LRQA

STRUCTURAL INTEGRITY AND RESILIENCE ACCREDITATION SCHEME (SIRAS)

SIRAS Standard

A comprehensive certification framework to standardise practices in structural rehabilitation and corrosion control

Version 1.0 issued April 2025

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1 | Executive summary

The Structural Integrity and Resilience Accreditation Scheme (SIRAS) has been developed by LRQA to certify corrosion control management processes designed, installed, commissioned and operational which meet standardised criteria, in order to provide assurance to asset owners as to the structural resilience of their asset. This guidance document outlines the principles and assessment criteria which underpin the SIRAS scheme providing assurance to asset owners and operators as to the rigorous nature of the scheme as well as guidance to corrosion management consultants and contractors who may be exposed to assessment under the scheme.

1.1 The background – structural degradation

Structures inevitably degrade over time, impacting their service life and asset value. Structural degradation, mainly due to steel corrosion, is a leading cause of infrastructure deterioration, affecting 70% of global structures. Environmental factors accelerate this degradation, reducing service life, increasing maintenance costs and diminishing asset value. Despite the proven benefits of corrosion control systems, their adoption has been limited due to uncertainty regarding their effectiveness and perceived technological risks.

1.2 SIRAS scheme assurance

Extending structural lifespan through effective corrosion control preserves asset value. As highlighted in the UK Government Construction Playbook and platform toolkit, it secures embodied carbon, directly supporting the Government's decarbonisation agenda. The SIRAS scheme has been established to assure asset developers, operators and owners regarding the technical integrity of corrosion control and monitoring systems throughout the implementation stages.

1.3 Scheme beneficiaries

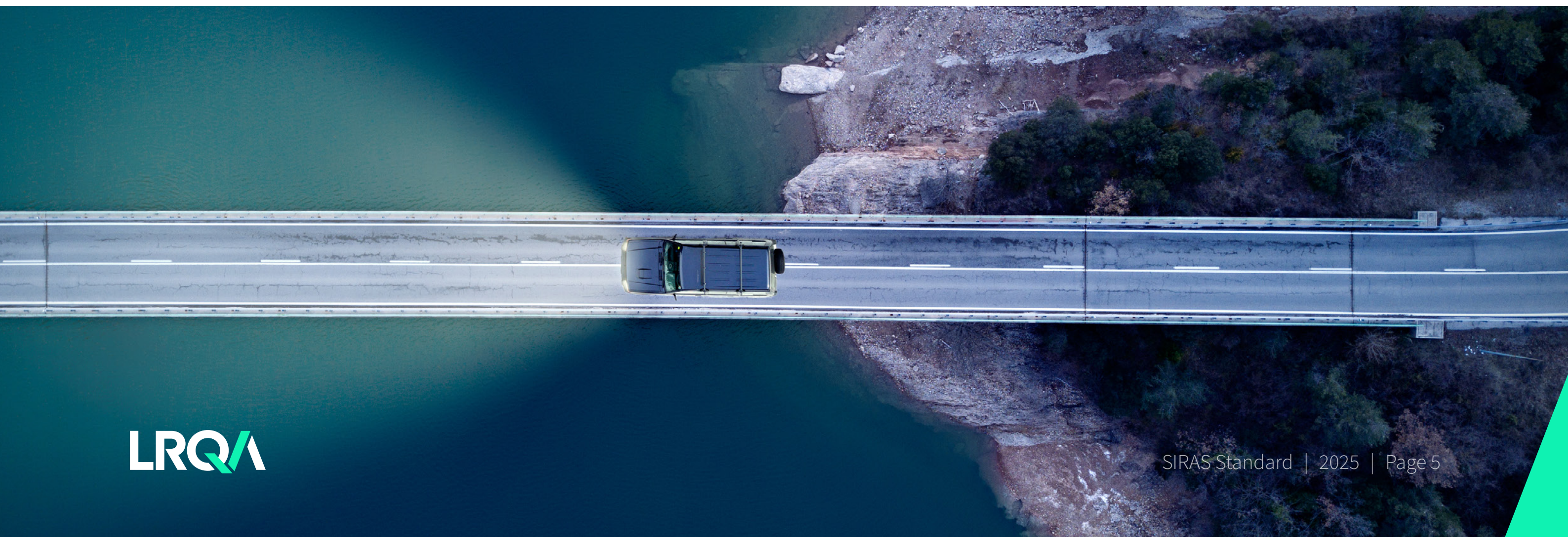
The SIRAS and SIRAS+ schemes are designed to benefit a wide range of stakeholders, including:

- Structure owners and developers
- Infrastructure operators and managers (e.g., utilities, industrial facilities, critical infrastructure, transportation)
- Asset managers (e.g., public and private buildings, car parks and heritage properties)
- Government agencies and regulatory bodies
- Consulting engineers and structural designers
- Insurance companies and risk assessors

1.4 Consultation

Industry specialists who have been consulted in the production of the scheme are as follows:

- **Makers Construction Limited**
- **Structural Healthcare Limited**
- **C-Probe Systems Limited**
- **Mott MacDonald**
- **LRQA Limited**



2 | Introduction and purpose

The purpose of this standard is to define the criteria against which the beneficiary seeking SIRAS accreditation may be assessed.

2.1 Introduction

By establishing a standardised framework for corrosion management, SIRAS provides confidence to asset owners, operators and stakeholders regarding the safety, durability and sustainability of accredited corrosion control management systems.

The design, installation and commissioning phases of corrosion management systems shall align with relevant industry standards, including EN1504-9, ISO 15257:2017, ISO 12696:2022 and this guidance document.

This guidance document provides comprehensive and structured principles for the requirements of the SIRAS scheme; the document aims to:

- Identify and mitigate risks, highlight areas for improvement in corrosion control systems and provide a framework for implementing corrective actions
- Promote best practices and encourage the adoption of proven corrosion control techniques to extend the serviceable lifespan of structures and maintain their value
- Support the UK government's decarbonisation programme and adoption of sustainability practices
- Facilitate continuous improvement through the closed-loop process for addressing audit findings, incorporating lessons learned and driving ongoing enhancements in corrosion-resilience practices
- Enhance transparency and trust by maintaining an online register of accredited properties and infrastructure, assuring asset developers, operators, owners and other stakeholders as to the corrosion integrity of the asset

2.2 Definitions – explanation of terminology

Accreditation: See Appendix 1, the accreditation flow chart process

Accreditation body: The Organisation operates the SIRAS scheme (currently LRQA Ltd.)

Accreditation certificate: Awarded to the asset after the satisfactory completion of the SIRAS assessment process.

Accreditation period: SIRAS accreditation validity is for a term of five years.

Associated technology: An approved technology used within the design to achieve the objectives of resilience and sustainability.

Assessment: Objective and detailed evaluation of the systems and processes that deliver a corrosion control management system into the broader restoration or prevention scheme.

Competent person: the Dispositioning Authority to evaluate and mitigate risks associated with new designs and products and changes to existing designs identified on the Accreditation Certificate. The minimum qualification is a level 4 Cathodic Protection Specialist as defined in Section 3.3.

Cathodic Protection: An electrochemical technique used to prevent metal surface corrosion by either galvanic or impressed current methods.

Dispositioning authority: A person (or a group of persons) is assigned responsibility and authority to make decisions to the change to SIRAS work specification is necessary, the consequences of the change are acceptable, the change is documented and the implementation plans are satisfactory.

Functionality: The ability of a completed installation to perform in accordance with the design and for the specified service life of the asset.

Milestones: Schedules agreed for the closure of gaps identified during an assessment or the achievement of targets agreed at the accreditation stage to demonstrate continuous improvement throughout the accreditation validity period.

Non-conformity: The identified absence of, or a failure to implement or maintain one or more of the minimum criteria against which accreditation may be granted. The non-conformity will be classified as either a major or minor non-conformity, as defined in Section 2.4.

Qualified supervisor: Person(s) appointed by the main contractor with responsibility for ensuring, at all relevant levels within the work process, that work is completed to time, quality, specification, etc.

The minimum qualification for Qualified Supervisors is a level 3 Cathodic Protection Technician as defined in A8.23.2.2 Appendix 8.

Scheme: The general requirements of the SIRAS scheme as defined in this document.

Sub-contractor: Typically responsible for project management and installation services, designing and supplying key components or systems for a project. Acting on behalf of the main contractor, the SIRAS sub-contractor may also undertake the test engineer role, overseeing the commissioning process to ensure that the supplied products meet performance specifications and integrate effectively into the overall project. Their expertise ensures the delivery of high-quality, tested solutions tailored to the project's requirements.

Supplier: Any subcontractor that serves as a specialist product supplier that the main contractor has engaged in supplying materials or services for a SIRAS project.

Work: The performance of SIRAS and onsite activities for Cathodic Protection systems involve the detailed inspection, testing and maintenance of CP installations to ensure their continued effectiveness in preventing corrosion, including data collection, analysis and physical checks of system components.

2.3 Mandatory and non-mandatory terms

In this document, the following terms have the stated meanings:

- **Shall**: Indicates a mandatory requirement
- **Should**: Indicates a strong preference and is used to denote best practice or where a new requirement is being introduced
- **May**: Indicates an option which is not mandatory

2.4 Definitions of major and minor non-conformities

2.4.1 Major non-conformities occur where there are

- Objective evidence demonstrates that an element from the scheme requirements has not been documented, implemented or maintained
- Repetitive failures (product quality or systems) or multiple minor non-conformities in a single category
- Significant numbers of minor non-conformities
- Action not taken to close previously identified minor non-conformities within agreed timescales or to meet the milestone goals set at the time of accreditation
- Use unsafe working practices and perform work outside the registered scope(s)

2.4.2 Minor non-conformities occur where there are

- Objective evidence that there is a weak element within the management system, procedure or control for the effective implementation and maintenance of the scheme requirements
- Isolated cases of non-conformance to procedures
- Isolated instances of failure to comply with Health and Safety procedures
- Isolated instances of failure to comply with reasonable safety/working practice
- Limited shortfalls in established document management and Health and Safety systems
- Failure to observe customer care protocols

2.5 Other grading definitions

- Scopes for Improvement (SFI) are raised when the assessment identifies an aspect of the main contractor's operation where, whilst scheme compliant, there is potential for improvement
- LR Prompts are observations made where the assessment identifies a potential weakness that the accreditation body may wish to visit and examine on their next assessment visit

2.6 Standard abbreviations

ICorr	Institute of Corrosion
CPA	Corrosion Prevention Association
CHAS	Contractors Health and Safety Assessment Scheme
ICCP	Impressed Current Cathodic Protection
DFMA	Design for Manufacturing and Assembly
DFSMA	Design for Safety, Manufacturing and Assembly
HSE	Health and Safety Executive
HSWA	Health and Safety at Work Act
PPE	Personal Protective Equipment
TR60	Technical Report 60 (Concrete Society) – Guidance on electrochemical tests for reinforced concrete.
Digest 444	BRE Digest 444 – Corrosion of steel in concrete (a guide to testing and repair)
AMPP	Association for Materials Protection and Performance (formerly NACE International)
ICRI	International Concrete Repair Institute
ASTM	American Society for Testing and Materials
TR60	Technical Report TR73 (Concrete Society) – Guidance on Cathodic Protection of steel in concrete
ISO 15257: 2017	International standard for competence levels of Cathodic Protection Personnel
ISO 12696: 2022	International standard for Cathodic Protection of steel in concrete

3 | Responsibilities

SIRAS accreditation requires that installed corrosion control systems in structures are systematically evaluated for long-term integrity and corrosion resilience through the deployment of a dedicated Structural Integrity and Resilience Project Delivery Team that establishes and maintains robust systems, procedures and competencies, with ongoing surveillance and collaboration between the main contractor and the accreditation body to meet client requirements and industry best practices consistently.

An essential feature of the SIRAS scheme process is the assurance that installed protection systems and associated management systems are consistently maintained in accordance with assessed and accredited procedures and practices. This is achieved throughout the accreditation period by implementing a surveillance visit programme.

3.1 Accreditation body responsibilities

The accreditation body's responsibilities are as follows:

- Conduct assessments against the scheme requirements in a technically competent and objective manner, ensuring that evaluations are thorough and based on sound engineering principles
- The main contractor shall provide evidence that a CP Level 4 professional or a Fellow of the Institute of Corrosion (FICorr) has assessed and approved the Structural and Condition Assessment, conceptual design, detailed design, installation and commissioning procedures, ensuring that the scope of their review aligns with the specific requirements of the BS EN ISO 12696:2022
- Adopt a pragmatic but rigorous and consistent approach to maintaining scheme standards. This includes applying the same scrutiny and criteria across all assessments to ensure fairness and reliability
- Respect the business constraints of the main contractor and ensure that any information accessed regarding their commercial interests is treated with the utmost confidentiality. This fosters trust and encourages openness during the assessment process

Deliver a comprehensive report of the assessed structure or infrastructure, including a clear definition of the limitations of the scope of approval, ensuring that all parties understand the boundaries of the accreditation.

Maintain an online register of SIRAS-accredited assets

3.2 Main contractor's responsibilities

The main contractor carries the primary responsibilities for each aspect of the Cathodic Protection system design, installation, testing of the installation, energising, commissioning and long-term operational control under the supervision of personnel with appropriate qualifications, training, expertise and experience in the particular element of the work for which they are responsible. The organisation shall demonstrate commitment to quality by maintaining an effective management structure capable of consistently delivering the accredited scopes of work in strict conformity with the SIRAS standards; this includes:

- Maintain robust management systems by establishing and upholding an effective management structure that consistently delivers accredited services that align with client requirements and industry best practices
- Define service scope: Delineate the range and limits of the services provided, ensuring full transparency and adherence to the SIRAS standard
- Provide technical guidance to engineers, architects and construction teams to align design and construction with SIRAS standards
- Conduct training sessions on best practices in structural resilience and integrity to educate stakeholders on scheme requirements
- Proactive quality monitoring by Implementing internal monitoring processes that continuously assess and verify the quality of work, independent of external oversight from the accreditation body or client, to ensure ongoing compliance and improvement
- Facilitate scheduled surveillance visits by coordinating with the accreditation body to arrange regular surveillance visits under the agreed programme, confirming that the established systems and procedures are being consistently applied
- Timely resolution of non-conformances by ensuring that any non-conformances identified by the accreditation body are addressed and closed out within the agreed time scales, maintaining the integrity of the accredited processes
- Timely notifications to the accreditation body promptly of any significant changes that could impact the SIRAS accreditation, including
  - Changes to key personnel
  - Changes to ownership
  - Changes to SIRAS installation processes
  - Receive HSE notices

3.3 Design responsibilities

The main contractor shall ensure that all personnel involved in the design, installation, commissioning, operation supervision, measurement, monitoring and maintenance supervision of Cathodic Protection systems possess the necessary competence for their assigned tasks. The key responsibilities include:

- The main contractors shall demonstrate comprehensive evidence of the detailed design, installation and commissioning processes, including all technical calculations, drawings, specifications and test results as required by BS EN ISO 12696:2022, signed off by a CP level 4 professional
- Following the feasibility assessment and confirmation of the appropriate Cathodic Protection system, comprehensive design documentation shall be developed. This includes detailed calculations, installation drawings, material and equipment specifications, phase-specific method statements, hydrogen embrittlement and stray current assessment for prestressed structures. While the ultimate responsibility lies with the main contractor (MC), individuals or subcontractors with Level 4 specialisms typically carry out this activity
- Design shall perform all tasks necessary to apply prevailing condition information to the requirements of the corrosion management systems to achieve the required service life and service life extension

3.4 Personnel

To ensure best practices in the design, installation and management of CP systems, the SIRAS scheme classifies CP personnel into five distinct competency levels.

Competence shall be verified using the method specified in EN 15257, with certification in accordance with this standard – or an equivalent prequalification procedure – required to demonstrate that each individual meets the necessary technical standards. Key personnel include:

- Level 1 Cathodic Protection Data Collector (or Tester)
- Level 2 Cathodic Protection Technician
- Level 3 Cathodic Protection Senior Technician
- Level 4 Cathodic Protection Specialist
- Level 5 Cathodic Protection Expert

Key responsibilities by level are detailed in Appendix 8: Each competency level inherently includes the skills and responsibilities of the preceding levels, ensuring a layered and integrated approach to CP system management. Technical Requirements: These competencies are further outlined in Clause 6 of BS EN ISO 15257:2017 (E).

4 | Project information requirements

4.1 Project overview

For the SIRAS accreditation process, the main contractor shall thoroughly assess an existing structure, including its material condition, structural integrity and the necessity and methodology for repairs, which shall be conducted per EN 1504 (all parts).

4.2 Scope of investigations

When CP is proposed as the corrosion mitigation method, additional investigations are mandatory to confirm suitability and provide system design input (see Annex B of BS EN ISO 12696:2022). These investigations shall include, but not be limited to:

A review of all available documentation (drawings, specifications, records, notes) is required to assess:

- Repair history of the asset
- Location, quantity, nature of the steel construction (e.g., routine, galvanised, epoxy-coated, prestressed), reinforcement continuity and additional steel
- Constituents and quality of the concrete cover to reinforcement
- Root causes of the observed corrosion both visual and assessed during condition surveying
- Existence and location of extraneous metals

4.3 Structure overview and documentation

- A precise summary of the structure shall be provided, including:
  - Key design features and unique aspects of structural integrity and corrosion protection measures
  - Type of structure (e.g., bridge, building, dam), geographical location and key challenges or objectives addressed

4.4 Building age and occupancy

- The construction date, current age and occupancy classification (e.g., residential, commercial, industrial) shall be documented
- It should include changes in occupancy over time and their potential impact on the structure

4.5 Location and environmental factors

- A description of the geographic location and surrounding environment shall be provided, including:
  - Climatic conditions (temperature extremes, rainfall, humidity, freeze-thaw cycles, wind patterns)
  - Exposure to corrosive elements (e.g., coastal air, industrial pollutants, de-icing salts)
  - Soil type, water table levels and potential for ground movement (e.g., settlement, landslides)

4.6 Purpose and function

- A definition of the primary function of the structure (e.g., habitation, commercial, industrial, critical infrastructure) shall be provided
- A definition of any intended change of use and its impact on the design purpose

4.7 Construction details

- A detailed construction history shall be provided, including:
  - Year of construction and materials used (e.g., concrete type, reinforcement steel specifications, coatings)
  - Construction methods and any modifications or retrofitting measures implemented

4.8 Traffic and loading

- For structures experiencing traffic loading (e.g., bridges, pavements), the following shall be specified:
  - Types of traffic (pedestrian, vehicular, heavy goods vehicles)
  - Traffic volume and frequency (e.g., average daily traffic, peak hour traffic)
  - Design loads (e.g., dead, live, wind, seismic loads)

4.9 Damage assessment

- The extent and nature of observed damage shall be described, including:
  - Types of damage (e.g., cracking, spalling, delamination, corrosion)
  - Location and extent of damage (use photographs, diagrams, or visual aids)
  - Underlying causes (e.g., chloride-induced corrosion, carbonation, freeze-thaw cycles)
  - Contributing factors (e.g., design deficiencies, construction errors, inadequate maintenance)

4.10 Document preparation and review

- All case study documents, including large models, shall be available for review where appropriate
- Pre-load large models and verify software requirements to avoid delays
- The organisation of the documentation with accurate and consistent information supported by evidence (e.g., photographs, test results, design drawings, inspection reports)

5 | Structural and condition assessment

5.1 General requirements

The Structural and Condition Assessment process is a cornerstone of the SIRAS accreditation framework, ensuring comprehensive evaluation per industry standards (e.g., The Concrete Society TR60, BRE Digest 444, or AMPP/ICRI/ASTM for international projects). Assessments shall systematically evaluate asset condition, repair compatibility and CM system design data. Compliance with BS EN ISO 12696:2022 and EN1504-9 shall be demonstrated through documented evidence.

5.2 Concrete and reinforcement evaluation

5.2.1 Technical requirements

Existing structures

- For existing structures, an assessment shall be conducted to evaluate material condition, structural integrity and repair needs in accordance with EN 1504 to ensure compatibility with repair, protection and strengthening standards
- Additional investigations shall confirm the structure's suitability for CP and provide data such as chloride levels, carbonation depth and reinforcement continuity for effective system design

New structures

- Ensure that CP considerations are integrated into the design phase of new structures to avoid future complications
- Advanced monitoring systems should be considered during the design phase, to facilitate long-term performance assessment

5.3 Review and supplement information

- All available drawings, specifications, records and notes shall be reviewed to determine reinforcement location, quantity, nature (e.g., steel type), continuity and concrete constituents and quality to establish a baseline
- This information shall be confirmed and supplemented through site surveys and laboratory tests to ensure accuracy and completeness
- Where records are incomplete or unclear, detailed site surveys should be prioritised to avoid assumptions that could compromise CM effectiveness
- All available records shall be reviewed to determine the location, quantity, nature (e.g., normal ribbed, galvanised, epoxy-coated, prestressed), reinforcement continuity and the concrete's constituents and quality

5.4 Visual and structural surveys

- A visual survey shall be conducted to identify defects (e.g., cracks, spalling), their causes, extent and features affecting CP effectiveness for a comprehensive damage assessment
- The concrete cover shall be delaminated in areas targeted for Corrosion Management (CM) to identify areas that need repair. CP Design choices may include surface-applied corrosion inhibitors and waterproofing.
  However, CP is cost-effectively implemented in areas that are not delaminated or spalled. It can and should be retrofitted within repair areas and generally applied to parent/unaffected but contaminated concrete
- Defects such as cracks, honeycombing, or poor construction joints that could impair CP shall be recorded for system design considerations
- Photographic evidence of defects to support repair and CP planning should be documented

5.5 Material and environmental assessments

Chloride analysis

Chloride ions accelerate reinforcement corrosion; their concentration and distribution in concrete dictate CP current requirements.

- Chloride content values and distributions shall be determined as required, following EN 14629, where corrosion is chloride-induced to quantify the threat)
- Additional sampling beyond the minimum requirement may be conducted if variability in chloride levels is suspected for enhanced accuracy

Carbonation depth measurement

Carbonation reduces concrete alkalinity, promoting corrosion; CP strategy is based upon the depth of carbonation determined by:

- Measurement as required, following EN 14630, where carbonation is a concern to assess corrosion risk
- tested at multiple locations to account for environmental exposure variations

Concrete cover and reinforcement location

The spacing between anodes and cathodes (reinforcement) and the density of steel affect current distribution and CP efficiency.

- Concrete cover distribution and reinforcement size/position shall be measured to assess anode/cathode spacing adequacy for current distribution planning
- Dense steel regions requiring high current density shall be identified and potential short circuits between reinforcement and impressed current anodes shall be assessed to prevent system failure
- Advanced techniques like ground-penetrating radar may be used for complex structures for improved precision
- Electrochemical survey techniques, such as half-cell potential mapping and is analysis in accordance with site conditions and Concrete Society TR60 and ASTMC876

5.6 Electrical assessments

Reinforcement of electrical continuity

Electrical reinforcement continuity ensures uniform CP current distribution across the protected zone.

- Drawings shall be checked for continuity and confirmed on-site by measuring electrical resistance and/or potential difference between remote bars to verify connectivity
- Electrical continuity shall be ensured within each CP zone and between reinforcement elements for system functionality
- Where continuity is uncertain, additional testing or reinforcement bonding should be strongly recommended

Steel/concrete potential

Measuring the electrochemical potential of steel in concrete indicates corrosion activity and helps define CP zones.

- Representative areas shall be surveyed for corrosion activity using portable reference electrodes to map corrosion risk
- Continuity of reinforcement/steel within survey areas shall be ensured before potential surveys to avoid misleading results
- Additional potential mapping may be performed for detailed corrosion profiling for refinement

Concrete electrical resistivity

Technical Principle: Concrete resistivity affects current flow in the CP system; variations shall be considered to optimise performance.

- The impact of resistivity variations on CP shall be considered for system design. Guidance should be sought from the RILEM TC 154 Report and Concrete Society Technical Report 60 for resistivity measurement and interpretation
- Resistivity testing may be extended to critical zones if variability is high for detailed analysis

5.7 Repair and reinstatement

Repairs must restore structural integrity and ensure compatibility with CP by matching the electrical and mechanical properties of the original concrete.

- All repair operations shall comply with EN 1504, except where otherwise specified for standardised repair quality
- Repair materials with significantly different electrical resistivity from the parent concrete shall be removed to prevent current shielding
- Loose corrosion products shall be removed from exposed reinforcement to ensure good contact with repair material and remove possible insulation effects
- Concrete reinstatement should use cementitious materials compatible with the original concrete's resistivity and mechanical properties (strong preference for CP efficiency
- Protection within the area of incipient anode activity following concrete repair shall be considered and necessary design steps shall be undertaken

Cementitious overlay

Overlays can protect anodes in some application types and enhance CP performance, requiring strong bonding and compatibility with the substrate.

- A cementitious overlay shall be applied over appropriate anode types, with materials and methods conforming to EN 1504 for durability
- The average bond strength between existing concrete and overlay shall exceed 1.5 MPa, with a minimum of 1.0 MPa for structural integrity
- Testing bond strength at multiple points should be strongly recommended to ensure consistency
- Where the anode acts as the overlay, such as with geopolymer mortar anodes, the same bond strength criteria shall apply

5.8 Design and construction considerations

CP integration in new structures requires a proactive design to ensure system effectiveness and longevity.

- Design, specification and construction procedures shall be assessed for structures incorporating CP for system integration
- Reinforcement/steel continuity shall be ensured, monitoring sensors and cables shall be secured and undesirable influences (e.g., short circuits) shall be prevented for operational reliability
- Early collaboration between CP designers and structural engineers should also be considered to optimise outcomes

5.9 Documentation

All assessment activities shall include record reviews, site surveys, testing and analysis.
The documentation shall include:

- Detailed descriptions of the assessment methods used
- Location and extent of any damage observed
- Results of all tests and measurements
- Analysing and interpreting the data collected
- Conclusions regarding the structure's condition and recommendations for repair and protection

6 | Design process

6.1 Key technical principles

The following principles guide this process:

6.1.1 Conceptual design process

- The main contractor must adhere to key technical principles for Cathodic Protection (CP) implementation. In the Feasibility Assessment, they shall evaluate CP as the optimal solution, considering structure condition, corrosion extent, environmental exposure and economic justification, supported by evidence of elevated concrete contaminants. Documentation must verify corrosion as the primary issue and justify CP over alternatives. The preliminary design requires anode zone sizing based on exposure, concrete properties and risks, with proactive mitigation strategies. Anode system selection involves choosing compatible, efficient anode types, planning cable routing and transformer-rectifier placement
- Technical requirements include classifying exposure conditions, assessing chloride content, calculating steel surface area, estimating current demand and ensuring system longevity aligns with service life. Environmental factors, weight constraints and installation feasibility must be evaluated, with anode ratings matching demand. Sustainability considerations (SIRAS+) prioritise decarbonised components with verified EPDs, while utilities access ensures power and broadband availability. The Corrosion Monitoring and Control System (CMCS) must support long-term performance, remote operation, and data access
- All processes require comprehensive documentation, including assessments, justifications, drawings and CMCS details, presented for review to ensure accuracy and traceability. The contractor must demonstrate compliance with standards, structural suitability and client expectations, integrating sustainability and utility assessments where applicable

6.1.2 Detailed design process

- The CP Level 4 must evaluate feasibility, anode selection, current demand, zone planning and monitoring to meet BS EN ISO 12696:2022 standards for corrosion protection. The main contractor must ensure CP Level 4 approves the detailed design, confirming compliance. The design phase addresses anode systems, current distribution and documentation. The main contractor must provide evidence of accurate steel surface area and current demand calculations, matching anode to cathode needs and validating anode types. Detailed drawings, 3D modelling and empirical data refine estimates. Anode systems must ensure ease of installation and longevity, supported by a detailed design document
- Cathodic Protection zones require efficient current distribution, uniform protection and feeder spacing to minimise voltage drops, with permanent monitoring electrodes. Computational modelling optimises layouts and standardised protocols track performance. Current provision calculations must include reserve capacity, adjusting for environmental conditions (2-20 mA/m²), validated by pilot tests and adaptive controls. For buried/immersed structures, system selection considers local conditions, avoiding shielding with robust cable protection. The design process mandates precise documentation, rigorous testing and quality plans to ensure the Cathodic Protection system meets all technical and performance requirements effectively

6.1.3 Design documentation

- To meet SIRAS and SIRAS+ accreditation, projects must provide detailed design documentation ensuring the Cathodic Protection (CP) system's integrity, performance and sustainability per BS EN ISO 12696:2022. The main contractor must submit technical calculations quantifying parameters like current demand and anode output, alongside a narrative report justifying design choices. Schematic and detailed drawings must depict protection zones, sensor placement and anode configurations. Material and installation specs should cover anode types, testing protocols and maintenance practices, aligned with environmental conditions. Pre-design surveys must assess exposure class, chloride content and concrete resistivity, validated independently. The scope of protection zones, based on survey data, must ensure uniform current distribution. A performance monitoring strategy, including sensor placement and remote data logging, should support long-term evaluation. Testing protocols must verify anode performance and steel continuity per ISO 12696:2022. The service life and operational plan must specify manual or remote operation, reporting frequency and maintenance schedules. Electrical performance calculations should ensure uniform current and acceptable voltage gradients. Cable and power supply specs must detail conductor types and redundancy mechanisms. Finally, a document index and audit trail with version control and signatures ensure traceability and transparency for third-party review

7 | Installation

The CP Level 3 is responsible for assessing electrical continuity, anode installation, concrete repairs and performance monitoring system installation, ensuring compliance with specified methods, materials and testing protocols outlined in the standard.

The main contractor must ensure that the CP level 4 reviews and approves the installation procedures, as mandated by the complex and specialised requirements, to guarantee the CP system's reliable operation and adherence to the stringent performance criteria of the SIRAS and SIRAS+ schemes, protecting the structure's long-term integrity and durability.

7.1 Continuity assurance: Electrical continuity

- **Testing**: The main contractor shall present for review the evidence of the tested, by or supervised by CP Level 3, electrical continuity between reinforcing bars or steel elements using direct current reverse polarity resistance or potential difference measurement techniques
- **Acceptance criteria**: The main contractor shall present the acceptance criteria of stable values and resistance less than 1.0 Ω or, if the potential method is used, less than 1V and in both polarities were met for review
- **Continuity and bonding**: The main contractor shall present for review the continuity testing and any required bonding for discontinuous steel that was conducted for all exposed steel during concrete repairs
- **Prevention of contact**: The main contractor shall review the electrical discontinuity between reinforcement/steel (DC negative) and the anode system (DC positive), which is assured in impressed current CP systems in both polarities
- **Performance monitoring system**
- **Monitoring provisions**: The main contractor should provide evidence that each zone of the CP system has monitoring provisions for power supply output voltage, current and steel/concrete potential using a sufficient quantity of permanently embedded monitoring devices to represent the performance of the zone and as shown in the detailed design document
- **Data collection**: The main contractor should provide evidence that the data collection is manual, electronically logged, or electronically transmitted
- **Data collection intervals**: The main contractor should provide evidence of the representative data collection occurring at scheduled intervals in accordance with BS EN ISO 12696:2022
- For corrosion rate monitoring, the main contractor should provide evidence of the representative data collection occurring at scheduled intervals so as to demonstrate the reduction of corrosion rates and the development and reporting of service life tracking; this will be assessed for SIRAS+ compliance

7.2 Connections to steel in concrete

- **Negative connections**: The main contractor shall present for review the multiple negative connections of cables provided to reinforcement/steel for CP DC protection current to assure sufficient redundancy in the system installation in the event of at least two cable breaks and at one test connection for each embedded monitoring device
- **DC cathode circuit continuity**: The main contractor shall present for review, verify electrical continuity between all negative connections and test connections with resistance of 1.0 Ω or less in both forward and reverse polarities

7.3 Concrete repairs associated with Cathodic Protection components

- **Repair methods and materials**: The main contractor shall present for review the concrete repairs that were performed using methods and materials conforming to EN 1504 (all parts)

7.4 Surface preparation for anode installation

- **Surface preparation**: The main contractor shall present the concrete surfaces prepared for review to present a clean, non-friable surface for anode material installation
- **Adhesion**: The main contractor shall present for review the substrate to overlay adhesion meets specified standards
- **Anode installation**
- **Installation conditions**: The main contractor shall install the anode system in accordance with the detailed design document and manufacturers guidelines such that it can be successfully tested, commissioned and operated in accordance with the international standards
- **Prevention of short-circuits**: The main contractor shall present for review data that demonstrates that the short-circuits between the anode system and reinforcement steel or other metallic components were avoided

7.5 Connections to the anode system

- **DC positive connections**: The main contractor shall present the multiple positive cable/anode connections so as to assure redundancy in the DC circuitry in the event of damage to at least two cable breaks and provided for review

7.6 Anode overlay, surface sealant, or decorative coating application

- **Application conditions**: The main contractor shall present for review the overlays, sealants, or coatings applied under controlled conditions
- **Material and method conformity**: The main contractor shall present for review the materials and application methods that conform to EN 1504 (all parts)

7.7 Electrical installation

- **Safety standards**: The main contractor shall present for review the international or applicable national electrical safety standards that were followed
- **Isolation and separation**: The main contractor shall present for review evidence of proper isolation and separation of mains voltage cables from low voltage direct current cables
- **Cable support and protection**: The main contractor shall present for review evidence of adequate support and protection for cables from environmental, human and animal damage

7.8 Testing during installation

- **Circuit checks**: The main contractor shall present all circuits' polarity, continuity and insulation checks conducted for review
- **Electrical safety tests**: The main contractor shall present for review evidence of and review documentation of electrical safety tests for the mains voltage electrical power supply system and transformer-rectifiers
- The main contractor shall provide QA/QC pro forma completion for each step of the CMS installation and especially for the pre-commissioning of any ICCP components prior to undertaking the full commissioning procedures and in accordance with BS EN ISO12696:2022 or future iteration of the standard

8 | Commissioning

The CP Level 4 shall verify the execution by the CP Level 3 of testing, inspection and performance validation procedures, ensuring the CP system operates as designed and meets the required service life and protection criteria.

Due to the complexities and specialised requirements of the commissioning process, the main contractor must confirm that the CP level 4 has reviewed and approved the commissioning requirements, ensuring compliance with the standard.

Commissioning a Cathodic Protection (CP) system for steel in cement-based concrete is a critical process that verifies the system's correct installation, functionality and initial performance. A structured and systematic commissioning process ensures that the CP system provides the intended level of corrosion protection; this extends in scope to the testing of other corrosion mitigation methods adopted within the design and installation, such as surface-applied corrosion inhibitors and galvanic anodes.

8.1 Visual inspection

A complete visual inspection of the Cathodic Protection system and all its components shall be conducted; this principle ensures that any defects or installation issues are identified before the system is energised.

Ensure all components and cables are correctly installed, labelled and protected from environmental, human, or animal damage.

- The main contractor shall ensure that all system components (e.g., anodes, cables, junction boxes) and cabling are correctly installed, labelled and protected against environmental degradation, human interference, or animal damage before commissioning
- The main contractor shall present documented evidence of a comprehensive visual inspection conducted before backfilling or concreting for buried elements and before submergence for immersed elements. This documentation shall include:
    - A detailed checklist of inspected components (anodes, wiring, reference electrodes, power supplies, etc.)
    - Photographic or video evidence of the installation
    - Records of any identified defects and their corrective actions
- For immersed elements, the main contractor shall present for review evidence of inspections conducted using divers or underwater cameras, including recorded video footage or photographic evidence
- The main contractor shall present for review the documented evidence that all components are labelled according to the design specifications and that cables are protected from potential damage

8.2 Pre-energising measurements

Baseline establishment

Measurements shall be recorded before energising the system to establish baseline conditions; this principle provides a reference for evaluating subsequent system performance. Record the potential of steel/concrete concerning reference electrodes and baseline corrosion rate from other sensors to develop baseline data.

- The main contractor shall measure and record the natural potential of the steel/concrete system relative to permanently installed reference electrodes and portable reference electrodes to establish baseline data before energising the CP system
- The main contractor shall ensure that the difference between low-impedance and high-impedance potential measurements is less than 10 mV, indicating measurement reliability
- The main contractor shall present records of pre-energising potential measurements for review to confirm that baseline data has been established using permanent and portable reference electrodes
- The main contractor shall present for review the difference between low-impedance and high-impedance measurements, which is documented and complies with the <10 mV requirement
- The main contractor shall present for review the baseline corrosion rate measurements at each probe position from a recognised 3-electrode electrochemical monitoring technique, such as linear polarisation resistance method (LPRM), recording any assumptions made for Tafel constants

8.3 Initial energising of impressed current systems

The concrete and any cementitious overlay, drill hole or chase shall be adequately cured before energising, preventing damage to the structure or system due to premature operation.

- The main contractor shall maintain correct polarity and investigate any positive shifts in steel/concrete/electrode potentials, documenting the cause and corrective actions
- The main contractor shall present for review initial energising records to confirm that the system was started at low current (10-20% of design current density) and that polarity and potential shifts are in the negative direction from base potential measurements and align with expected behaviour
- Current density: The main contractor shall present for review and verify uniform anode current density (attenuation) within each zone
- The main contractor shall present base corrosion potentials and corrosion rates where monitoring is adopted for the evaluation of other CM methods, such as surface-applied corrosion inhibitors and galvanic anodes

8.4 Initial adjustment of impressed current systems

The system shall be energised to a current level estimated to meet performance objectives. This principle aims to achieve adequate protection from the outset.

Initial settings shall be maintained for a sufficient period (typically 7 to 28 days) to achieve significant polarisation. This duration allows the system to stabilise.

- The main contractor shall energise the CP system at a low current, typically 10-20% of the design current and record the steel/concrete potentials and power supply output values (e.g., voltage and current)
- The main contractor shall maintain correct polarity and investigate any positive shifts in steel/concrete/electrode potentials, documenting the cause and corrective actions
- The main contractor shall present for review initial energising records to confirm that the system was started at a low current (10-20% of design) and that polarity and potential shifts align with expected behaviour
- The main contractor should present for assessment any positive potential shifts were adequately investigated and resolved, ensuring documentation of findings and actions taken
- The main contractor shall perform, record and present data for instantaneous-off potentials at each embedded monitoring device in accordance with BS EN ISO12696:2022 following an extended period of energised state as per advice of CP Level 4

After initial polarisation, an initial performance assessment shall be conducted; this principle verifies whether the system meets protection criteria. Measure output voltage, current and "Instantaneous OFF" potentials to assess system performance.

8.5 Criteria of protection: Interpretation of performance assessment data

Performance data shall be reviewed and interpreted against specified criteria and this principle ensures the system provides adequate corrosion protection. Ensure steel/concrete potentials meet specified criteria to confirm adequate protection.

- The main contractor shall ensure that "Instantaneous OFF" steel/concrete potentials meet one of the following mandatory criteria:
  - A potential decay of at least 100 mV over 24 hours
  - A potential decay of at least 150 mV over an extended period to full depolarisation
- To avoid overprotection, the main contractor shall ensure that no "Instantaneous OFF" potential exceeds the maximum limits: -1100 mV for plain reinforcing steel or -900 mV for prestressing and post-tensioned steel tendons
- The main contractor shall present for review the documented evidence that recorded "Instantaneous OFF" potentials meet at least one of the specified protection criteria (100 mV polarisation, 100 mV decay over 24 hours, or 150 mV decay over an extended period)
- The main contractor shall present for review the documented evidence that maximum potential limits (-1100 mV for plain steel, -900 mV for prestressing steel) are not exceeded, ensuring compliance with safety and performance thresholds

8.6 Adjustment of protection current for impressed current systems

If protection criteria are not achieved, the current output shall be adjusted, followed by repeated performance assessments; this principle ensures continuous refinement until objectives are met. Make further adjustments if criteria are unmet, followed by repeated performance assessments.

- The main contractor shall make further adjustments to the protection current if the protection criteria are not met, followed by repeated performance assessments after a minimum stabilisation period of 28 days
- The main contractor should consider long-term polarisation effects and potential reductions in current requirements to optimise system efficiency
- The main contractor shall present for review records of any additional adjustments and subsequent performance assessments, ensuring a minimum 28-day stabilisation period was observed
- The main contractor should present for assessment. Long-term polarisation effects and current reduction considerations were documented and implemented as part of best practice
- The main contractor shall maintain comprehensive records of all commissioning activities, including but not limited to:
  - Design specifications
  - Installation records
  - Inspection reports
  - Measurement data
  - Calibration certificates
  - Adjustment records
  - Corrective action reports

9 | System records and documentation requirements

All stages of the Cathodic Protection and corrosion management system – from design through installation and testing – shall be fully documented. This ensures a complete record of the system's development and performance, which is critical for accountability and future reference.

Records shall be maintained in a traceable manner for all quality assurance and test procedures. This principle ensures that every action, measurement and component can be linked to its origin, supporting verification and compliance.

9.1 Quality and test records

It is imperative to compile a comprehensive set of documents that shall include the following:

9.1.1 Quality plan

- A detailed quality plan shall be included, outlining all stages of the work (e.g., design, installation, testing), which will provide a structured framework for quality control
- The quality plan should be reviewed and approved by all relevant stakeholders before implementation and may include digital quality management systems for real-time updates and tracking

9.1.2 Visual inspection records

- All visual inspections conducted during installation, including photographs and detailed descriptions of findings, shall be documented, ensuring that physical checks are recorded for validation
- The standardised inspection should include checklists to ensure consistency and may include implementing automated inspection tools (e.g., drones or robotic systems) for hard-to-reach areas

9.1.3 Test results

- All test results – such as electrical continuity, potential measurements and system performance assessments – shall be recorded to demonstrate the system's operational integrity
- Record all test results, including electrical continuity, potential measurements and system performance assessments
- Use standardised formats should be used for recording and presenting test data to ensure consistency and comparability
- Additional diagnostic tests or analyses, if deemed necessary, may be included for a comprehensive assessment

9.1.4 Calibration certificates

- All test instruments shall have valid calibration certificates traceable to national or European standards; the inclusion ensures measurement accuracy and reliability
- A log of calibration dates and schedules for all instruments should be maintained and automated calibration management systems should be used for tracking and reminders

9.2 Installation and commissioning report

A comprehensive report shall cover all aspects of the installation and commissioning phases. This ensures the system's deployment is fully captured for operational and historical purposes.

Detailed as-built drawings and descriptions shall be included. This principle facilitates an accurate representation of the final system configuration, which is essential for maintenance and future modifications.

Technical requirements

9.2.1 General description

- The report shall include a general description of the works, identifying the parties involved (e.g., contractors, designers) and key personnel responsible for design, supervision and commissioning, establishing accountability
- A summary of the project scope, objectives and key milestones should be provided and may include a brief history of the structure and the reasons for implementing CP and CM methods

9.2.2 Method statements and specifications

- Copies of method statements, specifications and drawings used during installation and commissioning shall be provided, noting any deviations or variations, ensuring transparency in the process
- All method statements should be reviewed and approved by relevant stakeholders before implementation and may include alternative methods or approaches considered during the design phase

9.2.3 Installation and commissioning details

- The report shall describe the installation and commissioning works, including key dates (e.g., start and completion) and milestones and track the timeline of activities
- A step-by-step account of the installation process should be provided, highlighting any challenges encountered and how they were resolved
- The installation record may include time-lapse records or progress reports for complex installations

9.2.4 As-built drawings

- Detailed as-built drawings shall be provided to facilitate future inspection, maintenance and reconstruction; this inclusion ensures an accurate post-installation record
- The installer should ensure the as-built drawings are updated in real-time during the installation process to reflect any changes or deviations
- This may include 3D models or digital twins of the system for enhanced visualisation and planning

9.2.5 Measurements and test data

- All measurements and test data taken before and during system energisation and initial performance assessment shall be included to verify initial system performance
- A standardised QA/QC pro forma should be used for recording and presenting test data to ensure consistency and comparability. These completed pro forma shall be included in the installation and commissioning report
- Additional diagnostic tests or analyses, if deemed necessary, may be included for a comprehensive assessment

9.2.6 Operating conditions

- The "as-left" operating conditions of the system shall be recorded, providing a baseline for future assessments
- A baseline performance report should be provided for future assessments
- Based on initial performance data, recommendations for optimising operating conditions may be included

9.2.7 Permanent records

- A copy of all permanent records shall be included, ensuring consistency across documentation
- Should ensure all permanent records are stored in a secure and accessible location
- The digital copies of the records may be provided for ease of access and sharing

9.2.8 Recommendations

- Recommendations for any revisions to the Cathodic Protection system should be provided. This strong preference reflects best practices for continuous improvement. Though it is not compulsory for SIRAS, it is essential for SIRAS+
- Recommendations for the retreatment of surface-applied corrosion inhibitors or the replacement of galvanic anodes
- Any proposed revisions or modifications should include a risk assessment
- They may also suggest alternative solutions or technologies for future consideration

9.3 Operation and maintenance manual

Comprehensive Maintenance Guide

- A detailed manual shall be provided to operate and maintain the Cathodic Protection system, ensuring that personnel have clear guidance on sustaining system performance

Routine and Performance Assessments

- Procedures for routine maintenance and performance assessments shall be outlined; this supports proactive management of the system over its lifespan

Technical requirements

9.3.1 System description and as-built drawings

- The manual shall include a detailed description of the system and a set of as-built drawings, which provide a foundational reference for operators
- The operation and maintenance manual should provide a user-friendly summary of the system's key features and components to facilitate quick understanding and efficient maintenance
- The documentation may include interactive digital manuals or augmented reality (AR) tools for enhanced understanding and visualisation of the CP and CM systems

9.3.2 Maintenance and inspection procedures

- An operation plan shall be provided that includes, recommended intervals and procedures for routine maintenance and inspection shall be detailed to ensure consistent upkeep of the system
- A checklist for routine maintenance activities should be provided to ensure consistency and completeness.
- Predictive maintenance techniques or tools for advanced monitoring may be included
- Any remote operational contractual requirements, such as annual renewal dates

9.3.3 Performance assessment procedures

- Recommended intervals and procedures for future performance assessments, along with data interpretation guidance, shall be provided; this step supports ongoing evaluation of system effectiveness
- The operation and maintenance manual should include guidelines for troubleshooting and diagnosing performance issues within the Cathodic Protection system
- The documentation may suggest using advanced diagnostic tools or software for enhanced performance monitoring and analysis

9.3.4 Data formats

- Proformas or computer data formats for all recommended routine maintenance, inspection and performance assessment activities shall be included; this standardises data collection and analysis
- Ensure that data formats within the operation and maintenance manual are compatible with commonly used software tools or access codes for online server facilities to facilitate efficient data management and analysis
- Include optional reporting and data analysis templates within the operation and maintenance manual to provide users with structured tools for interpreting and presenting system performance

9.3.5 Error-finding procedures

- Procedures for identifying and resolving errors within the system (e.g., electrical power supply issues or short circuits) shall be outlined, ensuring rapid reporting online and troubleshooting
- The operation and maintenance manual should provide step-by-step troubleshooting guides for common issues encountered during the operation of the Cathodic Protection and CM systems
- The operation and maintenance manual may include diagnostic tools or software recommendations for enhanced error detection and system analysis

9.3.6 Maintenance and repair procedures

- Procedures for maintaining and repairing the electrical power supply equipment, networks, monitoring devices, data logging/control equipment and anode system shall be provided to support system longevity
- The operation and maintenance manual should include detailed safety precautions and risk assessments specific to maintenance activities
- The operation and maintenance manual may provide supplementary video tutorials or demonstrations for complex repair procedures

9.3.7 Component list and spare parts

- A list of major components, data sheets and sources for spare parts and maintenance shall be included; this step facilitates timely repairs and replacements
- The Operation and Maintenance Manual should provide contact information for suppliers and main contractors of critical CP and CM system components and maintenance services
- The Operation and Maintenance Manual may include a lifecycle analysis for critical CP and CM system components, providing insights into expected service life and sustainability credentials, including embodied carbon LCA assessments and replacement planning

9.3.8 Monitoring and control information

- All necessary information, passwords and protocols for long-term connection to and operation of any monitoring and control system shall be provided, which ensures uninterrupted system management
- Access information for the Cathodic Protection system should be securely stored and shared only with authorised personnel
- Multi-factor authentication or other security measures may be implemented to enhance the protection of the Cathodic Protection system's access information

9.4 Digital asset management

- All digital assets related to the project, including design models, drawings, specifications and data from monitoring systems, shall be managed effectively. This includes appropriate version control, secure storage and accessibility for authorised personnel
- Data security procedures shall be in place to ensure the security and integrity of digital assets, protecting against unauthorised access, modification, or loss

10 | Operation and maintenance

The essential operation and maintenance procedures for Cathodic Protection (CP) and corrosion management (CM) systems are applied to steel in concrete. Section 10 ensures that CP and CM systems for steel in concrete are effectively maintained, prolonging the lifespan of the structures they protect and ensuring their safety and reliability. Regular maintenance and monitoring are crucial to ensure the long-term effectiveness of the CP and CM systems and the protection of the reinforced concrete or masonry structure.

10.1 Intervals and procedures

Structured maintenance framework

The operation and maintenance shall follow the recommended intervals and procedures outlined in the operation and maintenance manual, ensuring a systematic approach to sustaining system performance.

Adaptive management

Intervals and procedures should be adjusted based on system performance and reliability. This strong preference reflects best practices, allowing flexibility to optimise maintenance based on real-world data.

10.1.1 Routine inspection procedures

Function check

- All systems shall be confirmed as functioning to verify operational integrity
- Output voltage and current to each zone of an impressed current Cathodic Protection system shall be measured, ensuring accurate monitoring of power delivery
- Data shall be assessed to evaluate system health for informed decision-making

Performance assessment

- "Instantaneous OFF" polarised potentials shall be measured to assess protection levels
- Potential decay shall be measured to evaluate polarisation sustainability
- Parameters from other sensors installed in the performance monitoring system shall be measured, ensuring comprehensive data collection
- A complete visual inspection of the Cathodic Protection system shall be conducted to identify physical issues
- Data shall be assessed to interpret system effectiveness
- Current or voltage output for impressed current systems shall be adjusted as needed, an action to maintain protection criteria

Recommended intervals

- Function checks should be conducted monthly in the first year and then at 3-month intervals if performance is satisfactory, a strong preference reflecting best practice for early monitoring and subsequent stability
- Performance assessments should be conducted at 3-month intervals in the first year and then at 6 to 12-month intervals if performance is satisfactory, another strong recommendation for balancing rigour and practicality
- Visual Inspections: While visual inspections are an integral part of performance assessments, they can be omitted after the first year if the system's performance is consistently good. However, visual inspections should always be included in the annual system review

10.1.2 Temperature considerations

- Performance monitoring should be avoided when temperatures are below 0°C, as low temperatures can affect the accuracy of measurements and the electrochemical processes involved in CP

10.2 System review

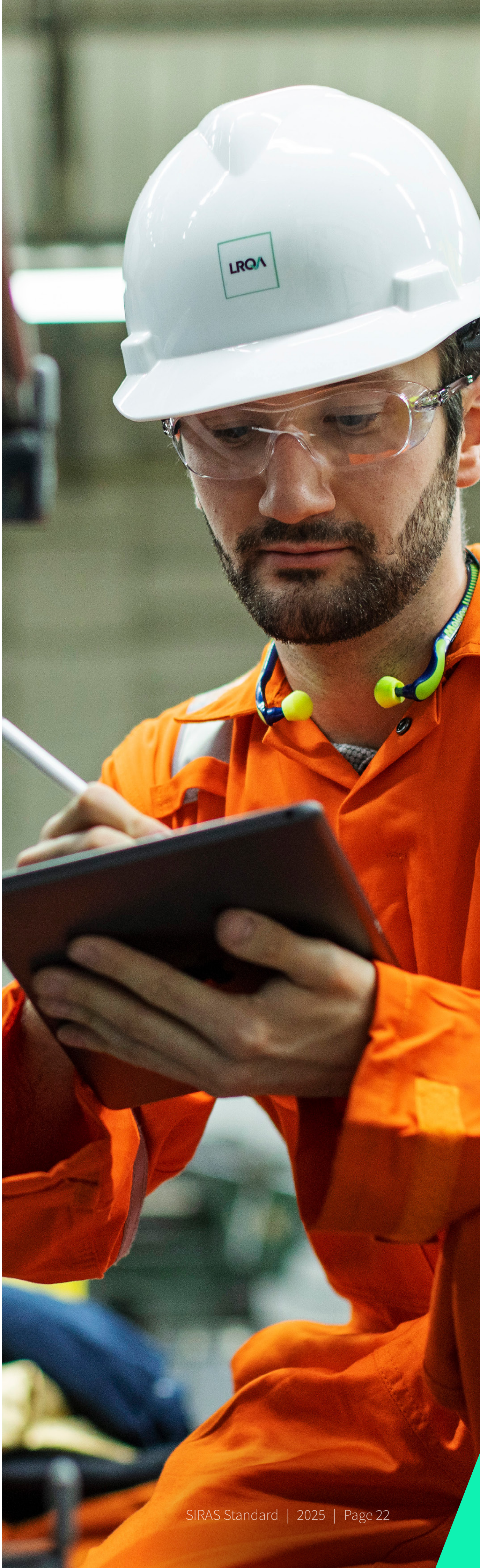
A system review shall be conducted at maximum intervals of 12 months to ensure regular, thorough assessment to maintain long-term system efficacy. This review shall include:

- **Data review**: Thoroughly examining all test data and inspection records collected since the previous review to identify trends or anomalies
- **Performance assessment**: A complete performance assessment described in BS EN ISO 12696:2022 section 10.1
- **Visual inspection**: A detailed visual inspection of the entire CP and CM system
- **Data interpretation**: Analysis and interpretation of all collected data to assess the overall performance and effectiveness of the CP and CM systems
- **Output adjustment**: The impressed current systems' output shall be adjusted to optimise protection levels
- **Report preparation**: Preparation of a comprehensive system review report

10.3 System review report

The system review report should provide a detailed account of the review process and its findings. Key elements of the report include:

- **Work undertaken**: The report should detail the work undertaken, including a description of all the activities performed during the system review
- **Data collected**: Presentation of all collected data, including measurements, inspection findings and sensor readings. A summary of the data collected during the review shall include the following:
  - "Instantaneous OFF" polarised potentials
  - Potential decay measurements
  - Sensor data (e.g., corrosion rate, concrete resistivity, temperature, humidity)
  - Visual inspection findings
  - Service life tracking
- Data interpretation and recommendations for any changes to the operation and maintenance or system review intervals and procedures, as well as a best practice suggestion to guide future adjustments
- Recommendations for any changes to the Cathodic Protection system, a strong preference to propose enhancements or repairs as needed



11 | Performance monitoring

11.1 Performance standards and improvement strategy

The SIRAS accreditation scheme emphasises robust quality improvement processes and performance monitoring as fundamental principles. These are essential to ensure the structural integrity, resilience and ongoing enhancement of Cathodic Protection and corrosion management systems and practices.

While this subsection provides an overarching framework rather than specific requirements, the principle of continuous improvement shall underpin all subsequent actions, an expectation implicit in the SIRAS scope to maintain long-term system effectiveness.

11.2 Defined performance standards

SMART standards: Specific, measurable, achievable, relevant and time-bound (SMART) performance standards shall be established to provide a concrete basis for evaluating the Cathodic Protection and corrosion management systems effectiveness, ensuring clarity and accountability.

Detailed requirements

- The main contractor shall establish and document SMART performance standards for all relevant services under the SIRAS scope to ensure quantifiable benchmarks
- These standards should align with industry best practices, regulatory requirements and the main contractor's and its stakeholders' specific needs, with a strong preference to ensure relevance and compliance with established norms

11.3 Improvement strategy

Structured enhancement

A documented improvement strategy shall outline a systematic approach to achieving and exceeding performance standards, ensuring proactive and sustained enhancement of the Cathodic Protection and corrosion management systems.

Resource commitment

Adequate resources shall be allocated to support this strategy, reinforcing the principle of operational sustainability.

Detailed requirements

- The improvement strategy shall include:
    - A clear articulation of the main contractor's commitment to continuous improvement, a statement of intent
    - A defined process for identifying areas for improvement (e.g., proactive risk assessments, incident reporting, audit findings, stakeholder feedback) for comprehensive coverage
    - A methodology for prioritising improvement opportunities based on risk, impact and feasibility for efficient resource use
    - A process for implementing and evaluating the effectiveness of improvements to verify outcomes
    - Regular reviews of the strategy to ensure continued relevance and effectiveness, a practice for adaptability
    - Resource allocation: The main contractor shall allocate adequate financial, human and technological resources to support the implementation and maintenance of performance standards and the improvement strategy to ensure feasibility
    - The strategy should reflect best practices in continuous improvement and a strong preference to optimise system performance over time

11.4 Auditing arrangements

11.4.1 Internal audit

Systematic oversight: An internal audit programme will assess the management system's effectiveness and compliance with SIRAS+ requirements, ensuring consistent monitoring and improvement.

The main contractor shall establish and maintain a documented internal audit programme for ongoing evaluation. The programme shall include:

- A defined audit schedule covering all relevant areas of the SIRAS+ scope for comprehensive coverage
- Clearly defined audit procedures and checklists aligned with SIRAS+ requirements for consistency
- A process for selecting competent main contractors' internal main contractors with the necessary skills and experience for credibility
- A system for documenting audit findings (e.g., non-conformities, observations), a practice for transparency
- A process for tracking corrective actions and verifying their effectiveness to close the feedback loop

11.5 External audit

Cooperation with accreditation: Full cooperation with external SIRAS+ audits shall be provided, ensuring independent validation of compliance and performance.

The main contractor shall cooperate fully with external audits conducted by the accreditation body to maintain SIRAS certification.

11.6 Measurement and reporting of service quality

Performance tracking: A system for measuring and monitoring performance against defined standards and key performance indicators (KPIs) shall be implemented, ensuring data-driven management.

The main contractor shall implement a performance measurement and monitoring system for accountability.

11.6.1 Performance measurement

The system shall include:

- Appropriate data collection methods (e.g., inspections, testing, surveys, incident reports) for robust data
- Regular analysis of performance data to identify trends and improvement areas for proactive management
- Clear and concise reporting of performance data to relevant stakeholders for communication

11.6.2 Reporting

Performance reports shall be generated regularly and communicated to relevant stakeholders (e.g., management, staff, clients as appropriate) for transparency.

Reports shall include:

- A summary of key performance indicators, a component for clarity
- Analysis of performance trends for insight
- Identification of areas for improvement and action planning
- Progress on implementing improvement actions, an update for accountability

11.6.3 Transparency

The main contractor should strive for transparency in performance reporting, making information readily available to stakeholders where appropriate, with a strong preference to enhance trust and engagement.

11.7 Risk-based auditing

The internal audit programme should be risk-based, with audit frequency and scope determined by the assessed risk level of the activity or process, a strong preference to optimise resource allocation and focus on critical areas.

11.8 Audit findings as risk input

- Audit findings (non-conformities and observations) shall be considered valuable input to the risk assessment process to integrate audit insights into risk management
- Identified weaknesses should trigger a review of relevant risk assessments to determine if further mitigation is needed, with a strong preference for proactive risk management

11.8.1 Proactive risk identification

- Audits should verify compliance and proactively identify potential risks not previously recognised, with a strong preference for forward-looking risk management

11.9 Identification and implementation of improvement opportunities

11.9.1 Systematic process

The main contractor shall have a documented process for identifying, evaluating and implementing improvement opportunities, ensuring a systematic approach to enhancement.

The main contractor shall have a documented process that includes:

- A system for capturing improvement suggestions from various sources (e.g., staff, clients, audits, risk assessments, industry best practices) for inclusivity
- A method for evaluating potential benefits and costs of proposed improvements for informed decision-making
- A process for prioritising improvement projects based on risk, impact and feasibility for efficiency

11.9.2 Implementation and evaluation

- Approved improvement projects shall be implemented in a controlled manner with clear responsibilities, timelines and resource allocation for execution
- The effectiveness of implemented improvements shall be evaluated to ensure desired outcomes are achieved for validation

11.9.3 Continuous improvement cycle

- Identifying, implementing and evaluating improvements should be a continuous cycle, with a strong preference to drive ongoing performance enhancement
- Regular management review of performance data, audit findings and risk assessments should identify emerging trends and prioritise future efforts, a best practice recommendation for strategic oversight

12 | Management and governance

12.1 Contractor main contractor

The main contractor should establish and maintain

- **Organisational commitment**: The main contractor shall establish a clear policy and structure to support the Structural Integrity and Resilience Accreditation Scheme (SIRAS); this ensures a commitment to corrosion protection, structural integrity, resilience and sustainability underpins accountability and alignment with industry standards
- **Competency assurance**: Personnel shall be qualified and competent, with processes to assess, maintain and enhance skills; this requirement ensures the workforce can deliver reliable Cathodic Protection services
- **Adaptive management**: Procedures and competencies should be regularly reviewed and adjusted based on performance and evolving needs, reflecting best practices for continuous improvement

12.1.1 Main contractor requirement

The main contractor should maintain a documented company policy statement outlining its role within SIRAS, emphasising structural integrity, resilience and company objectives communicated across all levels. This strong preference ensures organisational alignment and employee engagement.

- **Service scope**: A concise definition of SIRAS-related services shall be documented, detailing corrosion protection, risk assessment, design and consultancy, including any SIRAS+ enhancements; this requirement clarifies the contractor's expertise and responsibilities
- **Organisational structure**: An organogram shall be provided, naming roles, individuals and responsibilities (e.g., Information Manager), supported by process flow charts; this structure promotes transparency and accountability
- **Delegation and responsibility**: Levels of delegation and limits of responsibility shall be documented for each role, ensuring transparent decision-making – a step for governance
- **SIRAS awareness**: A managed process shall ensure all personnel understand SIRAS requirements through training and briefings for compliance
- **Behavioural expectations**: Personal behaviour aligned with company values should be promoted at all levels, with a strong preference for fostering a positive culture
- **GDPR and insurance**: A GDPR policy with minimum cyber essential certification and appropriate insurance coverage shall be defined for legal and risk management compliance
- **Health, safety and environment (HSE)**: Processes should measure HSE performance against standards, a best practice recommendation to target improvements

12.2 Human resources

The main contractor should document recruitment, selection and appointment criteria, with a strong preference for structured staffing processes.

- Job descriptions for all roles in place, which specify minimum competency for each role
- A documented recruitment, selection and induction plan exists and has been applied
- Regular competence assessments done and assessments linked into a skills/competence matrix
- A training plan (linked to the skills/competence matrix) has been developed
- Arrangements in place for managing competency gaps
- Evidence of a programme/forecast capacity against the actual capacity for the next 12 months provided
- **Recruitment verification**: Procedures should verify qualifications, references and test/medical results, a best practice recommendation for robust hiring

12.3 General competency requirements

The main contractor should ensure that all personnel are qualified and experienced and meet this standard's general and role-specific competency requirements.

- **Qualification assurance**: The main contractor shall ensure personnel meet general and role-specific competency requirements for quality delivery
- **Competency process**: For roles critical to SIRAS, a documented evaluation process and minimum competency requirements (training, experience, qualifications) should be established, with annual reviews by a Competent Person – a strong preference for ongoing assurance
- **Training and supervision**: Staff shall be trained to meet job description competencies, with supervision for those not yet fully competent. A training programme should address gaps and a best practice suggestion
- **Certification management**: A process shall ensure timely renewal of qualifications, a safeguard against lapses
- Role-specific competencies should be presented in a matrix form that reflects job description requirements, detailing the minimum requirements for each role and the actual competence held by each individual within that role. The minimum competency levels, defined within a documented competency evaluation process, should support the matrix

12.4 Training and competency

The main contractor seeking SIRAS accreditation should demonstrate a robust system for defining roles, assessing competencies, providing training and tracking certifications.

- **Role definitions**: Clear project role definitions and a strong preference for a functional quality management system should be documented
- **Competency matrix**: A matrix should align roles with ISO 15257:2017 Levels 1– 4, ICorr membership and fellowship and required training, a best practice recommendation
- **Certification tracking**: An automated system should track certification expiry, with a strong preference for maintaining validity
- **Training programmes**: Essential skills training (e.g., electrical safety) and project inductions should be provided based on risk assessments, with RAMS for high-risk tasks – a best practice approach

12.5 Career progression

The main contractor should support career progression through mentoring and training, with a strong preference for workforce development. Evidence should be documented, including training records, competency assessments and a best practice recommendation.

12.6 Using temporary staff

Where staff are employed temporarily, competence should be determined for the tasks they are required to undertake and the level of supervision provided should be commensurate with the assessed competence. They should also receive technical and safety briefings before work commences.

12.7 Design team competency

- Design personnel shall demonstrate familiarity with CP systems and relevant design processes
- A formal design approval process shall be documented, defining approval authority and scope
- Competent persons approving designs should hold Chartered membership in a recognised professional institution
- When multiple design sections exist, the responsible, competent persons shall be clearly documented

12.8 Qualified supervisor

- **Supervisory roles**: SIRAS Providers should appoint competent supervisors for installation and assembly, with a strong preference for ensuring safety and quality
- **Professional membership**: Evidence of technical membership (e.g., ICorr, AMPP) shall be provided, demonstrating expertise. Accreditation (e.g., CHAS) should be shown, or alternatives detailed – a strong preference

12.8.1 Technical membership and accreditation

Where the activities of a role materially contribute to the processes involved in the delivery of SIRAS services, the main contractor should

- Professional memberships (e.g., ICorr, CPA, AMPP) shall be held by relevant personnel
- Accreditation from recognised bodies (e.g., CHAS, Achilles) should be provided. If unavailable, alternative competency evidence may be accepted

12.9 Administration

Performance measures: Administrative performance should be measured for quality and compliance, which is a best practice suggestion, though formal qualifications are not mandatory.

13 | Health, safety, environment and risk assessment

13.1 HSE policy documentation

13.1.1 Comprehensive documentation

The main contractor shall provide detailed, up-to-date Health, Safety and Environmental (HSE) policy documentation, ensuring a robust framework for managing HSE risks associated with Cathodic Protection systems.

- The HSE policy shall include step-by-step procedures for safe operations, emergency responses and incident management
- It shall clearly define the responsibilities of all staff to ensure accountability
- Best practices for risk mitigation and sustainable operations

13.2 Management culture and commitment

A safety-focused management culture should be actively demonstrated through leadership engagement to promote transparency and continuous improvement in HSE practices.

- Leadership should actively engage through regular safety briefings to communicate HSE priorities
- There should be structured periodic performance reviews to evaluate HSE effectiveness
- Employee feedback forums should be encouraged to report and discuss safety concerns

13.3 Management structure and key safety responsibilities

The contractor shall establish a clear, documented structure assigning HSE responsibilities, ensuring effective decision-making and accountability. The structure shall include:

- An organisational chart detailing the hierarchy
- Written procedures specifying roles, supervision and communication channels

13.4 HSE performance measurement and continuous improvement

Robust processes shall be implemented to measure HSE performance and drive improvement, ensuring ongoing compliance and enhancement of HSE practices.

- Key performance indicators (KPIs) shall quantify HSE performance
- Regular audits and reviews shall identify shortfalls
- Corrective actions and lessons learned shall be documented for continuous improvement

13.5 Competency requirements

Competency processes should align with generic requirements, ensuring staff are adequately trained for HSE responsibilities.

- There shall be comprehensive HSE training programmes for all staff
- It should include regular assessments and record-keeping of competency
- Should demonstrate specific verification procedures for temporary staff via technical and safety briefings

13.6 Incident reporting and investigation procedures

A documented process shall be in place for incident management, ensuring timely and effective responses to HSE incidents.

- Reporting procedures shall ensure timely communication of incidents
- Lessons learned should be integrated into safety planning

13.7 Employee involvement in HSE decision-making

Employees should be involved in HSE decision-making. This strong preference leverages frontline experience to refine policies.

- Employee involvement should leverage frontline experience to refine HSE policies and procedures
- Feedback surveys should capture employee insights
- Systematic recording of employee input should be implemented to ensure continuous policy refinement and demonstrate consideration of frontline experience

13.8 Emergency procedures and environmental impact control

Detailed emergency procedures shall be documented to prepare the team for crisis management and environmental protection.

- Emergency response plans shall be documented and regularly tested
- Environmental mitigation should include scheduled audits and controls

13.9 Management of temporary staff and contractor compliance

Temporary staff and contractors shall be integrated into the HSE system, ensuring consistent safety standards across all personnel; the following shall be enforced:

- Dedicated induction programmes on HSE policies
- Ongoing supervision and audits to verify compliance
- Documentation should confirm integration into the HSE management system

13.10 General risk management approach

A proactive, well-documented risk management process is vital. It should include the following components:

- A project-specific risk register detailing risks, likelihood, consequences and ownership
- Risk identification using workshops, checklists and brainstorming, considering internal/external factors
- Risk assessment based on likelihood and impact, with mitigation strategies regularly reviewed
- Stakeholder involvement in risk planning

13.10.1 Risk reporting and monitoring

- A detailed risk register shall be maintained with clear reporting channels
- Regular risk review meetings and concise reports shall be conducted, integrating risk data into project management
- Lessons learned should be captured to improve assessments

13.10.2 Escalation procedures

Structured Escalation Process:

- Establish formal procedures for escalating significant risks to senior management
- Ensure effective communication channels and protect those reporting potential issues

13.10.3 Project-specific risk management

For each project, a detailed and tailored approach is required:

- A tailored approach shall document project hazards, regulatory requirements and a site-specific safety plan, including implementation, monitoring and incident reporting
- Integration with project management shall link the risk register to planning documents

14 | Project management

The project management team should demonstrate robust technical expertise and a proven track record. This strong preference ensures the team can oversee complex Cathodic Protection and corrosion management projects effectively.

The main contractor should standardise their project management methodology across projects. This strong preference aligns with industry best practices and ensures consistency.

14.1 Project team competence and experience

- The project manager should exhibit technical expertise to manage subcontracts, ensure specifications are met and integrate all project functions (design, construction, SIRAS services), reflecting best practices for seamless compliance
- The project team should be competent in appointing supervisors, managing subcontractors and overseeing SIRAS activities, which is a strong recommendation for effective execution
- The main contractor should demonstrate accountability mechanisms for project managers within the contractual chain, with clearly defined roles and responsibilities
- Qualified supervisors should be appointed to meet competency standards, with shortfalls identified and addressed by a competent person, ensuring robust oversight

14.2 Project management methodology

- An overview of the methodology should be provided, demonstrating alignment with SIRAS standards
- Project management plans should include scope, objectives, deliverables, work breakdown structures, Gantt charts and resource allocation, with monitoring processes to ensure timelines and quality meet client needs
- Progress monitoring and issue resolution processes should be explained and regular progress reports shall be provided to stakeholders
- Performance monitoring shall use KPIs to track project and subcontractor performance, with documented records of subcontract management

14.3 Change management

- A well-defined change management process shall be in place to handle project deviations, ensuring adaptability without compromising project integrity
- A formal change control process shall manage design and construction changes, with the main contractor explaining schedule adaptations for client-driven changes
- Procedures should detail how changes are identified, evaluated, approved, implemented and communicated, including updates to the configuration baseline

14.4 Communication and stakeholder management

- Robust stakeholder communication should be established to manage expectations and ensure collaboration. This strong preference fosters project success
- A verifiable client interface management process should be implemented
- The main contractor should explain stakeholder expectation management while a documented subcontract management process shall be in place
- Clear communication channels should be established among the project manager, subcontractors and stakeholders
- An issue-tracking system shall be implemented to resolve project issues

14.5 Project closeout

- The closeout process should capture lessons learned for future improvement. This strong preference enhances project management methodology over time
- Documented records of project closure and handover shall be maintained
- The main contractor should explain how lessons learned are applied to improve methodology
- Formal mechanisms like post-project reviews and knowledge transfer workshops should be used to capture insights
- Documentation should show the integration of past learnings into current practices

14.6 Project record documentation

- A formal process should capture all project records. This strong preference ensures traceability and audit readiness
- Records should include design documents, construction records, as-built information and project plans
- All records shall be retained under the main contractor’s document retention policy and be accessible for audits

15 | Insurance

The main contractor shall maintain insurance coverage tailored to their scope of work. This ensures financial protection against risks associated with Cathodic Protection and corrosion management projects, safeguarding the contractor and stakeholders.

The main contractor shall demonstrate adequate insurance, including:

- Public Liability, Third Party Liability, Professional Indemnity and Contractor All Risk cover, as applicable to the scope of work
- Business continuity insurance or equivalent risk mitigation within the risk management process
- Details of coverage limits for public liability, employer liability and professional indemnity insurance shall be provided to verify sufficiency
- The contractor shall explain how they ensure coverage adequacy for each project, addressing project-specific risks
- Insurance should encompass public liability, third-party liability, professional indemnity and contractor All-risk coverage, reflecting best practices for comprehensive protection

16 | Appendix 1: SIRAS accreditation process

A1.16.1 Accreditation process overview

CP and CM system design, installation and commissioning shall comply with ISO 15257:2017 and ISO 12696:2022.

SIRAS accreditation shall be awarded after successfully assessing the project scope and quality.

Accreditation certificates shall list the main contractor, installed systems and accreditation scope.

Accreditation details should be updated on the SIRAS website with current colour-coded statuses.

A1.16.2 Approval process: Accreditation assessment

The assessment represents a standard, evidence-based audit of the main contractor's structure, processes, procedures and competencies.

The SIRAS scheme aims to:

- Recognise and reward good practices in corrosion management
- Identify and validate sustainability credentials
- Promote a controlled and planned preventative strategy
- Encourage the preservation of embodied carbon
- Enhance asset value through demonstrable commitment
- Provide a platform for insurers and asset owners

Verbal feedback on the assessment outcome shall be provided after the assessment.

A comprehensive report will follow.

If major nonconformities are identified, they shall be verified as closed out before accreditation can be given.

A1.16.3 SIRAS assessment and scoring

SIRAS accreditation shall use a Gold, Silver and Bronze tiered system based on weighted scores; these reward varying levels of compliance and resilience.

- SIRAS questions have a maximum weight of 4, SIRAS+ up to 5, reflecting advanced criteria
- Accreditation shall be valid for 5 years, with a surveillance programme scheduled

A1.16.4 SIRAS+ standard tiers and grading definitions

Tiers shall be awarded based on a SIRAS+ Assessment Findings Log scoring system, ensuring consistency and incentivising high standards.

A1.16.4.1 Gold Tier (85%-100% – 510-600 points)

Awarded to projects demonstrating exceptional adherence to the highest standards in corrosion resilience, proactive management and sustainability. This tier signifies best-in-class performance and a strong commitment to long-term structural health.

A1.16.4.2 Silver Tier (70%-85% – 420-509 points)

Designated for projects indicating a strong commitment to compliance with SIRAS+ guidelines, demonstrating effective corrosion management and resilience practices.
While achieving a high standard, some areas may be identified for further improvement to reach Gold tier status.

A1.16.4.3 Bronze Tier (50%-70% – 300-419 points)

This is for projects reflecting essential compliance with SIRAS guidelines. While meeting minimum requirements, these projects require significant improvements to achieve higher tiers and demonstrate a robust corrosion management, resilience and sustainability approach.

A1.16.5 SIRAS accreditation award

At the end of the SIRAS accreditation process, the structure and the organisation will be awarded the SIRAS Certificate of Excellence.

A1.16.6 Organisation SIRAS certificate

SIRAS+ accreditation demonstrates your organisation's commitment to excellence in structural integrity and resilience, incorporating sustainability and proactive management strategies.

A1.16.7 Structure listing on the SIRAS website

Properties which have been designed, installed and constructed compliant with the SIRAS scheme may be listed on the SIRAS website subject to the following information being made available

- Full details of address, including name/number, postcode and geographic coordinate system
- Confirmation of installed system
- Details of the SIRAS-accredited designer and installer

A1.16.8 Surveillance programme

A surveillance programme shall be implemented over the 5-year term, ensuring sustained compliance and improvement.

Key areas of surveillance visit shall include:

- General management and competency
- Comprehensive documentation and review
- Environmental performance and life cycle assessment
- Digital innovation and data integrity
- Operations and maintenance protocols
- Remote monitoring capabilities and comprehensive reporting
- System security and cybersecurity
- Site visit schedules and maintenance
- Component lifespan and system longevity
- Continuous improvement and benchmarking

Additional surveillance visits may be required for major nonconformities or complaints.

All such additional visits will be at the beneficiary's cost.

A1.16.9 Surveillance visit programme

Each scope of accreditation shall be subject to audit, as a minimum, annually.

Accreditation may be suspended, or a revised surveillance programme may be established if a shortfall in standards is identified.

A1.16.10 Surveillance visit arrangements

Abortive visit charges for cancellations with less than 1 week's notice shall be made.

An additional visit may be required for work activities not being carried out as scheduled.

An additional fee commensurate with that visit may be chargeable.

A1.16.11 Investigations and removal of accreditation

Accreditation shall be subject to cancellation or amendment for:

- False claims
- Failure to rectify non-conformances
- Inadequate corrective actions
- Safety violations or substandard workmanship
- Bankruptcy or insolvency
- Misrepresentation of accredited scopes
- Misuse of the scheme and/or logo
- Notifying the accreditation body that they no longer wish to be accredited for scopes of work

The scheme beneficiary will be notified in writing of the intention to cancel accreditation.

Once accreditation has been withdrawn, the scheme beneficiary must re-apply and be subject to the full reassessment process.

A1.16.12 Appeals, complaints and disputes concerning accreditation

The scheme beneficiary may appeal within twenty-one days of notification of a failed audit.

- An independent SIRAS panel shall review appeals
- Decisions should be communicated with transparent reasoning
- Reinstating project accreditation may require a full re-assessment

A1.16.12 Re-certification

A reassessment shall be undertaken at the end of the 5-year accreditation term.

Re-certification should focus on improvement areas and past performance.

Limited scope reassessments may be applied to consistently compliant organisations.

17 | Appendix 2

A2.17.1 SIRAS+

The Structural Integrity and Resilience Accreditation Scheme (SIRAS) and SIRAS+ are designed to ensure the highest safety, reliability and sustainability standards for structures and infrastructure.

The foundational SIRAS accreditation scheme introduces a tiered award system (Gold, Silver and Bronze) to benchmark system performance and maintenance practices against international standards like ISO 15257:2017 and ISO 12696:2022.

However, SIRAS+ builds on the foundation of SIRAS by adding additional criteria and features that emphasise sustainable materials, flexible system integration and enhanced durability in corrosion protection.

SIRAS+ incentivises the use of low-carbon materials and implements data-driven structural health monitoring, aligning with global decarbonisation goals and proactive corrosion management strategies

A2.17.2 Eligibility

To be considered for the SIRAS+, the main contractor shall meet

- The Gold Tier standard of the SIRAS accreditation
- Minimum of 3 years regular site visits, with evidence of:
    - Rigorous testing
    - Detailed documentation demonstrating ongoing assessment.
    - Proactive updates, driving continuous improvement in system performance and resilience
- High-performance thresholds
- Sustainable and proactive management
- Comprehensive reporting and monitoring
- Robust security measures
- Continuous improvement framework
- Holistic approach to structural integrity

This process evaluates adherence to SIRAS requirements and assesses the maturity of the organisation's practices, ensuring baseline compliance with structural integrity, resilience and sustainability criteria.

Following the third year of the main contractor consistently adhering to the SIRAS requirement through the Surveillance Visit audit, the main contractor shall be eligible to apply for an upgrade audit to SIRAS+ or at the recertification after the 5-year cycle.

A2.17.3 SIRAS+ Tiered award structure

To achieve certification, projects shall attain a minimum score of 330 out of 440 weighted points (75%),ensuring alignment with SIRAS+ guidelines for excellence in corrosion management, safety and operational performance. Projects are reviewed annually over three years, with a final evaluation based on demonstrable evidence and numerical grading; a minimum compliance score of 75% (330 out of 440 weighted points) is required to achieve certification.

A2.17.4 Maintaining SIRAS+ accreditation

Achieving SIRAS+ certification is not a one-time event. Continued compliance with the SIRAS and SIRAS+ requirements is essential for maintaining accreditation and the assigned tier. SIRAS+ certification shall undergo an annual review over five years. This process evaluates adherence to SIRAS+ requirements and assesses the maturity of the organisation's practices.

A2.17.5 SIRAS+ accreditation award

At the end of the SIRAS+ accreditation process, the structure will be awarded the SIRAS+ certificate of excellence by the accreditation body for the scope of work assessed under the scheme with the assurance that procedures and practices, against which approval has been awarded, are consistently applied and maintained

A2.17.5.1 Organisation SIRAS+ certificate

SIRAS+ accreditation demonstrates your organisation's commitment to excellence in structural integrity and resilience, incorporating sustainability and proactive management strategies.

18 | Appendix 3: SIRAS+ the core principles

SIRAS+ audit guidelines detail the System Monitoring and Review Report requirements, a crucial component of the accreditation process. The report should comprehensively document the system's performance, identify potential issues and recommend improvements. It should be structured and presented concisely and be auditable.

The System Monitoring and Review Report is a critical component of the SIRAS+ accreditation scheme, ensuring that Cathodic Protection (CP) and corrosion management (CM) systems are continuously monitored, reviewed and optimised to maintain structural integrity and resilience. This report shall provide a comprehensive overview of the system's performance, data analyses and recommendations for improvement. The following requirements shall be adhered to.

A3.18.1 Comprehensive documentation and review

The System Monitoring and Review Report shall provide a complete account of the work undertaken on the CP system, detailing the methodologies used for:

- **Work undertaken**: A detailed description of the monitoring activities performed, including site visits, remote monitoring and data collection processes
- **Data collection methodology**: Detailed explanation of data collection, including the frequency, methods and tools used. This should include justification for the chosen methods and their suitability for monitoring the system
- **Data analysis and interpretation**: Presentation of the collected data in a clear and understandable format (e.g., graphs, tables). Analysis of the data, highlighting trends, anomalies and potential issues. This section should demonstrate a thorough understanding of the data and its implications for system integrity and resilience
- **System performance assessment**: Evaluation of the system's performance against the defined requirements and capabilities (detailed in Section II). This should include a discussion of any deviations from expected performance and their potential impact
- **Recommendations**: Specific, actionable recommendations for changes to the system, including hardware upgrades, software updates, process improvements, or maintenance schedule adjustments. The data analysis and system performance assessment should justify each recommendation
- **Conclusion**: Summary of the key findings and recommendations, emphasising the overall status of the system and its resilience
- **Appendices**: Supporting documentation, such as raw data, calibration certificates and other relevant information
- This report is a living document updated regularly to reflect ongoing system performance and support continuous improvement

A3.18.2 System requirements and capabilities

The CP system shall have real-time monitoring capabilities that enable continuous performance tracking and provide immediate access to operational data with full context. It shall support:

- Continuous real-time monitoring and analysis of system performance to ensure immediate detection and response to any irregularities
- **Remote operations**: Capability to manage and control system functions from remote locations, enhancing operational flexibility and accessibility
- **Data access and context**: Comprehensive access to system data with contextual information to facilitate informed decision-making and analysis
- **System reliability**: Ensuring consistent and dependable system performance under various conditions, minimising downtime and operational risks
- Proof of system upgradeability and futureproofing the operation for the designed service life (often 25+ years from commissioning

A3.18.3 Comprehensive reporting and compliance

Reporting within the system shall adhere to established standards, ensuring functional confirmation of all data collected. Reports shall be clear, concise and client-focused to promote operational transparency. This includes documenting key performance indicators, deviations from expected performance and the corrective actions taken, providing a complete audit trail and demonstrating compliance with SIRAS+ requirements.

A3.18.4 System requirements and capabilities

The report shall address the following system requirements and capabilities, providing evidence of their implementation and effectiveness:

- **Performance monitoring**: Demonstrate the capability of the system to provide monitoring as agreed on a daily, weekly, monthly or annual schedule of critical parameters. Explain the frequency of data collection and the methods used to display and analyse the data

- **Remote operations**: If applicable, describe the system's remote operation capabilities, including controlling and monitoring the system remotely. Provide evidence of the security measures in place to protect against unauthorised access
- **Data access and context**: Explain how data are accessed and how context is provided to ensure the data are meaningful and actionable. This includes describing the data visualisation tools and any contextual information provided
- **System reliability**: Assess the system's reliability, including the performance of key components and the overall system uptime. Provide data on system failures and the steps taken to prevent future occurrences

A3.18.5 System security and cybersecurity

Robust security protocols shall be integrated into the system, including encryption measures, secure VPN connections and strict access control policies. These measures are essential to safeguard sensitive operational data and to ensure that all communications and remote access channels remain secure against unauthorised access or cyber threats. The report shall address the following security aspects:

- **Security protocols**: Describe the security protocols implemented to protect the system from unauthorised access and cyber threats
- **Encryption and VPNs**: Detail the use of encryption and VPNs to secure data transmission and remote access
- **Access control**: Explain the control mechanisms to restrict system and data access

A3.18.6 Remote monitoring and control capabilities

The CP system shall support remote access and operational replication, allowing system performance to be monitored, controlled and managed off-site. This capability ensures that any issues can be promptly identified and addressed, even when the physical system is located remotely, thus enhancing overall system responsiveness and reliability.

A3.18.7 Site visit intervals and maintenance

A structured schedule for site visits and maintenance shall be established to ensure the early detection of any operational issues and to validate system performance. The report should include assessments of the lifespan and condition of critical components – such as power supplies, embedded, buried or immersed elements and monitoring devices – and document any technology updates or proactive measures to extend the system's longevity.

The following guidelines shall be followed for site visits and maintenance:

- **Recommended visit schedule**: Establish a schedule for routine site visits based on system requirements and environmental conditions
- **Early issue detection**: Implement measures to detect and address issues early, minimising downtime and repair costs
- **Software compatibility**: Ensure all monitoring software is compatible with the system and regularly updated

A3.18.8 Component lifespan and system longevity

The monitoring and review process shall address the lifespan of key components, including:

- **Power supplies monitor**: and plan for the replacement of power supplies as they near the end of their service life
- **Buried components**: Regularly assess the condition of buried components to prevent unexpected failures
- **Monitoring devices**: Ensure the embedded devices function correctly and replace them as needed
- **Technology updates**: Stay informed about technological advancements and incorporate software and firmware updates and hardware upgrades to enhance system performance and maintain relevance

A3.18.9 Main contractor benchmarking, future-proofing and cost-effective solutions

The monitoring report shall include benchmarking results that compare the main contractor's performance against industry standards and SIRAS+ criteria. The report shall:

- **Benchmark capabilities**: Describe the main contractor's benchmark capabilities and how they are used to assess performance
- **Quality auditing**: Conduct periodic audits to ensure the main contractor meets SIRAS+ requirements. Outline the quality auditing procedures used to ensure the ongoing integrity of the system
- **Future-proofing technology**: The report should address the system's ability to adapt to future changes:
  - **System evolution**: Discuss the potential for system evolution and expansion. Plan for the evolution of the system to accommodate future needs and technologies
  - **Proactive updates**: Outline a plan for proactive updates and upgrades to keep the system current and resilient
- **Cost-effective solutions**: The report should consider the cost-effectiveness of the system and its maintenance:
  - **Balanced investments**: Demonstrate a balanced approach to investment in the system, considering both performance and cost. Balancing upfront costs with long-term savings through efficient system design and maintenance
  - **Efficiency gains**: Identify opportunities for efficiency gains through system optimisation and improved maintenance practices. Identifying opportunities to improve system efficiency and reduce operational costs

19 | Appendix 4: SIRAS+ general principles

A4.19.1 Main contractor

Membership in relevant technical institutions:

- Confirm that the CMS contractor or corrosion design advisor is a member of a relevant technical institution such as ICorr, AMPP or CPA

A4.19.2 Project main contractor (principal contractor)

- Service Provide organisational structure:
    - Provide a clear main contractor organisational structure, outlining key roles and responsibilities for project delivery
    - Ensure that the structure includes defined roles for project management, supervision and subcontractor oversight

A4.19.3 Key responsibilities for project delivery

Clearly define the responsibilities of each role involved in project delivery, ensuring accountability and effective management.

Appoint a competent person to oversee all offsite service activities and maintain informed oversight of the contractual chain of activities.

A4.19.4 Training and competency

- Project role definitions:
    - Establish and document clear project role definitions, ensuring compliance with ISO 152572017 Levels 1 to 4 and ICorr membership or fellowship status
    - Develop an integrated competency matrix that defines minimum competencies for each role and actual competencies held by individuals
    - Ensure the competency certification body is accredited
- Competency assessment and training:
    - Align competency level responsibilities and sign-off with those defined in ISO 15257:2017 for Cathodic Protection works
    - Implement a comprehensive project induction programme and provide evidence of delivered toolbox talks

A4.19.5 Structural and condition assessment

- Visual inspection and defects recording:
    - Conduct visual inspections for concrete defect types and delamination checks
    - Record all defects in the defects register, such as cracks, honeycombing and poor construction joints
- Chloride content and carbonation measurement:
    - Evaluate the chloride content of concrete in accordance with EN14629
    - Undertake carbonation and depth measurements in accordance with EN14630
- Electrical continuity testing:
    - Prove reinforcement electrical continuity using electrical resistance/potential difference measurements between bars

A4.19.6 Concept CP design process

- **Corrosion and deterioration assessment**
    - Confirm that structural deterioration is due to corrosion caused by elevated carbonation, sulphate, or chloride content
- **Service life confirmation**
    - Obtain confirmation from the client regarding the desired service life of the structure, CP and CM system
- **Exposure conditions assessment**
    - Assess the structure's exposure conditions to determine the appropriate anode type and system components
- **Sustainable components**
    - Use sustainable and decarbonised components defined by Type III Environmental Product Declarations (EPDs) to contribute towards SIRAS+ accreditation
- **Power and communication access**
    - Assess access to mains power and dedicated broadband communications
- **CMS system suitability**
    - Confirm the designed CMS system is appropriate for the structure's service life and the CP element

A4.19.7 Detailed design

- **Anode selection and calculations**
    - Base anode selection on life, current density, reliability, exposure, cost assessment and aesthetics
    - Provide detailed calculations for design current density, anode outputs, monitoring choices, zone size, current distribution and cable connections
- **Cable specifications and resistance**
    - Calculate cable specifications and resistance to minimise voltage drop and ensure uniform current distribution
- **Environmental product declarations**
    - Include Type III Environmental Product Declarations (EPD) for all CP components to contribute towards SIRAS+ achievement

A4.19.8 Design documentation

- **Specifications and drawings**
  - Provide specifications for materials, installation, testing, commissioning and operation
  - Include parts of the structure to be protected, with criteria for selective area protection based on survey outcomes

A4.19.9 Project risk assessment (principal contractor)

- **Risk register and reporting**
  - Use a risk register and effective risk reporting arrangements to document and manage project-specific risks
  - Compile a site-specific risk assessment and safety plan/ safe system of works per QP requirements
  - Incorporate lessons learned from earlier projects into the project QP and procedures

A4.19.10 Installation

- **Anode system life and performance**
  - Ensure the anode system's calculated life is sufficient for the design life
  - Use validated techniques to demonstrate anode performance and current distribution
- **CP system performance**
  - Determine Cathodic Protection system performance in accordance with BS EN ISO12696:2022
  - Use precise instrumentation and robust data management systems to monitor the performance of CP and CM systems

A4.19.11 Commissioning

- **Pre-energising measurement**
  - Make and record measurements before energising in accordance with the quality plan
- **Initial performance assessment**
  - Measure output voltage, current supply, "Instantaneous OFF" potentials and potential decay
  - Ensure interpretation of performance to ISO12696:2022 by at least a Level 3 ISO15257:2017 CP professional
  - Sign-off of performance by Level 4 ISO15257:2017 CP specialist

A4.19.12 Deliverables

- **Quality records**
  - Maintain quality records, including the quality plan, visual inspection reports, mock-up test results, QA/QC site installation pro forma and pre-commissioning and commissioning tests

20 | Appendix 5: Website details

A main contractor's entry on the website shall be graded as:

- **Blue**: when the company and technology are under Assessment
- **Green**: when full accreditation has been gained, including assessment by LRQA and the associated technology
- The foundational SIRAS accreditation scheme introduces a tiered award system:
  - Gold Tier
  - Silver Tier
  - Bronze Tier
- **Gold and green**: when SIRAS+ has been awarded
- The addition of a potential main contractor at Blue can be made as soon as the assessment has commenced; at this stage, website entry is optional but requires submitting company and installed system details to LRQA

The transition to Green (Approved) status will only be made following the successful completion of the process, the installation of the system assessments and the acceptance of a surveillance visit programme.

21 | Appendix 6: Principles of Cathodic Protection

The technical principles and requirements outlined in BS EN ISO 12696:2022 Annex A ensure the practical application of Cathodic Protection to steel in concrete. By understanding protection mechanisms, current density requirements, potential limits and reference electrode characteristics, engineers can implement strategies that mitigate corrosion risks, prolonging the service life of concrete structures.

A6.21.1 Protection mechanism

- **Passivation**: Steel in concrete is protected by a stable oxide layer due to the high alkalinity of the concrete pore solution. The high pH of concrete (typically >12.5) creates a passive oxide layer on steel, preventing corrosion
- **Depassivation**: Corrosion occurs when chlorides or carbonation reduce the alkalinity, destabilising the oxide layer. Chlorides (e.g., from de-icing salts or seawater) or carbonation (reaction with atmospheric CO_2) lower the pH, breaking down the passive layer and initiating corrosion
- **Cathodic Protection**: Applies an external DC current to shift the steel's electrochemical potential to a more negative value, halting or slowing down corrosion

A6.21.2 Criteria for protection

- **Cathodic prevention**: Applied early in the service life to prevent chloride-induced corrosion by maintaining the steel/concrete potential lower than the pitting potential (Epit) for new structures
- **Cathodic Protection**: For existing structures with corroding steel, the potential should be lowered to the protection potential (Eprot) to reduce corrosion rates to negligible levels

A6.21.3 Current density requirements

- **Cathodic prevention**: Requires lower current densities (0.2 mA/m^2 to 2 mA/m^2) for new structures
- **Cathodic Protection**: Requires higher current densities (2 mA/m^2 to 20 mA/m^2) for existing corroding structures

A6.21.4 Buried or immersed structures

- **Water saturation**: Reduces oxygen content and current requirements
- **Current density**: Ranges from 0.2 mA/m^2 to 2.0 mA/m^2 for new structures and up to 20 mA/m^2 for corroding structures
- **Design consideration**: The design shall account for these reduced oxygen levels to optimise system efficiency

A6.21.5 Prestressing steel

- **Hydrogen embrittlement**: High-strength steels should not be exposed to potentials more negative than −900 mV vs Ag/AgCl/0.5 M KCl
- **Monitoring**: The potential should be closely monitored in prestressing steel systems to ensure compliance with this limit

A6.21.6 Monitoring devices

- Silver/silver/chloride/potassium chloride (SSC) are used for their stability and suitability, which are demonstrated for concrete, buried and immersed applications
- Alternatively, MnO_2 electrodes are sometimes used for their stability and compatibility with the alkaline environment of concrete
- SSC-based corrosion rate probes incorporating platinum or graphite auxiliary electrodes are suitable for corrosion potential and rate monitoring for concrete applications

A6.21.7 Technical detailed requirements

A6.21.7.1 General requirements

- **Documentation**: All stages of design, installation, energising, commissioning and operation must be fully documented
- **Quality management**: Each element of the work must be undertaken in accordance with a fully documented quality plan

A6.21.7.2 Personnel

- **Competence**: Personnel must have appropriate qualifications, training, expertise and experience in Cathodic Protection

A6.21.7.3 Design

- **Detailed design**: Includes calculations, installation drawings, material specifications and method statements
- **Assessment**: Structures must be assessed for susceptibility to hydrogen embrittlement and stray currents

A6.21.7.4 Structure assessment and repair

- **Visual inspection**: Identify defects and features influencing Cathodic Protection
- **Chloride analysis**: Determine chloride content distribution
- **Carbonation depth measurement**: Measure carbonation depths
- **Concrete cover and reinforcement location**: Assess anode/cathode spacing and potential short circuits

A6.21.7.5 Cathodic Protection and corrosion management system components

- All embedded, buried and immersed components must be resilient in the environment to which they will be installed for the whole design service life
- **Anode systems**: Must supply the required performance and have a sufficient design life
- **Monitoring sensors**: Include reference electrodes, corrosion rate and other sensors for performance monitoring
- **Direct current cables**: Must meet design current requirements and minimise voltage drops
- Monitoring and network cabling must meet design requirements for communication and data transfer

A6.21.7.6 Installation procedures

- **Electrical continuity**: Test and ensure continuity between reinforcing bars or steel elements
- **Performance monitoring system**: Install sensors at representative points for performance assessment
- **Anode installation**: Follow design specifications and avoid short-circuits
- **Cathode installation**: Follow design specifications to establish DC negative connections and circuitry
- **Power, control and monitoring system**: Follow design specifications for the operation of the installed systems and associated networking and environmentally protective zonal enclosures
- **AC power and communications**: Follow design specifications for the requirements to provide AC power and dedicated broadband communications to the Central Management System and networks

A6.21.7.7 Commissioning

- **Visual inspection**: Confirm proper installation of all components
- **Pre-energising measurements**: Record baseline data before energising the system
- **Initial energising:** Start at low current and adjust to achieve performance objectives

A6.21.7.8 Operation and maintenance

- **Intervals and procedures**: Follow recommended intervals and procedures for routine inspection and testing
- **System review**: Conduct annual reviews and prepare system review reports

22 | Appendix 7: Cathodic Protection system components

A7.22.1 Anode systems

Anodes are the core of the Cathodic Protection system, delivering current to protect the steel:

- **Current distribution**: Anode systems shall distribute Cathodic Protection current uniformly and effectively to all embedded steel surfaces to ensure comprehensive corrosion control
- **Design life**: Anode systems should be designed with a calculated or anticipated service life that matches or exceeds the intended design life of the structure, minimising the need for premature replacement
- **Current density**: The anode's current density should not exceed manufacturer-specified limits, as excessive current can degrade performance or cause early failure (e.g., through acid generation or material breakdown)

A7.22.2 Monitoring sensors

Sensors provide critical data to evaluate system performance:

- **Performance monitoring**: Robust sensors shall be deployed to continuously or periodically assess the effectiveness of the Cathodic Protection system, ensuring that steel remains within the protection potential range
- **Reference electrodes**: These shall measure the steel/concrete potential accurately, serving as the primary tool for confirming that protection criteria (e.g., Eprot or Epit) are met

A7.22.3 Direct current cables

Cables are essential for delivering current efficiently:

- **Current capacity**: Cables shall be capable of carrying the design current without overheating, with permissible temperature increases aligned with material specifications
- **Voltage drop**: Voltage drops along cables should be minimised to maintain uniform current distribution across the protected steel surface, optimising system efficiency

A7.22.4 Power supplies

Power supplies drive impressed current systems:

- **DC power supply**: Transformer-rectifiers or switch-mode rectifiers shall provide a stable direct current tailored to the system's requirements, ensuring consistent protection
- **Environmental suitability**: Power supplies shall be designed to operate reliably in the specific environmental conditions of the installation site (e.g., temperature, humidity, or exposure to corrosive elements)

A7.22.5 Detailed technical requirements for Cathodic Protection system components

Anode systems

- **General requirements**: Anode systems shall meet the performance specifications outlined in the design, including current output, durability and compatibility with concrete environments

A7.22.5.1 Types of anodes:

- **Conductive coating anodes**: These may include organic coatings (e.g., carbon-based paints) or thermally sprayed metallic coatings (e.g., zinc or titanium). They shall provide uniform, current distribution over large surface areas
- **Activated titanium anodes**: Used as impressed current anodes, these shall be available in forms such as mesh, strips, or tubes, offering high durability and resistance to degradation in concrete
- **Titania ceramic anodes**: These may be used for specific applications with advantageous properties (e.g., chemical stability)
- **Conductive cementitious anodes**: Conductive materials like carbon fibres shall integrate seamlessly with concrete and provide consistent current output
- Conductive low-carbon geopolymer cementitious anode mortars are available for use as drilled-in, sprayed and chased-in reinforced concrete and steel-framed masonry-clad structures
- **Galvanic anodes**: These include embedded or surface-mounted zinc anodes, which may be used for localised protection, relying on sacrificial corrosion rather than an external power supply
- **Buried and immersed anodes**: For structures in soil or water, these shall be suitable for the electrolyte environment and capable of delivering the required current

A7.22.6 Monitoring sensors

- **General requirements**: Sensors shall be robust, durable and suitable for long-term exposure to the highly alkaline conditions of concrete (pH > 13). They shall withstand environmental stresses without degradation

A7.22.7 Types of sensors:

- **Portable reference electrodes**: These may be used for direct, temporary measurements on concrete surfaces to verify system performance during inspections
- Embeddable reference electrodes and corrosion rate probes: These are used commonly for the electrochemical monitoring of the installed CP and CM systems

- **Potential decay probes**: These should measure potential changes over short periods (e.g., after a current interruption) to assess depolarisation and confirm protection
- **Coupons and macro-cell probes**: These may estimate local current density and corrosion rates, providing supplementary data to validate corrosion control

A7.22.8 Monitoring instrumentation

- **Digital meters**: Instruments used for potential measurements shall have a minimum resolution of 1 mV and an accuracy of ±1 mV to ensure precise monitoring
- **Data loggers**: These should feature multi-channel inputs, a real-time clock and resolution/accuracy compatible with the sensors (e.g., ±1 mV), enabling comprehensive data collection over time

A7.22.9 Data management system

- **Data collection**: The system should collate, organise and present performance data clearly to facilitate analysis and decision-making
- Options are available for the open networking of multiple zones in simple and complex CP and CM applications. These networks can accommodate interoperability with additional functions, such as structural and environmental sensing, lighting control, webcams, etc
- **Documentation**: It shall include detailed records such as anode-zone layouts, sensor locations, power unit ratings and historical performance data to support long-term system management

A7.22.10 Direct current cables

- **Colour coding**: Cables should be colour-coded according to their function (e.g., positive, negative, or monitoring) to aid identification during installation and maintenance
- **Identification**: Cables shall be clearly labelled in junction boxes and at the connection points to prevent errors during installation or troubleshooting
- **Specifications**: Cables shall meet requirements for current capacity, voltage drop (typically <5% of supply voltage) and resistance to environmental exposure (e.g., moisture, UV, or chemical attack)

A7.22.11 Junction boxes

- **Environmental protection**: Junction boxes shall be rated per IEC 60529 (e.g., IP66 for water/dust resistance) and IEC 62262 (e.g., IK08 for impact resistance) to protect connections from environmental and mechanical damage
- **Non-metallic construction**: Non-metallic materials (e.g., polycarbonate) should be used for external environments to avoid corrosion, though metallic options may be considered for indoor settings if suitably protected

A7.22.12 Power supplies

- **Transformer-rectifiers**: These shall be continuously rated, self-contained units suitable for the operating environment (e.g., indoor or outdoor conditions)
- **Output control**: They shall provide stepless control from zero to full-rated output, allowing precise current adjustment to meet protection criteria
- **Safety features**: Units shall include surge protection, electrical isolation and clear labelling (e.g., voltage and current ratings) to ensure safe operation

A7.22.13 Transformer-rectifiers (detailed specifications)

- **Construction**: Housed in robust enclosures (e.g., steel or reinforced plastic), they shall be suitable for wall or floor mounting with adequate ventilation or cooling
- **Output specifications**: To prevent interference with protection performance, the output shall not exceed 50 V DC, with a ripple content not exceeding 100 mV RMS
- **Testing**: Manufacturers shall conduct tests to demonstrate conformity with design specifications and fitness for purpose, with results documented for verification

23 | Appendix 8: Competence levels of Cathodic Protection persons

A8.23.1 Key technical principles

The main contractor shall adhere to the ISO/IEC 17024 requirements for all certification processes related to the defined competence levels. This demonstration must include documented procedures and records that illustrate compliance with the international standard.

The main contractor shall present for review the certification processes to ensure compliance with ISO/IEC 17024 and other applicable international certification standards. This review will assess the certification activities' impartiality, competence, consistency and validity.

The main contractor will confirm that it has appropriate documentation to support their ISO/IEC 17024 compliance claim.

A8.23.2 Detailed requirements: competence requirements

The main contractor shall demonstrate implementing a structured competence management system encompassing five distinct competence levels. Each level must clearly define specific roles, responsibilities and knowledge requirements. This demonstration must include documented evidence of how these levels are applied across the four specified application sectors.

The main contractor shall demonstrate the alignment of these defined competencies with the outcomes of a comprehensive Job Task Analysis (JTA). This alignment must ensure that personnel competencies directly correlate with the required tasks and reflect current industry standards.

The main contractor shall ensure the clarity and adherence to the definitions of each competence level, ensuring that the roles, responsibilities and knowledge requirements are unambiguous and measurable.

A8.23.2.1 Level 1 Cathodic Protection data collector (or tester)

- Collect CP performance data of simple systems
- Perform basic CP tasks following instructions from higher levels
- Record data accurately
- Understand measurement fundamentals, error sources and safety issues
- Not authorised to analyse data

A8.23.2.2 Level 2 Cathodic Protection technician

- All Level 1 responsibilities
- Conduct various CP measurements, inspections and supervisory activities
- Collate and classify data
- Knowledge of electricity, corrosion, coatings, CP, measurement techniques, safety and standards
- Check equipment calibration, supervise installations and perform routine maintenance
- Not authorised to choose test methods and techniques, create instructions, or interpret results

A8.23.2.3 Level 3 Cathodic Protection senior technician

- All Level 2 responsibilities
- Knowledge of corrosion and CP principles, electricity, coatings and test procedures
- Perform and supervise Level 1 and 2 duties
- Guide to lower levels
- Prepare technical instructions and assess data

A8.23.2.4 Level 4 Cathodic Protection specialist

- All Level 3 responsibilities
- Detailed knowledge of corrosion theory, electricity, CP design, installation, testing and performance evaluation
- Establish testing criteria
- Design CP systems, including complex ones
- Define guidelines for CP systems
- Consider technical and safety aspects
- Prepare instructions and assess data
- No supervision is required

A8.23.2.5 Level 5 Cathodic Protection expert

- All Level 4 responsibilities
- Advanced CP knowledge through scientific work and publications
- Significant original contribution to CP science or practice
- Detailed knowledge and range of competencies across all sectors
- Established reputation as a top-level CP specialist in at least one sector
- High-level activities like RandD management, publications, lectures, standardisation work and new technology development
- Certification bodies are not required to use Level 5 personnel
- Level 4 personnel may perform Level 5 tasks

A8.23.3 Certification maintenance and professional development requirements

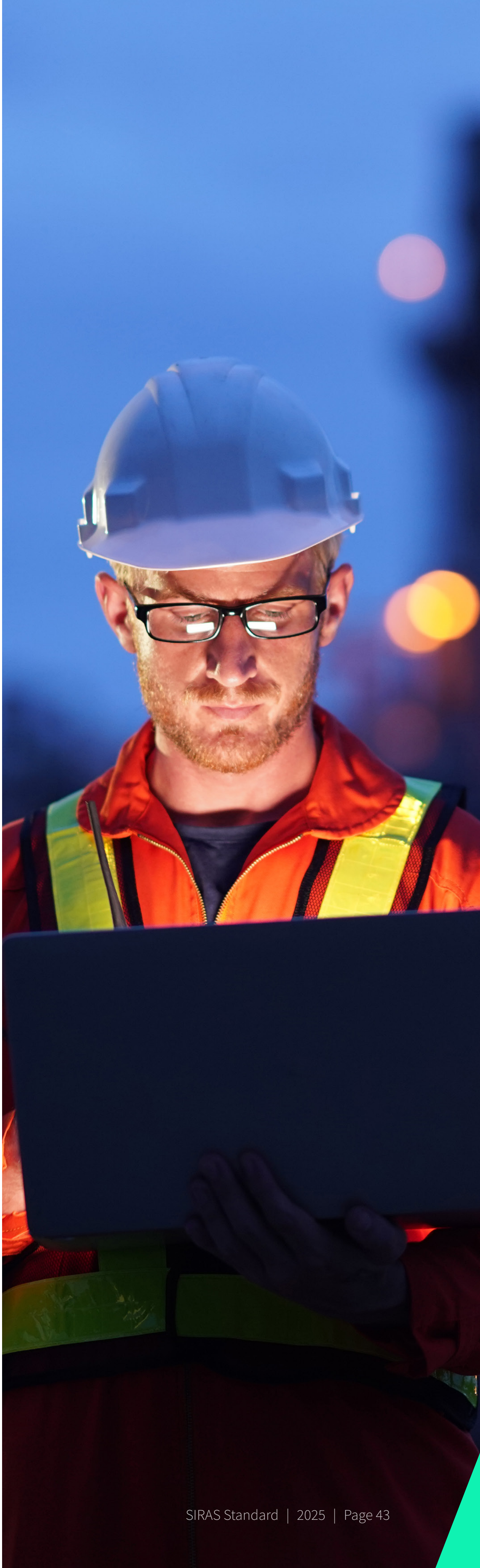
The main contractor shall demonstrate adherence to established certification maintenance protocols to ensure ongoing competency and relevance. This includes:

- Periodic re-certification: Successful re-certification every five (5) years, evidenced by documented proof of continued competent professional (CP) work and demonstrated acquisition of updated technical knowledge relevant to the certified scope. This evidence must be readily available for review
- Dossier submission (Levels 4 and 5): For individuals holding Levels 4 and 5 certifications, the main contractor shall provide a comprehensive dossier for auditor review. This dossier must detail the certified person's professional development activities undertaken since the previous certification or re-certification

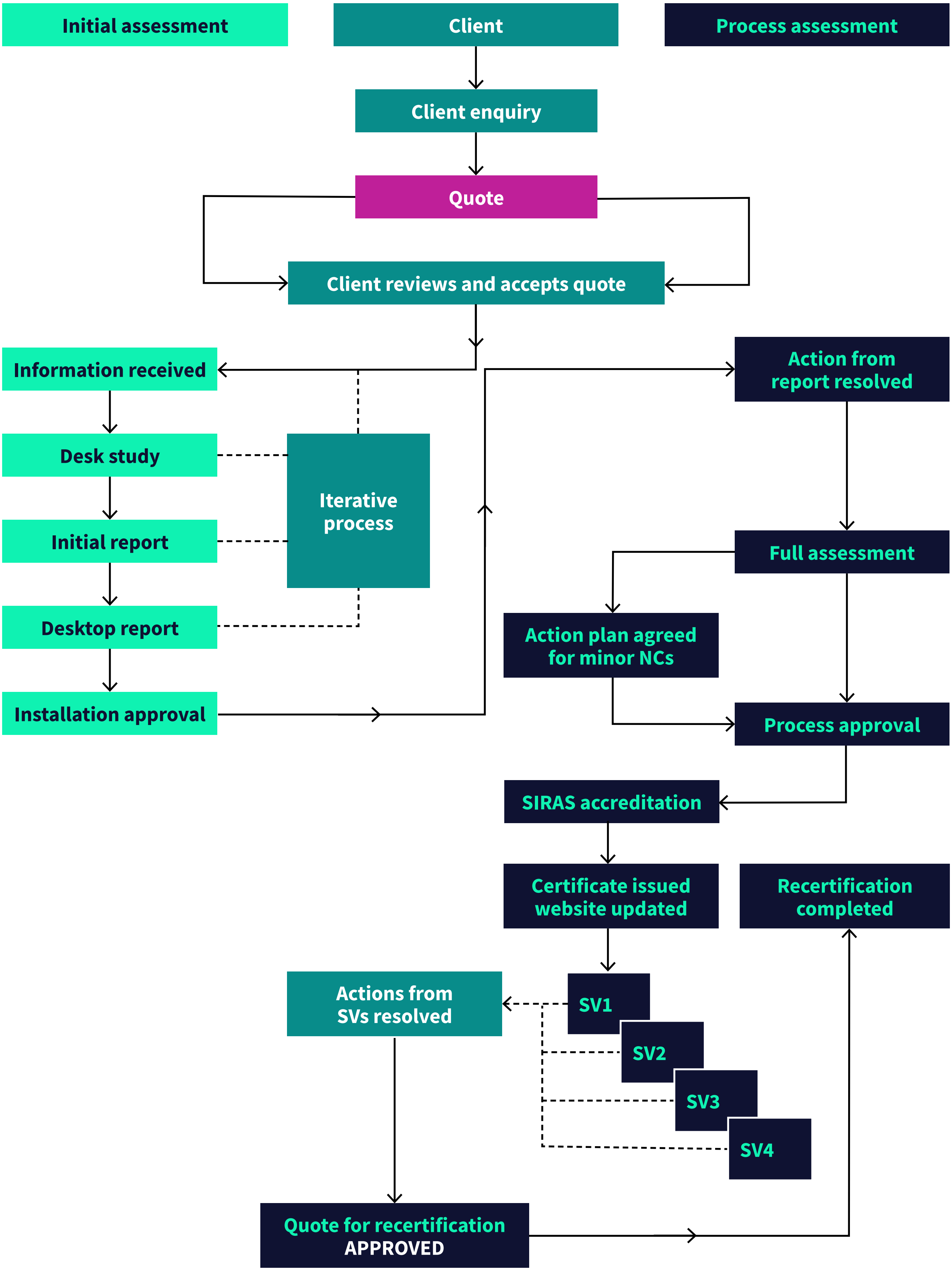
A8.23.4 Documentation and record-keeping requirements

Certification body records: The main contractor shall ensure the certification body maintains detailed records for each certified individual. These records must include, but are not limited to, training documentation, practical experience gained, examination results and the current certification status.

Each competency level inherently includes the skills and responsibilities of the preceding levels, ensuring a layered and integrated approach to CP system management. Detailed requirements for these competencies are further outlined in Clause 6 of BS EN ISO 15257:2017 (E).



Appendix 9: Application process flowchart



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