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Ocena učinkovitosti in uspešnosti ter stanja stavb in nizkih gradenj - Okvir za ocenjevanje pri obvladovanju fizičnega premoženja

Performance and condition assessment for buildings and civil engineering works - Framework for assessment within physical asset management

Leistungs- und Zustandsbewertung für Immobilien ; Bewertungsrahmen für Gebäude und Anlagentechnik

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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prEN 17840

April 2022

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English Version

**Performance and condition assessment for buildings and
civil engineering works - Framework for assessment
within physical asset management**

Leistungs- und Zustandsbewertung für Immobilien &
Bewertungsrahmen für Gebäude und Anlagentechnik

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 319.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17840:2022) has been prepared by Technical Committee CEN/TC 319 “Maintenance”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

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prEN 17840:2022 (E)**Introduction**

There are various standards available about monitoring, inspection and assessment of physical assets. All these standards have their own purpose and place in the field of assessment. This document for performance and condition assessment is an umbrella standard for physical assets and refers to other standards for detailed methods.

The scope of this document is buildings and civil engineering works. The intended audience for this document is asset owners (small and large, public and private), asset managers, facility managers, property managers, observers and consultants.

This document consists of two parts:

- The assessment process: The steps that are needed to perform an assessment;
- The observation process: The steps that are needed for acquiring and analysing the asset status data to give recommendations as part of the assessment process.

In both cases, the purpose is to enhance the quality of the assessment and to provide information for the asset owner/manager to support the decision making process.

The document assists asset and facility managers in selecting the appropriate technique and determining the quality of the work that has been done.

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1 Scope

This document specifies and gives guidance on the performance and condition assessment process of existing physical assets in the utilization stage (from commissioning to the end of life).

This document relates to assessment of physical assets within the building and civil engineering sector; however, it can also be used in other sectors where applicable.

This document describes a generic framework for assessment, specification of requirements, the observation process and gathering of the required information in order to sustain informed asset management decision making.

This document is an umbrella standard and refers to other standards for detailed methods. It does not replace any other standard, but is an addition to provide a system for the assessment work.

NOTE 1 The references to other standards only relate to building and civil engineering works. There are no references for production machinery and equipment, offshore, electrical and mechanical assets, mobile assets and non-tangible assets.

NOTE 2 In this document the physical assets will be referred to as assets, except in the clause Terms and definitions.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

NOTE Several terms have multiple definitions in different standards, depending on the context. All definitions in this document are fitted for performance and condition assessment.

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

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

3.1 Asset management

3.1.1

asset management

coordinated activity of an organization to realize value from assets

Note 1 to entry: Value can be tangible or intangible, financial or non-financial, and includes consideration of risks and liabilities. It can be positive or negative at different stages of the asset life.

Note 2 to entry: Physical assets usually refer to facilities, civil engineering works, street furniture, technical installations, equipment, inventory and properties owned by the organization. Physical assets are the opposite of intangible assets, which are non-physical assets such as leases, brands, digital assets, use rights, licenses, intellectual property rights, reputation or agreements.

Note 3 to entry: A grouping of assets referred to as an asset system could also be considered as an asset.

[SOURCE: ISO 55000:2014, 3.3.1, modified - Note 2 examples of physical assets have been added]

prEN 17840:2022 (E)**3.1.2****asset portfolio**

assets that are within the scope of the asset management system

Note 1 to entry: A portfolio is typically established and assigned for managerial control purposes. Portfolios for physical hardware might be defined by category (e.g. properties, civil infrastructure, road network, plant, equipment, tools, land). Software portfolios might be defined by software publisher, or by platform (e.g. PC, server, mainframe).

Note 2 to entry: An asset management system can encompass multiple asset portfolios. Where multiple asset portfolios and asset management systems are employed, asset management activities should be coordinated between the portfolios and systems.

[SOURCE: ISO 55000:2014, 3.2.4, modified - NOTE 1 examples of physical asset portfolios have been added]

3.1.3**asset system**

set of assets that interact or are interrelated

Note 1 to entry: A sewage system, tunnel, building, bridge, network of motorways are typical examples of asset systems.

[SOURCE: ISO 55000:2014, 3.2.5, modified - Note 1 to entry has been added]

3.1.4**asset type**

grouping of assets having common characteristics that distinguish those assets as a group or class

EXAMPLE Physical assets, information assets, intangible assets, critical assets, enabling assets, linear assets, information and communications technology (ICT) assets, infrastructure assets, moveable assets.

[SOURCE: ISO 55000:2014, 3.2.6]
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3.1.5**asset**

item, thing or entity that has potential or actual value to an organization

Note 1 to entry: In this document the term 'asset' means physical asset (3.1.8).

Note 2 to entry: Value can be tangible or intangible, financial or non-financial, and includes consideration of risks and liabilities. It can be positive or negative at different stages of the asset life.

Note 3 to entry: Physical assets usually refer to equipment, inventory and properties owned by the organization. Physical assets are the opposite of intangible assets, which are non-physical assets such as leases, brands, digital assets, use rights, licences, intellectual property rights, reputation or agreements.

Note 4 to entry: A grouping of assets referred to as an asset system (3.1.3) could also be considered as an asset.

[SOURCE: ISO 55000:2014, 3.2.1, modified – Note 1 to entry has been added]

3.1.6**interoperability**

ability of systems to provide services to and accept services from other systems and to use these services to enable them to operate effectively together

[SOURCE: ISO 37153:2017, 3.8, modified – Notes 1 and 2 to entry have been deleted]

3.1.7

item

part, component, device, subsystem, functional unit, equipment or system that can be individually described and considered

Note 1 to entry: A number of items e.g. a population of items, or a sample, may itself be considered as an item.

Note 2 to entry: An item may consist of hardware, software or both.

Note 3 to entry: Software consists of programs, procedures, rules, documentation and data of an information processing system.

[SOURCE: EN 13306:2017, 3.1]

3.1.8

physical asset

item that has potential or actual value to an organization

Note 1 to entry: Examples of physical assets are components, machines, plants, construction works, buildings.

[SOURCE: EN 13306:2017, 3.2]

3.1.9

physical asset management

coordinated activities of an organization to realize value from physical assets

Note 1 to entry: Realization of value will normally involve a balancing of costs, risks, opportunities and benefits.

Note 2 to entry: In the life cycle context, physical asset management is the optimal life cycle management of physical assets to sustainably achieve the stated business objectives.

[SOURCE: EN 16646:2015]

3.2 Assessment

3.2.1

assessment

systematic process of collecting and analysing data to determine the status of a product, a process, a system, a person or an organization

[SOURCE: ISO 10795:2019, 3.24]

3.2.2

assessment strategy

outline plan that includes a coordinated set of activities and the allocation of resources necessary to perform the assessment

[SOURCE: ISO 56000:2020]

3.2.3

condition

physical state of an asset or item at a particular time compared to state at the time of commissioning

[SOURCE: CEN/TS 17385:2019, 3.4]

prEN 17840:2022 (E)**3.2.4****condition assessment**

objective method for determining the physical condition of a constructed asset or a part of it

[SOURCE: CEN/TS 17385:2019, 3.4, modified – Note 1 to entry has been deleted.]

3.2.5**function**

intended effect of a system, subsystem, product or part

[SOURCE: ISO 21351:2005, 3.1.5, modified – Notes to entry have been deleted.]

3.2.6**performance**

ability to fulfil required functions under intended use conditions or behaviour when in use

Note 1 to entry: Derived from the definition of performance in ISO 6707-1.

Note 2 to entry: The required functions address both the functionality requirements as well as the technical requirements.

EXAMPLES Traffic handling, flood protection, conservation of nature, to provide shelter, to provide security, to provide a healthy environment, group accommodation, to provide residence or work environment, lifting.

[SOURCE: ISO/TS 21929-2:2015, 3.28, modified – Examples have been added]

3.2.7**performance assessment**

objective method for determining the performance of a constructed asset or a part of it

3.3 Maintenance

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3.3.1**condition based maintenance**

preventive maintenance which include a combination of condition monitoring and/or inspection and/or testing, analysis and the ensuing maintenance actions

Note 1 to entry: The condition monitoring and/or inspection and/or testing may be scheduled, on request or continuous.

[SOURCE: EN 13306:2017, 7.3]

3.3.2**corrective maintenance**

maintenance carried out after fault recognition and intended to restore an item into a state in which it can perform a required function

[SOURCE: EN 13306:2017, 7.9]

3.3.3

improvement

combination of all technical, administrative and managerial actions, intended to ameliorate the reliability and/or the maintainability and/or the safety of an item, without changing the original function

Note 1 to entry: An improvement may also be introduced to prevent misuse in operation and to avoid failures.

Note 2 to entry: Improvement may also encompass aesthetics, comfort, health, environment, etc.

[SOURCE: EN 13306:2017, 7.6, modified – added Note 2 to entry.]

3.3.4

modernization

modification or improvement of the item, taking into account technological advances, to meet new or changed requirements

[SOURCE: EN 13306:2017, 7.8]

3.3.5

modification

combination of all technical, administrative and managerial actions intended to change one or more functions of an item

Note 1 to entry: Modification is not a maintenance action, but has to do with changing the required function of an item to a new required function. The changes may have an influence on the dependability characteristics.

Note 2 to entry: Modification may involve the maintenance organization.

Note 3 to entry: The change of an item where a different version is replacing the original item without changing the function or ameliorating the dependability of the item is called a replacement and is not a modification.

[SOURCE: EN 13306:2017, 7.7]

3.3.6

operational mode

configuration in which an item is operated and utilized during a given period characterized by units of use (hours, loads, number of starts/stops, number of transients, etc.)

Note 1 to entry: Operational mode determines the frequency, load, continuity and performance rate of utilization.

Note 2 to entry: Operational mode may, or may not, comply with the inherent item specifications as defined.

[SOURCE: EN 13306:2017, 4.20]

3.3.7

operating constraints

characteristics of the item, which set limits for the use of the item and may determine requirements for maintenance activities

Note 1 to entry: These characteristics are the results of design and construction of the item.

[SOURCE: EN 13306:2017, 4.21]

prEN 17840:2022 (E)**3.3.8****operating conditions**

physical loads and environmental conditions experienced by the item during a given period

Note 1 to entry: Operating conditions can vary during the item's life cycle.

[SOURCE: EN 13306:2017, 4.22]

3.3.9**performance based maintenance**

preventive maintenance based on the performance of an asset which include a combination of performance monitoring and/or inspection and/or testing, analysis and the ensuing maintenance actions

3.3.10**predetermined maintenance**

preventive maintenance carried out in accordance with established intervals of time or number of units of use but without previous condition investigation

Note 1 to entry: Intervals of times or number of unit of use may be established from knowledge of the failure mechanisms of the item.

[SOURCE: EN 13306:2017, 7.2]

3.3.11**preventive maintenance**

maintenance carried out intended to assess and/or to mitigate degradation and reduce the probability of failure of an item

Note 1 to entry: Preventive maintenance is based on the output of an assessment, or predetermined.

[SOURCE: EN 13306:2017, 7.1, modified – NOTE 1 is extended with predetermined maintenance]

3.3.12**service life**

duration throughout which an asset is used economically

3.3.13**utilization stage**

life cycle phase at which safe exploitation for the intended use (or uses) of a physical asset is possible, within specified as-built properties

Note 1 to entry: Derived from ISO 2394: revised.

Note 2 to entry: Stage may include: Exploitation, operation, modernization, renovation, maintenance and other utilization support.

3.4 Objectives and requirements**3.4.1****condition requirements**

specification of a required physical state of an asset or item

3.4.2**compliance**

meeting all the organization's compliance obligations

Note 1 to entry: Compliance is made sustained by embedding it in the culture of an organization and in the behaviour and attitude of people working for it.

[SOURCE: ISO 37301:2021]

3.4.3**compliance commitment**

requirement that an organization chooses to comply with

[SOURCE: ISO 37301:2021]

3.4.4**compliance requirement**

requirement that an organization has to comply with

[SOURCE: ISO 37301:2021]

3.4.5**legislation**

directives, acts, ordinances, and regulations

[SOURCE: ISO 14385-1:2014, 3.10]

3.4.6**nonconformity**

non-fulfilment of a requirement

[SOURCE: ISO 37301:2021]

3.4.7**non-compliance**

on-fulfilment of a compliance obligation

[SOURCE: ISO 37301:2021]

3.4.8**objective**

result to be achieved

Note 1 to entry: An objective can be strategic, tactical or operational.

Note 2 to entry: Objectives can relate to different disciplines (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process).

Note 3 to entry: An objective can be expressed in other ways, e.g. as an intended outcome, a purpose, an operational criterion, a physical asset objective or by the use of other words with similar meaning (e.g. aim, goal, or target).

Note 4 to entry: In the context of asset management systems, physical asset objectives are set by the organization, consistent with the organizational objectives and asset management policy, to achieve specific measurable results.

[SOURCE: ISO 55000:2014, 3.1.12]

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