life ring (sometimes referred to as a lifebuoy) is recommended for steeply shelving and medium shelving beaches. The specification should include the following features:

Flotation

A positive flotation/buoyancy of at least 50N to help support the casualty in the water.

Weight and dimensions

The unit should have a weight of 1–2kg and a diameter of 18–24 inches (45–61cm).

Line

The line must be able to float, be highly visible and have a maximum length of 25m plus any expected maximum drop, with a thickness of 9.5–13.5mm and be made of polypropylene staple. It must be coiled in a clockwise direction or in a bag that is easy to check and deploy freely.

The line should have a minimum of 0.5 tonne breaking strain and should, where possible, have unique coloured strands to assist with identifying theft. The line should have little or no memory to be repacked effectively.

Please note, polypropylene staple rope should always conform to BS EN 699:1995. This type of line is the only MCA-approved safety rope.

Features

The life ring must have retro-reflective tape on four points to aid visibility at night-time and it must be durable to sustain long-term exposure to outside environmental conditions.

The life ring must be foam filled (polyurethane) or made of a solid mass (foam) to prevent water entering the item. The unit should be brightly coloured (ideally red and white or orange). A grip handle is recommended to aid the throwing technique and there should be a rope attached to at least four points around the ring, made to



18–24 inches (45–61cm)
small to medium-sized ring diameter

the same or similar line specification detailed above.

User information

PRE should display accurate minimum instructions, for example pictograms, with a maximum reading time of 10 seconds. Please refer to page 43 of this guide for more information.

PRE for rocky coasts, tidal inlets and estuaries

Throw bags or small to medium-sized life rings are recommended PRE devices for rocky coastal locations, tidal inlets and estuaries. However, throw bags should only be used if there is at least 40N of positive buoyancy at the end of the line to assist the casualty. Throw bag devices are most suitable at swift-water locations such as river mouths, estuaries and areas around rocky coasts where frequent strong currents are present. Refer to pages 19 and 20 for these coastal descriptions.

Throw bag specifications

Flotation

A positive flotation/buoyancy of at least 40N to help support the casualty in water.

Line

The line must be able to float, be highly visible and have a maximum length of 25m plus any expected maximum drop, with a thickness of 6–13.5mm and be made of polypropylene staple. It must be coiled in a bag that is easy to check and deploy freely.

The line should have a minimum of 0.5 tonne breaking strain and should, where possible, have unique coloured strands to assist with identifying theft. The line should have little or no memory to be repacked effectively. The line should have no looped ends; it is important that the line can be released quickly by the rescuer if required.

Please note, polypropylene staple rope should always conform to BS EN 699:1995. This type of line is the only MCA-approved safety rope.

Features

The throw bag must have retro-reflective tape on the buoyed section to aid visibility at night-time and it must be durable to sustain long-term exposure to outside environmental conditions. The unit should be brightly coloured (ideally red, yellow or orange).



User information

PRE should display accurate minimum instructions, for example pictograms, with a maximum reading time of 10 seconds. Please refer to page 43 of this guide for more information.



18–24 inches (45–61cm)
small to medium-sized ring diameter

Small to medium-sized life ring specifications

Flotation

A positive flotation/buoyancy of at least 50N to help support the casualty in the water.

Weight and dimensions

The unit should have a weight of 1–2kg and a diameter of 18–24 inches (45–61cm).

Line

The line must be able to float, be highly visible and have a maximum length of 25m plus any expected maximum drop, with a thickness of 9.5–13.5mm and be made of polypropylene staple. It must be coiled in a clockwise direction or in a bag that is easy to check and deploy freely.

The line should have a minimum of 0.5 tonne breaking strain and should, where possible, have unique coloured strands to assist with identifying theft. The line should have little or no memory to be repacked effectively.

Please note, polypropylene staple rope should always conform to BS EN 699:1995. This type of line is the only MCA-approved safety rope.

Features

The life ring must have retro-reflective tape on four points to aid visibility at night-time and it must be durable to sustain long-term exposure to outside environmental conditions.

The life ring must be foam filled (polyurethane) or made of a solid mass (foam) to prevent water entering the item. The unit should be brightly coloured (ideally red and white or orange). A grip handle is recommended to aid the throwing technique and there should be a rope attached to at least four points around the ring, made to the same or similar line specification detailed above.

User information

PRE should display accurate minimum instructions, for example pictograms, with a maximum reading time of 10 seconds. Please refer to page 43 of this guide for more information.

PRE for man-made coasts

A life ring is recommended for man-made coastal features described on page 21 of this guide. There are two sizes of life ring: a small to medium-sized ring and a large-sized ring.

Where to use the large-sized life ring

If there is a straight drop between the rescuer and the casualty, with little or no throwing needed, then a large, SOLAS (Safety of Life at Sea) approved, life ring can be used. Harbour walls, piers and breakwaters are examples of suitable locations for large-sized life rings.

Where the casualty might not be easily recovered from the water (for example, where there are no obvious access/exit points such as ladders, slipway or steps) then it is advisable to use a large-sized life ring.

It is also recommended that a large-sized life ring be provided at locations where there is a possibility of multiple casualties, such as where boats are frequently moored or harbour walls that are accessible to the public.

Where to use the small to medium-sized life ring

In all situations, other than those mentioned above, a small to medium-sized life ring should be used.

Other methods to recover a casualty

As well as PRE solutions for man-made coasts, there may be additional equipment that could be considered to aid casualty recovery, for example ladders, grab chains/ropes near water level, steps or scramble nets.

Life ring specifications

Flotation

A positive flotation/buoyancy of at least 50N to help support the casualty in the water.

Weight and dimensions

The small to medium-sized ring should have a weight of 1–2kg and a diameter of 18–24 inches (45–61cm).

The large-sized ring can have a diameter of 25–32 inches (63–81cm). Please refer to the *International Convention for the Safety of Life at Sea* (SOLAS) for specifications regarding large SOLAS-approved life rings (see page 48).

Line

The line must be able to float, be highly visible and have a maximum length of 25m plus any expected maximum drop, with a thickness of 9.5–13.5mm and be made of polypropylene staple. It must be coiled in a clockwise direction or in a bag that is easy to check and deploy freely.

The line should have a minimum of 0.5 tonne breaking strain and should, where possible, have unique coloured strands to assist with identifying theft. The line should have little or no memory to be repacked effectively.

Please note, polypropylene staple rope should always conform to BS EN 699:1995. This type of line is the only MCA-approved safety rope.

Features

The life ring must have retro-reflective tape on four points to aid visibility at night-time and it must be durable to sustain long-term exposure to outside environmental conditions.

The life ring must be foam filled (polyurethane) or made of a solid mass (foam) to prevent water entering the item. The unit should be brightly coloured (ideally red and white or orange). A grip handle is recommended to aid the throwing technique and there should be a rope attached



18–24 inches (45–61cm)
small to medium-sized ring diameter

25–32 inches (63–81cm)
large-sized ring diameter

to at least four points around the ring, made to the same or similar line specification detailed above.

User information

PRE should display accurate minimum instructions, for example pictograms, with a maximum reading time of 10 seconds. Please refer to page 43 of this guide for more information.

Emergency communications

Emergency communications form part of public rescue equipment at coastal locations. There is often a reliance on mobile telephones to summon the assistance of the emergency services when away from the home or work environment. However, coverage and reliability are often poor and factors such as difficulty determining location and lack of power bring problems that can be life-threatening.

With new technology and more cost efficient options now available, emergency communications as a form of PRE should always be considered.

Emergency communication devices such as emergency telephones and call points are very useful for summoning emergency assistance at remote locations where mobile phone coverage is limited and help is not close at hand. Such places may include cliff walks, rural beaches with little infrastructure, or resort beaches where mobile phone reception is poor and there are limited public access telephones available.

Emergency communications as a supplement to PRE

Please remember, emergency telephones should not replace general PRE but should supplement it where necessary. Your risk assessment should highlight if there is a need for emergency telephones in addition to PRE. It may be a good idea to liaise with your local coastguard officer to help identify if there is a need or to determine the effectiveness of any current emergency communication provision.

Types of emergency communications

There are fundamentally two types of emergency communication devices suitable for coastal locations:

- fixed land-line emergency telephone
- GSM (Global Systems Mobile)-based emergency telephone/call point.

Locating and signing emergency communications

Emergency communication devices should be clearly visible, well signed and easy to use. Generally, phones are yellow in colour, but larger call points may incorporate additional suitable colours, for example red.

Emergency communications should be fixed at a height that best suits site conditions and needs; a fixing height of between 1.2m and 1.5m (from floor to handset) is usually appropriate. Consideration should be given to locating emergency communications so they are not likely to be damaged by high tides or stormy conditions.

Signs should be provided to help the public find the communication devices; more information about signs can be found on page 42 of this guide.

For manufacture and supply information please refer to the contacts, which can be found inside the back cover of this guide.

About fixed land-line emergency telephones

Location

Can be located where land-line can be accessed

Call routing

Calls can be routed to the Coastguard or a local centre, for example a lifeguard post during set hours

Special features

Vandal-proof, hands-free operation, with no moving parts

Example product

BT emergency telephone



Example of an emergency telephone

About GSM-based emergency telephones/call points

Location

Can be located anywhere a GSM signal is detected

Call routing

Calls can be routed to the Coastguard or a local centre, for example a lifeguard post during set hours

Special features

Vandal-proof, hands-free operation, with no moving parts. Unit is self contained, requiring no external connections and can be remotely monitored with daily diagnostic test calls.

Example product

SafetySTATION – see safetynetplus.co.uk for details.



Example of a GSM-based emergency telephone

Remember, calls are usually routed direct to the emergency services, therefore it is essential that phones are not located where there is a likelihood of misuse resulting in hoax calls to the emergency services. It is advisable to contact your local coastguard officer and/or community police team to identify if any potential issues could arise from installing an emergency telephone at a new location.

Locating PRE and communications

It is essential that PRE is sited in suitable locations; the following pages will explain some basic principles to help position your PRE most effectively. The outcome of a beach risk assessment will assist with effective positioning and the following basic principles should be applied when determining PRE locations.

Basic principles for positioning PRE


- Located at intervals determined by visitor numbers and risk assessment (where the greatest risk of immersion is likely to be).
- Clearly visible and close to the location of the hazard.
- Location should be easily accessible and not at risk of being submerged by the tide.
- If feasible, it is advisable to locate PRE near access points to assist casualty recovery.
- Located between a coastal access point and the hazard (to encourage people to notice the PRE while passing towards the hazard area).
- Positioned at an optimum height for ease of access. A fixing height of between 1.2m and 1.5m (from floor to centre of equipment) is usually appropriate.
- If beach safety signage is displayed, then it may be appropriate to locate PRE nearby. It is beneficial to have a safety area that incorporates signage and PRE.

Location examples


A variety of illustrations are shown over the following pages with examples of different coastal environments and the ideal locations for positioning PRE. Some illustrations show just one coastal environment and some show combined environments. Please use these examples as a best practice guide when deciding where to locate PRE at your site.


Information to help determine which size of life ring to use can be found on page 30 of this guide.

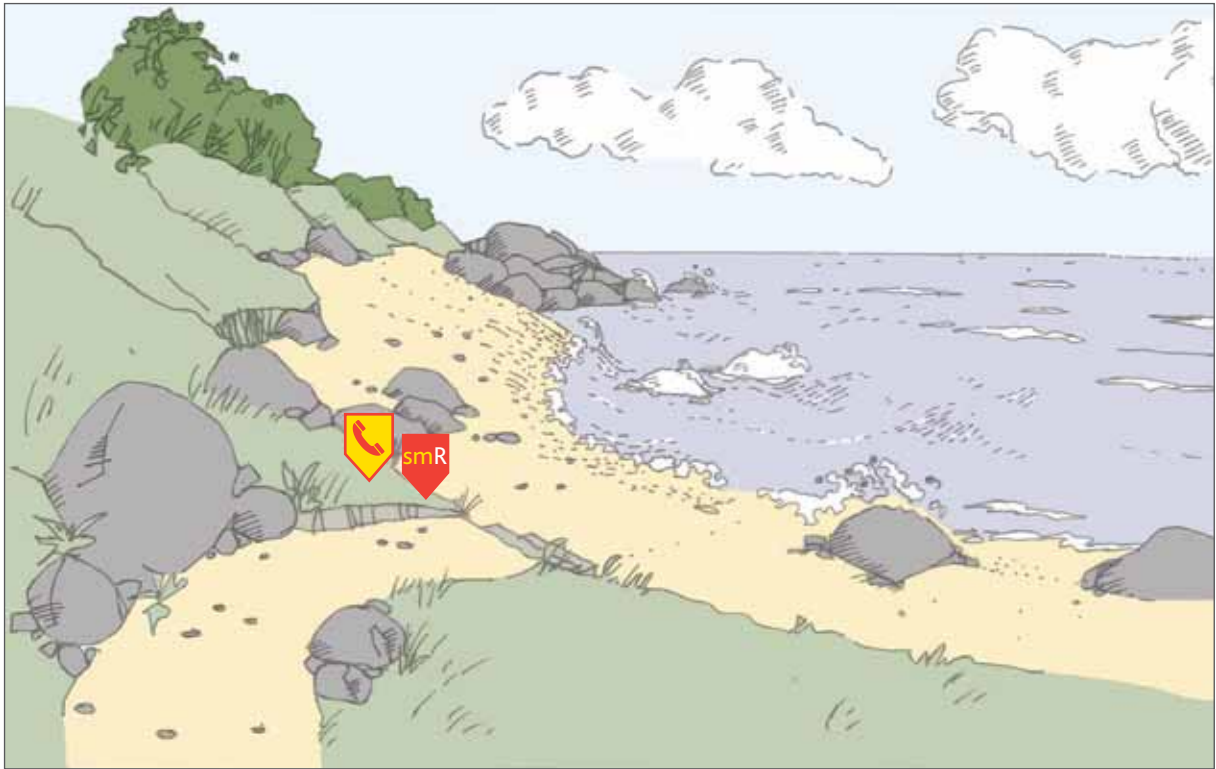
Key to location symbols

 Small to medium-sized life ring

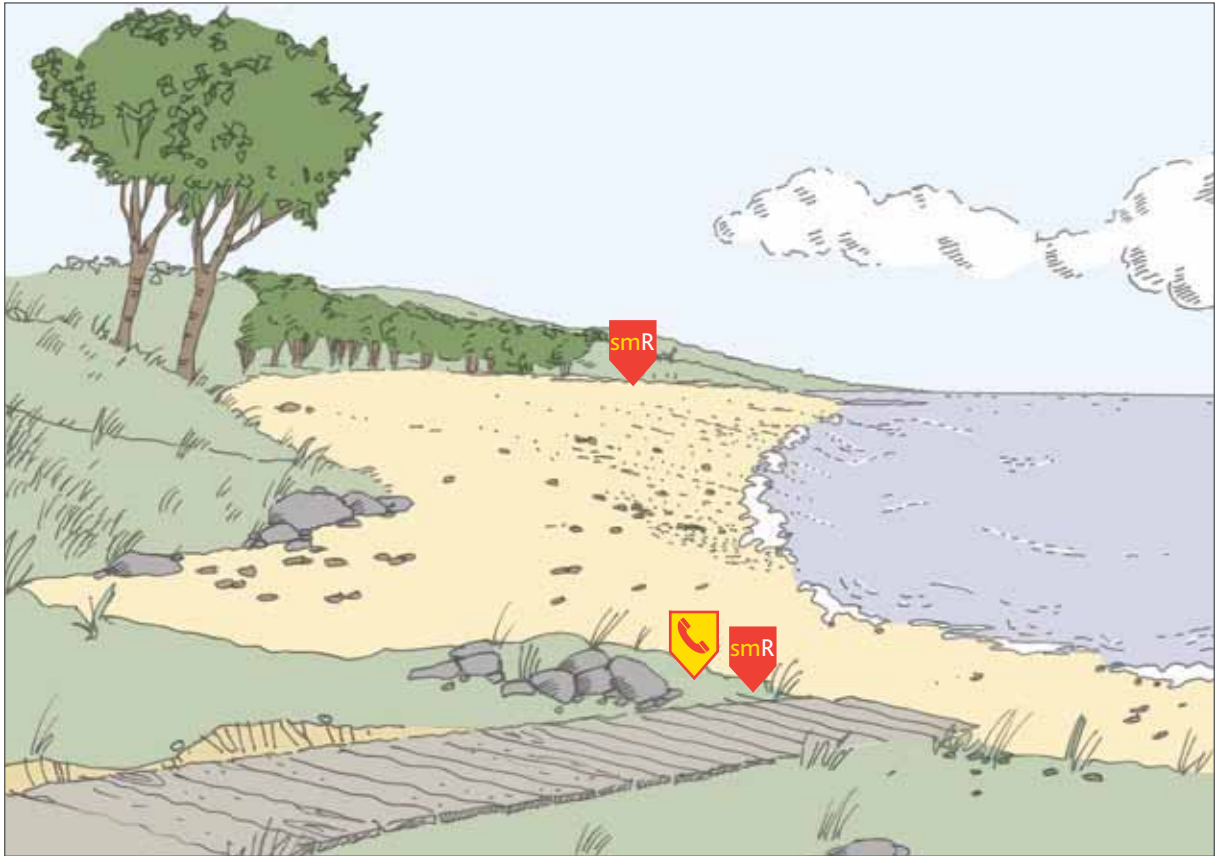
 Large-sized life ring

 Throw bag

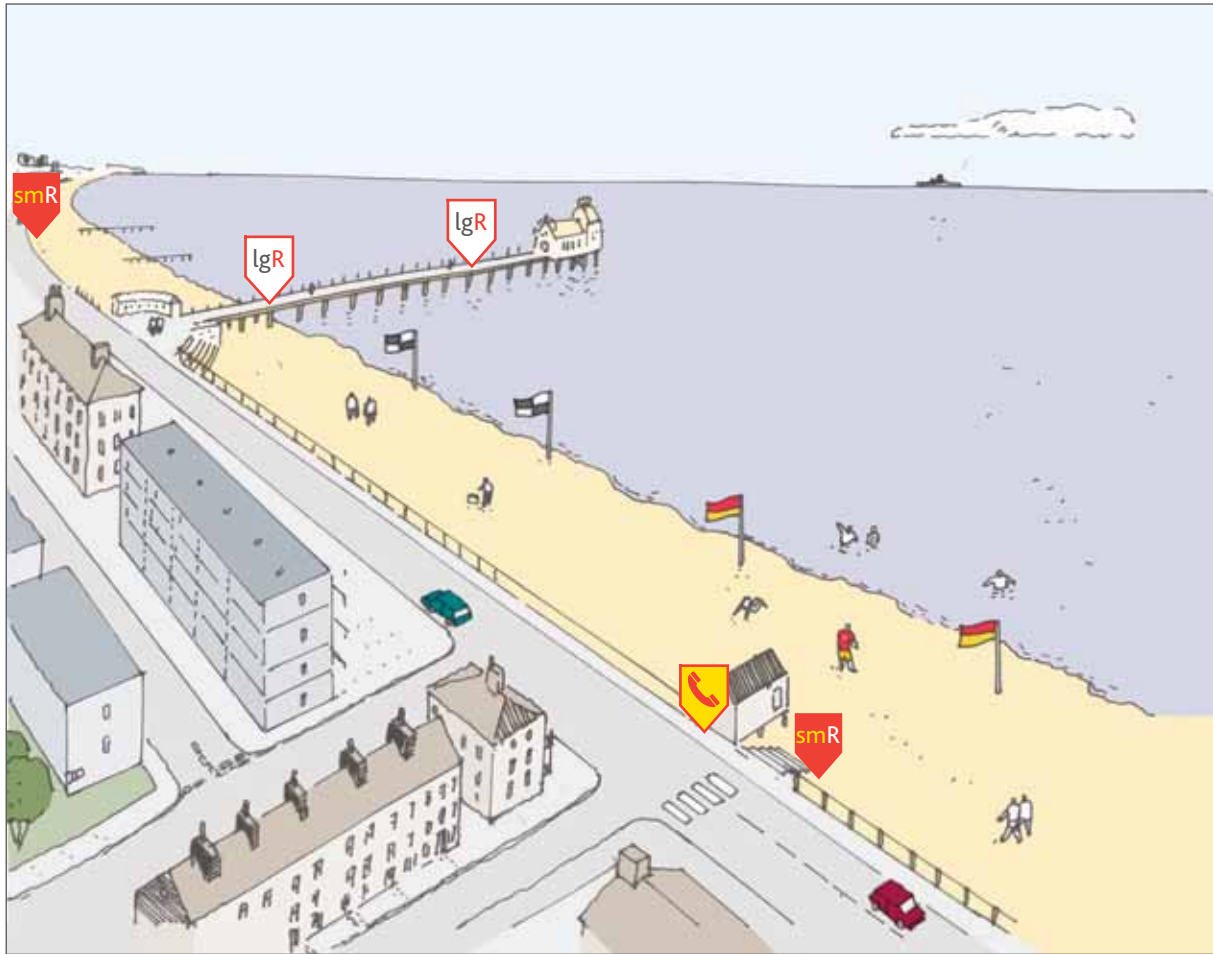
 Emergency communications



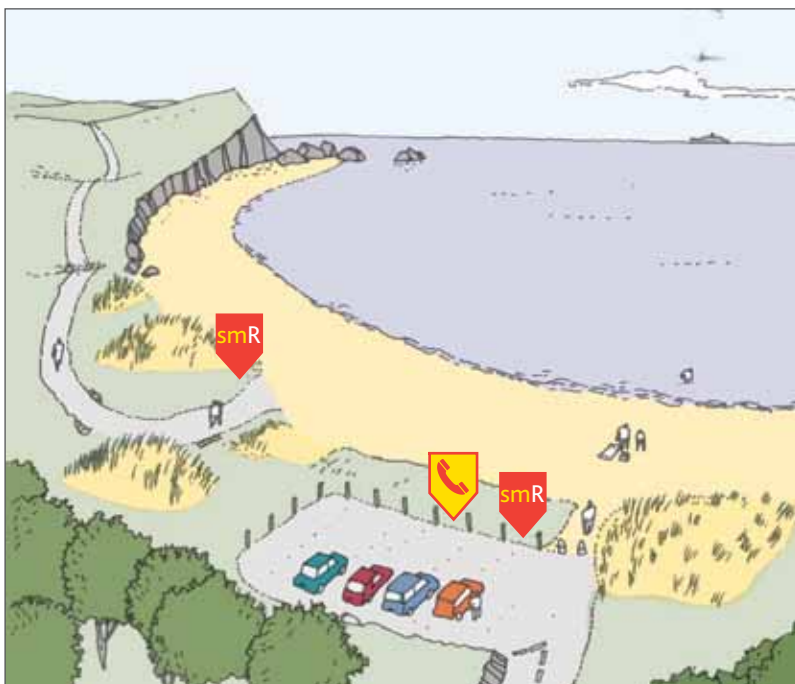
Suggested locations for a small to medium-sized life ring and emergency communications on a steeply shelving beach



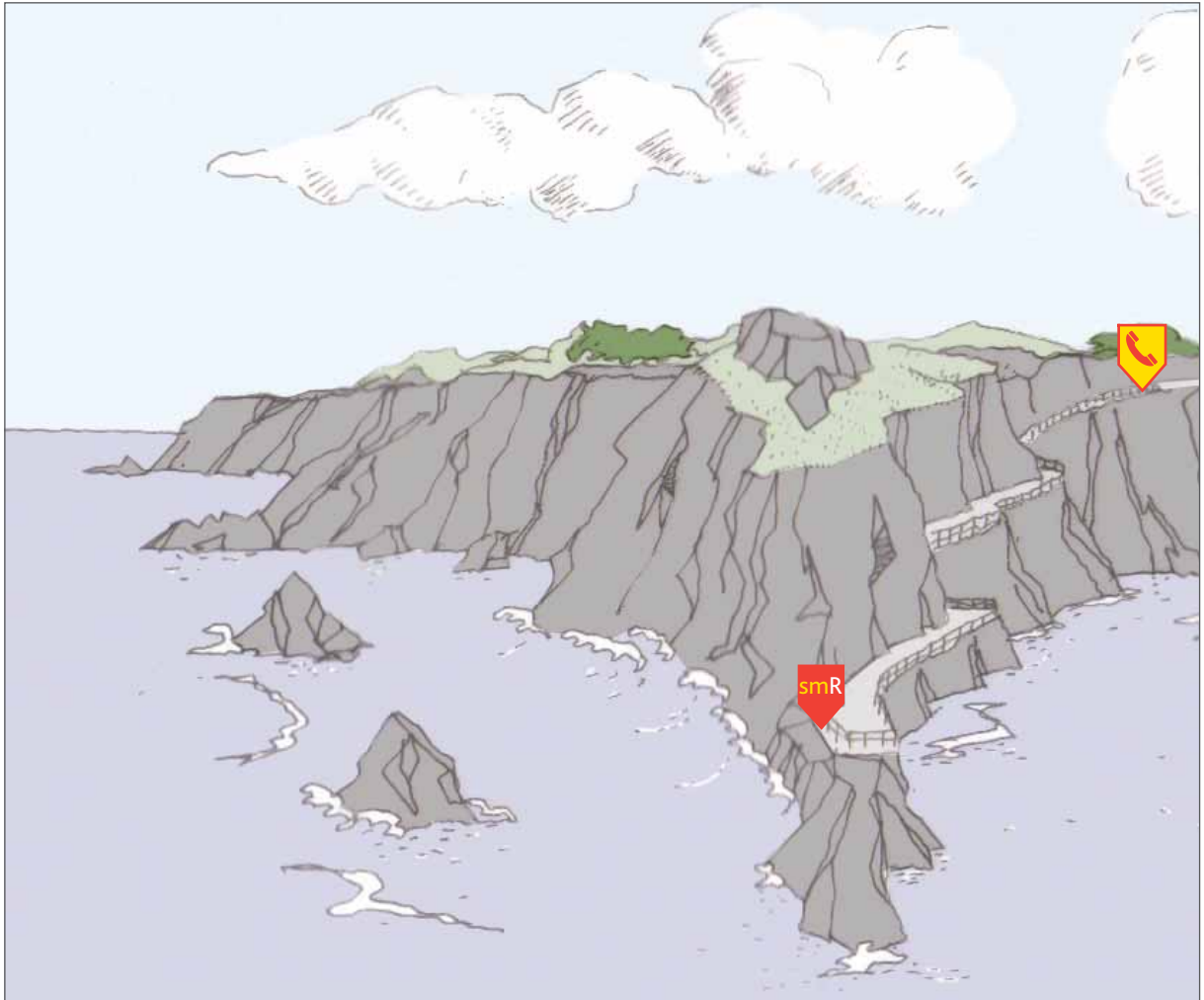
Suggested locations for a small to medium-sized life ring and emergency communications on a medium shelving beach



Suggested locations for small to medium-sized life rings, large-sized life rings and emergency communications on a shallow shelving beach with man-made structures





Suggested locations for small to medium-sized life rings and emergency communications on a medium shelving beach with some rocky coastline




Suggested locations for a **small to medium-sized life ring** and **emergency communications** along a rocky coastline

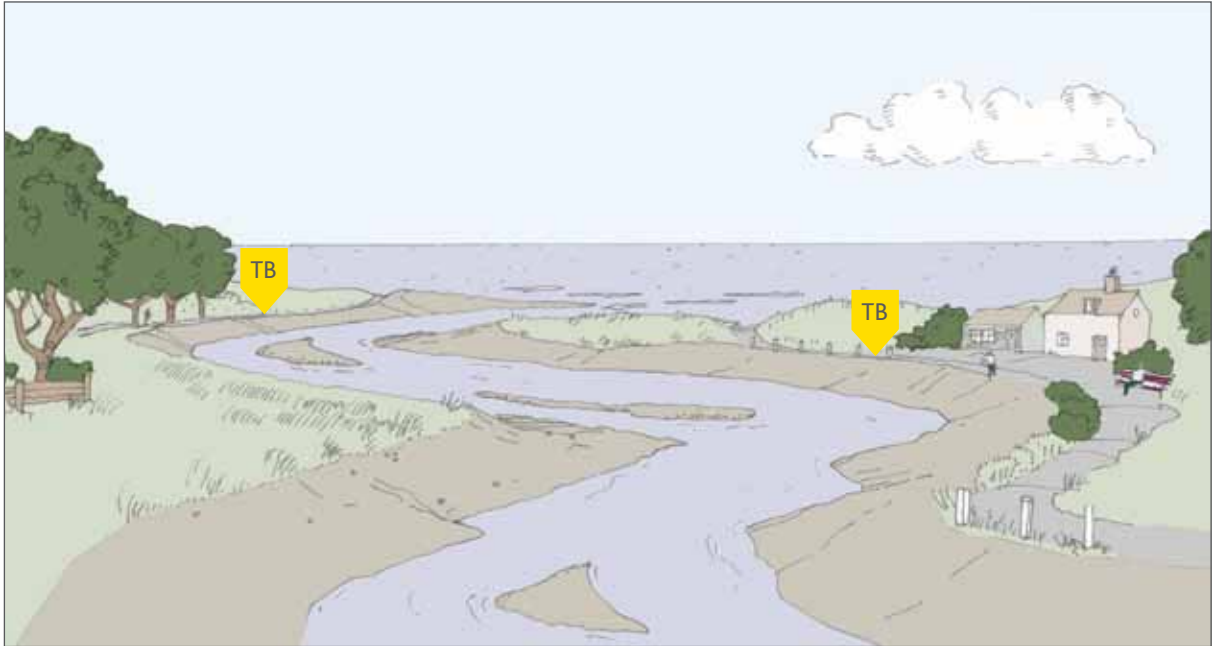
Key to location symbols

 Small to medium-sized life ring

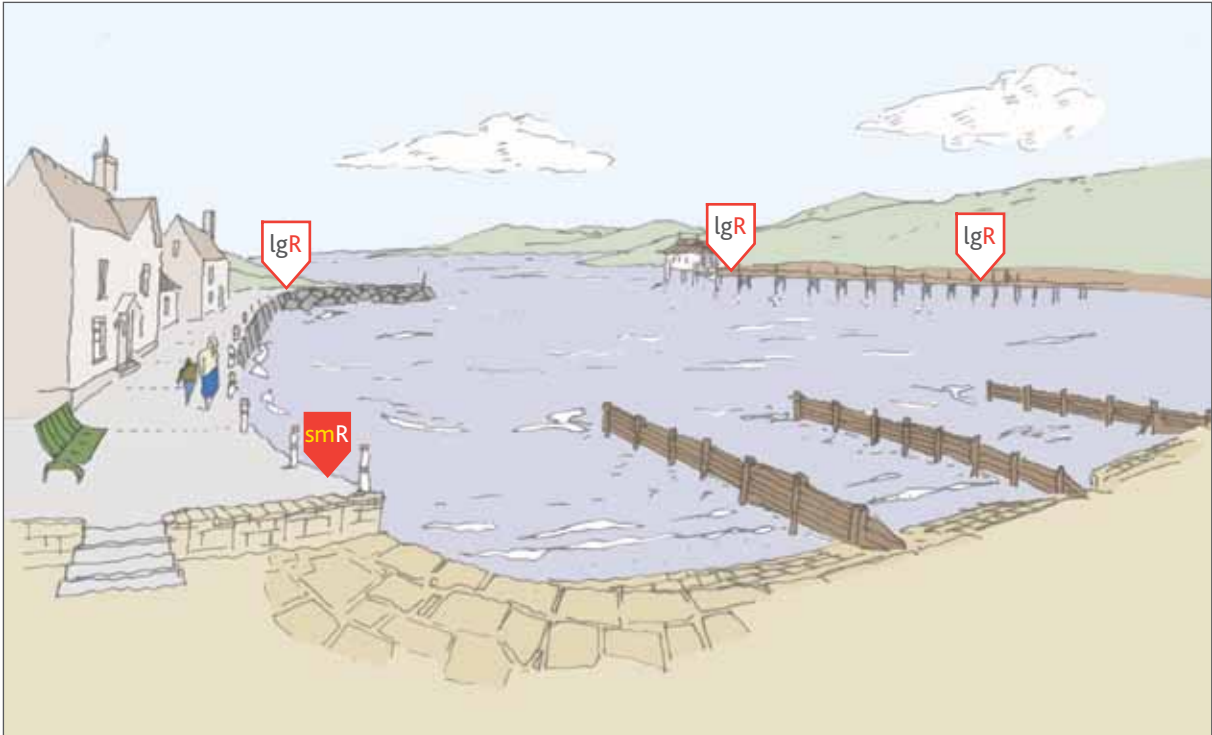
 Large-sized life ring

 Throw bag

 Emergency communications



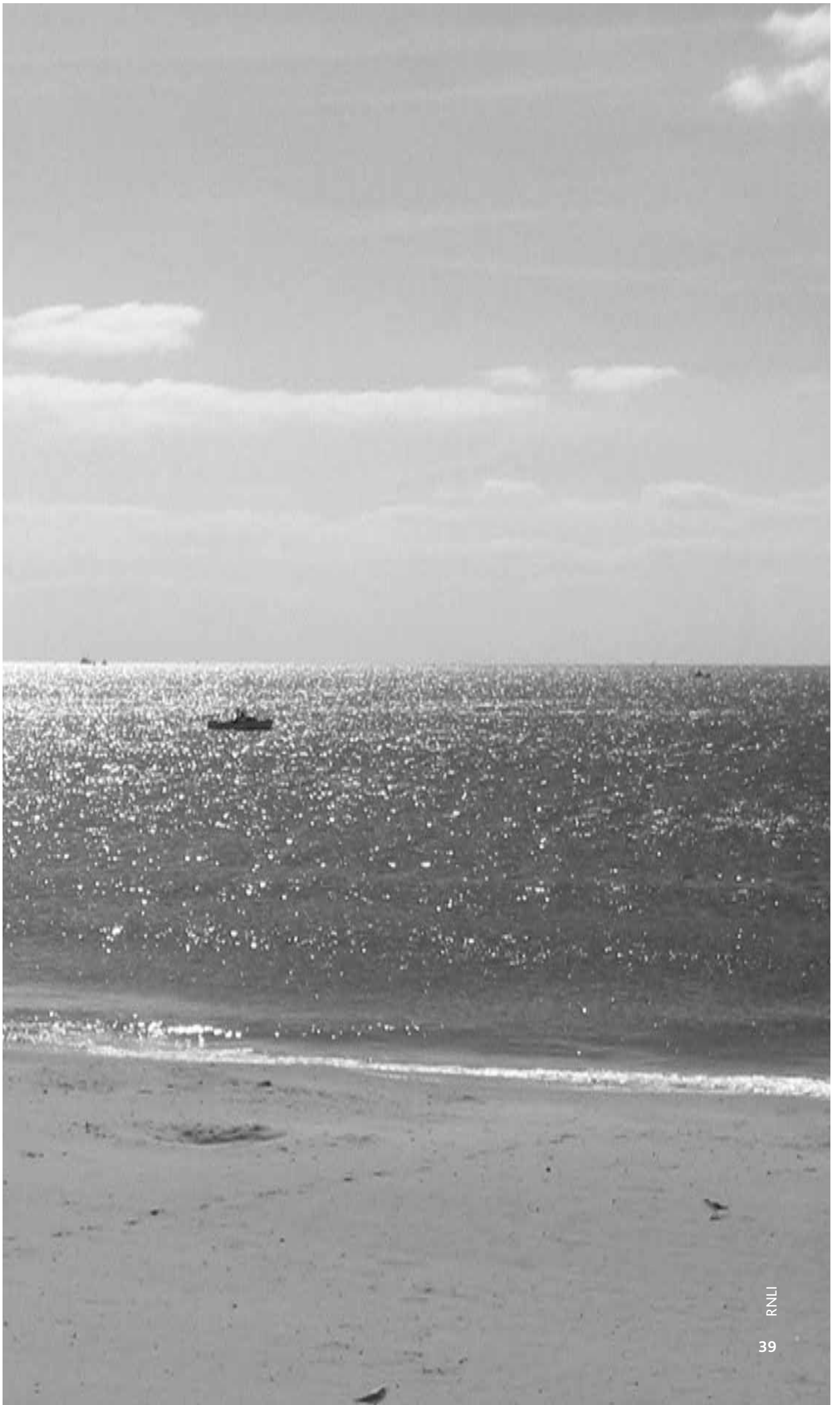
Suggested locations for **throw bags** at a tidal inlet or estuary



Suggested locations for **small to medium-sized and large-sized life rings** along a coast with man-made structures

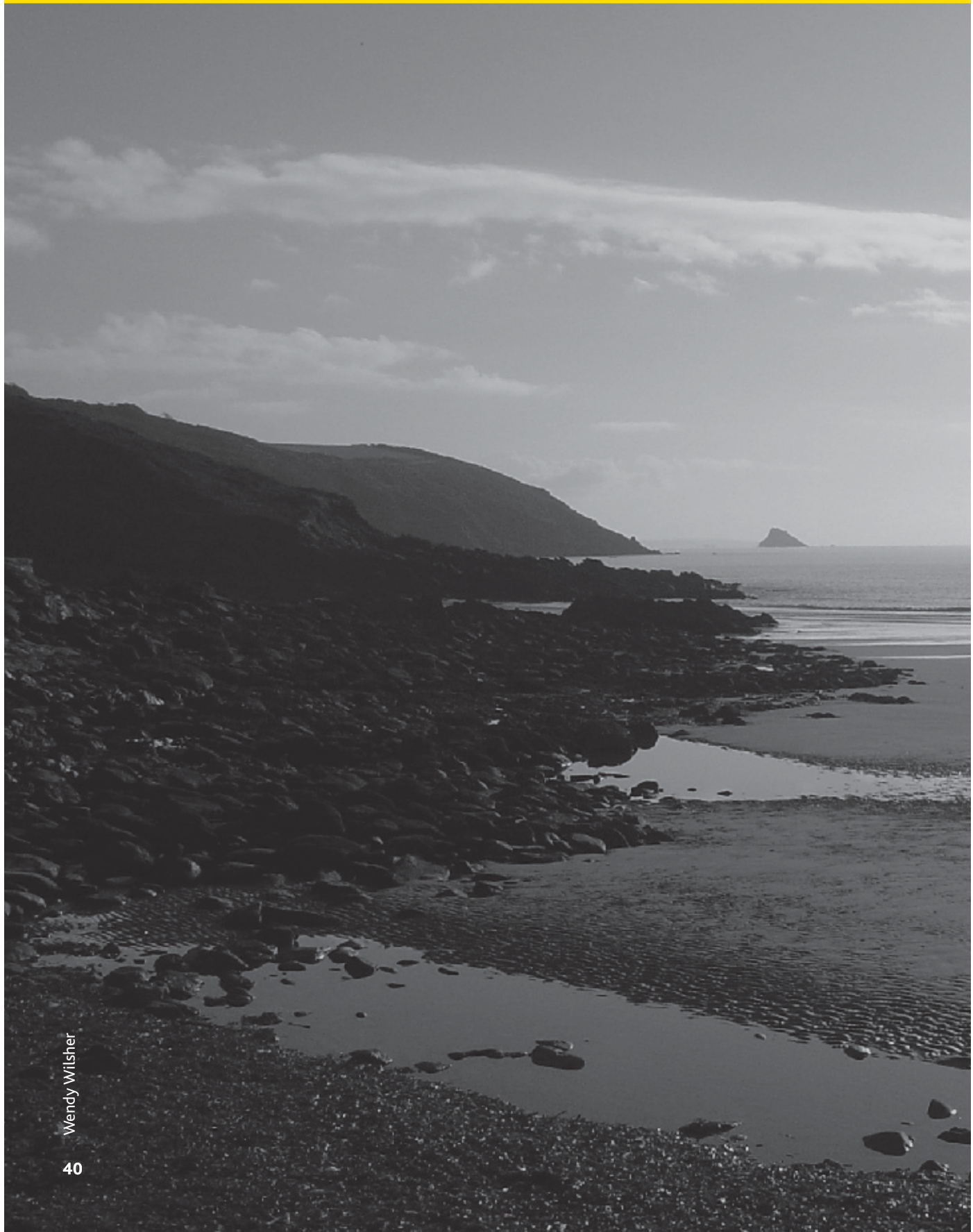
Key to location symbols

- smR
▾
Small to medium-sized life ring
- lgR
▾
Large-sized life ring
- TB
▾
Throw bag
- ☎
Emergency communications



Once you have selected and decided where to locate your PRE, other important considerations should be taken into account.

The following section includes useful information on PRE and emergency communication signs, user instructions for PRE, housing options available, ways to maintain and check PRE, suggested methods to reduce vandalism and theft and some useful further reading and contacts.



Additional information



Signs and user information

The use of signs and user information for PRE should be considered and specified. The following shows some examples of signs and user information that can be displayed to help people find and operate PRE and emergency communications.

About signs

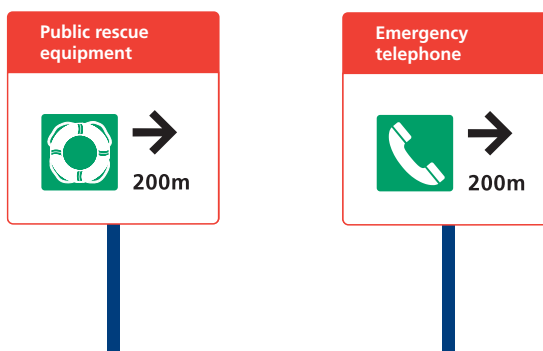
The RNLI has created a family of signs to direct to and identify PRE and emergency communications. This sign family is consistent in design with the beach safety signs the RNLI has also developed. Please refer to the RNLI's *A guide to beach safety signs, flags and symbols* for more information and specifications for these signs. Examples of the directional and identification signs for PRE and emergency communications are shown on this page.

Positioning signs

Directional signs should be positioned at regular intervals along the coastline when PRE or emergency communications are within 500m. Care should be taken to position signs at decision points in pathways, along pathways and access areas to inform the public of the distance to the next PRE facility. Directional signs should be fixed at a height of between 1.2m and 1.5m to the underside of the sign and, if possible, should have a tactile quality. The signs can be single or double sided to suit the environment.

Identification signs should be used to identify PRE and emergency communications. The signs should be fixed at two heights: at a high level between 2.5m and 3m to the underside to ensure distance viewing without visual obstructions, and at a lower level, usually on the PRE unit, at a fixing height of between 1.2m to 1.5m to the underside of the sign. Identification signs can be single, double or four sided to suit viewing angles.

Examples of directional signs



Examples of identification signs



About user information

PRE should display accurate minimum instructions, for example pictograms, with a maximum reading time of 10 seconds. Pictograms should be clear, simple and easy to read and interpret. Any accompanying text must be simple and concise. The following illustrations and text are examples of clear instructions on how to use PRE:

Life ring user instructions



Pick up life ring



Keep hold of end of line



Throw ring to casualty
Pull casualty to shore

Throw bag user instructions



Pick up throw bag



Keep hold of end of line



Throw bag to casualty
Pull casualty to shore

PRE housing

There are several options available when deciding which PRE housing best suits your needs; all options are suitable for both life rings and throw bags. The options outlined include the advantages and disadvantages of each type.

Housing options

- No housing (fixed to wall or post by hook/holder)
- Open housing
- Closed housing

Factors to consider

The following factors should be taken into consideration when determining which option is best for your coastal environment:

- susceptibility to vandalism/theft
- frequency of PRE maintenance checks
- UV and weathering
- housing should be brightly coloured to aid identification.

Never tie the end of a line to a fixed point: the end of the line must be free with no loops or attachments.

Safety advice and management information

It is advisable to incorporate safety advice and management information either on the PRE housing or within the signage. The advice and information should include the following:

- emergency assistance information, for example *Call 999/112 in an emergency and ask for Coastguard*
- anti theft/vandalism information, for example, display information about the Criminal Damage Act (see page 47)
- unique beach location codes to help manage and maintain the equipment: you can learn more about unique beach location codes in the RNLI's *A guide to beach safety signs, flags and symbols*
- details of the location to help the rescuer direct the emergency services to the area.



No housing

Advantages

- Easy to see if equipment is in place from a distance
- Easy to check for maintenance/vandalism/theft
- Reduced costs
- Easy to replace equipment once deployed

Disadvantages

- Prone to UV damage and weathering
- Could be prone to theft/vandalism
- Needs a separate sign to display instructions and information



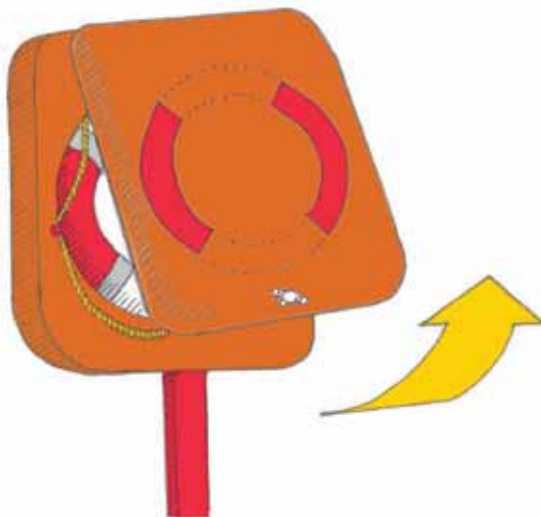
Open housing

Advantages

- Easy to see if equipment is in place from a distance
- Medium level of protection from UV damage and weathering
- Easy to check for maintenance/vandalism/theft
- Easy to replace equipment once deployed
- Easy to display instructions and information

Disadvantages

- Prone to some UV damage and weathering



Closed housing

Advantages

- Full protection from UV damage and weathering
- May reduce theft/damage
- Easy to display instructions and information

Disadvantages

- Increased costs
- Harder to check for theft/damage

Maintenance

Regular checks should be carried out on all PRE. These checks should be carried out in conjunction with a full beach risk assessment, with accurate results recorded. The frequency of checks can be monitored for a period of time to gauge how often the equipment is used, vandalised or removed.

As a guide, the following recommendations are based on best practice:

- equipment placed in lifeguarded locations should be checked daily during the lifeguarding season
- equipment based in a non-lifeguarded resort and/or popular location should be checked on a weekly basis
- equipment located in remote and/or out-of-season locations should be checked monthly

In addition, the rope on PRE should be checked for condition and breaking strain at least every year using a recognised outlet or as recommended by the manufacturer. It is also recommended that the line be replaced at least every 5 years or as recommended by the manufacturer.

A maintenance/audit survey form should be completed while conducting PRE maintenance checks; you should ensure the form covers the following points:

- date of inspection
- name of person conducting inspection
- PRE location
- inspection frequency
- type of PRE
- condition of PRE
- remedial action required
- further action required.

Electronic checking systems

As an alternative to manually recording the condition of PRE using the maintenance survey, there are also electronic systems available to help speed up and automatically record audit information, which can be downloaded to a spreadsheet when docked into a PC.

One such system that was trialled successfully by the RNLI is called SafetyTAG.

Description of SafetyTAG

SafetyTAG is an electronic auditing tool that is reliable and easy to use. It is small, light and durable so can be carried to sites for audit. The audit labels are made from a durable laminated polyester and can be applied externally to the plastic and metal of PRE and PRE housing. A variety of reports can be created from the audit results using SafetyTAG software with your PC.

For more information on this product, please see safetynetplus.co.uk.

Reducing vandalism

Vandalism and theft of public rescue equipment is a very real problem experienced at many coastal locations. Therefore, budgetary allowance should be made for its checking, maintenance and replacement.

There are several methods that can help reduce vandalism of PRE. These include the following:

- displaying and enforcing byelaws
- electronic warning systems
- awareness and education
- repositioning/removal of PRE.

The control methods detailed here aim to reduce vandalism or theft and can be used independently or combined. It is recommended if there is a problem with either damage or stolen equipment that your local community neighbourhood police team be contacted for further advice and best practice guidance.

Displaying and enforcing byelaws

New legislation allows local authorities to impose fixed-penalty fines of up to £100 and set local laws without seeking the approval of central government. These can relate to interfering with lifesaving equipment such as PRE. Clearly displayed information referring to the byelaws and fines should help to minimise vandalism. For further information please contact your local authority enforcement team.

Any damage to, or destruction of, property by vandalism, graffiti or arson is likely to be a criminal offence under the Criminal Damage Act. The damage does not have to be permanent, for example, it can be caused by graffiti with a washable paint. Some authorities, including the British Transport Police, have found anti-social behaviour orders useful to address those who repeatedly cause criminal damage. You may consider displaying this Act as a deterrent and to inform the public that you will prosecute anyone tampering with or stealing PRE.

Electronic warning systems

There are electronic warning systems available to help reduce vandalism and they enable remote monitoring of PRE. Such devices are easily installed on existing posts; rail and wall kits are also available. Alerts are then sent via email and SMS text message for easy management once the item is deployed and being vandalised.

Features of these systems include:

- steel housing, vandal-proof module
- no civil works required
- alerts sent upon opening of housing, high rate of temperature rise and activation of tilt sensor
- daily integrity test calls ensure system is operating correctly
- intelligent battery level monitoring
- compatible with all closed housing.

Awareness and education

One of the most effective ways to reduce vandalism and theft is to target and educate those responsible. In some locations that are prone to theft, police officers or lifeguards have gone into local schools/youth groups to raise awareness of why PRE is installed and that its purpose is to save lives.

Repositioning/removal of PRE

Where PRE is regularly vandalised or stolen from a location, equipment removal may be the most appropriate option as a last resort after consultation with the local community and police team. This is especially relevant where an item of PRE is missing more than it is present.

Prior to removal, a sign or poster should clearly tell the public that an item of PRE is potentially going to be removed due to regular theft or vandalism and cannot be reinstalled until the problem is rectified. You should consider contacting your local police team to discuss what opportunities are available at local schools and youth groups to educate/warn those that may be responsible for the PRE damage or theft.

In the future, the RNLI is planning to launch an educational resource for all schools in the UK to help teachers educate children about the importance of PRE and explain how PRE is operated.

Useful reading

Current standards and guidelines

There are several national, European and international standards and guidelines that relate to lifesaving appliances. Although the majority of these standards are aimed at the shipping industry, appropriate elements have been consulted and incorporated into this guide. Please ensure that PRE is fit for purpose and manufactured in line with the current standards. The following is a list of identified standards and guidelines:

International Convention for the Safety of Life at Sea (SOLAS), Chapter III 'Lifesaving appliances and arrangements'

SI 1999 No 1957, *The Merchant Shipping (Marine Equipment) Regulations, 1999*

European Union Marine Equipment Directive

European Standard EN 14144:2003, *Lifebuys – requirements and tests*

International Maritime Organization, *Testing and evaluation of life-saving appliances, 2003*

Books

RNLI, *A guide to beach safety signs, flags and symbols, 2005*

RoSPA, *Safety on Beaches Operational Guidelines, 2004*

Websites

RNLI

www.rnli.org.uk

RNLI extranet site for coastal managers

www.rnli-extranet.org.uk/lifeguards

MCA

www.mcga.gov.uk

Health and Safety Executive, Risk Management

www.hse.gov.uk/risk

British Standards

www.bsi-global.com

RoSPA

www.rospace.com

National Water Safety Forum

www.nationalwatersafety.org.uk

National Beach Safety Council

www.nationalbeachsafety.org.uk

ENCAMS

www.encams.org

RLSS UK

www.lifesavers.org.uk

SLSA GB

www.surflifesaving.org.uk

International Life Saving Federation

www.ilsf.org

Irish Water Safety

www.iws.ie

Useful contacts

- RNLI Lifeguards
RNLI
West Quay Road
Poole, Dorset
BH15 1HZ
t 0845 122 6999
e beachsafety@rnli.org.uk
w www.rnli.org.uk/lifeguards
- BSI - British Standards
t 020 8996 9000
w www.bsi-global.com
- Maritime and Coastguard
Agency
t 023 8032 9100
e micmca@mcga.gov.uk
w www.mcga.gov.uk
- National Beach Safety Council
w www.nationalbeachsafety.org.uk
- Royal Life Saving Society UK
t 01789 773994
w www.lifesavers.org.uk
- The Royal Society for the
Prevention of Accidents
t 0121 248 2000
e help@rospa.com
w www.rospa.com
- Surf Life Saving Association
of Great Britain
t 01392 218007
w www.surflifesavers.org.uk

National beach award operators

- ENCAMS
(England)
t 01942 612621
w www.encams.org
- Keep Scotland Beautiful
t 01786 471333
w www.cleancoastscotland.org.uk
- Keep Wales Tidy
t 029 2025 6767
w www.keepwalestidy.org

PRE manufacturers and suppliers

- Amberol
w www.amberol.co.uk
- Aspli
w www.aspli.com
- Cosalt
w www.cosalt.co.uk
- Glasdon UK Ltd
w www.glasdon.com
- I. C. Brindle & Co
w www.brindle.uk.com
- Jo Bird
w www.jobird.co.uk
- Movevirgo
w www.swellsurfproducts.co.uk
- Ocean Safety
w www.oceansafety.com
- SafetyNET services
w www.safetynetplus.co.uk

The manufacturers and suppliers listed do not form a definitive list and they are not endorsed by the RNLI in any way.

As a charity, the RNLI continues to rely on
voluntary contributions and legacies for its income.
A charity registered in England, Scotland and the Republic of Ireland.