

This is a preview of "ISO 13822:2010". [Click here to purchase the full version from the ANSI store.](#)

Second edition  
2010-08-01

---

---

## **Bases for design of structures — Assessment of existing structures**

*Bases du calcul des constructions — Évaluation des constructions  
existantes*



Reference number  
ISO 13822:2010(E)

© ISO 2010

This is a preview of "ISO 13822:2010". [Click here to purchase the full version from the ANSI store.](#)

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

This is a preview of "ISO 13822:2010". Click [here](#) to purchase the full version from the ANSI store.

## Contents

Page

Foreword .....	v
Introduction.....	vi
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 General framework of assessment.....	3
4.1 Objectives .....	3
4.2 Procedure .....	4
4.3 Specification of the assessment objectives .....	5
4.4 Scenario.....	5
4.5 Preliminary assessment .....	5
4.6 Detailed assessment .....	6
4.7 Results of assessment.....	7
5 Data for assessment .....	7
5.1 General .....	7
5.2 Actions and environmental influences .....	7
5.3 Material properties .....	8
5.4 Properties of the structure .....	8
5.5 Dimensions .....	8
6 Structural analysis .....	9
6.1 Models .....	9
6.2 Limit states.....	9
6.3 Basic variables .....	9
6.4 Model uncertainties.....	9
6.5 Conversion factors.....	9
6.6 Uncertainty about the condition of components .....	9
6.7 Deterioration models.....	9
7 Verification .....	10
7.1 Bases .....	10
7.2 Reliability assessment .....	10
7.3 Limit states.....	10
7.4 Plausibility check .....	10
7.5 Target reliability level.....	10
8 Assessment based on satisfactory past performance.....	10
8.1 Assessment of safety.....	10
8.2 Assessment of serviceability .....	11
9 Interventions .....	11
10 Report .....	11
10.1 General .....	11
10.2 Conclusions .....	11
10.3 Sufficient reliability .....	11
10.4 Insufficient reliability.....	12
10.5 Recommendations for interventions.....	12
10.6 Inspection and maintenance plan.....	12
10.7 Documented information .....	12
10.8 Reporting style .....	12

This is a preview of "ISO 13822:2010". [Click here to purchase the full version from the ANSI store.](#)

<b>11</b>	<b>Judgement and decision</b> .....	<b>12</b>
<b>11.1</b>	<b>Decision</b> .....	<b>12</b>
<b>Annex A</b> (informative)	<b>Hierarchy of terms</b> .....	<b>13</b>
<b>Annex B</b> (informative)	<b>Flowchart for the general assessment of existing structures</b> .....	<b>14</b>
<b>Annex C</b> (informative)	<b>Updating of measured quantities</b> .....	<b>15</b>
<b>Annex D</b> (informative)	<b>Testing for static and dynamic properties of structures</b> .....	<b>21</b>
<b>Annex E</b> (informative)	<b>Assessment of time-dependent reliability</b> .....	<b>24</b>
<b>Annex F</b> (informative)	<b>Target reliability level</b> .....	<b>28</b>
<b>Annex G</b> (informative)	<b>Test report format</b> .....	<b>30</b>
<b>Annex H</b> (informative)	<b>Design of upgrading</b> .....	<b>33</b>
<b>Annex I</b> (informative)	<b>Heritage structures</b> .....	<b>35</b>
<b>Bibliography</b> .....		<b>44</b>

This is a preview of "ISO 13822:2010". [Click here to purchase the full version from the ANSI store.](#)

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13822 was prepared by Technical Committee ISO/TC 98, *Bases for design of structures*, Subcommittee SC 2, *Reliability of structures*.

This second edition cancels and replaces the first edition (ISO 13822:2001), which has been technically revised, including the addition of a new Annex I, the associated change to the Foreword and with some minor editorial changes.

## Introduction

The continued use of existing structures is of great importance because the built environment is a huge economic and political asset, growing larger every year. The assessment of existing structures is now a major engineering task. The structural engineer is increasingly called upon to devise ways for extending the life of structures whilst observing tight cost constraints. The establishment of principles for the assessment of existing structures is required because it is based on an approach that is substantially different from design of new structures and requires knowledge beyond the scope of design codes. This document is intended not only as a statement of principals and procedures for the assessment of existing structures but also as a guide for use by structural engineers and clients. Engineers can apply specific methods for assessment in order to save structures and to reduce a client's expenditure. The ultimate goal is to limit construction intervention to a strict minimum, a goal that is clearly in agreement with the principles of sustainable development.

The basis for the reliability assessment is contained in the performance requirements for safety and serviceability of ISO 2394. Economic, social and sustainability considerations, however, result in a greater differentiation in structural reliability for the assessment of existing structures than for the design of new structures.