



IQI Infrastructure Standard - Core

IQI STANDARD IQC1

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Common Requirements for Determining Infrastructure Quality

INFRASTRUCTURE QUALITY INITIATIVE

Foreword

Infrastructure makes everyday activities possible. Buildings provide places to live and work, bridges provide passage, water systems deliver water, and data centers provide computing, storage, and connectivity capabilities used to deliver digital services.

These objects serve different purposes and often depend on one another. Their Quality concerns whether they realize their Intended Functions and Intended Results under the relevant conditions, from early development through operation and eventual decommissioning.

A component may meet its own requirements while the whole infrastructure does not fulfill its intended purpose. The absence of an observed failure is also insufficient to establish Quality. The parts, people, Work, Results, and connections must be examined together.

This Standard provides common Factors and Indicators for examining infrastructure Quality. It begins with what the declared infrastructure is intended to do and produce, then guides examination of what is actually realized. Context-specific requirements and Quality Outcome Criteria provide the detail needed for each application.

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Introduction — A common language for infrastructure quality

A bridge, a data center, and an apartment building serve different purposes. Yet examining their Quality begins with the same questions: What is the infrastructure intended to do? What results should it produce? What requirements apply? What Evidence shows whether those requirements are fulfilled?

This Standard provides a common language for answering those questions. Its fourteen Quality Factors identify the major dimensions of infrastructure Quality. Its eighty-three Quality Indicators identify distinct points of examination within those dimensions. The IQI Factors and Indicators Justification articles explain why each is necessary.

The examination begins by identifying the infrastructure as a Quality Object—what is being examined. This involves more than naming a physical asset. The object is identified through its Intended Functions and Intended Results and the Work and Results essential to realizing them. It may begin as plans and studies, become a built and operating system, change through maintenance or modification, and eventually be decommissioned. Records and other Results may remain relevant after the physical infrastructure is gone.

Essential contributions may come from designers, contractors, operators, inspectors, authorities, and connected infrastructure. They must be included in the declared scope or addressed through identified Interfaces. These functional connections do not necessarily follow ownership, organizational, contractual, or physical boundaries. Accounting for an external contribution does not make the contributor's entire organization part of the object.

The Core establishes a General Core Requirement under each Indicator. Context-specific documents may add detail and establish Quality Outcome Criteria stating the expected states or results for a particular application. Where no Context Guide is needed, these criteria may be established directly under the general requirement. The common Factors and Indicators remain the same; the application reflects the infrastructure being examined.

The following sections explain how to identify the object, apply requirements, examine Evidence, determine what can be established about Quality, and communicate the resulting Findings. The Factor descriptions and Indicator requirements provide the common basis for this examination. Annex A illustrates its application to different infrastructure objects, life-cycle stages, and Scales.

The governing WQI and IQI vocabularies define the terms used here. WQI foundational articles explain the methods and their relationships, while related WQI standards establish requirements for Evidence Quality, Claim Quality, Organization Quality, and Management System Quality. The Core introduces these subjects and directs readers to those publications for fuller treatment.

1 Scope, Purpose, and Use

1.1 Scope

This Standard applies to infrastructure generally, including buildings, data centers, fixed transportation infrastructure, water systems, energy facilities, networks, and larger interconnected systems. Fixed transportation infrastructure includes objects such as roads, bridges, tunnels, railway infrastructure, and stations. Moving vehicles and transportation services are not included merely because they use that infrastructure; relevant interactions with them remain part of the examination.

It establishes common Quality Factors, Quality Indicators, and general requirements for examining a declared Infrastructure Quality Object. The object may be a constituent, a facility, a network, or a larger system, provided that what is being examined is clearly identified.

Its scope includes the Work and Results essential to realizing the object's Intended Functions and Intended Results during the relevant life-cycle stages. These may extend from conceptual development, investigation, and design through construction, commissioning, operation, maintenance, modification, decommissioning, and continuing Results after physical removal.

Essential external contributions shall be accounted for within the declared scope or through identified Interfaces. Their relevance does not depend solely on ownership, organizational, contractual, or physical boundaries.

The Standard may support determinations concerning selected Indicators or Factors, or the whole declared Infrastructure Quality Object. Each determination shall remain within its stated scope.

The Core does not prescribe universal technologies, engineering methods, technical solutions, or acceptance thresholds. Application-specific detail is established through the applicable requirements, Quality Outcome Criteria, and Reference Layer.

1.2 Purpose

The purpose of this Standard is to provide a common basis for understanding and determining infrastructure Quality across different infrastructure types, life-cycle stages, and scales.

The fourteen Core Quality Factors identify the common Quality dimensions, and the eighty-three Core Quality Indicators identify the distinct points of examination within them. This Core establishes a General Core Requirement under each Indicator. Context-specific requirements and Quality Outcome Criteria provide the detail needed for the particular infrastructure being examined.

The Standard guides users from identifying what the infrastructure is intended to do and produce to examining Evidence, making a Quality Determination, and communicating supported Findings. It helps make clear what has been examined, what the Evidence supports, and what remains uncertain or unresolved.

This common basis also allows people working in different infrastructure fields to understand and use one another's Findings while preserving the technical distinctions of each application.

1.3 Intended Users

This Standard is intended for people who need to understand, examine, communicate, or make decisions about infrastructure Quality.

Users may include owners, operators, designers, constructors, manufacturers, maintenance personnel, inspectors, assessors, regulators, workers, infrastructure users, communities, financiers, insurers, and researchers.

The common Factors and Indicators help these users address the same infrastructure from their different responsibilities and perspectives. The scope and depth of each application depend on the declared Quality Object, the purpose of the determination, and the Applicable Basis.

Use of this Standard does not by itself confer certification, regulatory approval, accreditation, or IQI endorsement.

1.4 Position Within Whole Quality

This Standard applies the Whole Quality approach to infrastructure. WQI provides the common concepts and methods; IQI establishes the infrastructure Factors, Indicators, and general requirements through which that approach is applied.

The governing WQI Vocabulary and IQI Vocabulary establish the meanings of terms used in this Core. The WQI Foundational Theory Articles explain the reasoning behind the approach, while the IQI Factors and Indicators Justification articles explain the basis for the fourteen Factors and eighty-three Indicators.

WQI Foundational Article 10 explains the methodology for Quality Outcome Criteria. Related WQI standards govern Evidence Quality, Quality Claims, Organization Quality, and Management System Quality. This Core uses those methods and directs readers to their governing publications for fuller treatment.

The Quality of infrastructure remains distinct from the Quality of an organization or its management system. Findings about either may contribute relevant Evidence, but do not by themselves establish the Quality of the infrastructure.

2 Start With the Infrastructure Being Examined

2.1 What the Infrastructure Is Intended to Do

To examine infrastructure Quality, first establish what the infrastructure is intended to do and what results it is intended to produce. These Intended Functions and Intended Results provide the starting point for identifying the Quality Object and its requirements.

A bridge may be intended to carry people and vehicles across an obstacle under specified conditions. A data center may be intended to provide the power, cooling, space, and connections needed for computing equipment to operate. An apartment building may be intended to provide habitable accommodation and the services needed for its use.

Work means what is performed, such as designing, constructing, inspecting, or maintaining. Results are what that Work produces, changes, preserves, or makes available. Completing the Work does not, by itself, establish that the required Result has been achieved.

The declared Infrastructure Quality Object's Intended Functions and associated Intended Results shall be stated, together with the conditions under which they are required or intended to be realized. The statement shall address the relevant life-cycle stage and make clear whose needs and uses the infrastructure is intended to serve.

These statements guide the identification of essential Work, Results, constituents, and external contributions. They also provide the basis for establishing Functional Requirements under Factor 1.

2.2 How the Infrastructure Changes Through Its Life Cycle

Infrastructure changes throughout its life. What is being examined may initially exist as a concept, study, or design, later become a physical operating system, and eventually be removed. Its description as a Quality Object must reflect the stage being considered.

The relevant life-cycle stages shall be identified. These may include conceptual development, feasibility studies and investigations, requirements development, design, construction and installation, commissioning, operation, maintenance, repair, modification, decommissioning, removal, and recultivation, as applicable.

At each relevant stage, the Infrastructure Quality Object shall be identified through the Work and Results essential to realizing its Intended Functions and Intended Results. The examination shall address what is required at that stage and any requirements concerning transitions to other stages.

For example, a design-stage examination concerns the design Work and Results and what they support about the proposed infrastructure. It does not establish the actual Quality of infrastructure that has yet to be constructed or operated.

At decommissioning, continued operation may no longer be intended. The examination shall address the closure, removal, restoration, monitoring, and continuing Results required at that stage. Documentation, restored land, remaining installations, or other Results may remain relevant after physical removal. Where such requirements remain, removal of the physical asset shall not, by itself, be treated as completion of the infrastructure's life-cycle obligations.

2.3 Boundaries and Interfaces at Each Relevant Stage

Boundaries make clear what is included in the Infrastructure Quality Object. Interfaces identify where its constituents connect with one another or with other objects. Both may change as the infrastructure develops, operates, or is decommissioned.

The Boundaries and relevant Interfaces shall be identified for each life-cycle stage being examined. Their identification shall follow the object's Intended Functions, Intended Results, and essential Work and Results. Boundaries shall not be assumed to coincide with ownership, organizational, contractual, or physical limits.

Relevant Interfaces may involve physical connections, information exchanges, human interaction, or dependencies on external Work and Results. The examination shall account for conditions at these Interfaces that affect realization of the declared object's Intended Functions and Intended Results.

A connection does not by itself make two objects one Quality Object. Where connected objects remain separately defined, their respective Boundaries and the contributions exchanged through their Interfaces shall be clear.

The description of Boundaries and Interfaces shall be reviewed when a change affects what must be included in the examination.

2.4 Essential Work and Results, Including External Contributions

Infrastructure depends on contributions from many parties. Design, construction, inspection, maintenance, or other essential Work may be performed outside the organization that owns or operates it. These contributions remain relevant to infrastructure Quality.

Work and Results essential to establishing, preserving, restoring, modifying, or examining realization of the declared object's Intended Functions and Intended Results shall be accounted for, whether

provided internally or externally. They shall be included within the declared scope or addressed through identified Interfaces, according to their role in the infrastructure being examined.

For example, an externally prepared design or a contracted maintenance activity may itself be examined as a Quality Object. Its contribution to the infrastructure shall also be considered, including whether its Results are suitable for their intended use and properly integrated with other relevant Work and Results.

Outsourcing shall not, by itself, exclude an essential contribution from consideration. Including that contribution does not make the entire external organization part of the Infrastructure Quality Object.

2.5 The Whole Infrastructure, Its Parts, and Fractal Determination

Infrastructure Quality depends on both its constituents and how they work together. Satisfactory parts do not automatically make a satisfactory whole.

A constituent may itself be examined as a Quality Object with its own Intended Functions, Intended Results, Work, and Results. It may be a component, subsystem, activity, or a Result such as a design. Applying the same Quality approach to separately identified objects at different scales is referred to as Fractal Quality Determination.

The common Factors and Indicators shall be applied to each declared object, with requirements, Quality Outcome Criteria, and examination detail appropriate to that object. Fractal determination applies across all Factors and Indicators.

When constituent Findings are used in determining the Quality of a larger infrastructure object, their relevance, scope, conditions, and limitations shall be considered. The examination shall also address the Interfaces, dependencies, and combined behavior needed to realize the larger object's Intended Functions and Intended Results.

A determination concerning a constituent shall not be treated as establishing the Quality of the whole. Equally, a determination concerning the whole shall not be assumed to establish the Quality of every constituent for its separate intended use.

2.6 Descriptions and Models of the Infrastructure Quality Object

A description or model helps people understand what infrastructure is being examined and how its relevant parts and contributions fit together. It may take the form of a written description, drawing, diagram, digital model, or a combination of these.

The description or model shall identify the declared object, its Intended Functions and Intended Results, and the relevant life-cycle stage. It shall make clear the Boundaries, Interfaces, constituents, and essential external contributions needed to understand the scope of the examination.

The level of detail shall be appropriate to the intended Quality Determination. Assumptions, simplifications, and omissions that could materially affect the examination shall be stated. The description or model shall be updated when relevant changes affect its suitability for that determination.

A description or model represents the object; it does not by itself establish the object's actual condition or Quality. Where a model is used as Evidence, its suitability and limitations shall be examined for the particular use.

2.7 Scale and Methodological Resolution

Scale identifies the Quality Object being examined—for example, a component, a building, a facility, or a network. Methodological resolution identifies the depth and detail needed to examine that object for the intended Quality Determination.

The Scale and methodological resolution shall be established for the examination. The chosen resolution shall be sufficient to address the relevant requirements, Interfaces, dependencies, and conditions that could materially affect the Findings.

A change in Scale may change the declared Quality Object. A change in resolution changes the detail of examination without necessarily changing the object. For example, examining a building's ventilation system as a separate object changes the Scale; examining the same building in greater detail changes the resolution.

The same Core Factors and Indicators shall be used across relevant Scales and resolutions. Context-specific requirements, Quality Outcome Criteria, and Evidence needs shall reflect the object and the detail required. Increasing or decreasing examination detail does not, by itself, change the Core set of Factors and Indicators.

The stated scope and limitations of the determination shall make clear the Scale and resolution examined, so that Findings are not extended beyond what the examination supports.

For the methodological explanation, see WQI Foundational Article 11 — Methodological Resolution.

3 Understanding the Common IQI Factors and Indicators

3.1 What a Quality Factor Represents

A Quality Factor identifies a major aspect of how infrastructure realizes its Intended Functions and Intended Results. It brings together related requirements concerning that aspect.

The fourteen Core Factors provide a common basis for examining different infrastructure types. For example, Functional Requirements address what the infrastructure is intended to do and produce, while Structural and Functional Integrity addresses whether its condition supports that realization.

The Factors are distinct but connected. A condition may be relevant to more than one Factor, but each Factor addresses it from its own perspective. Favorable Findings under one Factor do not, by themselves, establish fulfillment of requirements under another.

Each Factor is expressed through its Indicators and their General Core Requirements. The Factor Description explains the dimension they address; it does not prescribe a particular technology, engineering solution, or universal technical limit.

3.2 What a Quality Indicator Identifies Within a Factor

A Core Quality Indicator identifies a distinct point of examination within its Factor—what is examined to understand that aspect of infrastructure Quality. The General Core Requirement under the Indicator states what shall be addressed. Applicable Quality Outcome Criteria establish the expected states or results for the particular context.

The Indicator and its general requirement remain common across infrastructure types. The context-specific detail and criteria reflect the declared object, its Intended Functions and Intended Results, and the relevant conditions.

An Indicator is not necessarily a numerical measure. Measurements, observations, tests, analyses, and other Evidence may be needed to determine whether its requirement has been fulfilled.

3.3 General Core Requirements Under the Indicators

The General Core Requirement under each Indicator states what shall be addressed wherever this Core is applied. It provides the common requirement while allowing the detail of its application to reflect the infrastructure being examined.

Each requirement shall be applied to the declared Quality Object with regard to its Intended Functions, Intended Results, relevant life-cycle stages, Boundaries, and Interfaces. Its application shall account for essential Work and Results, including external contributions.

A context-specific document may add detail to the general requirement but shall preserve its meaning. One or more Quality Outcome Criteria shall establish the expected outcomes for the particular application, whether under a detailed context-specific requirement or directly under the General Core Requirement.

Fulfillment shall be determined from relevant Evidence against the applicable requirement and criteria. Restating the requirement or documenting an intention to fulfill it does not, by itself, demonstrate fulfillment.

3.4 How Relevant Activities Are Considered When Applying Indicator Requirements

An activity may contribute to several aspects of infrastructure Quality. Design Work, for example, may address Functional Requirements, Technical Requirements, integrity, safety, and environmental interaction.

An activity shall be considered under each Indicator requirement to which it is relevant. Its placement under one requirement shall not exclude consideration under another.

Each requirement retains its distinct subject and meaning. Evidence concerning the same activity may support Findings under several Indicators, but its relevance and sufficiency shall be examined against each requirement separately.

Considering an activity under several requirements does not create additional Indicators or establish that those requirements have all been fulfilled. The Findings shall make clear what the Evidence supports under each applicable requirement.

3.5 Applying the Same Factors and Indicators Across Life-Cycle Stages, Scales, and Resolutions

The common Factors and Indicators apply throughout the infrastructure life cycle and at different Scales and levels of examination detail. Their meaning remains consistent, while the requirements' application reflects the object and conditions being examined.

For each determination, the General Core Requirements shall be applied to the declared Quality Object at the relevant life-cycle stage, Scale, and methodological resolution. Context-specific detail, Quality Outcome Criteria, and Evidence shall address what is required for that application.

For example, Functional Requirements may be examined when developing a proposed facility, modifying an operating system, or planning decommissioning. The relevant functions and expected Results differ, but the requirement to define them remains.

A change in life-cycle stage, Scale, or resolution shall not, by itself, change the Core set of Factors and Indicators. Findings from one application may inform another, but their relevance and limitations shall be examined before they are used to support a different determination.

Requirements expressed in terms of operating performance or capability shall be examined according to the declared life-cycle stage. At the design stage, the examination concerns the design Work and Results and the basis they provide for the required future performance. During construction and commissioning, it concerns the Work, Results, and demonstrations relevant to those stages. Such Findings shall not be presented as Evidence of actual operating performance that has not yet occurred.

3.6 Applying the Dual-Nature Postulate Across All Factors and Indicators

Each Factor and Indicator concerns Quality in its own right. Failure to fulfill an applicable requirement may also create a condition through which Harm becomes possible. This is the Dual-Nature Postulate: each Factor and Indicator has an independent Quality nature and a latent Harm-related nature.

Both aspects shall be considered when applying each Factor and Indicator. The Quality examination shall establish what the Evidence supports about fulfillment of the applicable requirement. The Harm-related examination shall consider whether an identified condition could contribute to adverse consequences through a demonstrable pathway in the relevant context.

A Quality deficiency does not, by itself, establish that Harm has occurred, that a particular level of Risk exists, or that the infrastructure is unsafe. Such Findings require examination of the relevant consequences, conditions, and relationships among Quality, Harm, Risk, and Safety.

Equally, the absence of observed Harm does not establish fulfillment of a Quality requirement. Quality Findings and Harm-related Findings shall remain distinguishable, with their respective basis, limitations, and uncertainty made clear.

For the methodological explanation, see WQI Foundational Article 14 — Quality and Harm: The Dual-Nature Postulate.

4 Applying the Core to a Particular Infrastructure Object

4.1 Describing the Object and the Intended Determination

Applying the Core begins with a clear statement of what is being examined and what the examination is intended to establish. This connects the general requirements to a particular infrastructure object and gives the Findings a defined scope.

The Infrastructure Quality Object shall be described, together with its Intended Functions and Intended Results. The description shall identify the essential Work and Results included in the examination and provide sufficient detail to distinguish the object from connected or contributing objects.

The same infrastructure name may describe different declared objects. A data-center examination may concern the facility infrastructure alone or a broader object that also includes computing, storage, and network equipment. The description shall make that scope clear. A determination concerning the infrastructure does not, by itself, establish the Quality of the digital services delivered through it.

Software, automation, control, and information systems essential to realization of the declared object's Intended Functions and Intended Results shall be included within its scope or addressed through

identified Interfaces. Their relevance shall not be overlooked because they are nonphysical or provided externally.

The purpose, intended use, and scope of the Quality Determination shall be stated. The scope shall identify whether the determination concerns selected Indicators or Factors, or the Quality of the whole declared object. The intended recipient of the Findings shall also be identified.

The description shall provide a common reference for selecting applicable requirements and Quality Outcome Criteria, examining Evidence, and communicating Findings. It shall be revised when changes to the object or the intended determination materially affect that reference.

A determination concerning selected aspects shall not be presented as establishing the Quality of the whole object.

4.2 Identifying the Relevant Life-Cycle Stage, Boundaries, and Interfaces

The same infrastructure may require different examinations during design, construction, operation, or decommissioning. Each determination needs a clear account of the stage and conditions to which its Findings apply.

The relevant life-cycle stage or stages shall be stated, together with the time or period covered by the determination. Where the examination concerns a transition between stages, the relevant transition conditions shall also be identified.

The declared Boundaries shall specify the Work, Results, and constituents included in the examination. Relevant Interfaces shall identify connections and dependencies within the object and with external contributors or connected infrastructure.

Exclusions and assumptions that could materially affect the Findings shall be stated. Essential contributions shall not be excluded solely because they fall outside an ownership, organizational, contractual, or physical boundary.

Findings shall remain applicable to the identified stages, Boundaries, Interfaces, and conditions. Their use for another stage or a changed object shall require examination of whether they remain relevant and sufficient.

4.3 Accounting for Outsourced and Other External Contributions

External contributions shall be identified according to what they provide to the declared infrastructure. These may include design Work, supplied components, utility services, inspection Results, maintenance, or other contributions essential to its Intended Functions and Intended Results.

For each essential external contribution, the examination shall identify what is required, how the contribution enters or supports the infrastructure, and which Interfaces and dependencies affect its use. Applicable requirements and Quality Outcome Criteria shall address both the contribution and its integration with the declared object.

Evidence from an external provider may support Findings where it is relevant and sufficient for the determination. A contract, provider approval, certificate, or favorable management system assessment shall not, by itself, establish that the contribution fulfills the infrastructure's requirements.

Where a contribution has been examined separately, its Findings shall be considered within their stated scope, conditions, and limitations. The infrastructure determination shall also address any integration conditions not covered by that separate examination.

The contribution shall remain distinguishable from the external organization providing it.

4.4 Examining Constituents and the Whole at Suitable Scales

Examining constituents helps establish how they contribute to infrastructure Quality. Examining the whole also requires attention to what happens when those constituents work together.

The constituents requiring separate examination shall be identified according to their relevance to the intended determination. Each shall have a defined scope, with applicable requirements, Quality Outcome Criteria, and examination detail appropriate to its contribution.

Findings concerning constituents shall be examined for their relevance to the larger object. Their use shall preserve the conditions, assumptions, uncertainty, and limitations under which they were established.

The examination of the whole shall address relevant Interfaces, dependencies, and combined behavior. It shall consider whether the constituents, as integrated, support realization of the whole object's Intended Functions and Intended Results.

A whole-object determination shall not be based solely on collecting favorable constituent Findings. The Evidence shall also support the relationships and conditions necessary for the whole to fulfill its applicable requirements.

4.5 Using Context Guides and the Reference Layer

Context Guides help apply the common Core requirements to a particular infrastructure type or use. The Reference Layer supplies the technical and other source material relevant to that application, such as regulations, standards, specifications, and engineering references.

Applicable Context Guides and Reference Layer documents shall be identified for the declared object and intended determination. Their selection shall reflect the relevant life-cycle stages, conditions, jurisdiction, and infrastructure characteristics.

A Context Guide may detail a General Core Requirement and establish context-specific Quality Outcome Criteria. It shall preserve the meaning of the Core Factors and Indicators. Where no Context Guide is needed, the applicable requirements and criteria shall be established directly under the General Core Requirements.

The role of each selected reference shall be clear. A document's inclusion in the Reference Layer does not, by itself, make every provision applicable or mandatory. Provisions used to establish requirements or criteria shall be traceable to the Applicable Basis.

Material gaps or conflicts among selected documents shall be identified and addressed. Any unresolved issue that limits the determination shall be reflected in the Findings.

5 From General Requirements to Context-Specific Requirements and Quality Outcome Criteria

5.1 The General Requirement Under Each Indicator

The General Core Requirement under an Indicator is the starting point for establishing what a particular infrastructure object must fulfill. It states the common requirement; its application must make clear what fulfillment means for the declared object.

Each General Core Requirement shall be considered in relation to the object's Intended Functions, Intended Results, relevant life-cycle stages, Boundaries, Interfaces, and conditions of use.

Where application requires further detail, context-specific requirements shall preserve the meaning of the General Core Requirement. One or more Quality Outcome Criteria shall state the quality objectives and expected outcomes against which fulfillment can be examined.

The relationship between the General Core Requirement, any context-specific detail, and the associated criteria shall be traceable. Context-specific detail and criteria shall not replace or narrow the general requirement in a way that omits an essential aspect of its application.

5.2 How Context-Specific Documents May Detail a Requirement

A general requirement may need further detail to be applied consistently. The requirement remains common, while the detail explains what it involves for a particular infrastructure type, life-cycle stage, or use.

A Context Guide or another applicable context-specific document may identify the functions, conditions, activities, Interfaces, or technical provisions that shall be addressed under a General Core Requirement. For example, detail concerning environmental interaction may differ for a water system, a data center, and an apartment building.

Each detailed requirement shall be traceable to the General Core Requirement it develops and to the relevant Applicable Basis. Its scope and conditions of application shall be clear.

Context-specific detail shall preserve the meaning of the Factor and Indicator. It shall not introduce a different Factor or Indicator, or treat one requirement as a substitute for another.

Where the General Core Requirement is sufficiently clear for the particular application, Quality Outcome Criteria may be established directly under it without an intermediate detailed requirement.

5.3 Establishing One or More Quality Outcome Criteria for a Requirement

Quality Outcome Criteria make clear what outcomes are expected when a requirement is fulfilled in a particular context. They provide a basis for examining actual conditions and interpreting the Evidence.

One or more Quality Outcome Criteria shall be established for each requirement being examined. They shall reflect the declared object's Intended Functions and Intended Results, relevant life-cycle stage, Boundaries, Interfaces, and conditions of application.

Each criterion shall state an expected outcome clearly enough to determine what Evidence is needed and whether that outcome has been achieved. Where relevant, it shall identify the applicable conditions, limits, or thresholds. A criterion may be quantitative or qualitative; a numerical measure is not required in every case.

Several criteria may be needed to address different outcomes under the same requirement. Together, they shall cover the outcomes necessary to examine fulfillment within the declared scope.

The criteria shall be traceable to the requirement and the Applicable Basis. Their establishment and use shall follow the methodology explained in WQI Foundational Article 10 — Quality Outcome Criteria in Whole Quality — How Expected States and Results Support Responsible Interpretation.

5.4 Establishing Quality Outcome Criteria Directly Under a General Requirement When a Context Guide Is Not Needed

A Context Guide is not necessary for every application. Where the General Core Requirement provides a sufficiently clear basis, Quality Outcome Criteria may be established directly under it for the declared Infrastructure Quality Object.

The criteria shall state the expected outcomes for that application and identify the conditions needed to interpret them. They shall be traceable to the General Core Requirement and the Applicable Basis, with sufficient clarity to guide Evidence collection and examination.

Using this direct route shall not omit relevant requirements, essential contributions, or Interface conditions. The criteria shall provide enough detail to examine fulfillment within the declared scope.

The absence of a Context Guide does not change the meaning of the Factor, Indicator, or General Core Requirement. The methodology explained in WQI Foundational Article 10 applies equally to Quality Outcome Criteria established through either route.

5.5 The Relationship Between Requirements, Quality Outcome Criteria, and the Applicable Basis

Requirements state what shall be fulfilled. Quality Outcome Criteria state the expected outcomes for the particular application. The Applicable Basis establishes the requirements and conditions against which the declared object is examined.

The Applicable Basis establishes what applies. The Reference Layer provides sources used to establish or justify the expected states or results expressed by the criteria. Context determines how those criteria apply to the particular object; it does not, by itself, establish what is acceptable.

The Applicable Basis shall be identified for the intended determination. It shall include the relevant Core requirements, any applicable context-specific requirements, and the legal, contractual, technical, or other provisions governing the examination.

Each Quality Outcome Criterion shall be traceable to the requirement it addresses and consistent with the Applicable Basis. Where interpretation or judgment is needed to establish a criterion, its reasoning and assumptions shall be recorded.

Reference Layer documents may help establish or interpret requirements and criteria. Their use shall distinguish binding provisions from guidance or supporting information; inclusion in the Reference Layer alone does not make a provision mandatory.

The requirements, criteria, and Applicable Basis used for a determination shall be identifiable by their applicable versions or dates. Material changes shall be examined for their effect on the Findings and any resulting Quality Claim.

6 From Evidence to Findings

6.1 Evidence About Actual Conditions

Evidence provides the information needed to examine whether the declared infrastructure fulfills its applicable requirements and Quality Outcome Criteria. It concerns the Work performed, the Results produced, and the conditions relevant to the determination.

Evidence may include observations, measurements, tests, analyses, records, models, operating experience, and professional judgments. Its suitability depends on what it can support about the particular object, life-cycle stage, and conditions being examined.

Evidence shall be linked to the requirements and criteria it addresses. Its source, scope, date or period, and relevant conditions shall be identifiable so that its applicability can be examined.

The examination shall distinguish intended or specified conditions from conditions shown to exist. A design specification states what is required; records of construction, inspection, or testing may help

establish what was actually realized. At a design stage, Evidence concerns the design Work and Results and what they support about the proposed infrastructure.

Evidence that challenges an expected outcome shall be considered alongside Evidence that supports it. The Findings shall reflect the relevant Evidence as a whole, including material inconsistencies and limitations.

6.2 Evidence Quality and Its Limits

Evidence must be suitable for the finding it is used to support. A large quantity of information, a formal document, or a precise measurement does not, by itself, establish that the Evidence is adequate for the intended determination.

Evidence Quality asks three questions: Is there enough of the necessary Evidence? Can it be relied upon for what it represents? Is it applicable to the particular Finding and intended determination? These questions concern Evidence Sufficiency, Evidence Trustworthiness, and Evidence Applicability under WQI_EQC1.

Evidence Quality shall be examined under WQI_EQC1, the governing WQI standard for Evidence Quality. The examination shall consider whether the Evidence applies to the declared object, requirements, criteria, life-cycle stage, and conditions, and whether its limitations permit the proposed Finding.

Material limitations shall be identified. These may concern incomplete coverage, outdated information, uncertain measurements, unverified assumptions, or inconsistencies among sources. Their effects on the Findings shall be stated.

Evidence Quality remains distinct from infrastructure Quality. Strong Evidence may support an unfavorable Finding. Limited Evidence may prevent a supported Finding without establishing that the infrastructure itself is deficient.

The certainty and scope of a Finding shall not exceed what the Evidence supports. Where Evidence is insufficient, the unresolved matter shall remain explicit.

6.3 Findings About Indicators and Factors

An Evidence-Supported Finding, referred to here as a Finding, states what the examined Evidence supports about fulfillment of an applicable requirement or Quality Outcome Criterion. It connects information about actual conditions to the aspect of Quality being examined.

Findings shall identify the requirements and criteria addressed, the supporting Evidence, and any material conditions or limitations. They shall distinguish demonstrated fulfillment, demonstrated non-fulfillment, and matters that remain unresolved.

Findings under an Indicator shall address its General Core Requirement through the applicable context-specific detail and criteria. Where several criteria apply, their Findings shall be considered together without overlooking a material deficiency or unresolved condition.

Findings concerning a Factor shall bring together the relevant Indicator Findings to establish whether the declared Infrastructure Quality Object fulfills the applicable requirements and Quality Outcome Criteria. The examination shall consider Evidence Quality, uncertainty, and relationships among the Findings while preserving their distinct meanings. A count, average, or score shall not, by itself, establish fulfillment.

A Finding concerning selected Indicators or Factors shall remain within that scope. It shall not, by itself, be presented as a Quality Determination for the whole declared infrastructure object.

6.4 Uncertainty, Missing Evidence, and Unresolved Conditions

An examination may leave questions unanswered. Evidence may be missing, conflicting, outdated, or insufficient to establish whether a requirement has been fulfilled. These limits must remain visible in the Findings.

Material uncertainty, Evidence gaps, and unresolved conditions shall be identified, together with the requirements, criteria, and parts of the declared object they affect. Their implications for the scope and certainty of the Findings shall be stated.

Where further examination could resolve a material issue, the additional Evidence or clarification needed shall be identified. Until then, assumptions shall not be presented as established conditions.

Missing Evidence does not, by itself, demonstrate non-fulfillment of an infrastructure requirement. Where the Applicable Basis separately requires particular Evidence or records, failure to provide them may establish non-fulfillment of that requirement, while the underlying infrastructure condition remains unresolved.

An unresolved condition that could materially constrain the Quality Determination shall not be obscured by favorable Findings elsewhere. Its effect on any permissible conclusion shall be addressed when making the determination.

6.5 Traceability From Evidence to Findings

Traceability allows a reader or reviewer to follow how a Finding was reached. It connects the declared object and applicable requirements to the criteria, Evidence, and reasoning supporting that Finding.

Each Finding shall be traceable to the Indicator requirement and Quality Outcome Criteria it addresses, the relevant Applicable Basis, and the Evidence used. The connection to the declared object, life-cycle stage, and examined conditions shall be clear.

Where Evidence is interpreted, combined, or used through a model or professional judgment, the material reasoning, assumptions, and limitations shall be recorded. Conflicting Evidence and the reasons for its treatment shall remain identifiable.

Evidence used for several Findings may be referenced without duplication, provided that its relevance to each requirement is clear. The records shall allow the supporting Evidence to be located and distinguished from superseded or inapplicable information.

Traceability shall be maintained when Findings are revised so that changes in Evidence, criteria, or reasoning and their effects on the Findings can be understood.

7 Making a Quality Determination

7.1 Determining What the Evidence Supports

A Quality Determination brings the Findings together to establish what can responsibly be concluded about the declared object within the stated scope. It requires consideration of their meaning and relationships, rather than simply counting favorable and unfavorable Findings.

The established Findings shall be examined together through a Synthesis of Material Findings to determine what conclusion, if any, they justify. Materiality shall govern which Findings and relationships require consideration. The synthesis shall preserve the identity of each Finding, the applicable requirements and Quality Outcome Criteria, and its evidentiary basis. Critical Conditions and material uncertainty shall remain visible. The synthesis shall not create new Findings or count repeated descriptions of the same underlying condition as independent Findings.

The determination shall consider the applicable requirements and Quality Outcome Criteria, the Findings, Evidence Quality, and material uncertainty. It shall address relevant Interfaces, dependencies, and conditions affecting realization of the object's Intended Functions and Intended Results.

Critical Conditions and other non-compensable conditions shall be identified and justified through Function Realization, the Applicable Basis, and applicable Quality Outcome Criteria. An unfavorable or unresolved Finding is not automatically a Critical Condition. Favorable Findings elsewhere shall not offset a condition where its justified basis prohibits such compensation.

Any conclusion shall remain within the scope, life-cycle stages, conditions, and certainty supported by the Evidence. Where the Findings do not support a conclusion, the determination shall state that limit rather than infer a favorable or unfavorable Quality State.

The determination and its reasoning shall be recorded with sufficient Traceability to show how the Findings support the conclusion or the decision not to express one.

Where a Quality Claim is made, this synthesis provides the basis for any overall Conclusion or Refusal to Express a Conclusion communicated about the infrastructure. Reporting the resulting conclusion does not constitute a second synthesis. A separate determination of Claim Quality examines the claim itself as another Quality Object.

For the methodological explanation of the Synthesis of Material Findings and its relationship to a claim, see WQI Foundational Article 16 — From Quality Conditions to Claims: The Claim as a Quality Object.

7.2 Findings About Selected Indicators or Factors

A determination may concern selected Indicators or Factors when that scope serves the intended purpose. Such a determination can provide useful Findings without establishing the Quality of the whole infrastructure object.

The selected Indicators or Factors shall be identified, together with the reason for their selection and the questions the determination is intended to answer. The applicable requirements, Quality Outcome Criteria, and examined conditions shall be stated or traceably referenced.

Relevant dependencies on other Indicators, Factors, or contributing objects shall be considered where they could materially affect the selected Findings. A limited scope shall not conceal conditions necessary to interpret those Findings.

The determination shall distinguish supported Findings from matters outside the examination or left unresolved. Its communication shall make clear that the Findings concern only the stated scope and shall not imply that unexamined requirements have been fulfilled.

7.3 When a Whole-Object Quality Determination Is Made

A whole-object Quality Determination concerns the declared infrastructure as an integrated object. It asks whether that object fulfills its applicable requirements and realizes its Intended Functions and Intended Results under the stated conditions.

The determination shall consider all fourteen Factors and eighty-three Indicators. Any requirement considered inapplicable shall have a recorded justification based on the declared object and its context. Lack of Evidence shall not be treated as inapplicability.

The Findings shall collectively address the essential Work and Results, relevant life-cycle stages, Boundaries, Interfaces, external contributions, and dependencies within the declared scope. The

examination shall include the combined behavior of constituents where it affects realization of the whole object's Intended Functions and Intended Results.

Critical Conditions, material deficiencies, uncertainty, and unresolved matters shall be addressed explicitly. Favorable Findings shall not be combined in a way that conceals a condition that prevents or constrains the conclusion.

A whole-object conclusion shall be expressed only where the Findings and their relationships provide sufficient support. Otherwise, the determination shall state what has been established and why a whole-object conclusion cannot responsibly be expressed.

7.4 Quality State and Determination Status

Quality State concerns the actual Quality of the declared object under the relevant conditions. Determination status concerns what the examination has been able to establish about that State. The object has an actual condition whether or not sufficient Evidence is available to understand it.

The determination shall distinguish its conclusion about Quality State from any limitation in the ability to reach a conclusion. "Indeterminate" describes the status of a determination; it shall not be presented as a third actual Quality State.

A Conditionally Positive Conclusion shall be expressed only where the material Findings justify a Positive Conclusion subject to identified material conditions to be fulfilled in the future. Those conditions and their significance shall be stated. Their planning, authorization, financing, or expected completion does not establish fulfillment.

A Negative Conclusion requires affirmative Findings that the object does not realize its Intended Functions or Intended Results as required. Insufficient Evidence alone does not establish a Negative Conclusion. The possibility of future corrective action shall not turn a currently justified Negative Conclusion into a Conditionally Positive Conclusion.

Where no conclusion can responsibly be expressed, the determination shall state that status and explain the material reasons. Refusal to Express a Conclusion shall remain distinct from a Negative Conclusion.

The stated conclusion or determination status shall identify the scope and conditions to which it applies. It shall not imply validity for unexamined life-cycle stages, changed conditions, or a different Quality Object.

7.5 Why a Constituent's Quality Does Not Establish the Quality of the Whole

A constituent may fulfill its own requirements while the infrastructure as a whole does not. Its suitability within the whole depends on how it is selected, connected, used, and maintained, and on its interaction with other constituents.

A whole-object Quality Determination shall therefore examine both the relevant constituent Findings and the conditions governing their contribution to the whole. These include Interfaces, dependencies, compatibility, and combined behavior affecting the infrastructure's Intended Functions and Intended Results.

For example, a ventilation unit may meet its specification while the building's ventilation remains inadequate because of its sizing, installation, controls, or interaction with other systems. The unit's conformity alone does not establish fulfillment of the building's requirements.

Separate constituent determinations may provide supporting Evidence, but shall not substitute for examination of integration and whole-object requirements. Their scope, assumptions, conditions, and limitations shall remain traceable when used in the broader determination.

The same principle applies at every Scale: Findings about parts support, but do not automatically establish, the Quality of the larger declared object.

8 Communicating Findings to an Intended Recipient

8.1 What the Recipient Needs to Understand

Communicating Findings allows another person to understand what has been examined, what has been established, and how that information may be used. The communication must make its meaning clear to the intended recipient.

The communication shall identify the infrastructure object, the purpose and scope of the examination, and the Findings relevant to the recipient's intended use. It shall make clear whether those Findings concern selected Indicators or Factors, or the whole declared object.

The applicable life-cycle stage, examined conditions, and material limitations shall be stated or made accessible through clear references. Uncertainty, unresolved conditions, and any conditions attached to a conclusion shall be communicated where they affect interpretation or use.

The wording and level of detail shall suit the recipient's needs and knowledge while preserving the meaning of the Findings. Technical terms shall be explained or linked to their governing meanings where needed for understanding.

The recipient shall be able to distinguish what the Evidence supports from assumptions, expectations, and matters outside the examination. The communication shall not imply broader coverage or greater certainty than the determination supports.

8.2 Claims About Selected Findings and Claims About the Whole Object

A Quality Claim may communicate selected Findings or a conclusion about the whole declared infrastructure object. Its scope depends on what it communicates and what the supporting determination has established.

The claimant responsible for the Quality Claim shall be identifiable.

A claim concerning selected Findings shall identify the Indicators, Factors, requirements, or conditions addressed. It shall not imply that other aspects have been examined or that the Quality of the whole object has been established.

A whole-object claim shall be supported by a whole-object Quality Determination under Section 7.3. It shall identify the declared object and preserve the material conditions and limitations of that determination.

An overall conclusion is not required for every Quality Claim. Selected Findings may be communicated where they serve the claim's intended purpose, provided that omitted information does not make the communication misleading.

Every claim shall remain within the meaning, scope, conditions, and certainty supported by its Findings. The governing WQI standard for Quality Claims, WQI_QCC1, applies.

8.3 Claim Scope, Basis, Limitations, and Uncertainty

A recipient needs to understand both what a Quality Claim says and the boundaries of its support. The claim shall therefore make its scope, basis, material limitations, and uncertainty clear.

The claim shall identify the declared Infrastructure Quality Object, the Findings or conclusion communicated, and the relevant life-cycle stage, time or period, and conditions. The applicable requirements, Quality Outcome Criteria, and supporting determination shall be stated or traceably referenced.

Material exclusions, assumptions, Evidence limitations, and unresolved conditions shall be disclosed where they affect interpretation or use. A condition attached to a conclusion shall remain visible in the claim.

The claim shall not imply that Findings remain valid after changes that could materially affect their basis. Any conditions of continued validity, including the need for review following relevant changes, shall be stated.

References may provide supporting detail, but shall not conceal information necessary to understand the claim. Its wording and presentation shall preserve the meaning and certainty of the underlying Findings.

8.4 The Quality Claim as a Separate Quality Object

A Quality Claim can itself be examined for Quality. In that examination, the claim is the Quality Object: its Intended Function is to communicate supported information to an intended recipient for a stated use.

The claim's Quality shall be determined under WQI_QCC1. The examination shall consider whether its content, wording, presentation, and supporting references fulfill its Intended Function without exceeding or distorting the Findings on which it relies.

The claim and the infrastructure it describes shall remain distinct Quality Objects. A favorable infrastructure conclusion does not, by itself, establish that the claim communicates it adequately. An unfavorable infrastructure conclusion may be communicated through a claim that fulfills its own requirements.

Findings about the claim shall identify communication deficiencies separately from deficiencies in the infrastructure or its determination. Where correcting a claim reveals a material weakness in the supporting determination, that weakness shall be addressed through the relevant determination process.

A Quality Claim shall not be treated as evidence of its own accuracy merely because it has been issued, signed, certified, or published.

For the foundational explanation of the claim as a Quality Object, see WQI Foundational Article 16 — From Quality Conditions to Claims: The Claim as a Quality Object. WQI_QCC1 establishes the requirements for determining Claim Quality.

9 Relationships That Remain Distinct

9.1 Infrastructure Quality and Management System Quality

Infrastructure Quality concerns the declared infrastructure object and realization of its Intended Functions and Intended Results. Management System Quality concerns the actual management through which realization is directed and controlled within a defined scope. That management may

involve functions from one or more organizations. Its Quality remains distinct from the Quality of the infrastructure it is used to realize.

A management system may influence design, construction, operation, maintenance, and other Work contributing to infrastructure Quality. Evidence about that system may therefore inform the infrastructure examination where its relevance is established.

A favorable management system assessment or certification shall not, by itself, establish fulfillment of infrastructure requirements. The infrastructure determination shall examine Evidence concerning the declared object, its Work, Results, and relevant conditions.

Equally, a satisfactory infrastructure Result shall not, by itself, establish the Quality of the organization's management system. It may provide relevant Evidence, but the management system shall be examined against its own Applicable Basis.

Where both are examined, their respective Quality Objects, requirements, Evidence, and Findings shall remain distinguishable and traceable. Management System Quality shall be addressed under the governing WQI standard for that subject.

9.2 Quality, Harm, Risk, and Safety

Quality concerns realization of the declared object's Intended Functions and Intended Results against its Applicable Basis. Harm concerns adverse consequences. Risk concerns determination of the probability and severity of Possible Harm according to the Applicable Basis. Safety concerns whether Risk associated with Possible Harm is acceptable or tolerable according to applicable Safety criteria established or justified through the Applicable Basis.

These concepts are related, but a Finding about one does not automatically establish a Finding about another. A Quality deficiency may exist without observed Harm. Harm may also arise from infrastructure performing as intended where its use or interaction with its surroundings creates adverse consequences.

Where a Quality condition has a possible Harm-related consequence, the examination shall identify the relevant pathway, affected people or other objects, and conditions under which that consequence could arise. Risk and Safety Findings shall have their own supporting basis, including the applicable criteria for tolerability.

The absence of observed Harm shall not be treated as proof of satisfactory Quality or Safety. Equally, a Quality deficiency shall not be described as unsafe without examining its relevant Risk implications.

Quality, Harm, Risk, and Safety Findings shall remain distinguishable while their material relationships are considered across all Factors and Indicators. The governing WQI meanings and methods shall apply.

For the methodological explanation, see WQI Foundational Article 15 — Quality and Harm — From Quality Conditions to Harm, Risk, and Safety.

A Harm-related examination shall distinguish a condition capable of contributing to Harm, the pathway through which Harm could arise, and Harm that has actually occurred. Establishing a pathway does not, by itself, establish the probability or severity of the possible consequences.

9.3 Work-Integrated Checking, Conformity Assessment, and Management System Assessment

Checking performed within Work, Conformity Assessment of a declared object, and assessment of an organization's management system serve different purposes. Their relationship shall be clear whenever their Results contribute to an infrastructure Quality Determination.

Work-integrated checking verifies conditions while an activity is being performed—for example, checking dimensions during installation or reviewing calculations during design. Such checking forms part of the Work and may produce Evidence relevant to its Results.

Conformity Assessment examines whether a declared Quality Object fulfills specified requirements within its Applicable Basis. Its scope may concern a component, activity, Result, or larger infrastructure object. Its Findings shall remain within the requirements and conditions assessed.

Management system assessment examines the organization's management system against its own Applicable Basis. It does not substitute for determining whether the infrastructure or a contributing Result fulfills its requirements.

Evidence and Findings from these activities may inform one another where relevant. Their use shall preserve the identity of the object examined, the assessment scope, and any material limitations. Completion of one activity shall not, by itself, establish completion or satisfactory Results of the others.

9.4 Separate Determinations for Connected or Contributing Quality Objects

Connected objects may influence one another while retaining their own Intended Functions, Intended Results, and requirements. A facility, an external utility service, a maintenance activity, and a Quality Claim may each be a separately declared Quality Object.

Where separate determinations are made, each object and its Applicable Basis shall be identified. The Boundaries, Interfaces, and contributions relevant to the relationship between the objects shall be clear.

Findings from one determination may support another where their relevance and sufficiency have been established. Their transfer shall preserve the scope, conditions, assumptions, uncertainty, and limitations under which they were reached.

A favorable determination for one object shall not automatically establish favorable Quality of a connected or receiving object. The receiving object's determination shall address whether the contribution is suitable and properly integrated for its intended use.

Maintaining separate determinations shall not exclude essential contributions from the infrastructure examination. They shall remain accounted for within the declared scope or through identified Interfaces, as required by Sections 2.4 and 4.3.

10 The Fourteen Core Quality Factors and Eighty-Three Core Quality Indicators

The following Factor descriptions identify the common Quality dimensions, and the Indicators identify the distinct points of examination within them. A General Core Requirement is established under each Indicator and shall be applied using the provisions in Sections 1–9.

Factor 1 — Functional Requirements

Factor Description

Functional Requirements state the Intended Functions of the declared Infrastructure Quality Object—what it is required or intended to do—and the associated Intended Results required or intended to arise through realization of those functions. They identify the relevant performance and use conditions, Boundaries, and exclusions needed to define those functions and results. They are stated clearly enough to determine whether they have been fulfilled, but do not prescribe the technical solution used to realize them.

Indicator 1.1 — Completeness of Functional Requirements

General Core Requirement

The Functional Requirements of the declared Infrastructure Quality Object shall identify all Intended Functions and associated Intended Results for the relevant life-cycle stages, including those needed to support or protect their realization. They shall specify the relevant performance and use conditions, Boundaries, Interfaces, and exclusions, and shall account for essential Work and Results provided by external contributors.

Indicator 1.2 — Clarity and Unambiguity of Functional Intent

General Core Requirement

Functional Requirements shall state the declared Infrastructure Quality Object's Intended Functions and associated Intended Results clearly and unambiguously. Relevant terms, conditions, and assumptions shall be explicit so that the requirements can be consistently understood without reliance on unstated knowledge. Material ambiguity shall be resolved or identified as an unresolved condition.

Indicator 1.3 — Explicit Treatment of Functional Boundaries and Interfaces

General Core Requirement

The functional extent of the declared Infrastructure Quality Object shall be explicitly defined and documented at the declared Scale. Its external Boundary, relevant internal Boundaries, and relevant internal and external Interfaces shall be identified in relation to its Intended Functions and Intended Results. Essential contributions exchanged through those Interfaces shall be stated so that functional responsibilities and dependencies are clear.

Indicator 1.4 — Identification and Documentation of Functional Assumptions and Uncertainties

General Core Requirement

Assumptions and material uncertainties affecting the Functional Requirements shall be explicitly identified, documented, and retained. Their relationship to the declared object's Intended Functions, Intended Results, and relevant conditions shall be clear. They shall be reviewed when knowledge improves or conditions change, and any resulting effects on the Functional Requirements shall be addressed.

Indicator 1.5 — Traceability of Functional Requirements Across the Lifecycle

General Core Requirement

Functional Requirements shall remain traceable across the relevant life-cycle stages of the declared Infrastructure Quality Object. The original and current requirements, their changes, and their relationship to the Work and Results through which they are realized shall be identifiable. Changes in the object or its conditions shall not result in the loss or unrecorded alteration of functional intent.

Indicator 1.6 — Functional Changes

General Core Requirement

Changes to the declared Infrastructure Quality Object's Intended Functions, Intended Results, or governing functional conditions shall be explicitly identified, justified, evaluated, documented, and authorized before implementation. Their effects on existing Functional Requirements, relevant Boundaries, Interfaces, and dependencies shall be examined. The functional basis shall be updated so that subsequent Work, Results, and Quality Determinations remain aligned with the changed requirements.

Factor 2 — Technical Requirements

Factor Description

Technical Requirements translate the Functional Requirements of the declared Infrastructure Quality Object into technical conditions that can be realized and examined. They specify the characteristics, capacities, limits, relationships, and performance provisions needed to realize its Intended Functions and Intended Results.

This Factor addresses whether that technical basis is complete, correct, coherent, and suitable for the relevant life-cycle conditions. Technical Specifications bring these requirements together, with the assumptions and Interfaces needed to understand and apply them. Particular values, materials, technologies, and engineering solutions depend on the infrastructure context and Applicable Basis.

Indicator 2.1 — Completeness of Technical Specifications

General Core Requirement

Technical Specifications shall include all Technical Requirements needed to realize the declared Infrastructure Quality Object's Functional Requirements under the relevant life-cycle conditions. They shall address the necessary technical characteristics, capacities, limits, performance provisions, and Interfaces, including those concerning essential external contributions. Required selections or additional provisions left open by referenced documents shall be explicitly established for the intended application.

Indicator 2.2 — Correctness and Unambiguity of Translation from Functional to Technical Requirements

General Core Requirement

Technical Requirements shall correctly and unambiguously translate the declared Infrastructure Quality Object's Functional Requirements into technical conditions suitable for realization and examination. Their relationship to the Intended Functions and associated Intended Results shall be traceable. The translation shall preserve functional intent, make material assumptions explicit, and resolve or identify ambiguities that could affect interpretation or fulfillment.

Indicator 2.3 — Internal Consistency and Coherence of Technical Specifications

General Core Requirement

Technical Specifications shall form a consistent and coherent technical basis for the declared Infrastructure Quality Object. Requirements for its constituents, activities, and Interfaces shall be compatible with one another and with the requirements of the whole. Material contradictions, conflicting provisions, or incompatible assumptions shall be resolved or explicitly identified as unresolved conditions.

Indicator 2.4 — Explicit Treatment of Technical Assumptions and Uncertainties

General Core Requirement

Assumptions and material uncertainties affecting the Technical Specifications shall be explicitly identified and documented. Their relationship to the Technical Requirements, relevant life-cycle conditions, and Interfaces shall be clear. They shall be reviewed when knowledge improves or conditions change, and their effects on the validity of the technical basis shall be addressed.

Indicator 2.5 — Alignment of Technical Specifications with Lifecycle Conditions

General Core Requirement

Technical Specifications shall reflect the conditions relevant to realizing the declared Infrastructure Quality Object's Intended Functions and Intended Results at each applicable life-cycle stage. They shall address relevant operating conditions, transitions, degradation, maintenance, and changes in use or configuration. Their continued suitability shall be reviewed when those conditions change, and necessary revisions shall preserve alignment with the Functional Requirements.

Indicator 2.6 — Traceability of Technical Specifications to Functional Requirements

General Core Requirement

Technical Specifications shall maintain traceable links between Technical Requirements and the Functional Requirements they are intended to realize. These links shall allow each Functional Requirement to be followed to its supporting Technical Requirements and each Technical Requirement to its functional basis. Traceability shall be maintained when either set of requirements changes.

Indicator 2.7 — Technical Specification Changes

General Core Requirement

Changes to Technical Specifications shall be explicitly identified, evaluated, documented, and authorized before implementation. Their effects on Functional Requirements, related Technical Requirements, assumptions, Interfaces, and relevant life-cycle conditions shall be examined. The specifications and associated Traceability shall be updated so that subsequent Work, Results, and Quality Determinations use the applicable technical basis.

Factor 3 — Conformity Assessment

Factor Description

Conformity Assessment examines whether the declared Infrastructure Quality Object fulfills the requirements within its identified assessment basis. This Factor covers conformity-assessment activities relevant to requirements under every Quality Factor and Indicator, wherever those activities occur across the relevant life cycle.

It addresses whether conformity to applicable requirements, including Technical Specifications and their continued alignment with Functional Requirements, is sufficiently examined and supported by Evidence.

Reviews, inspections, tests, verification, and other assessment activities provide Work and Results that may also be examined as Quality Objects. Their Quality remains distinct from the conformity of the infrastructure they examine. The same approach applies when such activities examine a constituent or contributing object.

Assessment methods, depth, and arrangements depend on the infrastructure context and Applicable Basis. Conformity Findings and Statements reflect what the assessment demonstrates, including material non-conformities, unresolved conditions, and limitations.

Indicator 3.1 — Defined Basis for Conformity Assessment

General Core Requirement

The basis for each Conformity Assessment shall be explicitly identified and documented. It shall specify the declared Quality Object, applicable requirements and Quality Outcome Criteria, and the relevant life-cycle stages, Boundaries, Interfaces, and conditions covered. The basis shall be traceable to the requirements under the Factors and Indicators being assessed, with the applicable versions of referenced documents and any material exclusions or assumptions made clear.

Indicator 3.2 — Assessment of Conformity to Technical Specifications

General Core Requirement

The declared Infrastructure Quality Object shall be assessed for conformity to the applicable Technical Specifications within the defined assessment scope. The assessment shall examine relevant Work, Results, constituents, and Interfaces using methods and Evidence suitable for the requirements and life-cycle conditions being assessed. Conformity Findings shall identify demonstrated fulfillment, non-conformities, and unresolved conditions, with material limitations made clear.

Indicator 3.3 — Assessment of Continued Consistency Between Technical and Functional Specifications

General Core Requirement

Technical Specifications shall be assessed for continued consistency with the Functional Requirements they are intended to realize. The assessment shall address changes in requirements, assumptions, configuration, Interfaces, and relevant life-cycle conditions that could affect that consistency. Material departures from functional intent shall be identified and resolved or recorded as unresolved conditions.

Indicator 3.4 — Risk-Proportionate Depth of Conformity Assessment

General Core Requirement

The depth and extent of Conformity Assessment shall be proportionate to the relevant Risk, the significance of the requirements being assessed, and the uncertainty affecting the determination. Assessment methods, coverage, sampling, and Evidence shall be sufficient to examine conditions whose non-conformity could materially affect Function Realization or contribute to Harm. The chosen depth and any material limitations shall be justified and documented.

Indicator 3.5 — Independence and Objectivity of Conformity Assessment

General Core Requirement

Conformity Assessment shall be conducted objectively, with independence appropriate to the Applicable Basis, assessment purpose, and relevant Risk. Conflicts of interest and pressures that could compromise the Findings shall be identified and addressed. The assessment arrangements shall support impartial judgment, and any material limitations on independence or objectivity shall be disclosed.

Indicator 3.6 — Treatment of Non-Conformity and Unresolved Conditions

General Core Requirement

Non-conformities and unresolved conditions identified during Conformity Assessment shall be explicitly recorded and evaluated for their effects on the applicable requirements, Function Realization, and permissible conformity conclusions. Their disposition shall be documented, and claimed resolution shall be supported by appropriate Evidence. Conditions that remain unresolved, including material limitations on their assessment, shall remain visible in the Findings and any resulting Conformity Statement.

Indicator 3.7 — Traceability of Conformity Statements

General Core Requirement

Conformity Statements shall be traceable to the declared Quality Object, the identified assessment basis, and the supporting assessment Findings and Evidence. They shall state or traceably reference the requirements assessed, relevant life-cycle stages and conditions, and material exclusions, limitations, and unresolved conditions. Their meaning, scope, and certainty shall not exceed what the assessment supports.

Factor 4 — Structural and Functional Integrity

Factor Description

Structural and Functional Integrity concerns whether the declared Infrastructure Quality Object has and preserves the structural and functional condition needed to realize its Intended Functions and Intended Results.

This Factor addresses the integrity of the whole object, its constituents, and their Interfaces under relevant life-cycle conditions. It includes the effects of degradation, damage, aging, foreseeable abnormal and transient conditions, and modification.

Integrity depends on how the infrastructure works as an integrated whole. Conformity of individual components does not, by itself, establish that the assembled object has or retains the required integrity.

Indicator 4.1 — Definition of Integrity-Critical Functions and Failure Modes

General Core Requirement

Functions whose loss or degradation could compromise the declared Infrastructure Quality Object's structural or functional integrity shall be explicitly identified, together with their relevant Failure Modes. The identification shall address constituents, Interfaces, and dependencies whose failure could affect realization of the whole object's Intended Functions and Intended Results. Relevant life-cycle conditions and potential infrastructure-level consequences shall be made clear.

Indicator 4.2 — Integrity of the Declared Infrastructure Quality Object

General Core Requirement

The declared Infrastructure Quality Object shall have and preserve the structural and functional integrity needed to realize its Intended Functions and Intended Results under the applicable life-cycle conditions. Its constituents, connections, and Interfaces shall function together without deficiencies that compromise the required integrity of the whole. Integrity shall be established for the assembled object rather than inferred solely from the conformity of individual components.

Indicator 4.3 — Consideration of Degradation, Damage, and Aging Mechanisms

General Core Requirement

Degradation, damage, and aging mechanisms that could materially affect structural or functional integrity shall be identified and addressed for the declared Infrastructure Quality Object. Their individual and combined effects on constituents, Interfaces, and the whole object shall be considered under the relevant life-cycle conditions. The integrity basis shall reflect their effects over time and be reviewed as condition information or knowledge of these mechanisms changes.

Indicator 4.4 — Integrity Under Foreseeable Abnormal and Transient Conditions

General Core Requirement

The declared Infrastructure Quality Object shall preserve the integrity required under foreseeable abnormal and transient conditions identified in the Applicable Basis. The examination shall address the effects of these conditions on constituents, Interfaces, and the whole object, including relevant combinations and transitions. Any permitted degradation, loss of function, or recovery condition shall be explicitly defined and consistent with the applicable requirements.

Indicator 4.5 — Preservation of Integrity Through Change and Modification

General Core Requirement

Changes and modifications to the declared Infrastructure Quality Object shall preserve the structural and functional integrity required for its Intended Functions and Intended Results. Their effects on constituents, Interfaces, dependencies, and the whole object shall be evaluated before implementation, including relevant temporary and transition conditions. The integrity basis shall be updated, and the resulting integrity shall be verified against the applicable requirements.

Indicator 4.6 — Integrity Margin and Tolerance to Uncertainty

General Core Requirement

The declared Infrastructure Quality Object shall have integrity margins and tolerance to uncertainty sufficient to fulfill the applicable integrity requirements under relevant life-cycle conditions. The basis for these margins shall address material uncertainties in loads, conditions, material properties, degradation, and analytical assumptions, as applicable. Reliance on margins shall be justified, and changes that could materially reduce them shall be evaluated.

Indicator 4.7 — Integrity-Relevant Information Retention

General Core Requirement

Information necessary to establish, examine, and preserve the declared Infrastructure Quality Object's structural and functional integrity shall be retained, accessible, and traceable to the object and relevant life-cycle conditions. It shall include applicable integrity requirements, assumptions, assessments, condition records, and the history of material damage, degradation, repairs, and modifications. Information gaps that could limit an integrity determination shall be explicitly identified.

Factor 5 — Harm, Risk, and Safety

Factor Description

Harm, Risk, and Safety concerns the hazards, threats, and vulnerabilities associated with the declared Infrastructure Quality Object and its interaction with its surroundings. It addresses how adverse consequences could arise and whether the necessary capabilities exist to prevent, control, or limit them.

This Factor covers relevant internal and external conditions, credible scenarios, and the effectiveness of Risk controls across operating modes and life-cycle changes. It includes systemic and cumulative effects that may not be apparent when individual constituents are examined separately.

Safety concerns whether Risk associated with Possible Harm is acceptable or tolerable according to applicable Safety criteria established or justified through the Applicable Basis. Risk tolerability criteria and required controls depend on the infrastructure context and Applicable Basis. A Quality deficiency or an identified hazard does not, by itself, establish that Harm has occurred or that Risk is intolerable.

Indicator 5.1 — Identification of Hazards, Threats, and Infrastructure Vulnerabilities

General Core Requirement

Internal and external hazards, threats, and vulnerabilities that could contribute to Harm shall be explicitly identified for the declared Infrastructure Quality Object. The identification shall address relevant life-cycle conditions, constituents, Interfaces, dependencies, and interactions with people and the environment. It shall be reviewed when changes or new information could materially affect the identified conditions.

Indicator 5.2 — Identification of High-Consequence and Loss-of-Control Scenarios

General Core Requirement

Credible scenarios that could lead to high consequences or loss of control shall be explicitly identified for the declared Infrastructure Quality Object. They shall connect relevant hazards, threats, and vulnerabilities to initiating conditions, possible sequences of events, and consequences. The identification shall address relevant operating modes, Interfaces, dependencies, and combinations of failures, with material assumptions and uncertainties made clear.

Indicator 5.3 — Definition of Risk Control Objectives

General Core Requirement

Risk Control Objectives shall be explicitly defined for the identified hazards and scenarios affecting the declared Infrastructure Quality Object. They shall state what must be prevented, controlled, or limited to meet the applicable Risk tolerability criteria. The objectives shall identify the required protective outcomes and relevant conditions, and shall provide a traceable basis for selecting and evaluating Risk controls.

Indicator 5.4 — Effectiveness of Risk Controls Across Operating Modes

General Core Requirement

Risk controls shall achieve their defined objectives across the operating modes and conditions for which they are required. Their effectiveness shall be established for relevant normal, startup, shutdown, maintenance, abnormal, and emergency conditions, as applicable. The examination shall address dependencies, interactions, and conditions that could impair the controls, with material limitations and residual Risk made explicit.

Indicator 5.5 — Systemic and Cumulative Risk Consideration

General Core Requirement

Risk arising from interactions, shared dependencies, and cumulative effects shall be identified and evaluated for the declared Infrastructure Quality Object. The examination shall address relevant combinations of hazards, failures, and exposures, including effects that develop over time or propagate across constituents and Interfaces. Risk controls shall account for these effects rather than rely solely on separate assessments of individual hazards or components.

Indicator 5.6 — Preservation of Risk Mitigation Alignment Under Change

General Core Requirement

Changes to the declared Infrastructure Quality Object or its relevant conditions shall be evaluated for their effects on hazards, scenarios, Risk Control Objectives, and the effectiveness of Risk controls. Necessary adjustments shall preserve alignment with the applicable Risk tolerability criteria, including during temporary and transition conditions. The Risk basis and controls shall be updated, and their continued suitability shall be verified.

Indicator 5.7 — Risk Information Retention and Transparency

General Core Requirement

Information necessary to understand the declared Infrastructure Quality Object's hazards, scenarios, Risk Control Objectives, controls, and residual Risk shall be retained, accessible, and traceable. Material assumptions, uncertainties, limitations, and changes to the Risk basis shall remain explicit. The information shall be available to those who need it for relevant decisions and activities throughout the applicable life cycle.

Factor 6 — Infrastructure and Environment

Factor Description

Infrastructure and Environment concerns the interaction between the declared Infrastructure Quality Object and its natural, physical, and ecological environment in both directions: how environmental conditions affect the infrastructure's Intended Functions and Intended Results, and how the infrastructure affects its surroundings.

This Factor addresses relevant environmental interactions and exposure pathways, environmental protection objectives, and the effectiveness of provisions for managing environmental effects on the infrastructure and preventing, controlling, or limiting adverse effects of the infrastructure on its environment. The Factor includes relevant environmental conditions, emissions, discharges, and changes in environmental conditions across the applicable life cycle. External infrastructure, utility supplies, and other functional contributions are addressed through their relevant Interfaces and dependencies. Their environmental interactions remain within this Factor where applicable.

Environmental requirements, limits, and expected outcomes depend on the infrastructure context and Applicable Basis. Environmental conformity alone does not establish the Quality of the whole infrastructure object.

Indicator 6.1 — Identification of Bidirectional Environmental Interactions and Exposure Pathways

General Core Requirement

Relevant interactions between the declared Infrastructure Quality Object and its natural, physical, and ecological environment shall be identified in both directions: environmental conditions affecting the infrastructure and the infrastructure's effects on its environment. The identification shall address

relevant environmental conditions, exposure pathways, affected environmental receptors, constituents, Interfaces, and dependencies across the applicable life-cycle stages. Environmental interactions involving connected infrastructure or external contributions shall be considered where relevant, without treating those contributions themselves as environmental conditions solely because they originate outside the declared object. Material assumptions and uncertainties shall be made clear, and the identification shall be reviewed when relevant conditions change.

Indicator 6.2 — Prevention and Limitation of Unintended Releases and Environmental Harm

General Core Requirement

The declared Infrastructure Quality Object shall have provisions to prevent or limit unintended releases and Environmental Harm through the identified environmental interactions and exposure pathways. These provisions shall address relevant sources, containment, isolation, and other protective capabilities, as applicable. Their suitability shall be established against the applicable environmental requirements and Quality Outcome Criteria, with material limitations made explicit.

Indicator 6.3 — Environmental Interactions Under Abnormal and Degraded Conditions

General Core Requirement

The declared Infrastructure Quality Object shall have provisions to address relevant abnormal and degraded environmental conditions affecting its Intended Functions and Intended Results, and to prevent or limit adverse environmental effects arising from the infrastructure under such conditions. The examination shall address environmental exposure, changes in environmental conditions, and conditions that could impair required environmental protection provisions, including relevant failures and dependencies. Required environmental protection outcomes, permitted limitations, and recovery conditions shall be established through the applicable requirements and Quality Outcome Criteria. Fulfillment shall be supported by Evidence.

Indicator 6.4 — Consideration of Cumulative and Long-Term Environmental Effects

General Core Requirement

Environmental effects that accumulate, interact, persist, or develop over time shall be identified and evaluated for the declared Infrastructure Quality Object. The examination shall address relevant repeated or distributed releases, combined exposures, and delayed effects across the applicable life cycle, including after decommissioning where relevant. Environmental protection provisions shall account for these effects, with material assumptions, uncertainties, and limitations made clear.

Indicator 6.5 — Environmental Protection Alignment Under Change

General Core Requirement

Changes to the declared Infrastructure Quality Object or its relevant environmental conditions shall be evaluated for their effects on environmental interactions, exposure pathways, and environmental protection provisions. The examination shall address changes in environmental conditions affecting the infrastructure, as well as changes in the infrastructure that may affect its environment. Necessary adjustments shall preserve alignment with the applicable environmental requirements and Quality Outcome Criteria, including during temporary and transition conditions. The environmental basis and relevant protection provisions shall be updated, and their continued suitability shall be verified.

Indicator 6.6 — Understanding and Limitation of Emissions and Discharges

General Core Requirement

Relevant emissions and discharges from the declared Infrastructure Quality Object shall be identified and characterized under the applicable life-cycle and operating conditions. Their sources, pathways,

quantities or other significant characteristics, and environmental effects shall be understood sufficiently to establish and verify the required limitations. Emissions and discharges shall remain within the applicable requirements and Quality Outcome Criteria, with material uncertainties and limitations made explicit.

Indicator 6.7 — Environmental Information Retention and Transparency

General Core Requirement

Information necessary to understand the declared Infrastructure Quality Object's environmental interactions, exposure pathways, protection provisions, and residual impacts shall be retained, accessible, and traceable. Material assumptions, uncertainties, limitations, and changes to the environmental basis shall remain explicit. The information shall be available to those who need it for relevant decisions and activities throughout the applicable life cycle, including after decommissioning where required.

Factor 7 — Operational Reliability

Factor Description

Operational Reliability concerns whether the declared Infrastructure Quality Object consistently realizes its Intended Functions and Intended Results under the operating conditions it is expected to face.

This Factor addresses continuity and stability of functional performance, tolerance to operational variability and disturbance, and recovery following disruption. It includes the effects of degradation, aging, and changes to the infrastructure or its conditions of use.

Required performance, permitted interruptions, and recovery outcomes depend on the infrastructure context and Applicable Basis. Successful operation at one time does not, by itself, establish continuing reliability.

Indicator 7.1 — Identification of Reliability-Critical Functions

General Core Requirement

Intended Functions whose loss, degradation, or interruption could materially affect the declared Infrastructure Quality Object's Intended Results shall be explicitly identified. Their required performance and continuity shall be defined for the relevant operating conditions, including dependencies on constituents, Interfaces, and external contributions. These functions shall provide a clear basis for examining Operational Reliability.

Indicator 7.2 — Consistency of Functional Performance Under Expected Operating Conditions

General Core Requirement

The declared Infrastructure Quality Object shall consistently realize its required functional performance under expected operating conditions. Performance shall meet the applicable requirements and Quality Outcome Criteria over the relevant operating period, including permitted variability and interruptions. Its consistency shall be established for the integrated object, taking account of relevant constituents, Interfaces, and external dependencies.

Indicator 7.3 — Tolerance to Operational Variability and Disturbance

General Core Requirement

The declared Infrastructure Quality Object shall tolerate operational variability and disturbances within the conditions established by the Applicable Basis. Required functional performance shall be maintained within the applicable limits, taking account of relevant constituents, Interfaces, and

dependencies. The extent of permissible performance degradation or interruption shall be explicitly defined, and the required tolerance shall be supported by Evidence.

Indicator 7.4 — Recovery Capability Following Disruption

General Core Requirement

The declared Infrastructure Quality Object shall have the capability to restore required Function Realization following relevant disruptions. Recovery requirements shall identify the functions and Results to be restored, the applicable time limits, and any conditions governing restoration. Recovery capability shall account for relevant constituents, Interfaces, resources, and external dependencies, and shall be supported by Evidence.

Indicator 7.5 — Reliability Implications of Degradation and Aging

General Core Requirement

The effects of degradation and aging on Operational Reliability shall be identified and evaluated for the declared Infrastructure Quality Object. The examination shall address changes over time in functional performance, continuity, disturbance tolerance, and recovery capability, including relevant constituent and Interface dependencies. The reliability basis shall reflect these effects and be reviewed as condition information and operating experience develop.

Indicator 7.6 — Reliability Under Change and Modification

General Core Requirement

Changes and modifications to the declared Infrastructure Quality Object shall be evaluated for their effects on Operational Reliability before implementation. The evaluation shall address required functional performance, continuity, disturbance tolerance, and recovery capability, including relevant Interfaces, dependencies, and temporary or transition conditions. The reliability basis shall be updated, and the resulting reliability shall be verified against the applicable requirements and Quality Outcome Criteria.

Indicator 7.7 — Reliability-Relevant Information Retention

General Core Requirement

Information necessary to understand and evaluate the declared Infrastructure Quality Object's Operational Reliability shall be retained, accessible, and traceable. It shall include relevant performance and interruption histories, reliability assumptions, known vulnerabilities, recovery experience, and changes affecting reliability. Material information gaps and limitations shall remain explicit so that later decisions and determinations do not rely on an incomplete or misleading reliability basis.

Factor 8 — Human and Infrastructure Interaction

Factor Description

Human and Infrastructure Interaction concerns the conditions under which people use, occupy, operate, maintain, inspect, or otherwise interact with the declared Infrastructure Quality Object. It includes visitors and emergency responders where relevant.

This Factor addresses whether the infrastructure's configuration, Interfaces, and information are suitable for foreseeable human capabilities and limitations. It includes clarity of use, prevention of unsafe interaction, and interaction under normal, abnormal, and emergency conditions.

The relevant people, activities, and interaction requirements depend on the declared object and its context. Workplace interaction is one application; this Factor also covers other forms of infrastructure use and occupancy.

Indicator 8.1 — Identification of Human–Infrastructure Interactions

General Core Requirement

Relevant interactions between people and the declared Infrastructure Quality Object shall be explicitly identified across the applicable life-cycle stages and conditions of use. The identification shall address the people involved, their activities, relevant Interfaces, and foreseeable human capabilities and limitations. It shall include interactions during occupancy, operation, maintenance, inspection, and emergency response, as applicable, and shall be reviewed when relevant conditions change.

Indicator 8.2 — Suitability of Infrastructure for Human Interaction

General Core Requirement

The declared Infrastructure Quality Object shall be suitable for the identified human interactions, taking account of foreseeable human capabilities and limitations. Its configuration, access arrangements, controls, and other relevant Interfaces shall support the required activities under the applicable conditions. Suitability shall be established against the relevant Functional and Technical Requirements and Quality Outcome Criteria, including the needs of different users where applicable.

Indicator 8.3 — Prevention of Unsafe Human–Infrastructure Interaction

General Core Requirement

The declared Infrastructure Quality Object shall incorporate provisions to prevent or limit foreseeable unsafe human interaction. Its configuration, controls, access arrangements, and other relevant Interfaces shall be examined for features that could encourage, permit, or fail to prevent unsafe actions. Protective provisions shall address the identified interactions and conditions, with their effectiveness and material limitations established against the applicable requirements and Quality Outcome Criteria.

Indicator 8.4 — Safety of Human Interaction Under Abnormal Conditions

General Core Requirement

The declared Infrastructure Quality Object shall support safe human interaction under the foreseeable abnormal and emergency conditions for which it is required. Relevant provisions shall address access, control, warning, evacuation, rescue, and emergency response, as applicable. Their effectiveness shall account for foreseeable human capabilities and limitations, degraded infrastructure conditions, and dependencies on external assistance. Required protective outcomes and material limitations shall be made explicit.

Indicator 8.5 — Clarity of Infrastructure for Its Users

General Core Requirement

The declared Infrastructure Quality Object shall provide understandable information and cues needed for the identified users to interact with it appropriately. Relevant controls, signs, signals, warnings, and instructions shall clearly communicate their meaning and required actions under the applicable conditions. Their clarity shall account for foreseeable user capabilities and limitations, and ambiguity or conflicting information that could materially affect interaction shall be addressed.

Factor 9 — Competence of Personnel

Factor Description

Competence of Personnel concerns whether people whose decisions, actions, omissions, or judgments materially affect the declared Infrastructure Quality Object possess and maintain the competence needed for their roles.

This Factor addresses technical and contextual competence under relevant life-cycle conditions, including abnormal, degraded, and non-routine situations. It includes recognition of the limits of expertise and authority, awareness of competence-related Risk, and adaptation of competence as requirements and conditions change.

The scope includes relevant personnel from internal and external organizations. It does not treat infrastructure users or occupants as personnel merely because they interact with the infrastructure, nor does it prescribe a personnel-management system, training method, or universal credential.

Indicator 9.1 — Identification of Infrastructure-Critical Roles

General Core Requirement

Roles whose decisions, actions, omissions, judgments, or authority could materially affect the declared Infrastructure Quality Object shall be explicitly identified. The identification shall address relevant life-cycle stages, activities, and Interfaces, including roles performed by external contributors. The responsibilities and competence-dependent contributions of these roles shall be clear, providing a basis for establishing the competence required.

Indicator 9.2 — Role-Appropriate Technical and Contextual Competence

General Core Requirement

Personnel performing infrastructure-critical roles shall possess the technical and contextual competence needed for their assigned responsibilities. Competence shall reflect the relevant Work, infrastructure characteristics, operating conditions, Interfaces, and applicable requirements. Its adequacy shall be supported by Evidence appropriate to the role; qualifications, training, or experience alone shall not be assumed to establish competence for every assignment.

Indicator 9.3 — Competence for Abnormal, Degraded, and Non-Routine Conditions

General Core Requirement

Personnel performing infrastructure-critical roles shall have the competence needed to recognize and respond appropriately to relevant abnormal, degraded, and non-routine conditions. This shall include interpreting available information, understanding the limits of established instructions, and seeking assistance or escalating matters when required. Competence shall be appropriate to the decisions and actions expected of the role under those conditions.

Indicator 9.4 — Recognition of Limits of Authority and Expertise

General Core Requirement

Personnel performing infrastructure-critical roles shall recognize the limits of their authority and expertise in relation to assigned responsibilities and actual conditions. Decisions or actions requiring competence or authorization beyond those limits shall be referred to appropriately competent and authorized persons. Uncertainty about those limits shall be made explicit and addressed before proceeding where it could materially affect the declared Infrastructure Quality Object.

Indicator 9.5 — Evolution of Competence with Lifecycle and Context

General Core Requirement

The competence of personnel performing infrastructure-critical roles shall remain appropriate as the declared Infrastructure Quality Object, its life-cycle stage, technology, requirements, or conditions change. Changes affecting role responsibilities and competence needs shall be identified, and resulting gaps shall be addressed before personnel undertake the affected Work or decisions. Continued competence shall be supported by Evidence relevant to the changed context.

Indicator 9.6 — Competence-Related Risk Awareness

General Core Requirement

Risks arising from gaps, loss, degradation, or misalignment of personnel competence shall be explicitly identified where they could materially affect the declared Infrastructure Quality Object, Function Realization, Evidence, or Quality Claims. The examination shall consider relevant roles, dependencies, availability of expertise, and changes in assignments or conditions. Personnel performing infrastructure-critical roles shall recognize their relevant limitations and circumstances requiring assistance or escalation.

Factor 10 — Regulatory and Standards Compliance

Factor Description

Regulatory and Standards Compliance concerns whether the requirements governing the declared Infrastructure Quality Object are correctly identified, interpreted, incorporated into relevant decisions, and fulfilled.

This Factor addresses applicable regulatory and standards obligations across relevant jurisdictions and life-cycle stages, including conflicts, overlaps, and changes affecting their application. It distinguishes binding obligations from voluntary guidance and other reference material.

Compliance is necessary where required by the Applicable Basis, but does not, by itself, establish the Quality of the whole infrastructure object. The scope, conditions, and limitations of demonstrated compliance remain explicit.

Indicator 10.1 — Identification of Applicable Regulatory and Standards Obligations

General Core Requirement

Regulatory and standards obligations applicable to the declared Infrastructure Quality Object shall be explicitly identified for the relevant jurisdiction, life-cycle stage, and conditions of use. Their scope, legal or contractual force, applicable editions, and conditions of applicability shall be clear. Binding obligations shall be distinguished from voluntary guidance and other reference material, and the identification shall be reviewed when relevant requirements or conditions change.

Indicator 10.2 — Integration of Regulatory and Standards Requirements into Infrastructure Decisions

General Core Requirement

Applicable regulatory and standards requirements shall be incorporated into decisions affecting the declared Infrastructure Quality Object. Relevant Functional and Technical Requirements, Work, Results, and Interface conditions shall reflect those obligations across the applicable life-cycle stages. Their integration shall be traceable so that compliance is addressed in realization of the infrastructure rather than assumed from a list of referenced documents.

Indicator 10.3 — Demonstration of Conformity with Applicable Requirements

General Core Requirement

Conformity with applicable regulatory and standards requirements shall be demonstrated through Evidence relevant to the declared Infrastructure Quality Object, life-cycle stage, and conditions assessed. The demonstration shall identify the obligations addressed, the assessment basis, and the Findings supporting conformity. Non-conformities, unresolved conditions, and material limitations shall remain explicit; approvals or certificates shall not be extended beyond their supported scope.

Indicator 10.4 — Treatment of Conflicting or Overlapping Requirements

General Core Requirement

Conflicts and overlaps among applicable regulatory and standards requirements shall be explicitly identified and evaluated for the declared Infrastructure Quality Object. Their treatment shall account for jurisdiction, legal or contractual force, scope, and conditions of applicability. Interpretations and resolutions shall be justified and documented, with unresolved conflicts and their effects on compliance and Function Realization made clear.

Indicator 10.5 — Continued Validity of Compliance Under Change

General Core Requirement

Changes to the declared Infrastructure Quality Object, its use, conditions, or applicable regulatory and standards requirements shall be evaluated for their effects on compliance. The applicable obligations, supporting assessments, and compliance Findings shall be reviewed and updated where necessary. Continued compliance shall be supported by Evidence, including any required reassessment or authorization, with transition conditions and unresolved obligations made explicit.

Indicator 10.6 — Recognition of Compliance Limitations

General Core Requirement

The scope, conditions, and limitations of demonstrated compliance shall be explicitly identified for the declared Infrastructure Quality Object. Compliance Findings shall distinguish the obligations fulfilled from requirements outside the assessment or left unresolved. Compliance shall not, by itself, be presented as establishing overall Infrastructure Quality, Safety, or realization of all Intended Functions and Intended Results.

Factor 11 — Infrastructure and Stakeholders

Factor Description

Infrastructure and Stakeholders concerns the relationship between the declared Infrastructure Quality Object and the people and groups affected by or dependent on it. These may include occupants, residents, users, customers, workers, owners, and neighboring communities.

This Factor addresses whether relevant infrastructure effects are understood and whether Work and Results align with applicable obligations, declared commitments, and relevant stakeholder expectations. It includes cumulative and long-term effects and responsiveness to infrastructure-related concerns.

Stakeholder views provide relevant information but do not replace Evidence-supported Quality Determination. Popularity, satisfaction, or the absence of complaints does not, by itself, establish Infrastructure Quality.

Indicator 11.1 — Identification of Affected Stakeholders and Communities

General Core Requirement

Stakeholders and communities affected by or dependent on the declared Infrastructure Quality Object shall be explicitly identified. The identification shall address relevant life-cycle stages, locations, uses, and dependencies, including groups whose circumstances or exposure may differ materially. It shall be reviewed when changes to the infrastructure or its context could alter who is affected.

Indicator 11.2 — Identification of Infrastructure Impacts Relevant to Stakeholders and Communities

General Core Requirement

Effects of the declared Infrastructure Quality Object relevant to identified stakeholders and communities shall be explicitly identified. The examination shall address beneficial and adverse effects of its Work and Results across the applicable life cycle, including effects on service, access, Safety, reliability, and environmental conditions, as relevant. The affected groups, pathways, and conditions shall be clear, with material assumptions and uncertainties made explicit.

Indicator 11.3 — Alignment with Declared Commitments and Expectations

General Core Requirement

The declared Infrastructure Quality Object's Work and Results affecting stakeholders and communities shall align with applicable obligations, declared commitments, and relevant stakeholder expectations established within the Applicable Basis. Their scope and conditions shall be explicit, and fulfillment shall be supported by Evidence. Material differences between commitments, expectations, and actual effects shall be identified and addressed, with unresolved differences made clear.

Indicator 11.4 — Consideration of Cumulative and Long-Term Community Effects

General Core Requirement

Effects on communities that accumulate, interact, persist, or develop over time shall be identified and evaluated for the declared Infrastructure Quality Object. The examination shall address relevant repeated, distributed, and combined effects across the applicable life cycle, including after decommissioning where relevant. Their implications for affected groups, applicable obligations, and declared commitments shall be considered, with material assumptions, uncertainties, and limitations made explicit.

Indicator 11.5 — Responsiveness to Infrastructure-Related Community Concerns

General Core Requirement

Infrastructure-related concerns raised by affected stakeholders or communities and relevant to the declared Infrastructure Quality Object shall be received, examined, and addressed according to their substance and significance. The response shall consider applicable requirements, declared commitments, and Evidence about actual or potential effects. Actions, reasons for decisions, and unresolved matters shall be communicated to the affected parties as appropriate. The absence of complaints shall not be treated as proof that relevant concerns or adverse effects do not exist.

Indicator 11.6 — Transparency of Infrastructure Impacts and Limitations

General Core Requirement

Known infrastructure effects, residual impacts, and material limitations relevant to affected stakeholders and communities shall be communicated clearly and without misleading omission. The communication shall distinguish established Findings from assumptions, forecasts, and unresolved

matters. Its scope, conditions, and uncertainty shall remain explicit so that the representation of the declared Infrastructure Quality Object's effects does not exceed what the Evidence supports.

Factor 12 — Infrastructure Monitoring

Factor Description

Infrastructure Monitoring concerns whether the declared Infrastructure Quality Object's condition, performance, and changes remain sufficiently observable and interpretable to support relevant decisions and Quality Determinations.

This Factor addresses identification of what needs monitoring, detection of degradation and deviation, interpretation of observations in context, and recognition of emerging or systemic Risk. It also considers whether monitoring remains relevant as the infrastructure and its conditions change.

Monitoring methods, coverage, frequency, and criteria depend on the declared object and Applicable Basis. The presence of sensors, records, or large amounts of data does not, by itself, establish that relevant infrastructure behavior is adequately understood.

Indicator 12.1 — Identification of Monitoring-Relevant Infrastructure Behaviors

General Core Requirement

Infrastructure behaviors and conditions requiring monitoring shall be explicitly identified for the declared Infrastructure Quality Object. The identification shall address the performance, changes, and warning signs relevant to its Intended Functions and Intended Results, including material constituent, Interface, and dependency conditions. What needs to be observed shall be clear for the applicable life-cycle stages and operating conditions, providing a basis for establishing suitable monitoring coverage and detail.

Indicator 12.2 — Adequacy of Monitoring to Detect Degradation and Deviation

General Core Requirement

Monitoring shall be adequate to detect material degradation and deviation in the identified infrastructure behaviors and conditions. Its coverage, sensitivity, frequency, continuity, and timeliness shall be appropriate to the applicable requirements, expected rates of change, and significance of the conditions monitored. Detection capability shall be supported by Evidence, with material gaps, uncertainties, and limitations made explicit.

Indicator 12.3 — Interpretation of Monitoring Information in Context

General Core Requirement

Monitoring information shall be interpreted in relation to the declared Infrastructure Quality Object's requirements, operating conditions, configuration, and relevant history. The interpretation shall distinguish meaningful changes and deviations from expected variability, taking account of measurement limitations, assumptions, and uncertainty. Findings shall remain traceable to the information and reasoning used, and shall not exceed what the monitoring supports.

Indicator 12.4 — Detection of Emerging and Systemic Risk

General Core Requirement

Monitoring information shall be examined for emerging warning patterns and systemic Risk affecting the declared Infrastructure Quality Object. The examination shall consider trends, interacting deviations, shared dependencies, and conditions that may not be apparent from individual observations. Material warning patterns shall be identified in time to support relevant decisions, with their significance, uncertainty, and need for further examination made clear.

Indicator 12.5 — Monitoring Relevance Under Change

General Core Requirement

Monitoring shall remain relevant when the declared Infrastructure Quality Object, its requirements, configuration, use, or operating conditions change. The effects of change on monitored behaviors, coverage, detection capability, and interpretation shall be evaluated. Necessary adjustments shall be implemented and their suitability verified, with temporary monitoring gaps and material limitations made explicit.

Factor 13 — Documentation and Traceability

Factor Description

Documentation and Traceability concerns whether information needed to understand the declared Infrastructure Quality Object remains available, connected, and usable throughout the relevant life cycle.

This Factor addresses the links among functional intent, Technical Requirements, realized infrastructure, decisions, assumptions, Evidence, assessments, and changes. It includes preservation of the reasoning, uncertainty, limitations, and known vulnerabilities needed to interpret that information.

Documentation supports understanding and determination of infrastructure Quality; its existence does not, by itself, demonstrate satisfactory Quality. The required information and depth of Traceability depend on the declared object and Applicable Basis, without prescribing a particular document-management system or data platform.

Indicator 13.1 — Documentation of Infrastructure-Relevant Decisions and Assumptions

General Core Requirement

Decisions and assumptions that materially affect the declared Infrastructure Quality Object shall be documented with their basis, relevant conditions, and rationale. The records shall identify their relationship to the object's requirements, Work, Results, and Interfaces, including essential external contributions. Material changes to those decisions or assumptions shall remain traceable so that their effects can be understood throughout the applicable life cycle.

Indicator 13.2 — Traceability Between Functional Intent, Technical Requirements, and Realized Infrastructure

General Core Requirement

Traceable links shall be maintained between the declared Infrastructure Quality Object's Intended Functions and Intended Results, its Technical Requirements, and the Work and Results actually realized. These links shall allow relevant constituents, configurations, and Interfaces to be related to the requirements they fulfill. Changes and material departures shall remain identifiable so that the current infrastructure condition can be understood against its applicable functional and technical basis.

Indicator 13.3 — Documentation of Uncertainty, Limitations, and Known Vulnerabilities

General Core Requirement

Material uncertainty, limitations, and known vulnerabilities affecting the declared Infrastructure Quality Object or its Quality Determination shall be explicitly documented. Their scope, basis, relevant conditions, and implications for interpreting requirements, Evidence, and Findings shall be clear. The records shall be reviewed and updated as knowledge or conditions change, while preserving Traceability to earlier determinations and decisions.

Indicator 13.4 — Traceability of Assessments, Evaluations, and Conformity Statements

General Core Requirement

Assessments, evaluations, and Conformity Statements concerning the declared Infrastructure Quality Object shall be traceable to the object, applicable requirements and Quality Outcome Criteria, supporting Evidence, and resulting Findings. Their scope, relevant conditions, material assumptions, uncertainty, and limitations shall remain identifiable. Revisions and superseded conclusions shall be distinguishable so that later use preserves the meaning and validity of the original assessment basis.

Indicator 13.5 — Documentation of Changes and Their Rationale

General Core Requirement

Changes that materially affect the declared Infrastructure Quality Object shall be documented with their reasons, scope, and supporting basis. The records shall identify affected requirements, constituents, configurations, Interfaces, and relevant Work and Results, together with the evaluation and authorization of the changes. The implemented condition and its relationship to previous conditions shall remain traceable, including any material limitations or unresolved matters.

Indicator 13.6 — Accessibility and Continuity of Quality-Critical Information

General Core Requirement

Information necessary to understand, preserve, or determine the declared Infrastructure Quality Object's Quality shall remain accessible and usable by those who need it throughout the relevant life cycle. Its identity, meaning, and Traceability shall be preserved through changes in personnel, organizations, ownership, systems, or information formats. Material loss, inaccessibility, or deterioration of information shall be identified, with its effects on decisions and determinations made explicit.

Factor 14 — Infrastructure Adaptability

Factor Description

Infrastructure Adaptability concerns whether the declared Infrastructure Quality Object can accommodate changes required for continued realization of its Intended Functions and Intended Results. The need for change may arise from demand, technology, operating or environmental conditions, Interfaces, or applicable requirements.

This Factor addresses the object's capability to accommodate required change. It remains distinct from requirements under other Factors concerning preservation of integrity, reliability, Safety, or other Quality conditions when a change is made.

Adaptability does not require change for its own sake, maximum flexibility, or adoption of every new technology. The required capability and acceptable outcomes depend on the infrastructure context and Applicable Basis.

Indicator 14.1 — Capability of Infrastructure to Accommodate Required Changes

General Core Requirement

The declared Infrastructure Quality Object shall have the capability to accommodate changes required for continued realization of its Intended Functions and Intended Results. The required changes and capability shall be established in relation to relevant life-cycle conditions, constituents, Interfaces, and dependencies. The capability shall be supported by Evidence against the applicable requirements and Quality Outcome Criteria, with material constraints, assumptions, and limitations made explicit.

Annex A — Infrastructure Examples Across Life-Cycle Stages and Scales

Informative

A data center, an apartment building, and a bridge serve different purposes. Yet their Quality can be examined using the same Core Factors and Indicators. What changes is the infrastructure being examined, the conditions it must meet, and the Evidence needed.

This Annex gives examples of that common approach. It does not establish technical requirements or Quality Outcome Criteria.

Infrastructure also depends on other infrastructure. Figure A-1 shows how electricity and other systems contribute to the functioning of three familiar infrastructure objects: a data center, a residential building, and a road bridge.

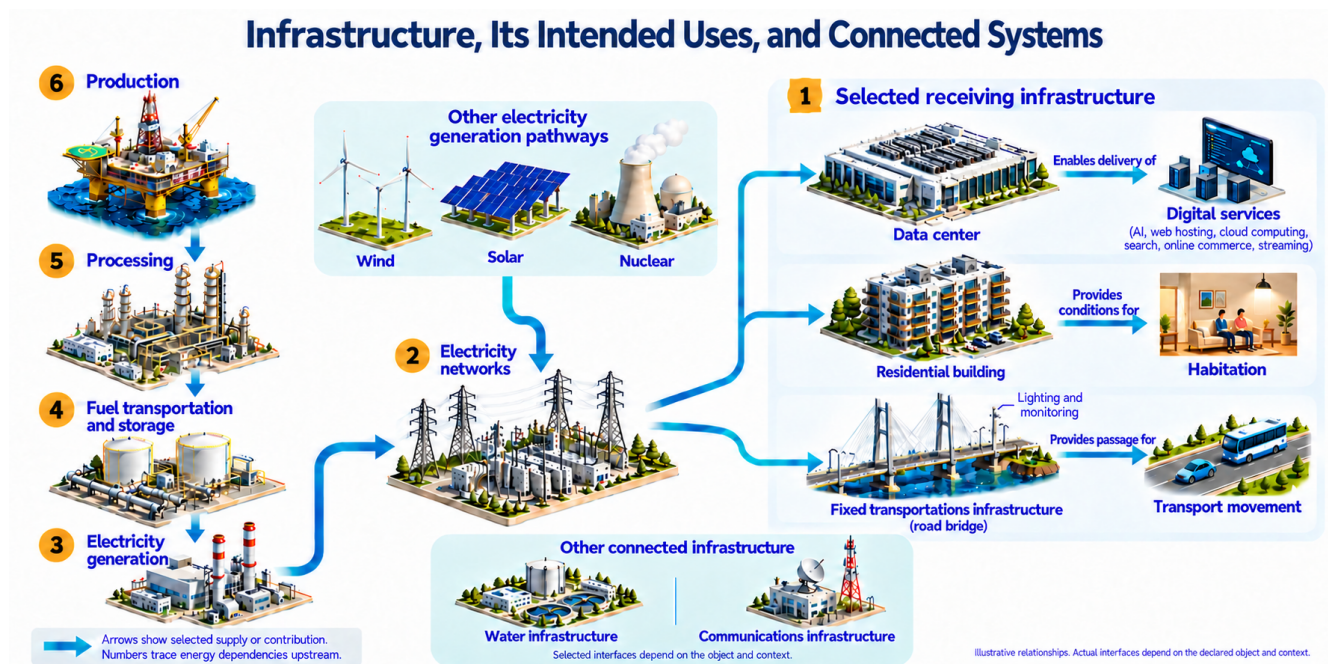


Figure A-1 — Infrastructure, Its Intended Uses, and Connected Systems

The arrows show selected supplies and contributions. Readers can start with the receiving infrastructure, marked 1, and follow its energy dependencies backward: electricity networks, generation, fuel transportation and storage, processing, and production. Wind, solar, and nuclear illustrate other electricity generation pathways. Water and communications illustrate other connected systems.

The three receiving infrastructure objects have different Intended Functions. The data center provides computing, storage, and connectivity capabilities used to deliver digital services. The residential building provides spaces and conditions for habitation. The bridge provides passage for traffic across an obstacle. Electricity contributes to realization of these functions in different ways. For example, it powers bridge lighting and monitoring equipment, while the bridge structure provides passage for traffic.

The digital services and moving vehicles illustrate activities enabled by the infrastructure. They remain distinct from the infrastructure objects examined here. The picture shows examples, rather than every possible connection. The relevant connections must be identified for each actual examination.

Each contributing system may also be examined as a separate Quality Object. Essential Work and Results must be included in the declared scope or addressed through identified Interfaces. A satisfactory contributing system does not, by itself, establish satisfactory Quality of the receiving infrastructure or the connected whole.

For a data center at the design stage, the examination may concern the design Work and Results for its physical infrastructure. It may ask whether power, cooling, space, and connectivity needs have been clearly identified and translated into suitable Technical Requirements. It also considers connections to systems that provide essential contributions. The Findings concern the design and what can be established from it about the proposed facility; they do not establish the actual Quality of a facility that has not yet been built.

For an occupied apartment building, the examination may concern the building and the essential Work and Results needed for its intended use. Relevant matters include living conditions, access, building services, integrity, interaction with people, and effects on residents and neighbors. Contracted maintenance and external utility contributions remain included in the scope or addressed through identified Interfaces.

For a bridge undergoing modification, the examination may cover the proposed change, the Work performed, the resulting bridge, and temporary conditions during the Work. It considers revised requirements, integrity, traffic arrangements, and external contributions. Replacement components may meet their own requirements while the modified bridge still has deficiencies. Both the parts and their integration require examination.

For a water-supply network, the examination may concern a component, a treatment facility, a distribution network, or a larger connected system. These are different Scales of examination. Each declared object has its own Intended Functions and Intended Results. Findings about pumps, pipes, or treatment equipment may provide Evidence for a network determination, but the connections and combined performance also need examination.

For decommissioned infrastructure, the examination may concern removal Work, restored land, remaining installations, monitoring, and continuing records. Removing the physical asset does not necessarily complete every requirement. The examination follows the functions and results still required at that stage.

In every example, users first make clear what they are examining and what they intend to determine. They then establish the applicable requirements and Quality Outcome Criteria and examine the Evidence. The technical detail changes; the meaning of the common Factors and Indicators remains the same.

Annex B — Using Infrastructure Context Guides

Informative

A Context Guide helps users apply the Core to a particular infrastructure type or use. It connects the common General Core Requirements to the functions, conditions, Interfaces, and technical provisions relevant to that context.

A guide may detail requirements and establish one or more Quality Outcome Criteria under an Indicator. Its Reference Layer identifies relevant regulations, standards, specifications, and other sources. The role and applicability of those sources remain explicit; reference to a document does not automatically make every provision binding.

Before using a guide, users examine whether it covers the declared Infrastructure Quality Object, relevant life-cycle stages, Scale, and conditions. A guide may address only part of a larger object. Several guides may contribute to one application, provided that their coverage, Interfaces, and any gaps or conflicts are understood.

The guide preserves the meaning of the Core Factors and Indicators. Differences in technology, jurisdiction, or infrastructure use are addressed through context-specific requirements, criteria, and Evidence rather than by silently changing the Core set.

Where no suitable guide exists, Quality Outcome Criteria may be established directly under the General Core Requirements, following Section 5. The absence of a guide does not remove the need to establish an adequate Applicable Basis.

Use of a Context Guide does not, by itself, establish conformity or Infrastructure Quality. Findings depend on examination of the declared object against the applicable requirements and criteria.

Experience from applying guides may also reveal recurring questions or gaps. These can inform further IQI research and controlled revision, while remaining distinct from the requirements of the current Core.

Annex C — Where to Find the Meaning of Terms

Informative

The Core uses a common vocabulary so that the same term retains its meaning across infrastructure applications. Capitalized methodological terms refer readers to the governing WQI or IQI vocabulary; capitalization does not create a separate definition.

The WQI Vocabulary provides the authoritative meanings of general Whole Quality concepts, including Quality Object, Intended Function, Intended Result, Quality State, Quality Determination, Quality Factor, Quality Indicator, Quality Outcome Criterion, Evidence, Materiality, Synthesis of Material Findings, Quality Claim, and Traceability.

The IQI Vocabulary provides infrastructure-specific terms and applications consistent with those governing WQI meanings.

The WQI Foundational Theory Articles explain the reasoning and relationships behind the concepts. Foundational Article 10 explains the methodology for Quality Outcome Criteria. Related WQI standards provide requirements for particular subjects, including Evidence Quality, Quality Claims, Organization Quality, and Management System Quality.

The IQI Factors and Indicators Justification articles explain why the Core Factors and Indicators are necessary and distinct. The descriptions and requirements in this Core bring those findings into application; they do not replace the supporting research.

Context Guides and Reference Layer documents provide infrastructure-specific technical terms, conditions, and application detail. Their use preserves the governing methodological meanings. Where a source uses a term differently, that difference is made explicit so that the applicable requirement and its interpretation remain clear.

The Governing References identify the publications and editions used by this Core. Explanations in the Core assist understanding without establishing competing definitions.

Governing References

The following publications provide the terminology, methodology, and supporting justification used by this Core. Their application shall reflect the declared Quality Object and the subject being examined. Reference to a publication does not make every provision applicable to every determination.

WQI Vocabulary — WQI_VOC1

Governs the general Whole Quality terms and methodological concepts used in this Core.

IQI_VOC1 — Infrastructure Quality Applied Vocabulary Standard, Revision 2.8 — October 2026.

Governs infrastructure-specific terminology consistent with the WQI Vocabulary.

WQI Foundational Theory Articles

Provide the methodological basis for the concepts and methods used throughout this Core, including Intended Functions and Intended Results, Function Realization, Fractal Quality Determination, Scale and Methodological Resolution, Quality Outcome Criteria, Evidence-supported Findings, Quality Determination, Quality Claims, and the relationships among Quality, Harm, Risk, and Safety. The series is referenced collectively here. Individual articles are identified in the relevant sections to direct readers to the methods being applied; those references do not imply that the other foundational articles are less relevant. The editions or versions used shall be traceable within the Applicable Basis.

WQI_EQC1 — Evidence Quality Standard

Governs determination of the Quality of Evidence used to support Findings.

WQI_QCC1 — Claim Quality Standard

First Draft Edition — October 2026. Governs determination of the Quality of a claim as a separate Quality Object.

WQI_QOC1 — Organization Quality Standard

Governs determination of Organization Quality as a separate Quality Object, where its Findings provide relevant information for an infrastructure examination.

WQI_QMS1 — Management System Quality Standard

Governs determination of Management System Quality as a separate Quality Object, where its Findings provide relevant information for an infrastructure examination.

IQI_FJQ1 — Justification of the Fourteen Invariant IQI Core Quality Factors

First Edition — Updated October 2026. Provides the derivation and justification of the fourteen Core Factors.

IQI_IJQ1 — Justification of the Invariant IQI Core Quality Indicators

First Edition — Updated October 2026. Provides the justification of the retained Indicators within the Factors, including the single Indicator under Infrastructure Adaptability.

Applicable Context Guides and Reference Layer documents shall be identified separately for each application. The editions or versions used shall remain traceable within its Applicable Basis.

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