



United Safety & Quality Council

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ISO 13822 · ISO 13822:2010

Assessment of Existing Structures

Bases for design of structures · Assessment of existing structures

Implementation Guideline

This implementation guideline is prepared by USQC to help engineering firms, infrastructure owners, and inspection bodies understand what ISO 13822 requires, how to build assessment procedures that meet it, and how to prepare for third-party certification.

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1

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Introduction

ISO 13822, first published in 2001 and updated in 2010, provides the international framework for assessing the reliability, safety, and residual life of existing structures. Where new-build design standards ask "will this structure be safe once built?", ISO 13822 asks "is this existing structure still safe, and for how long?".

The standard is technical rather than a management-system standard. It sets out a methodology · a way of investigating, analysing, verifying, and reporting on an existing structure so that owners, insurers, authorities, and courts can rely on the conclusions.

COMMITTEE & BASIS

ISO 13822 was prepared by ISO/TC 98, Bases for design of structures, subcommittee SC 2, Reliability of structures. It is based on and used alongside ISO 2394, General principles on reliability for structures.

2

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Scope & Applicability

ISO 13822 is applicable to any existing structure originally designed to accepted engineering principles or built to accepted historic practice. It covers structures of any material · concrete, steel, timber, masonry, and composites · although material-specific adaptations may be required.

When an assessment is required

- Anticipated change of use, occupancy category, or extension of design working life
- Reliability check requested by authorities, insurers, or owners (e.g. seismic, wind, traffic loading)
- Structural deterioration from time-dependent actions · corrosion, fatigue, creep, carbonation
- Damage caused by accidental actions · fire, blast, impact, foundation settlement
- Preservation, adaptation, or reuse of historic or heritage structures

What is out of scope

- New-build design (covered by material-specific ISO codes and national standards)
- Purely aesthetic or non-structural surveys
- Ground-condition characterisation without structural interpretation

3

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Structural Overview of the Standard

ISO 13822 is organized into eleven clauses and eight informative annexes. Firms preparing for certification should be able to point to procedures, records, and reports that address each clause.

CLAUSE	TITLE	WHAT YOUR PROCEDURES MUST ADDRESS
4	General framework of assessment	The overall procedure and decision flow · agreement with the client on objectives, utilization plan, and safety plan.
5	Data for assessment	How you obtain and record data on material properties, structural properties, dimensions, previous actions, and current conditions.
6	Structural analysis	The analytical models used, their assumptions, and how they represent the actual state of the structure.
7	Verification	How safety, serviceability, and durability are verified against limit states and target reliability.
8	Assessment based on satisfactory past performance	The rules for accepting long-standing safe service as evidence, particularly for historic structures.
9	Interventions	How repair, rehabilitation, upgrade, risk-control, or acceptance options are evaluated.
10	Report	The mandatory content and structure of the assessment report.
11	Judgement and decision	How the engineer's recommendation and the client's decision are recorded.

4

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Implementation Roadmap

USQC recommends a five-phase roadmap. Each phase produces artefacts that USQC auditors will look for during Stage 1 and Stage 2.

Phase 1 · Scope & competence baseline

WEEK 1 TO 2

- Documented ISO 13822 assessment scope (which sectors, materials, and asset types)
- Competence matrix for engineers · qualifications, experience, and continuing professional development
- List of tools, references, and software with version control

Phase 2 · Procedure development

WEEK 2 TO 5

- Assessment procedure aligned to ISO 13822 clauses 4 to 11
- Standard forms · utilization plan, safety plan, condition survey record, data-collection sheet
- Report template mapped to clause 10 requirements
- Sign-off matrix for peer review and independent check

Phase 3 · Pilot on live projects

WEEK 4 TO 8

- Three completed assessments using the new procedure
- Documented lessons and procedure revisions
- Evidence of independent check for each pilot

Phase 4 · Internal audit & management review

WEEK 7 TO 9

- Internal audit report covering procedure and sample projects
- Management review record showing decisions on nonconformities and improvements

Phase 5 · Certification audit**WEEK 9 TO 12**

- Stage 1 documentation review (typically remote)
- Stage 2 audit covering procedures, competence, and sampled assessment work
- Certificate issued after independent USQC technical review

5

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Documentation Requirements

USQC auditors will expect to see a controlled set of documents. The specific content is your choice · what matters is that each item exists, is version-controlled, and is actually used on live projects.

DOCUMENT	PURPOSE
Assessment procedure	Defines the sequence from scope agreement to reporting, mapped to ISO 13822 clauses.
Utilization plan template	Captures the intended future use and loading, agreed with the client.
Safety plan template	Sets out the target reliability, hazard scenarios, and verification approach.
Data collection forms	Structural properties, material properties, dimensions, condition, and historical actions.
Analysis records	Model assumptions, software version, input data, results, and sanity checks.
Verification records	Limit-state checks, target reliabilities, and comparison with resistance.
Report template	Report structure matching ISO 13822 clause 10.
Peer review sign-off	Evidence that another qualified engineer independently checked the work.
Competence records	Qualifications, continuing professional development, and project experience per engineer.
Internal audit records	Periodic self-audit of procedure and sample projects.

6

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Roles & Responsibilities

ISO 13822 makes the roles of the client, the assessing engineer, and (where relevant) the authorities explicit. Your internal procedures should mirror this.

ROLE	RESPONSIBILITY
Client / owner	Defines the objective of the assessment, provides available records, agrees the utilization plan and safety plan, decides on interventions.
Assessing engineer	Applies the ISO 13822 framework, gathers data, conducts analysis and verification, prepares the report, and makes recommendations.
Independent checker	Conducts a peer review of the assessment before issue. Should be competent, uninvolved in the primary assessment, and empowered to require changes.
Authority (where relevant)	Sets or approves the objective and target reliability, particularly for public infrastructure or heritage assets.
Technical director	Owns the assessment procedure, approves procedure changes, and ensures competence is maintained.

7

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Common Pitfalls

Skipping the utilization plan

Engineers move straight from investigation to analysis without documenting the future use, loading, and remaining working life the client and authorities agreed to. This is the single most common finding at Stage 1.

Under-documented data provenance

Material strengths and dimensions used in the analysis are not traceable to a specific test, drawing, or survey record. Any assessment that cannot be reconstructed six months later will attract findings.

Confusing new-build codes with assessment

Applying full new-build partial factors to an existing structure without any reliability update produces conservative but unhelpful results. ISO 13822 allows updated partial factors based on measured data · this must be documented.

Missing independent check

Sole-engineer sign-off with no peer review does not satisfy the standard's expectation of impartial judgement. A senior engineer within the same team is acceptable if there is a documented independence rule.

Assessment report as a memo

A one-page opinion letter cannot substitute for the report structure implied by clause 10. Every clause of ISO 13822 should be traceable to a section of the report.

8

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Certification Readiness Checklist

- ✓ Scope of certification defined · which sectors, materials, and asset classes are covered
- ✓ ISO 13822-aligned assessment procedure issued and version-controlled
- ✓ Utilization plan, safety plan, and report templates in use on live projects
- ✓ Competence matrix maintained for each engineer
- ✓ At least three completed assessments available for audit sampling
- ✓ Independent peer-review records available for each sampled project
- ✓ Data-collection records traceable to the analysis inputs
- ✓ Internal audit and management review completed within the last 12 months
- ✓ Software tools inventoried with version numbers used on record
- ✓ Sign-off and issue procedure controls who can release an assessment report

9

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USQC Support

USQC's certification services and consulting services are structurally separated. Certification is delivered by USQC Certification Services, an accredited certification body. Where firms want implementation support, this is delivered by USQC Advisory Services under a separate engagement and cannot be combined with the certification audit for the same client.

For a certification proposal covering scope, timeline, and fees, contact admin@usqc.us or +1 732-354-1094. USQC will issue a written proposal within one working day and can typically begin Stage 1 within two weeks of agreement.

Ready to Get Certified?

USQC will confirm scope, timeline, and fees within one working day of your inquiry. Stage 1 typically begins within two weeks of agreement.

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