مؤسسة المواصفات والمقاييس الأردنية

الرقم: م/علم/24187
التاريخ: 16/06/1447 هـ
الموافق: 07/12/2025 م

معالي .....
عطوفة .....
سعادة .....

تحية طيبة وبعد،

أرجو معاليكم/عطوفتكم/ سعادتكم التكرم بالعلم بأن أسلوب العمل الفني المتبع في وضع المواصفات القياسية والقواعد الفنية الأردنية يقتضي تعميم مشروع التصويت على الجهات ذات العلاقة، وذلك لإبداء الرأي والتصويت عليه تمهيداً لعرضه على مجلس الإدارة لاعتماده كمواصفة قياسية أو قاعدة فنية أردنية.

لذا أرجو أن أرفق لكم نسخة عن مشروع التصويت للمواصفة القياسية الأردنية ٢٤٢٠ /٢٠٢٥ الخاص **بالاستدامة في المباني وأعمال الهندسة المدنية ـ إرشادات لتطبيق المبادئ العامة في المواصفة القياسية الدولية ١٥٣٩٢**، الذي أعدته اللجنة الفنية الدائمة للاستدامة في المباني والمنتجات الإنشائية الصديقة للبيئة رقم (٥٨).

يرجى التكرم بالإيعاز لمن يلزم بعرض هذا المشروع على المختصين لديكم وموافاتنا بردكم عليه خلال شهرين من تاريخه، وذلك باستخدام بطاقة التصويت المرفقة، علماً بأنَّ عدم الرد خلال هذه المدة يعتبر موافقة من قبلكم على المشروع المذكور.

وتفضلوا بقبول فائق الاحترام

المديـــــر العـــام
م. عبير بركات الزهير

المرفقات : مشروع التصويت
: بطاقة التصويت

نسخة/ مدير مديرية التقييس
نسخة/ رئيس قسم الصناعات الهندسية
نسخة/ رئيس قسم فحص ومتابعة المواصفات
نسخة/ أمين اللجنة الفنية م. بلقيس المكاوي
ربا-٢٠٢٥/١٢/٤

مؤسسة المواصفات والمقاييس الأردنية

الرقم: م/عام/24187

التاريخ: 16/06/1447 هـ

الموافق: 07/12/2025 م

تعميم مشروع التصويت

عنوان المشروع: الاستدامة في المباني وأعمال الهندسة المدنية - إرشادات لتطبيق المبادئ العامة في المواصفة القياسية الدولية ١٥٣٩٢

أمين اللجنة الفنية: م. بلقيس المكاوي

قائمة الجهات التي تم التعميم عليها			
الرقم	الجهة	الرقم	الجهة
١	وزارة الصناعة والتجارة والتموين	٩	غرفة تجارة الأردن
٢	وزارة الأشغال العامة والإسكان	١٠	غرفة صناعة الأردن
٣	وزارة الإدارة المحلية	١١	غرفة صناعة عمان
٤	وزارة البيئة	١٢	غرفة تجارة عمان
٥	أمانة عمان الكبرى	١٣	الجمعية العلمية الملكية
٦	مؤسسة الإسكان والتطوير الحضري	١٤	الجامعة الأردنية
٧	نقابة المهندسين الأردنيين	١٥	المجلس الأردني للأبنية الخضراء
٨	نقابة مقاولي الإنشاءات الأردنية		

المديـــر العـــام

م. عبير بركات الزهير

نسخة/ مدير مديرية التقييس
نسخة/ رئيس قسم الصناعات الهندسية
نسخة/ رئيس قسم فحص ومتابعة المواصفات
نسخة/ أمين اللجنة الفنية م. بلقيس المكاوي
ربا-٤/١٢/٢٠٢٥

مؤسسة المواصفات والمقاييس الأردنية

بطاقة تصويت

رقم المشروع: ٢٠٢٥/٢٤٢٠	عنوان المشروع: الاستدامة في المباني وأعمال الهندسة المدنية ـ إرشادات لتطبيق المبادئ العامة في المواصفة القياسية الدولية ١٥٣٩٢
اسم اللجنة الفنية: منتجات مواد البناء ٥٦	أمين اللجنة الفنية: م. بلقيس المكاوي
تاريخ التعميم: ٢٠٢٥/١٢/٠٤	آخر موعد للرد: ٢٠٢٦/٠٢/٠٤

الرقم	نوع الملاحظة			الملاحظة *	التعديل المقترح	رأي اللجنة الفنية
	عامة	فنية	هيكلية وصياغية			

النتيجة النهائية للتصويت:

☐ موافقة (لا توجد ملاحظات).

☐ موافقة مع الملاحظات المرفقة، والتي يمكن الأخذ بها أو تجاوزها حسب الاقتضاء.

☐ عدم موافقة للأسباب الفنية المرفقة، والتي عند زوالها ينقلب التصويت إلى موافقة.

* يرجى تزويدنا بالمراجع التي اعتمد عليها في حالة وجود ملاحظات.

الجهة القائمة بالتصويت:	التاريخ:
اسم الشخص المسؤول:	

DJS 2420:2025
First edition

ع ت ٢٠٢٥/٢٤٢٠
الإصدار الأول

مشروع تصويت

الاستدامة في المباني وأعمال الهندسة المدنية ــ إرشادات لتطبيق المبادئ العامة في المواصفة القياسية الدولية ١٥٣٩٢

Sustainability in buildings and civil engineering works — Guidelines on the application of the general principles in ISO 15392

مؤسسة المواصفات والمقاييس

المملكة الأردنية الهاشمية

Contents

Figures

Tables

Foreword

Jordan Standards and Metrology Organization is the national standardization body in Jordan. The work of preparing Jordanian Standards is normally carried out by technical committees composed of the interested parties, which are involved in the scope of the standard. All the interested parties have the right to vote on the draft Jordanian Standard during the enquiry stage, taking into consideration the importance of harmonizing Jordanian Standards with the international, regional or national standards (as much as possible) for the purpose of eliminating technical barriers to trade and facilitating the international trade.

Jordanian Standards are drafted in accordance with the rules given in the Jordanian Directive 1-2:2005, part 2: Rules for the structure and drafting of Jordanian Standards*.

The permanent technical committee for construction materials products 56 has studied the prepared project 2420:2025 related to "**Sustainability in buildings and civil engineering works — Guidelines on the application of the general principles in JS ISO 15392**", and has recommended to approve the amended project as a Jordanian Standard 2420:2025, according to article (12) of standards and metrology law No. (22) for the year 2000 and its amendments.

This Jordanian Standard 2420:2025 is a modified adoption of the International Standard TS 12720:2024" **Sustainability in buildings and civil engineering works — Guidelines on the application of the general principles in ISO 15392**", using reprint method, single vertical bars (|) in the margins are used to indicate the applicable technical modifications of the International standard, and single vertical dotted bars (⋮) in the margins are used to indicate the applicable editorial modifications of the International standard which have been changed. Each variation is cross-referenced to the clause of the International standard together with reasons for these deviations listed below.

For the purposes of this Jordanian standard, the following Technical changes have been made:
- Modifying "social needs" in table 1 , table 3 and table 4 to be "social and cultural needs", to match clause 5 in this Jordanian standard.
- Adding "Why are we doing this project? Whom are the beneficiaries of this project?" in the row of "strategic planning" under the column of "Question raised" of table 2, the committee's decision to clarify the goal and the beneficiaries of the project.
- Modifying "A sustainable construction project, with detailed drawings and specifications" to be "A sustainable construction project with detailed drawings, scope, budget, schedules, and specifications" in the row of "Design" under the column of "Result/deliverables" in table 2, to confirm with the national requirement.

For the purposes of this Jordanian standard, the following Editorial changes have been made:
- Replace "this document" by "this Jordanian Standard", Applying the Jordanian Directive 21-1/2009, Regional or national adoption of International standards and other International deliverables, part1: adoption of international Standards
- Addition of "clause" before each referenced sub clause, Applying the Jordanian Directive 21-1/2009, Regional or national adoption of International standards and other International deliverables, part1: adoption of international Standards.

*) Under amendment

- Replace "ISO 15392:2019" by "JS ISO 15392:2025", to confirm with the published Jordanian Standard.
- Inclusion of Bibliography into Annex A, Applying the Jordanian Directive 21-1/2009, Regional or national adoption of International standards and other International deliverables, part1: adoption of international Standards.
- Adding the titles of columns in tables 3 and 4 into the table's footnote, Applying the Jordanian Directive 21-1/2009, Regional or national adoption of International standards and other International deliverables, part1: adoption of international Standards.

●- Introduction

This Jordanian standard is intended for use by stakeholders involved during the life cycle of a construction works. More and more decision makers involved in construction projects are establishing goals to improve the sustainability performance of a construction works.

Decision-making typically relates to the planning, design, construction, use and operation, and end-of-life processes. The planning and design phases usually include the project inception/initiation, conception of need and feasibility, and initial and detailed design, all of which lead to the actual construction and occupancy of the building.

This Jordanian standard aims to demonstrate to each actor at each phase of the construction project a way to implement the nine general principles of sustainability in buildings and civil engineering works, as described in JS ISO 15392.

Although the following topics are currently outside the scope of this Jordanian standard, the guidelines in this Jordanian standard can also facilitate the different actors in

- identifying and setting performance targets,
- elaborating relevant practical tools (criteria, indicators, measurement methods) for assessing/measuring the actual performance levels, and
- formalizing a management system based on the general principles of sustainability, which can be monitored, assessed, and improved.

Application of the nine general principles to the life cycle of construction works introduces a multidimensional puzzle leading to a complex framework. Clause 4 presents the different primary elements of the framework and the related facets to be considered regarding each element. Clause 5 introduces the methodological approach for applying sustainability thinking to the development of the construction works and identifies six phases of the decision-making process and 18 sustainability objectives. Clause 6 gives application guidance developed on the basis of these objectives and related issues of concern (see Table 3) and detailed recommendations attached to each issue (see Table 4).

Sustainability in buildings and civil engineering works — Guidelines on the application of the general principles in ISO 15392

1- Scope

This Jordanian standard provides guidance for the application of the nine general principles of sustainability in buildings and civil engineering works as specified in JS ISO 15392:2025, clause 5-3. It shows the different actors involved with the construction works how to take these principles into account in their decision-making processes in order to increase the contribution of the construction works to sustainability and sustainable development.

This Jordanian standard provides a step-by-step approach for:

- encouraging the application of the general principles by all stakeholders at each stage of the project and its use, from the decision to build and the initial development of the project brief until the end-of-life of the construction works;
- helping interested parties to consider and/or incorporate sustainability thinking in all phases of the building's or civil engineering works' life cycle, for all relevant issues of concern, by raising key questions in relation to the general principles;
- understanding the outcome (effect) of the application of the general principles;
- building on acquired experience to develop best practices and engendering a continuous improvement process.

2- Normative references

The following referenced documents are indispensable for the application 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 6707-1, Buildings and civil engineering works — Vocabulary, Part 1: General terms.
- ISO 14050, Environmental management — Vocabulary.
- JS ISO 15392:2025 [1], Sustainability in buildings and civil engineering works — General principles.
- ISO/TR 15686-11, Buildings and constructed assets — Service life planning, Part 11: Terminology.
- ISO/TR 21932, Sustainability in buildings and civil engineering works — A review of terminology.

3- Terms and definitions

For the purposes of this Jordanian standard, the terms and definitions given in ISO 6707-1, ISO 14050, JS ISO 15392, ISO/TR 15686-11 and ISO/TR 21932 apply.

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

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

[1] Under development

4-Elements of the framework

Sustainability related to buildings and civil engineering works is a complex issue, and the application of a holistic approach is one of its general principles. When incorporating sustainability thinking into the different processes involved in the development of a construction works, it is relevant to keep in mind the elements presented in Table 1, as pieces of a multidimensional puzzle to be assembled. It should be noted that, often, different individual aspects will interrelate with one another.

Table 1 — Primary elements for consideration

Primary elements	Facets to be considered
Primary aspects of sustainability	- environmental protection, - economic efficiency - social and cultural needs
General principles of sustainability related to construction works (JS ISO 15392:2025, clause 5-3)	- continual improvement - equity - global thinking and local action - holistic approach - involvement of interested parties - long-term consideration and resilience - risk management - responsibility - transparency
Sustainability objectives (JS ISO 15392:2025, clause 5-2)	- provision of functionality, health, comfort, safety and accessibility; - performance management during operation; - application of life cycle thinking; - provision of economic value over time; - provision of social and cultural value over time and for all; - minimization of adverse end-of-life impacts; - limitation of adverse environmental impacts and where possible, maintenance or provision of environmental value over time; - adaptability; - efficient and responsible management throughout the process; - integration into the relevant planning schemes and policies (including sustainability planning) related to local building / town-planning and infrastructure; - involvement of interested parties and consideration of their needs; - reconciliation of contradictory interests or requirements arising from short-term and long-term planning or decision-making; - stimulation of innovation; - stimulation of a pro-active approach; - improvement of the construction sector and the built environment;

Table 1 — Primary elements for consideration (cont.)

Primary elements	Facets to be considered
Sustainability objectives (JS ISO 15392:2025, clause 5-2)	- decoupling of economic growth from increasing adverse impacts on the environment and/or society; - maximization of beneficial impacts and value through application of restorative and regenerative approaches; - reduction of adverse impacts while improving value, where impacts as well as value may be judged against any combination of the three primary aspects of sustainability.
The functions of a building and its site	- supporting main activities corresponding to users' needs - providing useable and functional indoor and outdoor spaces - providing a healthy indoor environment - providing safety and security - providing for privacy - providing a sense of place
The functions of a civil engineering works	- conveying and managing flows (material, water, energy, waste, goods, persons, information, etc.) - storing, treating, or converting flows - producing, storing, distributing, or managing energy - connecting places, functions, or people - producing services for the community - accommodating medium- or large-scale activities - providing safety and security - protecting the environment, goods, or people
Main stakeholder groups	- clients - designers: architects, engineers, and related consultants - contractors: builders, constructors, services engineers - suppliers and manufacturers - users - facility managers - community interest groups - regulatory authorities
Main types of construction works [a)]	- buildings - residential buildings - commercial buildings - public buildings - industrial buildings - etc. - civil engineering works - parks and public spaces - transportation systems - water and sewerage systems - energy generation and distribution systems - waste systems - airports - etc.

Table 1 — Primary elements for consideration (cont.)

Primary elements	Facets to be considered
Decision-making processes	- strategic planning - project definition - design - construction and handover - operation and maintenance - end-of-life strategy
Geographical scales linked to a project	- construction works and its site - local and extended neighbourhood - city or region
Physical life cycle stages of a construction works ("cradle to grave")	- production stage (including extraction of raw materials and manufacturing of products) - construction stage - in-use stage (including use, operation, maintenance, repair, replacement, and refurbishment) - end-of-life stage
Combined product and process approach (see Figure 1)	- product-oriented, in terms of performance (technical, functional, environmental, social, economic) of the resulting works - process-oriented, in terms of decision-making over the entire life of the works
[a] For each type of works (buildings or civil engineering works) the issues of concern should be studied from a relevance and significance point of view. It is not in the scope of this Jordanian standard to elaborate more on the types of works.	

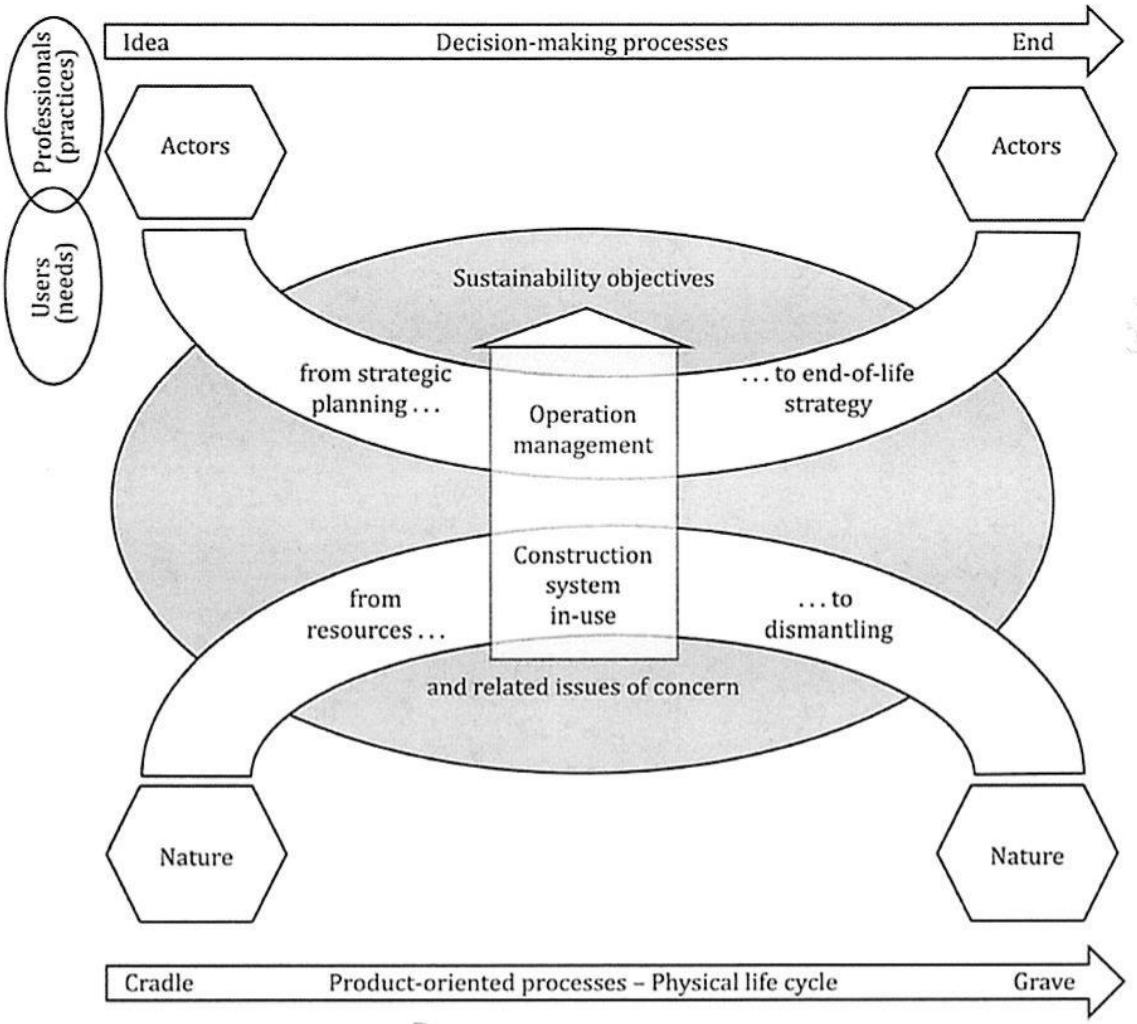

Figure 1 — Diagram of process-oriented and product-oriented life cycles

5- Methodological approach

5-1 General

The starting point of the methodology of applying sustainability thinking to development of construction works is from JS ISO 15392:2025, clause 5-1, Paragraph 1.

Six main phases are identified within the decision-making processes that relate to the life cycle of a construction works, from the first expression of a need (idea) until the end-of-life of the works. These are:

- strategic planning (leading to the project definition);
- project definition (leading to the creation of the project/client brief);
- design (conceptual, detailed);
- construction and handover (including commissioning);
- operation and maintenance (including repair, replacement, and refurbishment);
- end-of-life strategy (deconstruction, waste treatment, and disposal).

Note 1: National practice can give alternative descriptions and groupings of phases in the life cycle of a construction works. The above presents the terms used in this Jordanian standard to identify the key elements that take place in all projects.

Note 2: Refurbishment is considered as a sub-project of the use phase including, in itself, strategic planning, project definition, design and construction, and also the end-of-life of some elements such as exterior claddings, windows, partitions, and interior finishes.

From a process or management point of view, the main phases of the decision-making process related to a construction project, together with the stakeholders and their actions/decisions at each phase, are the core elements for this Jordanian standard (see Table 2).

From a point of view of sustainability objectives, the thematic issues of concern provide the basis for operational guidance and the technical and management recommendations (see Table 3 and Table 4).

In simple terms, each phase will:

- raise questions that should be addressed;
- implicate the various stakeholders or actors needing to answer these questions;
- end with an optimal result or deliverable.

This is made more explicit in Table 2.

Table 2 – The six phases of the decision-making process

Decision-making process	Questions raised	Main stakeholders (or actors)	Result/deliverables
Strategic planning	- What is the demand? - What are the needs? - What are the sustainability objectives? - What are the opportunities and constraints of the site? Why are we doing this project Whom are the beneficiaries of this project	Clients, users, community interest groups	- Preliminary objectives - Decision to proceed or not
Project definition	- What are the technical and functional requirements? - What are the environmental, economic, and social performance requirements?	Clients, users, community interest groups	- Project detailed objectives - Creation of the project/client brief [a)]

Table 2 – The six phases of the decision-making process

Decision-making process	Questions raised	Main stakeholders (or actors)	Result/deliverables
Design	- How is the demand expressed into a project, first schematically and then in detail?	Designers, engineers, clients, users, regulatory authorities, community interest groups	- A sustainable construction project with detailed drawings, scope, budget, schedules, and specifications
Construction and handover	How is the design realized and the works handed over to users?	Contractors, suppliers, manufacturers, clients, users	A sustainable construction process, a sustainable works/asset, a user guide, specifications for use
Operation and maintenance	How to operate and maintain the built environment in an effective, sustainable way?	Clients, users, facility managers, suppliers, community interest groups	A sustainable service life, including continuous improvement
End-of-life strategy	Once full obsolescence is reached, how to deal with the end-of-life, without creating damage to the environment or the community?	Clients, suppliers, contractors, community interest groups	A sustainable exit strategy and its realization, a clean site

[a] The resulting brief is expected to balance the consideration of the technical, functional, environmental, economic, and social aspects and to prioritize the related performance requirements.

The guidance in Clause 6 demonstrates to each actor, at each phase of the construction project, a way to implement the nine general principles. The guidelines can be used as a framework against which decisions can be checked. The most practical way to implement them is to translate them into sustainability objectives and related issues of concern, with both a product-oriented and a process-oriented approach.

Sustainability objectives and issues of concern are the items or requirements that should be raised and taken into consideration at different critical points throughout the project life cycle, starting with the choice of the site and the elaboration of the brief, which is a critical document. These items/requirements need practical solutions to help ensure the maximum contribution to sustainability and sustainable development from the construction works. All the actors involved in the process should have these items/requirements in mind, while knowing that JS ISO 15392 requires solutions to be given and that each of the actors has a role and a responsibility in enabling those solutions to be progressively elaborated throughout the project's life cycle.

The sustainability and sustainable development objectives identified in JS ISO 15392:2025, Clause 5-2 are presented in Table 1 as follows:

a) provision of functionality, health, comfort, safety and accessibility;

b) performance management during operation;
c) application of life cycle thinking;
d) provision of economic value over time;
e) provision of social and cultural value over time and for all;
f) minimization of adverse end-of-life impacts;
g) limitation of adverse environmental impacts and where possible, maintenance or provision of environmental value over time;
h) adaptability;
i) efficient and responsible management throughout the process;
j) integration into the relevant planning schemes and policies (including sustainability planning) related to local building/town-planning and infrastructure;
k) involvement of interested parties and consideration of their needs;
l) reconciliation of contradictory interests or requirements arising from short-term and long-term planning or decision-making;
m) stimulation of innovation;
n) stimulation of a pro-active approach;
o) improvement of the construction sector and the built environment;
p) decoupling of economic growth from increasing adverse impacts on the environment and/or society;
q) maximization of beneficial impacts and value through application of restorative and regenerative approaches;
r) reduction of adverse impacts while improving value, where impacts as well as value may be judged against any combination of the three primary aspects of sustainability.

5-2 Grouped sustainability objectives

5-2-1 General

In order to facilitate practical consideration of these 18 objectives, they have been grouped into four overarching categories, referred to as the grouped sustainability objectives in the remainder of this Jordanian standard. The grouped sustainability objectives, without indication of importance or priority, are: provision of base requirements, application of life cycle thinking, efficient and responsible management, and improvement of the construction sector and the built environment. The description, purposes and expected outcomes of each grouped sustainability objective is presented in clauses 5-2-2 to 5-2-5.

5-2-2 Provision of base requirements

5-2-2-1 Description

Provision of functionality, health, comfort, safety, accessibility and adaptability.

5-2-2-2 Purposes

- To specify performance requirements during the service life of buildings, and meet identified requirements on functionality, health, comfort, safety, accessibility and adaptability.
- To establish, at the key stages of the process, rational criteria for indoor air quality, thermal comfort, acoustical comfort, visual comfort, HVAC system controls and accessibility.
- To incorporate design and construction features that make it easy for a construction works, or its parts, to be modified in order to satisfy altered functional requirements; including changed use, occupancy and climatic loads.

5-2-2-3 Outcomes

- Provision of indoor and outdoor spaces that meet the needs of the users and other affected parties in terms of well-being, productivity and serviceability, without compromising the respect of other sustainability issues.
- Reduction in the environmental footprint by reducing waste and extending the life of built works; benefiting from energy recovery; and reducing energy consumption.

5-2-3 Application of life cycle thinking

5-2-3-1 Description

The application of life cycle thinking via provision of economic, social, cultural and environmental value over time for all, while minimising adverse end-of-life and environmental impacts.

5-2-3-2 Purpose

To bring the life cycle thinking approach into practice at key stages of the project/process, thereby enabling:

a) the optimization of short-term and long-term costs (avoiding sub-optimization and shift of liability to other parties or outside the system boundary);

b) the integration of costs within holistic assessments at different system levels;

c) comparative decision-making and evaluation of consequences within a current context, scope and chosen boundaries;

d) the analysis of validity of results and preferences stemming from different scenarios;

e) the provision of and/or access to social and cultural services facilitating social mix and good social climate, at the building scale and as a contribution to the local context;

f) the inclusion of design and construction features that make it easy for a construction works to be disassembled, and products and assemblies to be recovered or for the construction works assemblies to be easily modified and maintained;

g) heightened understanding of the environmental implications of proposed design and construction solutions, making any adverse impacts as low as is reasonably practical, and maximising environmental benefits.

5-2-3-3 Outcomes

- Decisions integrating information from life cycle thinking and analysis, dealing with environmental, economic and social issues.
- Identification and transparent documentation of quantified costs for the subject under study, over a defined period of analysis and within a defined scope.
- Construction works that contribute to the social and cultural attractiveness of the neighbourhood, leading to users' and neighbours' satisfaction.
- Construction works that contribute to social cohesion, equity and progress.
- Reduction in the environmental footprint by reducing waste and/or avoiding use of new resources through recovery of materials for reuse, recycling or energy recovery; and reduction of energy consumption by intelligent design.
- Optimization of the design and construction solution in relation to its local, regional and global environmental impacts, in both the short and long terms.

5-2-4 Efficient and responsible management

5-2-4-1 Description

Efficient and responsible management throughout the process including:

a) involvement of, and consideration of the needs of, interested parties;
b) integration into relevant planning schemes and policies related to local building/town planning and infrastructure;
c) reconciliation of contradictory interests or requirements arising from short-term and long-term planning or decision-making;
d) performance management approach during operations.

5-2-4-2 Purposes

- To generate an anticipatory sense that the problems, needs, changes and issues expected to arise throughout and beyond the life cycle will be addressed in a manner that considers sustainability aspects associated with products, components, assemblies and service systems that are part of a construction works.
- To ensure early identification of roles, needs, desires, values and requirements of interested parties, clear project organization and planning at each phase, shared decision-making, traceability, with good anticipation of risks, problems and conflict resolution.
- To ensure that management practices have a sense of place and synergies within the local environment.
- To ensure provision of a planning framework that considers the impacts and required mitigation arising from any given decision upon other stages of the life cycle; evaluating initial or current functional requirements, time-dependent shifts in those needs as well as the effects of age upon the environmental, social and economic performance of construction works.
- To satisfy the required functions of a construction works through appropriate operation and maintenance over its use phase, by means of performance indicators.
- To stimulate application of a proactive approach and heighten innovation.
- To encourage the continual evolution of the knowledge and application of practices related to the sustainability of construction works, including consideration of the impacts of non-traditional materials and systems, innovative construction and assessment procedures, and financing methods as well as inventive stakeholder feedback techniques.

5-2-4-3 Outcomes

- The capability to thoroughly plan actions for all future possibilities during the life cycle.
- A planning and decision-making framework that assesses and utilises relevant historical information from construction works and projects that had similar scope, social, economic and environmental concerns, in order to improve future performance.
- Elaboration of a sustainable and concerted brief, then an optimized project meeting the brief requirements, and a construction works reaching and maintaining the expected performances.
- Satisfaction of the client, the users and the local community, while applying responsible patterns of production and consumption.
- The opportunity for known interested parties to engage in the decision-making process from the outset of the project and maintain communication and dialogue.
- A 'good fit' within (contributing to and respecting) the local context.
- Resolution of conflicts and creation of a sustainable brief.
- Satisfaction of users and other interested parties with the brief, the design and the use.
- Integrated design process.
- Consultative processes with key stakeholders throughout the service life.
- Provision of functions at the desired quality all through use phase of the construction works.

- Potentially greater uncertainty for initial performance predictions.
- Knowledge expansion and growth of the sustainable development community in the long term.

Note: As a direct consequence of using new, or innovative, materials and techniques, there is less confidence associated with the predicted performance of the installations.

5-2-5 Improvement of the construction sector and the built environment

5-2-5-1 Description

Improvement of the construction sector and the built environment by reducing adverse impacts and decoupling economic growth from increased adverse impacts to the environment and/or society. The maximization, where possible, of beneficial impacts via application of restorative and regenerative techniques. Impacts as well as value may be judged against any combination of the three primary aspects of sustainability.

5-2-5-2 Purposes

- To improve the sustainability performance of construction works and construction processes, minimising adverse impacts while contributing to, or maintaining, environmental, economic and socio-cultural well-being.
- To encourage the adoption and implementation of environmentally and socially beneficial solutions that yield economic growth.
- To increase the consideration of environmental and social issues within options analysis and decision-making.
- To contribute directly to generating enduring net-positive benefits to social, economic and ecological systems, while considering these systems and benefits in an integrated way.
- To encourage performance and process improvement in any, and all, of the sustainability aspects without harming other processes or causing any reduction of performance.

5-2-5-3 Outcomes

- Documentation, monitoring and reporting over time – creation of databases of evidence-based solutions.
- Heightened significance of environmentally and socially beneficial projects and approaches.
- Buildings and communities that offer net-positive environmental, social and process-oriented benefits.
- Collaborative, diverse, interdisciplinary, community-based stakeholder participation throughout the life of a construction works.
- Social and economic well-being without decreasing the natural environment's resilience and capacity.

6- Application guidance

In this clause, the grouped sustainability objectives are detailed in issues of concern, each being expressed as a short list of statements, actions or recommendations. The issues of concern are referenced relative to the sustainability objective(s), as listed in Table 1, with which they are most closely associated. These are intended to make the objectives and issues more evident for the various stakeholders' consideration. Table 3 presents the list of grouped sustainability objectives and related issues of concern, and indicates whether they are linked to:

- the three primary aspects of sustainability;
- the nine general principles of sustainability related to construction works;
- either a building or civil engineering works, or both;
- either a product- or process-oriented approach, or both.

All the issues presented in Table 3 should be considered from the initiation of the project, during the project definition and the elaboration of the brief. A brief, that appropriately integrates these issues (detailing the three primary aspects of sustainability), can result in a project that contributes positively to sustainable development.

Note: Buildings and other types of construction works are designed to meet numerous requirements, expressed and established in national and international standards or regulations.

Table 4 gives detail to each issue of concern together with recommendations. The issues are also marked as to their relevance to four categories of questions.

- Who is involved in dealing with or identifying a solution to that issue?
- In which context should the issue be considered?
- To which phase of the project/process does the issue relate?
- To which stage of the life cycle of the construction works does the issue refer?

Table 3 — List of grouped sustainability objectives and issues versus primary aspects, general principles of sustainability, works and approach

Grouped sustainability objectives and related issues of concern	Aspects			General principles of sustainability									Works		Approach	
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
1 — Provision of base requirements Provision of functionality, health, comfort, safety, accessibility and adaptability.																
A1 — Description of the intended use (and related requirements) of the construction works and end-users needs							X					X			X	X
A2 — Assessment of serviceability		X	X		X		X						X		X	
A3 — Functional flexibility	X	X	X	X		X	X		X				X	X	X	
A4 — Provision of good indoor air quality	X	X	X			X			X	X			X		X	
A5 — Provision of good visual comfort		X	X				X	X	X				X		X	
A6 — Provision of good acoustic comfort		X	X				X	X					X	X	X	
A7 — Provision of good thermal comfort		X	X					X							X	
A8 — Provision of a safe and resistant construction works during exceptional events		X	X			X	X		X	X	X				X	
A9 — Provision of accessibility for all		X	X		X		X		X				X	X	X	
H1 — Adaptability for different uses		X	X	X			X		X	X			X		X	X
H2 — Adaptability in response to climate change	X	X		X			X		X				X	X	X	X
H3— Adaptability/flexibility in response to change in functional requirements (obsolescence).	X	X	X	X			X		X				X	X	X	X
2 — Application of Life Cycle thinking The application of life cycle thinking via provision of economic, social, cultural and environmental value over time for all, while minimising adverse end-of-life and environmental impacts.																
C1 — Provision of information to successive actors to ensure they are aware of the initial principles, objectives, technical and architectural choices that are specific to the construction works, and the implications of these for its operation and its disposal at the end-of-life.	X	X	X	X			X		X		X	X	X	X		X
C2 — During brief and design phases, establishment of an expected service life of the building, including maintenance, replacement and end-of-life plans.	X	X					X		X	X	X	X	X	X	X	
C3 — When making a decision, consideration of its implications for all subsequent stages of the life cycle.	X	X				X	X	X	X	X	X	X	X	X	X	X

Table 3 — List of grouped sustainability objectives and issues versus primary aspects, general principles of sustainability, works and approach (cont.)

Grouped sustainability objectives and related issues of concern	Aspects			General principles of sustainability									Works		Approach	
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
D1 – Total monetary cost of ownership		X			X				X			X	X	X	X	
D2 – Economic viability		X							X	X			X	X	X	
D3 — Life cycle cost optimisation		X			X							X	X	X	X	
D4 — Consideration of externalities	X	X	X			X	X			X	X		X	X	X	
D5 — Consideration of impacts of the construction works and related activities on the local economy		X	X			X					X		X	X	X	
D6 – Value over time		X		X					X	X			X	X	X	
E1 — Quality of social life			X	X	X	X	X		X		X		X	X	X	X
E2 — Quality of cultural life			X		X			X	X				X	X	X	X
E3 — Security		X	X		X		X	X		X	X	X	X	X	X	X
E4 — Contribution to social equity and improvement in the social climate		X	X	X	X	X				X	X	X	X	X	X	X
E5 — Social and functional diversity			X		X		X	X					X	X	X	
E6 — Socio-economic conditions		X	X		X	X	X		X		X		X	X	X	X
F1 — Ease of disassembly	X	X			X				X	X			X	X	X	
F2 — Recovery of materials for reuse and recycling potential	X	X					X		X				X	X		X
G1 — Use of resources (materials)	X	X		X	X	X	X	X	X	X	X	X	X	X	X	
G2 — Energy resources consumption	X	X		X	X	X	X	X	X	X	X	X	X	X	X	
G3 — Water resources consumption in use	X	X		X	X	X	X	X	X	X	X	X	X	X	X	
G4 — Efficiency of land use	X	X	X	X	X		X	X	X		X	X	X	X	X	
G5 — Reduction of GHG emissions	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
G6 — Reduction of other airborne emissions that have large scale effects	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
G7 — Waste reduction and management (construction and operation)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
G8 — Protection and/or enhancement of biodiversity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
G9 — Reduction of construction site pollution	X	X	X	X	X		X	X		X	X	X	X	X	X	
G10 — Management of other Environmental Risks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3 — List of grouped sustainability objectives and issues versus primary aspects, general principles of sustainability, works and approach (cont.)

Grouped sustainability objectives and related issues of concern	Aspects			General principles of sustainability									Works		Approach	
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
3 — Efficient and responsible management throughout the process Efficient and responsible management throughout the process including: 1) involvement of, and consideration of the needs of, interested parties; 2) integration into relevant planning schemes and policies related to local building / town planning and infrastructure; 3)reconciliation of contradictory interests or requirements arising from short-term and long-term planning or decision-making; and 4) performance management approach during operations																
I1 — Establishment of the sustainability policy of the client or main decision-maker and communication of the vision	X	X	X			X					X	X	X	X		X
I2 — Availability of resources (e.g. financial, technical, human, etc.)		X	X						X		X		X	X		X
I3/L3 — Implementation of an integrated multidisciplinary approach throughout the process, permitting consideration of the implications of any given decision upon all subsequent stages of the life cycle	X	X	X				X		X		X	X	X	X		X
I4 — Adoption of an iterative process and validation of the choices at each key stage	X	X	X	X			X	X			X	X	X	X		X
I7 — Formalization of contracts and responsibilities between parties	X	X	X	X			X	X		X	X	X	X	X		X
N3 – Consideration of value (socio-cultural, technical performance etc.) throughout the life cycle	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
I5/M5 — Management of risks and resilience	X	X	X			X	X		X	X	X		X	X		X
I8/B1 — Ability to operate, maintain and the achievement of the expected performance	X	X	X	X			X		X	X	X		X	X	X	X
B2 — Performance monitoring over time	X	X		X					X		X	X	X	X	X	X
N1 — Continuous performance monitoring throughout the use stage	X	X	X	X				X	X	X		X	X	X	X	X
I6 — Responsible Sourcing	X		X			X					X	X	X	X		X

Table 3 — List of grouped sustainability objectives and issues versus primary aspects, general principles of sustainability, works and approach (cont.)

Grouped sustainability objectives and related issues of concern	Aspects			General principles of sustainability								Works		Approach	
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
B3 — Replacement and refurbishment strategy	X	X	X				X		X				X	X	X	X
L1 — Understanding of the intended initial use (and related requirements) of the construction works and end-users needs	X	X	X				X	X				X	X	X	X	
K1 — Identification, characterisation and involvement of the future end-users and their needs		X	X		X			X	X			X	X	X		X
K2 — Identification and involvement of other interested parties	X	X	X		X	X		X	X			X	X	X		X
K3/ N5 – Formalised periodic management and resolution of contradictions or conflicts amongst the opinions of the stakeholders and interested parties			X		X	X		X	X	X	X	X	X	X		X
I9 — Respect of human values			X		X			X			X	X	X	X		X
B5 — User behaviour	X	X	X	X	X			X			X		X			X
K4 — Satisfaction of users and other affected parties			X	X	X		X	X	X	X			X	X		X
I10/L8 — Establishment of transparent decision- making and communication processes			X					X			X	X	X	X		X
I11/B4/ M6— Learning from experience	X	X	X	X	X			X	X	X	X	X	X	X		X
M1 — Adaptability for different uses	X	X	X		X		X		X				X		X	X
M2 — Adaptability/flexibility in response to change in functional requirements (obsolescence)	X	X	X	X		X			X	X		X	X	X	X	
M8 — Reversibility	X	X		X			X		X	X			X	X	X	
I13 — Innovation	X	X	X	X	X	X	X		X	X			X	X	X	X
I14/ J1 — Survey and assessment of the impacts on the local environment	X	X	X	X		X	X	X	X		X	X	X	X	X	X
J2 — Contribution to local appeal and the quality of life	X	X	X	X		X			X	X			X	X	X	
J3 — Creation of synergies within the existing context	X	X	X			X	X		X	X	X		X	X	X	X
J4 — Optimisation of the degree of access to public and personal transport, other services and amenities (including schools, shops, green and open spaces, etc.)	X	X	X		X	X		X					X	X	X	X
I12 — Periodic review of the management system	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
4 — Improvement of the construction sector and the built environment																

Table 3 — List of grouped sustainability objectives and issues versus primary aspects, general principles of sustainability, works and approach (cont.)

Grouped sustainability objectives and related issues of concern	Aspects			General principles of sustainability									Works		Approach	
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
Improvement of the construction sector and the built environment by reducing adverse impacts and decoupling economic growth from increased adverse impacts to the environment and/or society. The maximisation, where possible, of beneficial impacts via application of restorative and regenerative techniques. Impacts as well as value may be judged against any combination of the three primary aspects of sustainability.																
O1 — Users' feedback and lessons from experience coupled with the identification, characterisation and involvement of the future end-users and their needs			x	x	x			x	x			x	x	x		x
O6 — Implementation of an integrated multidisciplinary approach throughout the process	x	x	x	x		x	x	x	x		x		x	x		x
Q2 — Recognition of the impact of decisions upon subsequent stages of the life cycle	x	x	x		x		x		x	x	x	x	x	x		x
P1/R5 — Quality of social and cultural life and contribution to social equity and improvement in the social climate			x	x	x		x				x	x	x	x		x
R3 — Management of risks	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x
R1 — Consideration of externalities and indirect impacts		x	x		x		x			x	x		x	x		x
R4 — Innovation	x	x	x	x			x	x	x	x	x		x	x	x	x
O3 — Economic viability		x		x			x		x	x	x		x	x	x	x
P6 — Responsible sourcing of resources (personnel and materials)	x	x	x	x	x	x		x			x	x	x	x	x	x
Q1 — Functional flexibility	x	x	x	x				x	x	x		x	x	x		x

[1] Environmental .
[2] Economic .
[3] Social and cultural needs.
[4] Continual improvement.
[5] Equity.
[6] Global thinking and local action.
[7] Holistic approach.
[8] Involvement of interested parties.
[9] Long term consideration and resilience.
[10] Risk management.
[11] Responsibility.
[12] Transparency.

Table 3 — List of grouped sustainability objectives and issues versus primary aspects, general principles of sustainability, works and approach (cont.)

Grouped sustainability objectives and related issues of concern	Aspects			General principles of sustainability									Works		Approach	
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)
[13] Building. [14] Civil Engineering. [15] Product-oriented. [16] Process-oriented.																

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
1 — Provision of base requirements Provision of functionality, health, comfort, safety, accessibility and adaptability.																	
A1 — Description of the intended use (and related requirements) of the construction works and end-users needs — Describing the primary functions of the works (e.g. school, offices, retail, residential, etc.) — Defining the functional performance required for each space and user group: — spatial arrangement, connectivity and geometry (area, access, etc.); — operating conditions; — maintainability; — specific requirements. — Defining the profiles of performance required to achieve the expected levels of functionality, health, comfort, safety and accessibility	X				X	X		X	X			X			X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
A2 — Assessment of serviceability — Assessing the levels of performance attained for each space and user group — Determining whether the level of serviceability is adequate to meet the profiles of performance required, and act accordingly	X	X		X	X	X				X	X	X			X	X	
A3 — Functional flexibility — Ensuring the works ability to accommodate: — individual user requirements; — change of user requirements; — technical changes; — change of use of some areas. Note 1: Refer to the adaptability Issues of Concern, H1 to H3, under this Grouped Objective as well as Issues of Concern M1 & M2 under Grouped Objective 3.	X	X			X			X	X	X					X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
A4 — Provision of good indoor air quality																	
— Identifying and managing health risks (local radon, contaminated soil, asbestos, electromagnetic fields, CO intoxication, etc.)																	
— Taking into account the health risks for users (water, air, soil, fumes, odours, noise, electromagnetic, etc.) in the choices of design and construction principles																	
— Considering the potential for materials, products, systems used, to become sources of health risk in the future		X	X	X	X	X			X	X	X	X		X	X	X	
— Identifying and avoiding sources of moisture and mould																	
— Identifying and avoiding olfactory nuisances, from indoor and outdoor sources																	
— Paying attention that functional flexibility will not compromise the indoor air quality (e.g. regarding the ventilation system)																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
A5 — Provision of good visual comfort																	
— Providing an indoor visual environment corresponding to the intended activities in the building, including architectural and engineering aspects of daylighting and artificial lighting for users' satisfaction and well-being		X		X	X	X			X	X		X			X	X	
— Optimizing size and orientation of windows, avoid glare and reflections																	
— Maximizing pleasant views on outdoor spaces																	
A6 — Provision of good acoustic comfort																	
— Providing indoor acoustic conditions adapted to the intended activities in the building, including architectural and engineering aspects of acoustics (sound attenuation, noise reduction, for users' satisfaction and well-being)																	
— Considering outdoor sources of noise		X	X	X	X	X			X	X	X				X	X	
— Considering indoor sources of noise, including plumbing, mechanical services and process equipment																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Considering and reducing noise during the construction or refurbishment phase (for the workers, the users occupying the building, the neighbours)																	
A7 — Provision of good thermal comfort — Providing indoor thermal conditions according to the scenarios of use, in all seasons — Considering the main parameters influencing thermal comfort, as air temperature, radiant temperature, air humidity, air velocity, user's characteristics and activity, taking account of outdoor climate and activity devices — Using simulation tools in order to anticipate and improve thermal conditions of the premises during design		X	X	X	X		X		X	X	X	X			X	X	
A8 — Provision of a safe and resistant construction works during exceptional events — Identifying exceptional events that might occur — Minimizing the likelihood of unacceptable risks of injury or damage		X	X		X		X		X	X	X	X			X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Considering importance of functional continuity of activities supported by the building or infrastructure, particularly for welfare activities — Establishing a minimum level of functional performance, during and after the event, typically based on national or local codes/regulations or required by the client's brief																	
A9 — Provision of accessibility for all — Providing spaces able to be entered and used with ease by all users (with different kinds of physical or cognitive abilities), including indoor and outdoor spaces of buildings, transport infrastructure, public spaces, etc.		X			X		X		X	X					X	X	
H1 — Adaptability for different uses — Specifying to what extent the construction works should be adaptable to alternative uses on the long term — Incorporating construction systems/elements that allow building elements to be modified, relocated or removed — Designing the construction works such that there can be a change of use with little or no need to change the load bearing structure and main equipment/systems	X	X		X	X	X			X	X		X	X		X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Considering specific adaptability principles of versatility, convertibility and expandability — Designing to allow parts to be removed or upgraded without adversely affecting the performance of other parts of systems																	
H2 — Adaptability in response to climate change — Establishing weather data for the locality, considering future trends that might arise from predicted climate change — Establishing response strategy, through design or operation, that takes into account the projected range of future climate conditions		X		X	X		X	X		X		X			X	X	
H3 —Adaptability/flexibility in response to change in functional requirements (obsolescence) — Projecting trends for key systems that might lead to their obsolescence — Establishing response strategy, through design or operation, that takes into account the projected changes in the functional needs of the construction works	X	X			X			X	X	X		X	X			X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
B1 — Ability to operate and maintain — Ensuring a detailed program of commissioning of services and systems is undertaken at the end of the construction phase — Identifying entities involved in operation and maintenance of the construction works — Ensuring design intentions and objectives, operational and maintenance requirements are understood by stakeholders — Ensuring that operation and maintenance staff (internal and/or external) have, as appropriate, the skills that are necessary to meet the requirements and achieve the objectives; if needed develop a training plan — Providing a user-friendly document, such as a manual and logbook, for operation and maintenance processes, procedures and reporting; disseminate it to the operation and maintenance staff	X	X	X	X	X				X	X	X	X			X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
B2 — Performance monitoring over time Creating a plan for performance monitoring involving the following: — Selecting appropriate indicators of performance (see ISO 21929-1:2011) covering environmental, economic and social fields — Establishing the target for each indicator — Determining measurement methods (e.g., by physical measurement, surveys, questionnaires, financial analysis, etc.) and frequency for each indicator	X	X		X	X		X	X	X	X		X		X	X	X	
B3 — Replacement and refurbishment strategy — Determining functions needed, and rank them in order of criticality — Identifying the level of performance and maintenance requirements for each critical function in addition to durability — Collecting service life data of system components in order to anticipate replacements	X	X		X	X			X	X	X		X	X		X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Establishing an initial replacement/refurbishment programme/strategy based on best available techniques/technologies, life cycle cost (LCC) analysis and life cycle environmental assessment — Reviewing strategy at each decision point to ensure it remains technologically, environmentally, economically and socially sound																	
B4 — Users' feedback and lessons from experience — Implementing a programme for post-occupancy evaluation (POE) — Identifying entity who receives user's POE feedback and how this will be used to improve both performance of the construction works and users' satisfaction — Ensuring that the received feedback is passed to organisation/individual responsible for maintenance and operation of the construction works — Ensuring that decisions/actions proposed are environmentally, economically and socially sound	X		X	X	X	X		X			X	X			X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Ensuring that users are informed of decisions made/actions taken in response to their feedback																	
B5 — User behaviour — Implementing an energy, water, waste management programme for users and maintain their awareness of this programme through ongoing appropriate communication and information — Implementing a behavioural safety programme to protect the health and safety of themselves and their colleagues — Providing education and training to users about environmental, economic and social impacts of their actions and behaviour, including any particular requirements in relation to the operation of the construction works	X			X	X							X				X	
2 — Application of Life Cycle thinking The application of life cycle thinking via provision of economic, social, cultural and environmental value over time for all, while minimising adverse end-of-life and environmental impacts																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
C1 — Provision of information to successive actors to ensure they are aware of the initial principles, objectives, technical and architectural choices that are specific to the construction works, and the implications of these for its operation and its disposal at the end-of-life — Creating record for the operating actors on critical features of the works that relate to sustainability issues	X	X	X	X	X					X	X	X	X	X	X	X	X
C2 — During brief and design phases, establishment of an expected service life of the building, including maintenance, replacement and end-of-life plans — Determining the expected service life of the construction works and of its components — Defining essential maintenance and replacement plans accordingly	X	X	X		X				X	X	X			X	X	X	
C3 — When making a decision, consideration of its implications for all subsequent stages of the life cycle — When a decision is to be made, conducting a systematic review of the potential environmental, social and economic effects of that decision during the life cycle of the project,																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
e.g. through the use of LCA, LCC and/or other assessment tools																	
— Identifying entities involved in collecting data and calculating indicators, and in assessing performance — Ensuring the assessment is objective and unbiased — Using performance monitoring to assist in decision-making for operation and maintenance with the aim to establish the absolute values, distance-to-target and trends over time for each indicator Note 2: Refer to Issues of Concern B2 and N1 under Grouped Objective 3.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
D1 — Total cost of ownership Estimating/calculating total cost of ownership including sub-categories: — non-construction cost; — construction cost; — operation cost;																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— maintenance (and replacement) cost; — end-of-life (deconstruction and recycling) cost. Establishing an LCC model applying the ISO 15686-5 methodology, defining adaptable methodology options and document transparently: — scope of the analysed system; — included cost categories; — period of analysis; — scenarios for the use stage; — scenarios for maintenance and replacement; — scenarios for development of performance over time; — scenarios for price increase rates and inflation. Note 3: Refer to ISO 15686-5. — Concerning system level, defining a scope for cost analysis, in accordance to the decision at hand. Embedding that analysis in a model covering the overall construction works	X	X			X	X			X	X	X	X		X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
and the full life cycle to avoid sub-optimization, or to enable analysis of conflict of interests																	
— Concerning stakeholder interests, establishing an LCC model that allows to optimise the concerns of specific parties, but that additionally allows to conduct LCC quantifications for other interests as well Note 4: The "total cost of ownership" implies that only the costs occurring to the building owner will be considered. — Regarding dependence on methodology choices, identifying reasonable scenarios, and also investigate diverging scenarios representing more benign or more risky boundary conditions. Displaying results for the chosen scenarios combined with results for other scenario combination in order to enable the analysis of result dependency on certain scenario combinations — Enabling analysis of the LCC calculation Establishing a calculation structure and result presentation that reflects later interpretation needs. Especially allowing analysis of different cost categories, life cycle stages, main construction elements, etc. A well-structured presentation of																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
the results may serve as a basis for LCC-optimisation as well as for tracing errors and identifying trends.																	
D2 — Economic viability Gathering information related to other economic aspects than life cycle costs:																	
— income from use;																	
— available budget for operation and maintenance;																	
— risks associated with market position of the asset, potential vacancy/redundancy, development of income;																	
— development of the asset value over time;	X	X			X	X		X	X	X		X	X	X		X	X
— development of performance over time;																	
— efforts required to adapt to user or use changes;																	
— efforts required to adapt to changing requirements;																	
— set up balance of costs and income for the asset;																	
— identify development of asset economy over time;																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— identify critical points in time; — identify critical events (e.g. replacements).																	
D3 — Life cycle cost optimisation Displaying the life cycle costs accumulated over the building life cycle. For details see ISO 15686-5. Costs to be considered include: — land, infrastructure, clearing; — planning, fees, taxes; — construction; — operation, maintenance; — replacement of components; — end-of-life scenarios (refurbishment, redevelopment, deconstruction). Optimisation may also involve a comparative analysis of options. As not only the total sum of costs accumulated over the life cycle may be relevant, consider the display of annual costs, costs per building elements or technical components,																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
costs not distributable to tenants, accumulated life cycle costs, net present value, annuity. Calculation of return on investment and payback periods may additionally to different initial costs and operation costs involve differences in the revenue associated with the compared options. …																	
D3 — Life cycle cost optimisation (continued) When conducting partial analyses or e.g. technical components, it must be ensured that only differences attributable to the compared options are included. — Identifying performance targets and designate to what extent they are negotiable — When carrying out cost optimisation (or value engineering) ensuring that identified performance requirements, goals for value-over-time or sustainability targets are not jeopardized by the cost optimization — Embedding such comparisons also in overall building perspective to indicate absolute relevance — Ensuring that potential influence on income and value over time is included in evaluation of options	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Identifying potential fields for cost optimisation based on overall cost distribution, opportunities and constraints — Conducting life cycle cost optimisation at significant decision points throughout the decision-making process — Maintaining former calculations as reference in order to display the direction of development — Ensuring optimisation is not entirely dependent on some external parameters, especially if their development over time is unsure and beyond the control of involved stakeholders — Applying different scenarios or parameters to comparative LCC calculation of options, to ensure optimisation is reliable and resistant to smaller changes in the business environment — Introducing priorities for ranking of options, such as return on investment, payback period, relevance with respect to overall cost, dependency on external factors, robustness to development scenarios, impact on other concerns, goals or priorities																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
D4 — Consideration of externalities																	
— Identifying parameters of concern or aspect external to the project and the actors involved	X	X			X	X	X	X	X	X	X	X	X		X	X	X
— Evaluating costs versus benefits of these externalities in monetary terms																	
D5 — Consideration of impacts of the construction works and related activities on the local economy																	
— Identifying economic inter-relation with other economic activity in the area and the regions	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X
— Identifying impacts on other business and other activity related to the project																	
— Encouraging positive impacts on the local economy																	
D6 — Value over time																	
— Considering maintainability, flexibility and adaptability to enable economic performance to be maintained in changing market conditions or in response to changes in user requirements	X	X	X	X	X				X	X		X		X	X	X	
— Minimizing risk of obsolescence occurring																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
E1 — Quality of social life — Identifying the existence of green spaces, leisure and sporting amenities, local associations in the neighbourhood — Providing users with reserved spaces (indoor and outdoor) for rest and relaxation, and enable all the users to enjoy them, and manage the proper use of these spaces — Providing spaces to meet neighbours or other people and develop conditions for social interaction — Improving living and working conditions of inhabitants and/or users, according to their needs, e.g. for elderly — Ensuring better connectivity between dwellings and working places — Looking for opportunities to: — provide benefits for the neighbourhood, in terms of quality of life, new services, or other advantages; — and contribute to meeting identified local/regional social and cultural needs.	X	X	X	X	X	X		X	X	X	X	X			X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
E2 — Quality of cultural life Consideration of the extent the construction works will assist with: — preservation, restoration or highlighting existing cultural heritage, including natural and built environment, local traditions and know-how; — facilitating cultural life, exchanges and diversity; — providing easy access for everybody to social and cultural information networks; — contributing to education of people to the environment and to sustainability.	X	X		X	X	X		X	X	X		X				X	
E3 — Security — Identifying potential risks for the construction works and their users — Ensuring the works provide conditions for and give a sense of security for users, in all spaces, especially in outdoor spaces, during the day and night, including when accessing the works site (transport) and nearby services (shops, schools, etc.)	X	X		X	X	X			X	X		X		X		X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Considering designs and technologies that offer personal and material security, data protection and security against crime and vandalism, according to the identified risks																	
E4 — Contribution to social equity and improvement in the social climate — Reducing potential for social tension or dispute through high quality design (e.g. good sound proofing between dwellings, equitable access to outdoor spaces and facilities) and/or operability/operation and maintainability/maintenance of common areas and equipment — Minimising disturbances and nuisances on neighbours during construction and operation	X	X	X	X	X	X			X	X	X	X			X	X	
E5 — Social and functional diversity — Facilitating social diversity in the project itself, or contribute to the social mix at the neighbourhood scale — Contributing to the functional diversity in the project itself where appropriate, or contribute to functional mix of the development at the neighbourhood scale	X	X			X	X		X	X	X		X				X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
E6 — Socio-economic conditions — Through the project, facilitating the provision of jobs, if possible permanent ones — Contributing to improvement in education level and to development of professional skills — Preventing social exclusion and combat poverty — Encouraging social cohesion, for instance between generations — Ensuring reasonable prices for purchase, rent and/or services, or affordable/variable prices according to socio-economic conditions of the local population	X	X	X		X	X		X	X	X		X			X	X	
F1 — Ease of disassembly — Enabling the products/systems to be easily taken apart and recovered at the end of its useful life — Designing demountable systems (e.g. modular, panelised or prefabricated components)																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Considering specific disassembly principles including accessibility, exposed and/or reversible connections, refurbishability, and simplicity		X	X	X	X				X	X			X	X	X		X
— For existing construction works: Identifying materials containing hazardous substances that may be released during disassembly and take appropriate measures to avoid health risks																	
— For new construction works: Avoiding use of materials containing hazardous substances that may be released during disassembly																	
F2 — Recovery of materials for reuse and recycling potential																	
— Identifying services in place in the local market that can provide a means for collection of recovered material for reuse, recycling, or for energy production																	
— Choosing construction products/systems that are capable of being reused, recycled or recovered for energy		X	X	X	X	X	X			X		X	X	X		X	X
— Giving preference to the use of materials with inherent finishes, i.e. materials that can be left in their most basic																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
state without an applied finish that may prevent reuse or recycling																	
G1 — Use of resources (materials) — Considering the environmental benefits of reusing existing major elements/structures/frames/foundations — Establishing a basis for choices of materials and set environmental targets, e.g. embodied energy, renewable materials — Considering potential for use of recovered/recycled materials or elements	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X
G2 — Energy resources consumption — Establishing basis for improving energy efficiency and setting targets across all phases of the project — Considering options available to minimise energy use: — reviewing possible passive design strategies to optimise thermal performance, insulation, air-tightness and ventilation;																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— using of natural ventilation and energy efficiency options relating to heating/cooling, hot water systems, lighting systems and day-lighting, internal transport (lifts, escalators etc.). — Developing a programme for commissioning of building systems and system controls and taking account of seasonal variations — Consider options available to optimise use of renewable energy sources and opportunities for exporting excess energy generated	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X
G3 — Water resources consumption in use																	
— Establishing basis for improving water efficiency and set targets across all phases of the project. — Considering options available to minimise water consumption and possible design strategies to optimise performance, (e.g. low/zero water use sanitary fittings, rainwater/grey water recycling/use) — In landscaping, ensuring the vegetation choices compatible with current and anticipated rainfall patterns	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Optimising water management and irrigation systems to control water consumption																	
G4 — Efficiency of land use Ensuring that the project: considers efficient land use by — using previously developed land/contaminated or land of low ecological value with a and long-term ecology management/improvement plan; — avoiding the use of previously undisturbed land and minimising impacts on areas of high ecological value/outstanding natural beauty; — optimising the use of space and land take through; — fitting development density and the relationship with local context, surroundings and needs; — efficiently using internal and external spaces, consider: flexibility and area of internal spaces are appropriate for intended use; — considering potential/ease of adaptation for future use/change of use. And adaptability over time	X	X			X	X	X	X	X	X				X			X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
G5 — Reduction of GHG emissions — Determining action to be taken to reduce likelihood of emissions of greenhouse gases other than through energy consumption (examples include: i) prevention of emissions of materials such as refrigerants and other compounds that have high global warming potential and; ii) increasing ease of disassembly, as discussed under issue of concern F1 of this grouped objective, to avoid waste creation and resource consumption)	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X
G6 — Reduction of other airborne emissions that have large scale effects — supplying heat and/or cooling from a system that minimises NOx emissions, and therefore reduces pollution of the local environment	X	X		X	X	X		X	X	X		X		X		X	X
G7 — Waste reduction and management (construction and operation) . — Promoting resource efficiency through effective management and reduction of waste:																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— considering how design and fabrication can optimise use of materials (dimensions, off-site pre-assembly) to avoid unnecessary waste of materials; — establishing a waste management plan for the construction works for each key phase of its life cycle, (construction, use, demolition/disposal); — considering options available for reduce/recycling of waste and avoidance of long-distance transportation of waste and waste going to landfill; and — setting targets for waste at each stage of the process	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
G8 — Protection and/or enhancement of biodiversity — Establishing measures that will contribute to reducing adverse effects of land use through actions to maintain and enhance the ecological value of the site as an integral part of development — Developing a biodiversity action plan which includes: — design features to encourage wildlife and habitat development;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— protection of local habitat during construction; — landscape planning and management to protect/enhance future biodiversity.																	
G9 — Reduction of construction site pollution — Setting requirements for plant and equipment fuel type/efficiency and maintenance — Planning necessary steps to minimise surface water run-off and prevent contamination of the local environment	X	X	X		X	X	X	X	X	X	X		X	X	X		X
G10 — Management of other Environmental Risks — Establishing strategies for minimising other environmental impacts as appropriate — Addressing resilience and resistance to flooding — Considering surface water run-off — Ensuring resilience and resistance of structure to fire — Considering options for on-site sewage treatment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
3 — Efficient and responsible management throughout the process Efficient and responsible management throughout the process including: 1) involvement of, and consideration of the needs of, interested parties; 2) integration into relevant planning schemes and policies related to local building/town planning and infrastructure; 3) reconciliation of contradictory interests or requirements arising from short-term and long-term planning or decision-making; and 4) performance management approach during operations																	
I1 — Establishment of the sustainability policy of the client or main decision-maker and communication of the vision — Defining the key elements of the sustainability policy for the project — Communicating this policy to the stakeholders	X				X	X	X	X									

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
I2 — Availability of resources (e.g. financial, technical, human)																	
— Ensuring the resources available for the project correspond to the ambitions of the project	X				X			X	X			X				X	
— Assuring the resources availability for the operation and maintenance to allow an optimal use of the works																	
I3/L3 — Implementation of an integrated multidisciplinary approach throughout the process, permitting consideration of the implications of any given decision upon all subsequent stages of the life cycle																	
— Identifying the necessary professional skills needed	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
— Facilitating integrated working																	
I4 — Adoption of an iterative process and validation of the choices made at each key stage																	
— Undertaking regular project reviews	X			X	X				X	X	X			X	X	X	X
I7 — Formalization of contracts and responsibilities between parties																	
— Establishing contracts suitable for the project and its specificities	X	X	X	X	X			X	X	X	X	X	X		X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Making sure that interfaces between actors are well organized and formalized																	
N3 – Consideration of value (socio-cultural, technical performance, etc.) throughout the life cycle	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
I5/M5 — Management of risks and resilience — Anticipating the administrative, technical and human issues, through early planning in sufficient detail — Identifying and assessing the financial, social, environmental, technical risks, considering short-, medium- and long-term issues — Determining acceptability and acting accordingly — Undertaking a regular review	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X
I8/B1 — Ability to operate, maintain and the achievement of the expected performance — Setting targets for performance — Carrying out a performance assessment and reviewing if any significant change in design or targets occurs																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— When the targets are not met, determining acceptability and acting accordingly — Implementing best practice certification schemes, labels and relevant standards — Ensuring a detailed program of commissioning of services and systems is undertaken at the end of the construction phase — Identifying entities involved in operation and maintenance of the construction works — Ensuring design intentions and objectives, operational and maintenance requirements are understood by stakeholders — Ensuring that operation and maintenance staff (internal and/or external) have, as appropriate, the skills that are necessary to meet the requirements and achieve the objectives; if needed developing a training plan — Providing a user-friendly document, such as a manual and logbook, for operation and maintenance processes, procedures and reporting; disseminating it to the operation and maintenance staff	X	X	X	X	X			X	X	X	X	X		X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
B2 — Performance monitoring over time Creating a plan for performance monitoring involving the following: — Selection of appropriate indicators of performance (see ISO 21929-1:2011) covering environmental, economic and social fields — Establishing the target for each indicator — Determining measurement methods (e.g. by physical measurement, surveys, questionnaires, financial analysis, etc.) and frequency for each indicator	X	X		X	X		X	X	X	X		X		X	X	X	
N1 — Continuous performance monitoring throughout the use stage		X		X	X			X	X	X	X	X				X	
I6 — Responsible Sourcing — Establish a responsible sourcing strategy for products and services	X	X	X	X	X				X	X	X	X		X	X	X	
B3 — Replacement and refurbishment strategy																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Determining functions needed, and rank them in order of criticality — Identifying the level of performance and maintenance requirements for each critical function in addition to durability — Collecting service life data of system components in order to anticipate replacements — Establishing an initial replacement/refurbishment programme/strategy based on best available techniques/technologies, life cycle cost (LCC) analysis and life cycle environmental assessment — Reviewing strategy at each decision point to ensure it remains technologically, environmentally, economically and socially sound	X	X		X	X			X	X	X		X	X		X	X	X
L1 — Understanding of the intended initial use (and related requirements) of the construction works and end-users needs	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	
K1 — Identification, characterisation and involvement of the future end-users and their needs																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Identifying the demographic features and other characteristics of the end users — Identifying the end users' needs, desires, values, and requirements? — Deciding when and how the end-users should be involved.	X	X		X	X			X	X	X		X			X	X	
K2 — Identification and involvement of other interested parties — Identifying other key interested parties (e.g. the neighbours, local authorities, local associations professionals) (service providers and operators) — Deciding when and how the other interested parties should be involved — Establishing their level, importance, influence and their role	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
K3/N5 – Formalised periodic management and resolution of contradictions or conflicts amongst the opinions of the stakeholders and interested parties																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Ensuring early identification of contradictions or conflicts and their resolution	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
I9 — Respect of human values — Identifying the relevance and significance of issues related to human values and address them appropriately (e.g. responsible behaviour, labour rights, consumer issues, equity, ethical behaviour, according to the principles of ISO 26000)	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X
B5 — User behaviour — Implementing an energy, water, waste management programme for users and maintain their awareness of this programme through ongoing appropriate communication and information — Implementing a behavioural safety programme to protect the health and safety of themselves and their colleagues — Providing education and training to users about environmental, economic and social impacts of their actions and behaviour, including any particular requirements in relation to the operation of the construction works	X			X	X							X				X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
K4 — Satisfaction of users and other affected parties — Deciding how and when the satisfaction of the users will be determined and assessed — Deciding how and when the satisfaction of the other interested parties will be determined and assessed — Taking into account their concerns in order to improve satisfaction and draw lessons for future projects	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
I10/L8 — Establishment of transparent decision- making and communication processes — Ensuring traceability and good quality documentation (e.g. relevant, complete, adapted to the user/reader, up-to-date) and its appropriate dissemination — Adopting factual approach to decision-making, based on best available data and information and consequence analysis	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
I11/B4/M6 — Users' feedback and learning from experience — Benefitting from past experiences or projects																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Capitalizing present experience for continuous improvement — Implementing a programme for post-occupancy evaluation (POE)																	
— Identifying entity who receives user's POE feedback and how this will be used to improve both performance of the construction works and users' satisfaction — Ensuring that the received feedback is passed to organisation/individual responsible for maintenance and operation of the construction works — Ensuring that decisions/actions proposed are environmentally, economically and socially sound — Ensuring that users are informed of decisions made/actions taken in response to their feedback	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
M1 — Adaptability for different uses	X	X			X	X	X	X	X	X		X		X	X	X	
M2 — Adaptability/flexibility in response to change in functional requirements (obsolescence)	X	X		X	X	X		X		X	X	X	X			X	X
M8 — Reversibility	X	X	X		X			X	X	X	X			X	X	X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
I13 — Innovation — Investigating whether innovative solutions/approaches have the potential to provide a more sustainable solution. (technical, organisational, financial, etc.)	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X
I14/J1 — Survey and assessment of the impacts on the local environment — Conducting a multi-criteria survey/analysis of the local environment prior to setting objectives for the project — Determining the needs, opportunities, constraints and limitations for the works in context (e.g. national, regional and/or local planning policies and regulations) — Implementing decisions or solutions based on the findings of the survey — Developing a work schedule and traffic plans — Limiting the impacts on the local environment (e.g. due to noise, dust, light pollution, glare, localised wind effects)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
J2 — Contribution to local appeal and the quality of life																	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Identifying the factors (shape, outdoor spaces, landscape, etc.) to be considered when setting the works in the local context — Assessing the project's contribution to the improvement of the neighbourhood/district image, the local economy and the quality of life	X	X		X		X	X	X	X	X		X		X		X	
J3 — Creation of synergies within the existing context — Identifying the factors (links, space and functions, continuity, contribution) that fit within and enhance the local environment — Ensuring coherence between the site development and the policy of the local community regarding sustainable development planning, including environment protection (energy, sewage, waste, rainwater, water resource, services, transport, risks, etc.)	X	X	X	X		X	X	X	X	X		X		X	X	X	
J4 — Optimisation of the degree of access to public and personal transport, other services and amenities (including schools, shops, green and open spaces, etc.) — Analysing the presence, quality and proximity of local transport modes, other services and amenities	X	X		X		X	X	X	X	X		X		X		X	

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
— Initiating dialogue with the local community representatives in order to ascertain what opportunities or mechanisms can be developed to improve the situation																	
I12 — Periodic review of the management system — Checking effectiveness of existing management system and considering improvement as necessary	X	X	X	X	X			X	X	X	X	X	X				
4 — Improvement of the construction sector and the built environment Improvement of the construction sector and the built environment by reducing adverse impacts and decoupling economic growth from increased adverse impacts to the environment and/or society. This includes the maximisation, where possible, of beneficial impacts via application of restorative and regenerative techniques. Impacts as well as value may be judged against any combination of the three primary aspects of sustainability.																	
O1 — Users' feedback and lessons from experience coupled with the identification, characterisation and involvement of the future end-users and their needs				X	X	X	X	X	X	X		X	X			X	X
O6 — Implementation of an integrated multidisciplinary approach throughout the process	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
Q2 — Recognition of the impact of decisions upon subsequent stages of the life cycle		X	X	X	X	X	X	X	X	X	X	X		X	X	X	
P1/R5 — Quality of social and cultural life and contribution to social equity and improvement in the social climate	X	X				X	X	X	X			X				X	X
R3 — Management of risks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
R1 — Consideration of externalities and indirect impacts	X	X			X	X	X	X	X	X		X	X	X		X	X
R4 — Innovation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
O3 — Economic viability	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
P6 — Responsible sourcing of resources (personnel and materials)	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	
Q1 — Functional flexibility	X	X		X	X			X	X	X		X		X		X	

[1] Client
[2] Designer/Engineer
[3] Contractor/Builder
[4] Operator
[5] Construction works
[6] Neighbourhood
[7] City/Region
[8] Strategic planning
[9] Project Definition

Table 4 — Detailed list of grouped sustainability objectives, issues of concern, guidance and recommendations (cont.)

Grouped sustainability objectives and related issues of concern	Who (main actor)				Context			Project-Process Phase						Life Cycle Stage			
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)
[10] Design																	
[11] Construction and handover																	
[12] Operation and maintenance																	
[13] End-of-life strategy																	
[14] Product ion																	
[15] Construction																	
[16] In-use																	
[17] End-of-life																	

Annex A
(informative)
Bibliography

[1] ISO 15686-1, Buildings and constructed assets — Service life planning, Part 1: General principles and framework.
[2] ISO 15686-2, Buildings and constructed assets — Service life planning, Part 2: Service life prediction procedures.
[3] ISO 15686-3, Buildings and constructed assets — Service life planning, Part 3: Performance audits and reviews.
[4] ISO 15686-4, Building Construction — Service Life Planning, Part 4: Service Life Planning using Building Information Modelling.
[5] ISO 15686-5, Buildings and constructed assets — Service life planning, Part 5: Life-cycle costing.
[6] ISO 15686-7, Buildings and constructed assets — Service life planning, Part 7: Performance evaluation for feedback of service life data from practice.
[7] ISO 15686-8, Buildings and constructed assets — Service-life planning, Part 8: Reference service life and service-life estimation.
[8] ISO/TS 15686-9, Buildings and constructed assets — Service-life planning, Part 9: Guidance on assessment of service-life data.
[9] ISO 15686-10, Buildings and constructed assets — Service life planning, Part 10: When to assess functional performance.
[10] ISO 20887, Sustainability in buildings and civil engineering works — Design for disassembly and adaptability — Principles, requirements and guidance.
[11] ISO 21929-1, Sustainability in building construction — Sustainability indicators, Part 1: Framework for the development of indicators and a core set of indicators for buildings.
[12] ISO 26000, Guidance on social responsibility.
[13] EN 15643-1:2010, Sustainability of construction works — Sustainability assessment of buildings, Part 1: General framework.
[14] EN 15643-2:2011, Sustainability of construction works — Assessment of buildings, Part 2: Framework for the assessment of environmental performance.
[15] EN 15643-3:2012, Sustainability of construction works — Assessment of buildings, Part 3: Framework for the assessment of social performance.
[16] EN 15643-4:2012, Sustainability of construction works — Assessment of buildings, Part 4: Framework for the assessment of economic performance.
[17] EN 15804:2012, Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products.
[18] EN 15978:2011, Sustainability of construction works — Assessment of environmental performance of buildings — Calculation method.
[19] prEN 16627:2013, Sustainability of construction works — Assessment of economic performance of buildings — Calculation method.
[20] prEN 16309:2013, Sustainability of construction works — Assessment of social performance of buildings — Methods.
[21] Taking sustainable development into account in projects — The French RST02 evaluation grid user guide, CERTU, ISBN 978-2-11-098186-8, January 2009 (English version).

[22] Smart-ECO Vision — EU Project "Smart-ECO" — Contract FP6-2005-TREN4-038699 Sixth Framework Programme; Priority 6.1.3.1.2.1: "ECO-BUILDINGS".
[23] CIB, "Agenda 21 on sustainable construction", CIB report publication 237, ISBN 90-6363-015-8, July 1999.