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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 145, *Graphical symbols*, Subcommittee SC 2, *Safety identification, signs, shapes, symbols and colours*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

There is a need to standardize a system giving safety information related to evacuation to safety evacuation areas in the event of natural disasters that relies as little as possible on the use of words to achieve understanding.

It is extremely important for people who do not understand the local language to figure out the evacuation route instantly when they encounter a natural disaster in a foreign country.

This standard reflects best practice; the illustrations show installation practice designed to provide the optimum amount of information to clearly identify the hazards of different types of natural disaster in order to direct evacuation by appropriate location of evacuation route signs, evacuation plan signs and selection of place of refuge.

International travel increases the need for standardized methods of safety communication. A standardized method of signing with the use of appropriate supplementary signs and text throughout the public environment assists the process of education and instruction on the meaning of the evacuation route signs and places of refuge signs, and the appropriate actions to take.

The illustrations within this document are based on assumptions that people may be unfamiliar with the features of the natural disaster or the location of places of refuge(s).

It is important that the application of safety way guidance systems is standardized to aid comprehension. Whilst education in the comprehension of the signs and evacuation plan signs is essential, incomprehension caused by lack of standardization can lead to confusion and possibly hinder effective evacuation.

This document does not purport to include all the necessary aspects or requirements on the design of a natural disaster safety way guidance system. Users are responsible for its correct application.

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Graphical symbols — Safety colours and safety signs — Natural disaster safety way guidance system

IMPORTANT — The colours represented in the electronic file of this document can be neither viewed on screen nor printed as true representations. For the purposes of colour matching, see ISO 3864-4 which provides colorimetric and photometric properties together with, as a guideline, references from colour order systems.

1 Scope

This document specifies the principles governing the design and application of signs and plans used to create a natural disaster safety way guidance system, which help people evacuate to safety areas or place of refuge in the case of natural disasters, for example, tsunami, flood, debris flows, steep slope failures, landslides, tornados, large scale fire, volcano.

This standard provides guidance on the selection and use of safety signs conforming to ISO 7010, public information symbols conforming to ISO 7001, and text on evacuation route signs, places of refuge and evacuation plan for information of particular natural disasters. Guidance on the design, location, mounting positions and maintenance of the signs and plan signs are also provided.

This document does not apply to the determination of the need for natural disaster safety way guidance. This standard assumes that the risk assessment or requirements of an enforcing authority has established the need for such natural disaster safety way guidance systems. This document does not apply to retroreflective road signs.

NOTE 1 This document is not applicable to the particular hazards of high winds, snow avalanches, earthquakes and hurricanes which cause the natural disasters covered in this standard.

NOTE 2 This document is applicable to the safety way guidance from the natural disasters, from the outside of the building to safe areas. ISO 16069 covers the safety way guidance within a building, to the emergency exit.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7001, *Graphical symbols — Public information symbols*

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

ISO 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-3, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

ISO 20712-3:2020, *Water safety signs and beach safety flags — Part 3: Guidance for use*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

**3.1
evacuation route**

direction from your location to the nearest safe area when a disaster occurs

**3.2
evacuation plan**

map or diagram displayed in public areas and workplaces to assist users to understand the environment, locate facilities and determine evacuation route to reach safe area

**3.3
natural disaster supplementary sign**

sign indicating the type of possible disaster

Note 1 to entry: Appropriate evacuation area and other related information are also displayed.

**3.4
phosphorescent material**

material incorporating phosphors that, if excited by UV or visible radiation, store energy, which is emitted as light over a period of time

[SOURCE: ISO 3864-1:2011, 3.12]

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Note 1 to entry: A phosphorescent sign is the same as "photoluminescent" commonly used in the literature of the photoluminescent safety sign industry.

**3.5
protection shelter**

facilities that provide protection from a disaster

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**3.6
natural disaster safety way guidance system**

system that includes evacuation plan signs, evacuation route signs and provides information of place of refuges to guide people from a location to places of refuge when natural disasters occur

**3.7
seamless design**

system of uninterrupted markings guiding people to place of refuge signs seamlessly when deploying the safety way guidance system

**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

[SOURCE: ISO 20712-3:2014, 3.8]

Note 1 to entry: Registered safety sign originals in ISO 7010 are in a uniform 70 mm size with corner marks to enable accurate enlargement and reduction scaling. A border is not shown.

**3.9
place of refuge**

outdoor areas or indoor space to which people can quickly evacuate in order to secure their lives when a disaster occurs or is likely to occur

Note 1 to entry: Place of refuge includes protection shelter, outdoor refuge area, tsunami evacuation area, and tsunami evacuation building.

4 Purpose and deployment

The natural disaster safety way guidance system is necessary to warn people in areas likely to be affected by a disaster when it occurs and help them take suitable action quickly according to the type of disaster.

The objective of the natural disaster safety way guidance system is to display information about the hazards of possible natural disasters in vulnerable regions, warn the people living in the area that is affected by a disaster when it occurs, and guide them to evacuate quickly.

The illustrations should be interpreted as recommendations and not as minimum requirements.

5 Planning of natural disaster safety way guidance system

Where mitigation plans have been prepared and are available to civil protection agencies or relevant authorities, a natural disaster safety way guidance system is required, when appropriate, to warn the population in zones that will be specifically affected.

The designer of the system shall identify the following based on the mitigation plans:

- a) locations of hazard zones;
- b) locations for place of refuge and their names;
- c) suitability of places of refuge for certain disasters;
- d) locations of evacuation routes to places of refuge;
- e) locations of accessible routes for flood from inland waters and fire disasters;
- 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) appropriate supplementary text to the evacuation route signs, such as information on recorded heights above sea level at locations within the inundation areas and height or depth of floods (inundations);
- k) use of local language(s) and other language(s);
- l) other sources of warning information, such as national and local media, and sound alarms.

6 Signs used in natural disaster safety way guidance systems

6.1 Signs

The safety sign components of natural disaster safety way guidance signs shall be registered safety signs from ISO 7010. Supplementary signs and combination signs shall meet the design requirements of ISO 3864-1. Signs used in natural disaster safety way guidance systems are shown in [Table 1](#).

Safety signs shall meet the colorimetric and photometric specifications of ISO 3864-4:2011 under the test conditions relating to safety signs being externally illuminated.

NOTE ISO 3864-4 defines colour under certain test conditions and not all conditions of observation of safety signs. Phosphorescent safety signs during luminance decay mode lack colour recognition of the green, however they are designed such the luminance contrast enables the graphical symbols to be/remain identifiable. Reflective signs lack colour discrimination in night-time illumination.

Classification of emission colour of phosphorescent material is given in ISO 3864-4:2011, Annex B.

Phosphorescent safety signs shall meet the colorimetric and photometric specifications of ISO 3864-4 under its specified test conditions relating to safety signs being externally illuminated.

Table 1 — Signs used in natural disaster safety way guidance system






























Type of disaster	Safety Signs		Supplementary signs	
	Warning signs	Safe condition signs		
Tsunami		 ISO 7010-E062 Tsunami evacuation area	 ISO 7010-E021 Protection shelter	
Storm surge	ISO 7010-W056 Warning; Tsunami hazard zone	 ISO 7010-E063 Tsunami evacuation building		
Flood (including flood from inland waters)		 ISO 7010-E062 Proposed new sign; Outdoor refuge area	 ISO 7010-E021 Protection shelter	
Debris flow		 ISO 7010-E062 Proposed new sign; Outdoor refuge area	 ISO 7010-E021 Protection shelter	
Steep slope failure		 ISO 7010-E062 Proposed new sign; Outdoor refuge area	 ISO 7010-E021 Protection shelter	
Landslide	ISO 7010-W078 Warning; Landslide zone	ISO 7010-E062 Proposed new sign; Outdoor refuge area	ISO 7010-E021 Protection shelter	

Table 1 (continued)

Type of disaster	Safety Signs		Supplementary signs
	Warning signs	Safe condition signs	
Large scale fire	 <p>ISO 7010-W073 Warning; Large scale fire zone</p>	 <p>ISO 7010-EXXX Proposed new sign; Outdoor refuge area</p>  <p>ISO 7010-E021 Protection shelter</p>	 <p>Large scale fire</p>
Tornado	 <p>ISO 7010-W074 Warning; Tornado zone</p>	 <p>ISO 7010-E021 Protection shelter</p>	 <p>Tornado</p>
Volcano	 <p>ISO 7010-W075 Warning; Active volcano zone</p>	 <p>ISO 7010-E021 Protection shelter</p>	 <p>Volcano</p>

6.2 Directional supplementary arrow signs

Arrows in direction signs shall be used in conjunction with safety signs to indicate the direction of movement a person should take to reach the indicated destination. The format of the direction arrow shall be arrow type D from ISO 3864-3. The meanings of different arrow orientations are shown in [Table 2](#).

Table 2 — Use of direction supplementary arrow signs









Arrow	Meaning
	Proceed to the right from here
	Proceed to the left from here
	a) Proceed forward from here b) Proceed forward and through from here c) Proceed forward and up from here

Table 2 (continued)

Arrow	Meaning
	a) Proceed up to the right from here b) Proceed forward and across to the right from here
	Proceed down to the right
	a) Proceed up to the left b) Proceed forward and across to the left from here
	Proceed down to the left
	Proceed down from here

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6.3 Supplementary symbols and suitability marking

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It is necessary to indicate the type of disasters in which the places of refuge are appropriate. Place of refuge signs ensure anyone who happens to be visiting and unfamiliar with the area is able to identify their suitability or unsuitability properly. This is because the construction and location for place of refuge may only be appropriate for particular natural disasters.

In areas where different types of natural disasters could occur, the local government or authority shall decide on the suitability of the places of refuge for a certain disaster.

In the place of refuge signs and evacuation route signs, the appropriate supplementary symbols which are given in [Table 1](#) should be used to indicate the suitable and not suitable natural disasters for that place of refuge.

Where it is necessary to warn people that the place of refuge is not suitable for particular types of natural disasters, an “x” or diagonal bar should be displayed.

A green tick may be used to indicate suitability. The green tick may be replaced by another element appropriate to cultural requirements of the target audience.

Example of suitability and unsuitability markings are presented as [Figure 1](#).