INTERNATIONAL STANDARD

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Second edition
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Water safety signs and beach safety flags —

Part 3: Guidance for use

Signaux de sécurité relatifs à l'eau et drapeaux de sécurité pour les plages —

Partie 3: Lignes directrices pour l'utilisation

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 145, *Graphical symbols*, Subcommittee SC 2, *Safety identification, signs, shapes, symbols and colours*.

This second edition cancels and replaces the first edition (ISO 20712-3:2008), which has been technically revised.

ISO 20712 consists of the following parts, under the general title *Water safety signs and beach safety flags*:

— *Part 1: Specifications for water safety signs used in workplaces and public areas*

— *Part 2: Specifications for beach safety flags — Colour, shape, meaning and performance*

— *Part 3: Guidance for use*

Introduction

This part of ISO 20712 reflects good practice in the use of water safety signs and beach safety flags. The illustrations show examples of the selection and location of water safety signs and beach safety flags designed to provide information about aquatic hazards and the action necessary to avoid those hazards.

A standardized method of signing with the use of appropriate supplementary text throughout the working and public environment assists the process of education and instruction on the meaning of water safety signs and beach safety flags, and the appropriate actions to take. The intention of this part of ISO 20712 is to ensure a uniformity of application of water safety signs and beach safety flags which leads to increased familiarity, and therefore improved safety, for the users including visitors and for the general public.

The illustrations within this part of ISO 20712 are based on assumptions that some of the people may be unfamiliar with the features of the indoor or outdoor swimming pools or of the beach. The illustrations are not intended to cover every potentially hazardous situation and they should be interpreted as recommendations and not as minimum requirements.

The use of water safety signs and beach safety flags does not replace the need for proper working methods and safety instruction or for training in accident prevention and the actions to be taken in the event of an emergency, or for the provision of lifeguards.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

NOTE 1 Some countries' statutory regulations may differ in some respect from those given in this part of ISO 20712.

NOTE 2 Some countries may differ in some respect from the requirements given in this part of ISO 20712 where they use the diamond geometric shape for warning signs.

Water safety signs and beach safety flags —

Part 3:
Guidance for use

IMPORTANT — The colours represented in the electronic file of this part of ISO 20712 can be neither viewed on screen nor printed as true representations. Although the copies of this part of ISO 20712 printed by ISO have been produced to correspond (with an acceptable tolerance as judged by the naked eye) to the requirements of ISO 3864-4, it is not intended that these printed copies be used for colour matching. Instead, consult ISO 3864-4, which provides colorimetric and photometric properties, together with, as a guideline, references from colour order systems.

1 Scope

This part of ISO 20712 gives guidance for the selection and use of water safety signs as specified in ISO 20712-1 and beach safety flags as specified in ISO 20712-2, in aquatic environments. It provides guidance on their location, mounting positions, lighting and maintenance. It also provides guidance on the design and location of multiple signs.

This part of ISO 20712 does not apply to traffic signs for use on the public highway or maritime signalling. It is not applicable to flags for use on firing ranges or to flags used to indicate water quality. It does not cover means of escape signs and their illumination which may be present.

NOTE The illustrations in this part of ISO 20712 are as accurate as possible within the limitations of the printing process.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3864-4, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

ISO 7001, *Graphical symbols — Public information symbols*

ISO 7010, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 17724, *Graphical symbols — Vocabulary*

ISO 20712-1, *Water safety signs and beach safety flags — Part 1: Specifications for water safety signs used in workplaces and public areas*

ISO 20712-2, *Water safety signs and beach safety flags — Part 2: Specifications for beach safety flags — Colour, shape, meaning and performance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17724 and the following apply.

3.1
beach
area forming a shoreline or sloping bank at the edge of the sea or a river estuary or lake

[SOURCE: ISO 20712-2:2007, definition 3.1]

3.2
beach safety flag
material that gives a particular safety message by means of a combination of one or more colours and a geometric shape, and is attached by one end to a pole or rope

Note 1 to entry: A flag can also have additional support, e.g. a horizontal support.

[SOURCE: ISO 20712-2:2007, definition 3.2]

3.3
factor of distance
z
relationship between the height (*h*) of a sign and the observation distance (*l*), used to determine observation distances of signs

$$z = l/h$$

[SOURCE: ISO 17724:2003, definition 28]

3.4
multiple sign
two or more safety signs and/or associated supplementary information on the same carrier

3.5
pool basin
water tank where water related activities can take place

3.6
pool surround
area around a pool basin for entry and exit to the pool basin and general circulation space

3.7
safety sign
sign which gives a general safety message, obtained by a combination of a colour and geometric shape and which, by the addition of a graphical symbol, gives a particular safety message

[SOURCE: ISO 17724:2003, definition 68]

3.8
sign height
diameter of a circular geometric shape or height of a rectangular or triangular geometric shape of the type of safety sign

Note 1 to entry: Any outer border to the safety sign is excluded. See ISO 3864-1.

4 Guidance for selection and siting of signs and flags

4.1 Guidance for risk assessment

Selection and use shall be determined following the results of a risk assessment. The risk assessment should take into account the following specific issues:

a) hazards and associated risks of the aquatic environment;

b) regulations or legislation;

c) operation and management of the aquatic environment;

d) users and their foreseeable behaviour.

In specific situations, other issues may have to be considered in a risk assessment.

NOTE The users can be in unfamiliar environments, not wearing their normal sight correction lenses, or in bare feet.

As the result of the risk assessment, a comprehensive statement of requirements should be prepared and used as the basis for the detailed design and specification for the selection and use of signs and flags.

4.2 Siting

4.2.1 Water safety signs and multiple signs

The siting of water safety signs and multiple signs should allow hazards to be recognized and appropriate avoiding action to be taken by users.

The following matters (issues, factors) should be considered:

a) location of hazards and their signage;

b) location of entrances/access to facilities;

c) location of any other signs;

d) location of architectural features, décor, structures, vegetation or people that could conceal or divert attention from signs;

e) lighting level and characteristics under both normal and mains-failure conditions;

f) appropriate supplementary text to water safety signs;

g) appropriate information on multiple signs.

4.2.2 Beach safety flags

The siting of beach safety flags should allow hazards to be recognized and appropriate avoiding action to be taken by users.

The following matters (issues, factors) should be considered:

a) nature and location of hazards and their relevant signage;

b) zoning or boundaries of aquatic activities;

c) location of structures, beach furniture or vegetation that could conceal or divert attention from flags;

d) location of flag-poles;

e) appropriate information on multiple signs, such as an explanation of meaning of flags and the presence or otherwise of a lifeguard service.

5 Water safety signs

5.1 General requirements for aquatic environments

5.1.1 General

The system designer should identify the locations of the hazards.

Water safety signs should conform to ISO 20712-1. Where other safety sign meanings are required, these safety signs should conform to ISO 7010. Safety signs should comply with the colorimetric and photometric requirements given in ISO 3864-4.

The required sign height of the safety sign should be determined from the maximum viewing distance under different external illumination conditions and the relevant distance factor *z* according to Table A.1.

The following principles should be taken into account when planning water safety signage; signs should:

a) be sited conspicuously within the normal field of vision;

b) contrast to their surroundings;

NOTE The contrast and conspicuity may be increased by the provision of an outer border or by mounting on a sign board with a colour contrasting to the surroundings.

c) be visible from any place within the vicinity of the hazard;

d) be sited at the same height throughout the aquatic facility, as far as is reasonable;

e) take precedence over all other signs with the exception of escape route signing, if applicable;

f) be placed so that they are not a hazard;

g) be placed at sharp changes in depth, if applicable;

h) be illuminated, if applicable, to ensure that they are visible and legible.

Care should be taken to avoid over-provision of safety signs at one location as this can confuse viewers and result in individual safety messages not being noticed and understood.

5.1.2 Mounting height

The following principles should be applied to assist users of the facilities to predict the location of successive signs, whether they are mounted on walls, posts or overhead.

a) Signs should be mounted as close as practicable to the observer's line of sight in the vertical plane. For a standing adult, this will be approximately 5° up or down from a point 1 500 mm above ground level in front of the observer.

b) Signs that are freestanding or mounted overhead should be placed so that they are not a hazard.

c) Where practical, the space in front of the sign should be clear so that people without correction lenses or with visual impairments are able to approach the sign to reduce their viewing distance.

5.1.3 Lighting

If artificial lighting is provided, effective illumination is required both in normal and in mains-failure conditions, if applicable.

There are various ways of ensuring the satisfactory illumination of signs.

Some types of lighting, e.g. low pressure sodium, do not enable effective colour recognition and are therefore unlikely to be suitable for the illumination of water safety signs.

Where a sign is illuminated by an external artificial light source, the vertical illumination should be a minimum of 100 lx under normal lighting conditions.

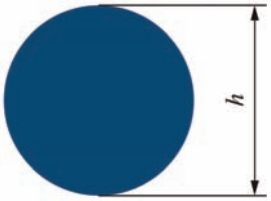
5.1.4 Sign height and maximum viewing distance

A sign should be both visible and legible at the maximum viewing distance.

NOTE 1 The sign height necessary to achieve these criteria will depend upon the viewing distance and the illumination of the sign. Measurement of sign height is given in Table 1.

NOTE 2 In external environments, a sign may be made more visible by provision of a larger colour contrasting border or background.

Table 1 — Measurement of sign height

Sign height h	Type of sign			
	Safe condition	Mandatory action	Prohibition	Warning
				

The required maximum viewing distance of a sign should be determined by its position within the area and take into account the needs of people with normal sight and people with visual impairments. Distance factors z for different illumination conditions and visual acuity are given in Table A.1.

The recommended maximum viewing distance for a particular sign height h, in millimetres (mm), can be calculated from the following equation:

$$l = zh$$

where

l is the required viewing distance, in millimetres (mm);

z is the relevant distance factor from Table A.1.

Recommended maximum viewing distances for different minimum sign heights under normal/natural illumination are given in Table 2.

Table 2 — Recommended maximum viewing distance for different minimum sign heights under normal/natural illumination

Minimum sign height mm	Maximum viewing distance m	
	Normal visual acuity	Visual acuity 6/60
60	3,6	0,36
80	4,8	0,48
120	7,2	0,72
180	10,8	1,08
240	14,4	1,44

For intermediate viewing distances, the next largest available sign height should be used.

The maximum viewing distances in Table 2 relate to viewing normal to the sign. When a sign viewed at an angle of α to the normal, the maximum viewing distances are reduced by the multiplying factor cos α.

The relevant viewing distance should be such that the observer is informed of potential hazards and of the safety precautions and/or actions required to avoid the hazard(s) before the observer makes any contact with the hazard(s).

Any variation of the sizes of signs within a facility should be kept to a minimum.

5.1.5 Use of supplementary text

A supplementary text sign will help to ensure that the meaning of the water safety sign is fully understood and may convey additional information. For guidance on supplementary text, see Annex D.

5.1.6 Construction: durability and suitability

Signs should be selected to be suitable for their operating environment.

NOTE ISO 17398 covers aspects of performance and durability of safety signs.

Factors that should be considered include:

a) durability of base material;

b) durability of graphical content;

c) colour/light fastness;

d) resistance to damage from bather traffic or from cleaning;

e) resistance to exposure to water;

f) resistance to corrosion, such as by sea spray;

g) resistance to graffiti;

h) flame resistance;

i) type and suitability of fixings;

j) resistance to wind loads.

Installed signs should be suitable for the expected environmental conditions.

Installers and designers should seek adequate assurance from suppliers in these aspects.

5.1.7 Servicing and maintenance

Signs should be cleaned and visually inspected at regular intervals, and action should be taken to remedy any defects. A sign which has been damaged or faded should be replaced.

A sign shall be removed when its function is no longer needed.

5.2 Specific requirements for the swimming pool environment

The system designer should identify the locations of the hazards associated with the swimming pool and equipment.

The following principles should be taken into account.

— Signs should be placed in a position where they can both be seen by users before entering the water on the pool surround and also once in the water in the pool basin.

— The number and location of depth markings should vary dependent upon the size and configuration of the swimming pool. Depth marking should always be provided at the shallow and deep end, and additional marking along the length of the swimming pool.

— Signs may be floor mounted and their orientation should be for a person at the swimming pool surround looking towards the water and should be within 0,5 m from the edge of the pool basin.

— All signs used at floor level and on the sides of the pool basin should not cause an abrasive hazard or obstruction to users.

— Signs may be mounted on the wall between the surface of the water and the edge of the pool basin, and should be aligned with any floor mounted safety signs on the swimming pool surround.

NOTE For example, the following signs may be used:

— "No running" (ISO 20712–1-WSP001) at the pool surround, including other wet floor areas;

— "No diving" (ISO 20712–1-WSP005) at appropriate locations alongside the swimming pool;

— Water depth: "Warning; Deep water" (ISO 20712–1-WSW005); "Warning; Shallow water (diving)" (ISO 20712–1-WSW006); "Warning; Sudden drop in swimming or leisure pools" (ISO 20712–1-WSW008).

Examples of signing swimming pools are given in Annex B.

6 Beach safety flags

6.1 General

Beach safety flags used should conform to ISO 20712-2.

Beach safety flags should be positioned so that all users can view them when they are displayed.

NOTE The distance can vary due to weather and light conditions and the locations of flags may need to be adjusted accordingly.

To ensure water users and members of the public are aware of the meaning of certain flags, it might be necessary to use text to explain the meaning. The text should either be fixed to the flag-pole, or given on multiple signs displayed along the beach and at beach entrances/access points.

Examples of positioning beach safety flags are given in Annex C.

Application and operation of beach safety flags should be carried out by an appropriately qualified person with knowledge of local conditions.

6.2 Application of specific beach safety flags

6.2.1 Red flag BF.01

Flag BF.01 should be used when there is danger of unsafe water conditions for swimming and other water activities. Examples of such conditions are rough conditions such as strong surf and/or currents are present. This flag should be used to designate the area along a beach where swimmers should not enter the water or conduct other water activities.

6.2.2 Yellow flag BF.02

Flag BF.02 should be used to designate a general warning. It is essential that a sign be placed in proximity to the flag to give additional information about the beach and swimming area and any specific updated information.

6.2.3 Red/yellow flag BF.03

Flag BF.03 should be used in pairs to designate each area along a beach which is most closely supervised or patrolled, and to which it is intended that swimming and body boarding is to be confined. The positions of red/yellow flags BF.03, indicating a lifeguard patrolled zone, should be designated by a qualified lifeguard. Where a lifeguard patrolled zone is not used, a single red/yellow flag BF.03 may be used to indicate that a lifeguard is on duty. This should only be displayed at the lifeguard station, hut or highchair etc.

6.2.4 Black/white flag BF.04

Flag BF.04 should be used to designate a zone or the boundary of the zone on a beach for use of surfboards and other water craft. These flags should be positioned outside of the area designated by the red/yellow flag BF.03 for swimming or body boarding.

6.2.5 Red/white flag BF.05

Flag BF.05 should be used to signify that people leave the water because of an emergency. Examples of emergencies include dangerous marine creatures, toxic spill causing water pollution and the discovery of an underwater hazard in the area.

6.2.6 Truncated orange cone

Windsock BF.06 should be used when there is danger of using inflatable leisure articles in windy or unsafe water conditions. This flag should be used to designate a beach where no such articles should be used on the water.

6.3 Materials for beach safety flags

Flags should be made of fabrics which meet the specifications of ISO 20712-2.

6.4 Operation of flags

6.4.1 Mounting position

The minimum height for a flag should be such as to help try and prevent damage to the flag by vandalism and to help prevent the flag flapping around people's heads and causing injury.

Each flag should be attached to a pole, and erected such that the lowest point of the flag, when it is at rest, is not less than 2,1 m above the immediate surrounding ground level. In the case of windsock BF.06, the lowest point of the flag, when it is at rest, should be not less than 2,3 m above the immediate surrounding ground level. Flags should be positioned so that they can be readily seen by persons on the beach and in the water. Flags should be mounted high enough to be seen above any obstructions.

Flags should be positioned so that they are visible without obstruction by other structures or by any flora and fauna that might be present.

The locations of flags should be carefully selected to ensure that the flags themselves, in particular the flag-poles, do not present a hazard.

6.4.2 Size of flag

The flag should not be smaller than the minimum size specified in ISO 20712-2. The flag size should be sufficient for the flag to fly in the wind conditions yet not cause a hazard.

6.4.3 Hoisting and taking down of flags

Hoisting and taking down of flags should be carried out by an appropriately qualified person with knowledge of local conditions.

As the environmental conditions alter from day to day, and in some cases during the course of a day, conditions should be monitored and flags hoisted or taken down accordingly. In the case of flags used to zone a section of beach or water activity, conditions should be monitored and these flags moved to suitable locations as any changes in conditions dictate.

Because of the need for someone to be present to monitor the conditions, and possibly to change flags, flags should only be operated during a prescribed and well publicized period each day. The presence of flags may also relate to seasonal activity.

6.5 Flag-pole

The flag-pole should be of appropriate material and be securely anchored so as to be stable under the prevailing weather conditions in the area and the conditions of the site.

NOTE 1 This may be done, for example, by means of a sand spike or by securing the flag-pole to a base.

NOTE 2 If the flag is secured to a base, this may also be used to display safety information.

6.6 Inspection and maintenance of flags and flag-poles

Inspection and maintenance of flags and flag-poles should be carried out on a regular basis. Flags can have a limited lifespan, particularly in adverse weather conditions. Any flag that has become torn or faded should be replaced.

6.7 Storage of flags

If flags are to be stored, for example at the end of the season, care should be taken to ensure that they are completely dry before they are put into storage. Flags should be stored in dry conditions away from sources of heat and chemicals. Flags that have been stored should be carefully inspected before they are put back into use.

7 Multiple signs

7.1 General requirements

The scheme designer should identify the types of multiple signs which are required and their siting.

The guidance and principles given in 7.2.1 to 7.2.6 should be considered when compiling and designing a signing scheme. Multiple signs should conform to the basic design templates given in 7.3.1 to 7.3.4 which can be stylised to suit the needs for national consistency.

7.2 Presentation of information

7.2.1 General

The presentation of information is very important to how people understand and react to a multiple sign. The layout and presentation of information should be consistent across the family of multiple signs; this will help people to read a sign and make their decision efficiently. Grouping information into categories

makes the information easier to understand. The scheme designer should apply a grid structure to the information content within the signs.

Multiple signs should be manufactured and fixed in the most appropriate manner to suit a particular aquatic environment. See 5.1.6 for consideration of factors relevant to the construction of a multiple sign.

7.2.2 Typeface

Recommendations on typefaces and use of upper and lower case letters, where appropriate to the language, are given in Annex D.

7.2.3 Type size

There are several factors which determine the choice of type size on signs. Factors that should be considered include:

a) intended viewing distance;

b) speed at which the sign will be read;

c) sign position;

d) typeface chosen;

e) sign colours.

Different types of signs and sections within signs will have different viewing distances; therefore a selection of type sizes is necessary. The minimum height of letters should take into account the needs of people with normal sight and people with visual impairments. The minimum letter height should be determined by dividing the required maximum viewing distance by the relevant distance factor given in Table A.2.

The minimum text height of upper case letters should be 15 mm.

7.2.4 Colour

The use of colour in a signing scheme can establish a visual look for the scheme. Colour selection is important as a multiple sign needs to be easy to find in the aquatic environment. It is essential that the colour contrast between the colour of the text and the colour of the sign background should be carefully considered to ensure legibility.

Safety signs, including warning, prohibition, mandatory action and safe condition, and their associated text, should be displayed on white section(s) of the multiple sign. The selected background colour for displaying other information, for example public information symbols, should ensure legibility of the symbols and text. Examples of multiple signs are shown in Figures 2 and 3.

7.2.5 Use of symbols

Water safety signs should conform to ISO 20712-1. Where other safety sign meanings are required, these safety signs should conform to ISO 7010. Beach safety flags should conform to ISO 20712-2. Public information symbols should conform to ISO 7001.

The positioning of symbols on a multiple sign should be given careful consideration; their positioning will effect how successfully the sign is read and understood. It is advisable to use supplementary text alongside symbols to explain their meaning and this text should clearly relate to the safety sign or beach safety flag symbol which it accompanies.

The minimum height of symbols should take into account the needs of people with normal sight and people with visual impairments. Relevant values for distance factor *z* are given in Table A.1. A minimum height of symbols should be 65 mm.

7.2.6 Terminology and language

The scheme designer should consider any terminology issues and policies agreed for national beach signing. Terms used on multiple signs should be understandable to first time users through to frequent beach users. Consideration should also be given to whether more than one language needs to be displayed on multiple signs.

7.3 Types of multiple signs

7.3.1 Approach signs

Approach signs should, most commonly, be consistent with relevant traffic sign standards. Usually these traffic signs are directional but they can also be informative, warning of a hazard or regulation. An outline drawing is not given for this sign type as its design and style will vary between countries and the design should adhere to road regulations.

Figure 1 gives examples of approach signs.

a) **b)**

Figure 1 — Approach sign design examples from Australia — National Aquatic and Recreational Signage Style Manual

7.3.2 Primary access signs

Primary access signs should be placed at each main entrance to an aquatic environment and should be used at pedestrian entrances; the exact position will depend upon the nature of the environment.

Figure 2 shows examples of primary access signs. The dimensions and proportions are not fixed nor is the exact shape.

Panels can be single or double and information can be displayed on both sides if appropriate. A hierarchical structure should be created within the sign to group information. The recommended information content for primary access signs is

— location name,

— emergency contact information,

— safety signs (includes safety hazards and safety prohibitions, mandatory actions and safe condition), and

— lifeguard service information and/or additional information related to public safety.

Additional information content may include additional prohibitions, local area information and public facilities.

Red background

Location name and emergency information

White background

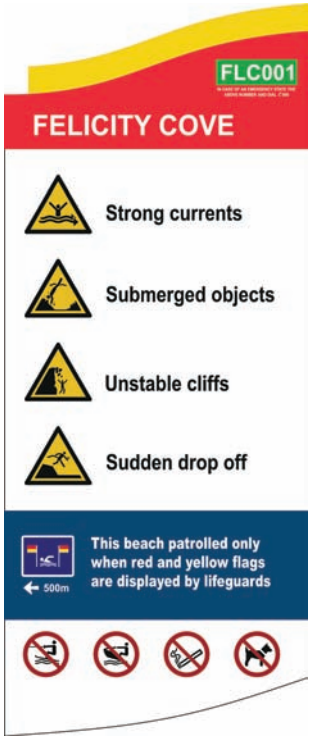
Safety signs

Yellow background

Lifeguard service information

Blue background

Local area information



Red background

Location name and emergency information

White background

Warning signs

Blue background

Lifeguard service information

(if an information symbol in this area uses blue then that symbol should have a prominent white outer border)

White background

Prohibition signs

a) **b)**

NOTE In example b), further white sections could be necessary for safe condition signs and mandatory action signs.

Figure 2 — Primary access sign design examples

7.3.3 Secondary access signs

Secondary access signs are commonly used at pedestrian entrances. These signs should be placed at each entrance that is not a main entrance, e.g. a small footway, dune access or coastal path access.

These signs can be used at main entrances if the location is small and rural. These signs can also be used to reinforce an entrance area such as a promenade and are fixed at regular intervals along an open promenaded beach.

Figure 3 shows examples of secondary access signs. The dimensions and proportions are not fixed nor is the exact sign shape; the signs can also be of horizontal format instead of vertical format as illustrated. A hierarchical structure should be created within the multiple sign to group information. The recommended information content for secondary access signs is

— location name,

— emergency contact information,

— safety signs (includes safety hazards and safety prohibitions, mandatory actions and safe condition), and

— lifeguard service information.

Red background

Location name

White background

Safety signs

Yellow background

Lifeguard service information

Red background

Emergency information

a)

Red background

Location name and emergency information

White background

Warning signs

Blue background

Lifeguard service information

(if an information symbol in this area uses blue then that symbol should have a prominent white outer border)

White background

Prohibition signs

b)

NOTE In example b), further white sections could be necessary for safe condition signs and mandatory action signs.

Figure 3 — Secondary access sign design examples

7.3.4 Directional signs

Directional signs display precise information and are small in size. These signs can be displayed temporarily depending upon conditions or local circumstances. Directional signs should commonly be used to direct users to the lifeguard service unit or public rescue equipment. These signs are commonly fixed at a low level, with a distance of around 1,5 m from the base of the sign to ground level. These signs should be fixed at regular intervals to provide a sequence of signs for people to follow. It is advisable to display the appropriate symbol, text and distance, in metres, to the facility.

Figure 4 is an example of a directional sign. The dimensions and proportions are not fixed nor is the exact sign shape; the signs can also be of horizontal format instead of vertical format as illustrated.

A hierarchical structure should be created within the multiple sign to group information.

The recommended information content for directional signs is

— symbol,

— supplementary text, and

— directional arrow.

Red background

Sign content title descriptor

Yellow background

Direction and distance to lifeguard patrolled area

Figure 4 — Directional sign design example

8 Tsunami signing system

8.1 Planning

Where tsunami mitigation plans have been prepared and are available to civil protection agencies, a tsunami signing system is required to warn the population in zones that will be specifically affected in the case of a tsunami event (inundation areas).

The system designer should identify the following as a consequence of the mitigation plans:

a) locations of tsunami hazard zones;

b) locations of tsunami evacuation areas and their names;

c) locations of tsunami evacuation buildings and their names;

d) locations of tsunami evacuation routes to tsunami evacuation areas;

e) locations of tsunami evacuation routes to tsunami evacuation buildings;

f) locations of rescue facilities (medical/fire fighting etc);

g) locations of facilities for enabling emergency evacuation (helicopter, lifeboats etc);

h) locations of emergency communications facilities/media;

i) locations of services such as water and energy supply;

j) information on recorded heights above sea level at locations within the inundation areas and height or depth of tsunami floods (inundations);

k) information on recorded maximum heights of tsunami attacks to used as information on access signs to the hazard zone/inundation areas;

l) other sources of warning information, such as national and local media, installations of flags and sound alarms.

8.2 Tsunami safety signs and associated safety information signs

A tsunami signing system comprises tsunami safety signs, safety instruction signs and hazard/evacuation maps.

The tsunami safety signs should be seamlessly provided including information systems from the beach to the evacuation areas, the evacuation buildings, and the targeted facilities and services within the inundation area. Figure 5 presents an overview of a seamless signing system.

Signs and graphical symbols should conform to ISO 20712-1 and ISO 7001. Supplementary text should be provided to convey the safety message.

The following principles should be taken into account:

a) warning signs should include information on the height above sea level;

b) safety instruction signs should provide relevant information on tsunami risk;

c) signs with directional arrows should be seamlessly provided until the targeted places to avoid missing the right way;

d) hazard maps should clearly visualize the location and numbers of evacuation areas and evacuation buildings;

e) hazard prediction maps may need to be renewed following changes of tsunami information/predictions, locations of targeted places and/or local management;

f) sizing of safety signs and text should be in accordance with this standard;

g) sign materials and durability should be in accordance with this standard.

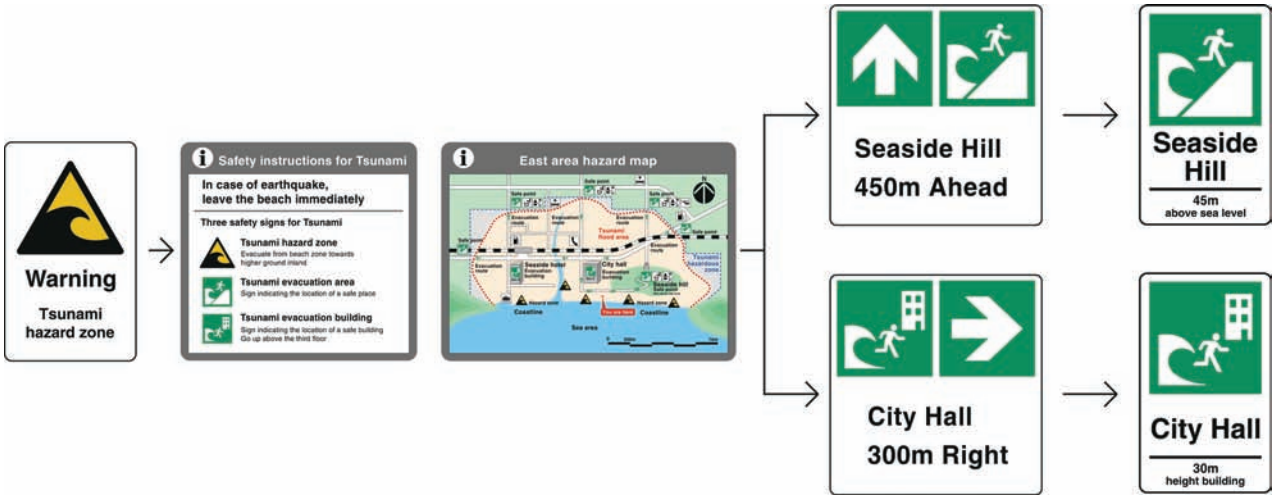


Figure 5 — An example of a seamless signing system for tsunami evacuation

More detailed examples of the sign components of the tsunami signing systems are given in Annex E.

Annex A
(informative)

Distance factor *z*

The *z* factors in Table A.1 relate to viewing normal to the sign. *z* factors depend upon angle of viewing such that at an angle of α to the normal, the *z* factors in Table A.1 should be multiplied by cos α. For example, when viewing a sign at 30°, 45° or 60° to the normal, the *z* factors in Table A.1 should be multiplied by 0,87, 0,71 or 0,5 respectively.

Table A.1 — Distance factor *z* for externally illuminated safety signs based on ordinary materials

Illumination condition	Distance factor *z*	
	Normal visual acuity	Visual acuity 6/60
Normal/natural illumination	60	6
Emergency lighting in buildings/low illumination	30	3

NOTE 1 Table A.1 does not apply to signs which are displayed under water where the effects of refraction and water conditions need to be taken into account.

The *z* factors in Table A.2 relate to viewing normal to the letters. *z* factors depend upon angle of viewing such that at an angle of α to the normal, the *z* factors in Table A.2 should be multiplied by cos α. For example, when viewing a sign at 30°, 45° or 60° to the normal, the *z* factors in Table A.2 should be multiplied by 0,87, 0,71 or 0,5 respectively.

Table A.2 — Distance factor *z* for externally illuminated letters

Illumination condition	Distance factor *z* for upper case letters		Distance factor *z* for lower case letters	
	Normal visual acuity	Visual acuity 6/60	Normal visual acuity	Visual acuity 6/60
Normal/natural illumination	250	25	350	35
Emergency lighting in buildings/low illumination	120	12	170	17

NOTE 2 Table A.2 does not apply to letters which are displayed under water where the effects of refraction and water conditions need to be taken into account.

Annex B
(informative)

Examples of signing swimming pools

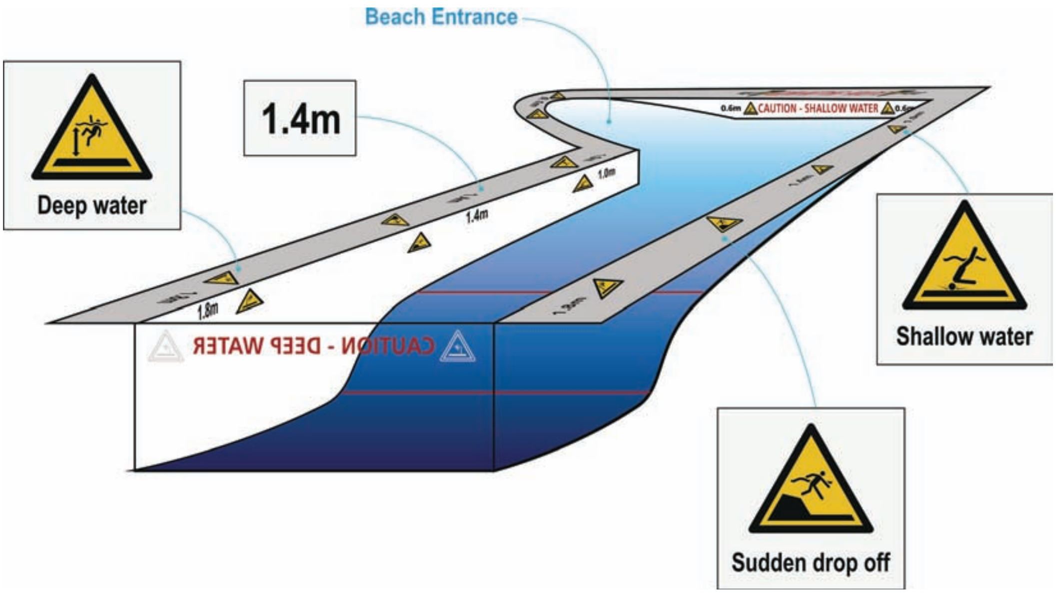


Figure B.1 — Example of positioning of signs (not to scale) on pool surround and pool basin with beach entrance

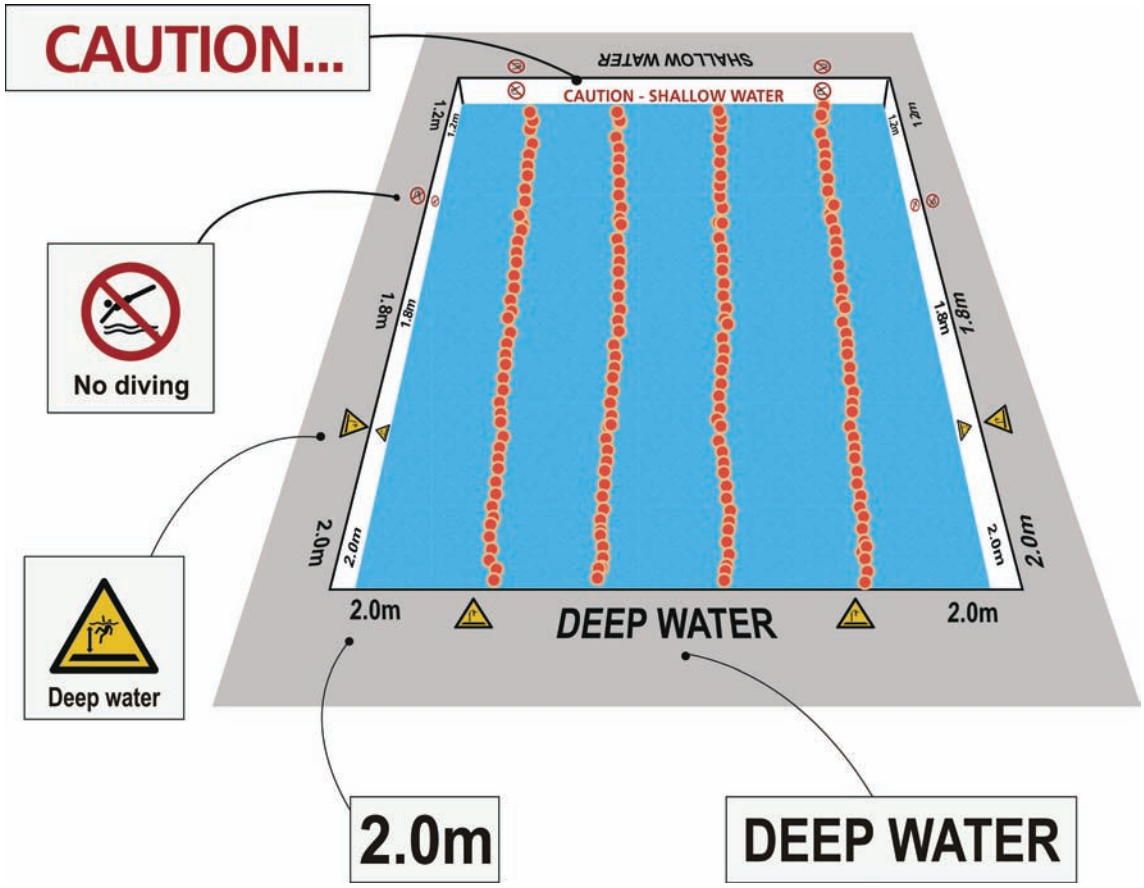


Figure B.2 — Example of positioning of signs (not to scale) on a pool surround and pool basin

Annex C
(informative)

Examples of positioning beach safety flags

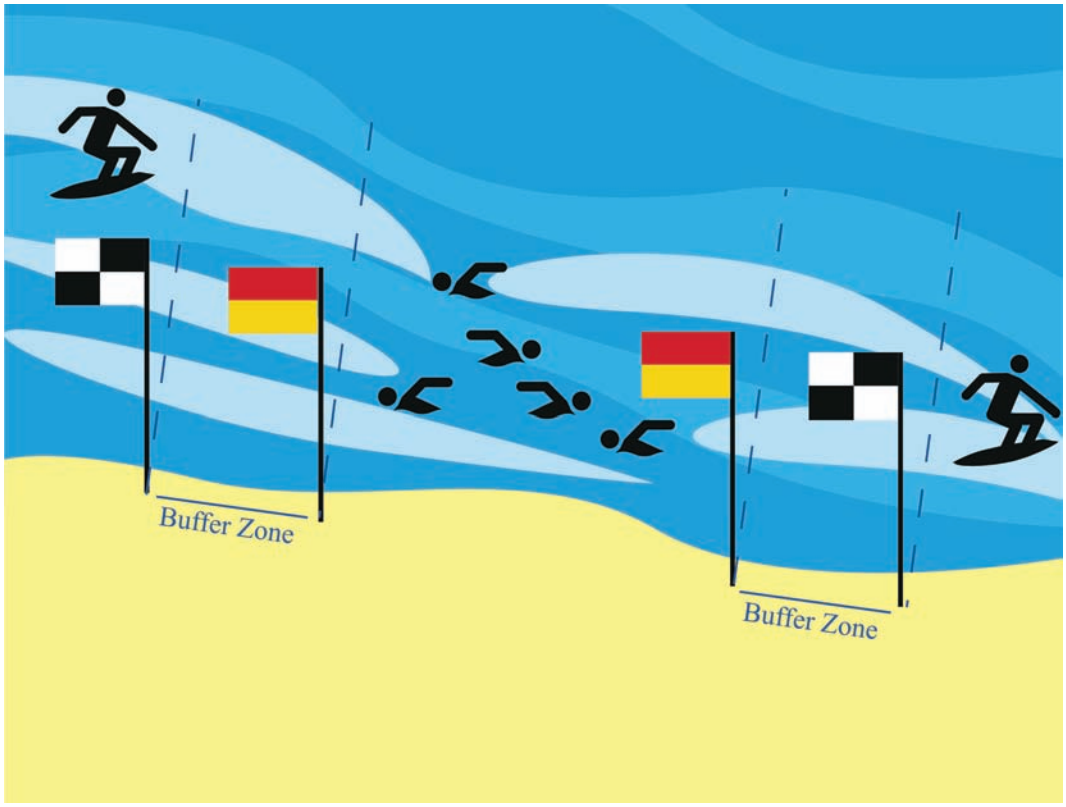


Figure C.1 — Example of positioning beach safety flags for swimming area between surfing areas with buffer zones

Figure C.2 — Example of positioning beach safety flags for swimming area alongside surfing area with buffer zone

Annex D
(informative)

Typeface for text

Care should be taken that the supplementary text to safety signs does not overpower the graphical symbol. The supplementary text height should not be used to determine the maximum viewing distance (see 5.1.4). The supplementary text should not be used on its own, and may need to be in more than one language.

The layout of supplementary text signs should be in accordance with ISO 3864-1. See Figure D.1 for an example of "No jumping into water".

The initial letter of the first word should be in upper case and the remainder of the wording should be lower case. Where a signal word is used on a supplementary text sign used with a warning sign, the text after the signal word should start on a new line; the initial letter of the first word should be upper case and the remainder of the wording should be lower case.

NOTE For short messages, all capitals may be used.

The font used should be either a sans serif typeface, or a typeface with very small serifs with the following characteristics:

— widths of strokes throughout the letters constant within 10 %;

— widths of strokes at least one sixth of the letter height;

— width of lower case letter "x" not less than 70 % of the letter height;

— not condensed, expanded, italic, script, outline or shaded;

— letters individually formed and not joined together.

Figure D.1 — Water safety sign (ISO 20712-1-WSP014) with supplementary text

A typeface for use on multiple signs should be carefully chosen based on the following guidelines:

— sans serif typeface or typeface with very small serifs;

— large x-height;

— consistent stem thickness;

— regular or semi-bold weight;

— open counters.

An example of a suitable typeface for use on beach signs is shown in Figure D.2.

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

Figure D.2 — Example typeface: Roman (1) and Bold (2)

Annex E
(informative)

Examples of tsunami signing system

The example layouts in this annex illustrate an assembly of safety sign components that constitute a tsunami signing system. The tsunami signing system should identify the following:

— tsunami hazard zone;

— tsunami evacuation route to a tsunami evacuation area;

— tsunami evacuation route to a tsunami evacuation building;

— tsunami evacuation area;

— tsunami evacuation building.

In tsunami hazard zones of the seashore, the tsunami warning sign ISO 20712-1-WSW014 should be used. The recommended supplementary text for signs positioned close to the seashore should be “Warning Tsunami hazard zone”, see example in Figure E.1. Additional signs can be positioned where the height of the ground is at least 2m above sea level for example. The recommended supplementary text on these signs should be “Ground height 2m above sea level”, see example in Figure E.1.

NOTE 1 Ground height of tsunami warning signs should be the height above sea level.

NOTE 2 In tsunami information signs and on hazard maps or in safety instructions at the seashore, also in the town guide, the height of historically analysed or the recorded height should be used.

Figure E.1 — Examples of signing in a tsunami hazard zone

Directional signs on evacuation routes to tsunami evacuation areas should use the sign ISO 20712-1-WSE002 together with the appropriate direction arrow, ISO 3864-3 arrow type D. The recommended

supplementary text for these signs should include the name of the tsunami evacuation area, distance in metres, and direction. Figure E.2a) shows an example of a direction sign on an evacuation route to a tsunami evacuation area.

Directional signs on evacuation routes to tsunami evacuation buildings should use the sign ISO 20712-1-WSE003 together with the appropriate direction arrow, ISO 3864-3 arrow type D. The recommended supplementary text for these signs should include the name of the tsunami evacuation building, distance in metres, and direction. Figure E.2b) shows an example of a direction sign on an evacuation route to a tsunami evacuation building.

a) Evacuation route to tsunami evacuation area

b) Evacuation route to tsunami evacuation building

Figure E.2 — Direction signing of tsunami evacuation routes examples

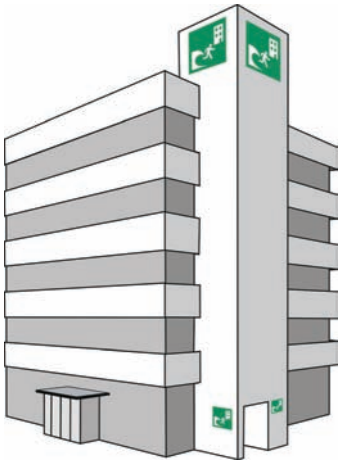
Signs ISO 20712-1-WSE002 and -WSE003 should be used to identify tsunami evacuation areas and tsunami evacuation buildings. The recommended supplementary text for these signs should include the

name of the tsunami evacuation areas and buildings, see the examples in Figure E.3 a), b), and c) and d) at higher places.

a) Tsunami evacuation area

b) Tsunami evacuation building

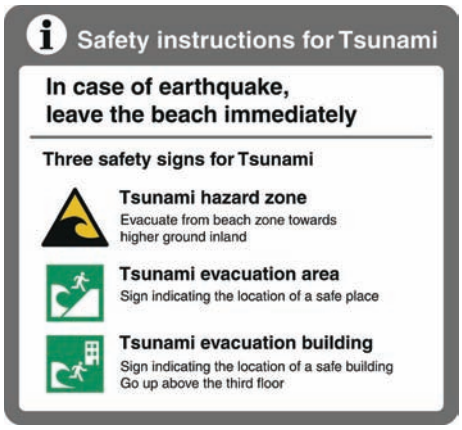
c) Example of signposting tsunami evacuation sign



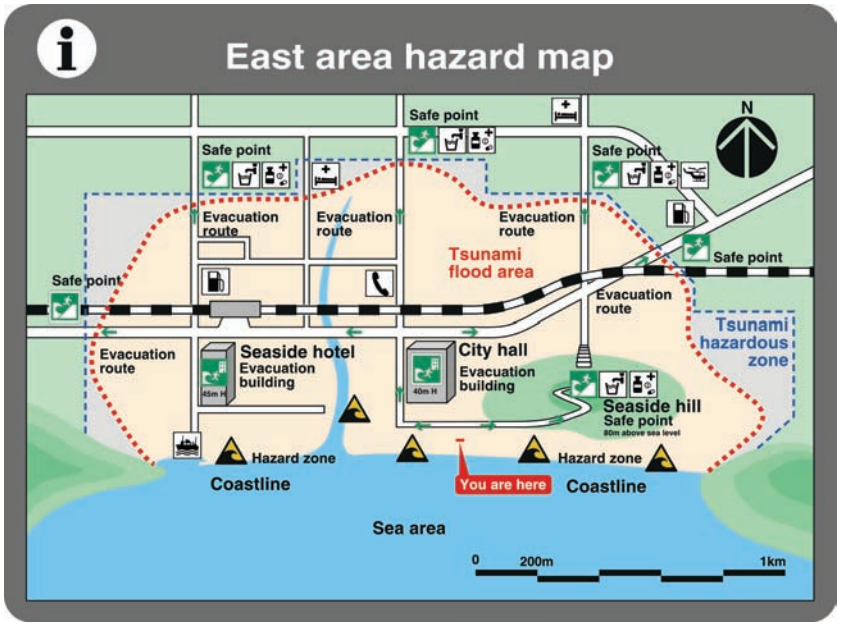
d) Example of signposting tsunami evacuation building

Figure E.3 — Signing of tsunami evacuation areas and evacuation buildings examples

Multiple signs and hazard maps should be used to provide tsunami safety instructions and identification of the hazard zone, evacuation routes and safe places. Figure E.4 shows examples of safety instructions and a hazard map.



a) Safety instructions



b) Hazard map

Figure E.4 — Multiple sign examples

Hazard maps for basic information should have the following contents with symbols and their names and the recommended route:

a) locations of tsunami warning signs;

b) locations of evacuation areas;

c) locations of evacuation buildings with names;

d) rescue facilities (medical/fire fighting etc.);

e) emergency evacuation means (helicopter, lifeboats etc.);

f) emergency communication media;

g) water supply and services;

h) energy sources and supply;

i) standing point for observers marked.

Figure E.5 is an example of positioning of the appropriate tsunami signs (supplementary text not shown) to lead people towards a safe area/evacuation area or tsunami evacuation buildings.

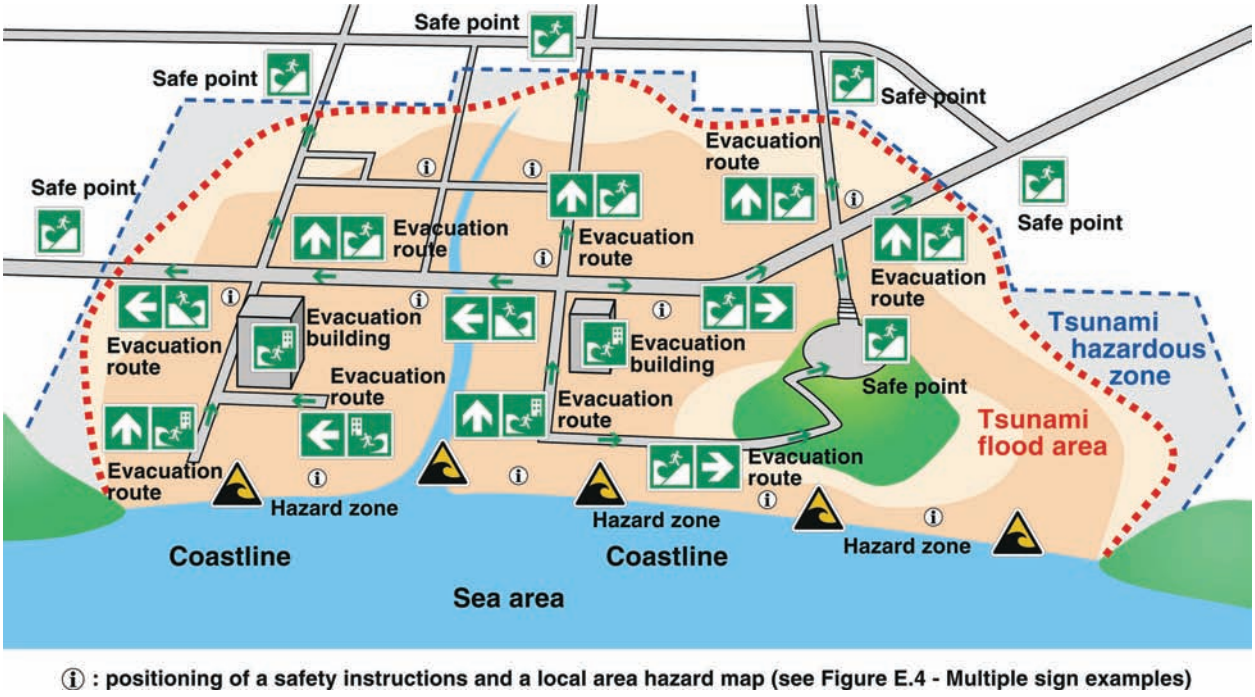


Figure E.5 — An example of positioning of tsunami signs

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2) Life Saving Victoria, 200 The Boulevard, Port Melbourne, Vic 3207, Australia.

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