AS 5104—2005
ISO 2394:1998

AS 5104—2005

Australian Standard™

General principles on reliability for structures

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee BD-006, General Design Requirements and Loading on Structures. It was approved on behalf of the Council of Standards Australia on 3 March 2005.
This Standard was published on 26 April 2005.

The following are represented on Committee BD-006:

Association of Consulting Engineers Australia
Australian Steel Institute
Cement and Concrete Association of Australia
Concrete Masonry Association of Australia
CSIRO, Building, Construction and Engineering
Cyclone Testing Station—James Cook University
Electricity Supply Association of Australia
Housing Industry Association
Institution of Engineers Australia
Master Builders Australia
Steel Reinforcement Institute of Australia
University of Melbourne
University of Newcastle

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Web Shop at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

Australian Standards™ and other products and services developed by Standards Australia are published and distributed under contract by SAI Global, which operates the Standards Web Shop.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.org.au, or write to the Chief Executive, Standards Australia, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 04179.

Australian Standard™

General principles on reliability for structures

First published as AS 5104—2005.

Published by Standards Australia, GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 6641 2

PREFACE

This Standard was prepared by the Standards Australia Committee BD-006, General Design Requirements and Loading on Structures.

This Standard is identical with and has been reproduced from ISO 2394:1998, *General principles on reliability for structures*.

The objective of this Standard is to provide writers of Standards and designers of structures with reliability principles for design of structures.

ISO 2394 has been adopted in order to provide information on the background of the Australian Standards on structural design. It provides useful guidance on the basic approach to structural design for safety. Guidance is also provided for control of design and construction processes.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text 'this International Standard' should read 'this Australian Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

CONTENTS

Page

Page

INTRODUCTION

This International Standard constitutes a common basis for defining design rules relevant to the construction and use of the wide majority of buildings and civil engineering works, whatever the nature or combination of the materials used. However, their application to each type of material (concrete, steel, timber, masonry, etc.) will require specific adaptation to ensure a degree of reliability which, as far as possible, is consistent with the objectives of the code drafting committees for each material.

This International Standard is intended to serve as a basis for those committees responsible for the task of preparing national standards or codes of practice in accordance with the technical and economic conditions in a particular country, and which take into account the nature, type and conditions of use of the structure and the properties of the materials during its design working life. It will also provide a common basis for other International Standards (e.g. ENV 1991-1 EC1) dealing with load bearing structures. Thus it has a conceptual character and it is of a fairly general nature.

It is important to recognize that structural reliability is an overall concept comprising models for describing actions, design rules, reliability elements, structural response and resistance, workmanship, quality control procedures and national requirements, all of which are mutually dependent.

The modification of one factor in isolation could therefore disturb the balance of reliability inherent in the overall concept.

It is therefore important that the modification of any one factor should be accompanied by a study of the implications relating to the overall reliability concept.

NOTES

AUSTRALIAN STANDARD

General principles on reliability for structures

1 Scope

This International Standard specifies general principles for the verification of the reliability of structures subjected to known or foreseeable types of action. Reliability is considered in relation to the performance of the structure throughout its design working life.

The general principles are applicable to the design of complete structures (buildings, bridges, industrial structures, etc.), the structural elements making up the structure and the foundations.

This International Standard is also applicable to the successive stages in construction, namely the fabrication of structural elements, the transport and handling of the structural elements, their erection and all work on site, as well as the use of the structure during its design working life, including maintenance and repair.

To allow for the differences in design practice between different countries, the national standards or codes of practice may be simpler or more detailed in comparison with this International Standard.

Generally the principles are also applicable to the structural appraisal of existing constructions or assessing changes of use. However in some respects this is associated with special aspects of the basic variables and calculation models. Such aspects are considered in clause 10.

NOTE — When this International Standard is applied in a particular country for the development of its standards, it is admissible not to use those clauses which are not in accordance with the regulations of that particular country.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

NOTE — An alphabetical index of the definitions is given in annex H.

2.1 General terms

2.1.1 structure: Organized combination of connected parts designed to provide some measure of rigidity.

2.1.2 structural element: Physically distinguishable part of a structure.

EXAMPLES: Column, beam, plate.

2.1.3 structural system: Load-bearing elements of a building or civil engineering works and the way in which those elements function together.

2.1.4 compliance: Fulfilment of specified requirements.