ACCREDITATION SCHEME FOR INSPECTION BODIES

TECHNICAL NOTE: SSF 01

SPECIFIC REQUIREMENTS FOR THE ACCREDITATION OF SITE SUPERVISION FIRMS

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The SAC Accreditation Programme is managed by Enterprise Singapore

1. INTRODUCTION

1.1. This document specifies the requirements for the accreditation of Site Supervision Firms carrying out site supervision works, as specified in Section 7 of the Building Control (BC) Act 1989.

1.2. This technical note (SSF 01) should be read in conjunction with documents listed in the references section and government regulations where applicable.

1.3. Supplementary information for specific areas of inspection may be published as other technical notes.

2. ABBREVIATIONS

2.1. The following abbreviations are used in this document:

BCA	Building and Construction Authority
BC Act	Building Control Act
BC Reg	Building Control Regulations
ERSS	Earth Retaining or Stabilising Structures
ISO/IEC	International Organization for Standardization / International Electrotechnical Commission
HR	Human Resources
JAC	IES-ACES C&S RE/RTO Joint Accreditation Council
NCR	Non-Conformity Report
PE	Professional Engineer, under the Professional Engineers Act 1991 and has in force a practising certificate issued under the said Act by Professional Engineers Board, Singapore
QP	Qualified Person as defined under the Building Control Act 1989
QP(D)	Qualified Person for Design
QP(S)	Qualified Person for Supervision

RE	Resident Engineer, holding a valid accreditation certificate issued by JAC
RTO	Resident Technical Officer, holding a valid accreditation certificate issued by JAC
RSS	Remote Site Supervision
SS	Singapore Standard
SAC	Singapore Accreditation Council
SOP	Standard Operating Procedures
SSF	Site Supervision Firms
PPVC	Prefabricated Prefinished Volumetric Construction

3. OBJECTIVE AND PURPOSE

3.1.1 The objective of the Site Supervision Firm ("**Firm**") is to uphold the competency and reliability of site supervision of large and complex projects in the construction industry by:

a) Employing highly competent and well-trained personnel, including PEs as QP and RE and/or RTO as site supervisors.
b) Providing a platform to enhance career stability and progression for RE and RTO as site supervisors
c) Leveraging technology as an enabler to enhance site supervision processes and improve overall efficiency in construction.
d) Facilitating the transfer of knowledge within the organisation and ensuring continuous improvement of industry standards and practices.

4. SITE SUPERVISION

4.1 Site Supervision is an inspection activity that comes under the scope of ISO/IEC 17020.

4.2 The accreditation of the Firm as the inspection body under this scheme covers the site supervision activities, associated supervision processes, auditing process and data collection functions within the accredited scope of works as listed in Annex A and Annex B.

4.3 The sites applicable to this technical note include construction sites with works required to be carried out under supervision, as stated under the BC Act 1989, section 7. The works include the following site activities:

1) Concreting works
2) Structural steelworks
3) Reinforcement in reinforced concrete (RC) Members
4) Foundation works
    a. Piling works
    b. Shallow foundation works
5) Earth Retaining or Stabilising Structures (ERSS) Works
6) Safety barriers
7) Precast concrete
8) Demolition works
9) Curtainwall and cladding systems
10) Post-installed anchors/rebars
11) PPVC system
12) Pre-stressing and post-tensioning works
13) Tunnelling
14) Land Reclamation

4.3.1 The Firm shall demonstrate, for accreditation purposes, minimum conventional site supervision capability for the activities within its accredited scope, as specified in Annex B – Minimum Conventional Site Supervision Capability Schedule. For accreditation purposes, the Firm must minimally demonstrate capability for all works listed under the key competencies in Table 1 below; any additional competencies will be listed in the accreditation schedule after assessments.

Table 1: Key and additional competencies of an SSF

Key Competencies	- Concreting works, including precast concreting - Structural steelworks - Reinforcement in reinforced concrete (RC) Members - Foundation works - Earth Retaining or Stabilising Structures (ERSS) Works - Safety barriers
Additional Competencies	- Pre-stressing and post-tensioning works - Post-installed anchors/rebars - PPVC systems - Demolition works - Curtainwall and cladding systems - Tunnelling - Land Reclamation

4.3.2 Annex B sets out, for each activity within scope:

a) The supervision process stages to be controlled by the Firm
b) The applicable codes, standards, approved plans and reference documents
c) The minimum personnel competence to carry out and supervise such activities
d) The minimum records and objective evidence to be maintained to demonstrate implementation and effectiveness.

4.3.3 The Firm shall establish and maintain documented procedures, personnel competency records and supervision records sufficient to demonstrate that it is capable of carrying out the applicable supervision processes in Annex B in accordance with the Building Control Act, applicable regulations, approved plans and relevant standards or codes of practice.

4.3.4 The Firm shall demonstrate supervision competency for each activity within its accredited scope through the implementation of the applicable supervision processes specified in Annex B. Where live projects are available, the Firm shall demonstrate competency through active implementation of the relevant supervision processes. Where no live projects are available at the time of assessment, the Firm may rely on records of objective evidence in the recent 3 years preceding the assessment to show their supervision capabilities in section 4.3.1, through the requirements set out in Annex B. For firms applying for new registration as SSFs, discretion may be exercised to waive the clause for the first 3 years of application.

4.3.5 The Firm shall maintain evidence that its personnel are competent to perform the applicable supervision processes for each activity within its accredited scope. Such evidence may include:

a) Qualification and professional certification records
b) Records documenting past and ongoing project supervision experience
c) Internal competency assessments or authorisations
d) Training records
e) Witnessed performance, mentoring or sign-off records.

4.3.6 The Firm shall maintain objective evidence demonstrating implementation of the relevant supervision processes for each activity within its accredited scope. Such evidence shall be traceable to:

a) The project
b) The structural activities inspected
c) The personnel deployed
d) The date and/or stage of inspection
e) The outcome, including non-conformities, rectification and closure

4.4 The purpose of site supervision is to ensure that construction works at sites are being carried out under close supervision of qualified and experienced personnel, in conformance with standards or other normative documents, general requirements and statutory requirements.

4.5 The firm shall demonstrate proficiency in BIM so that they are able to work with other BIM-competent QP(D) firms to implement effective site supervision control.

4.6 The minimum conventional site supervision capability requirements in Annex B shall be read together with the Guide Book for Site Supervision Plan, SS 515, approved plans, project specifications and any other applicable legislative or regulatory requirements. Where there is any inconsistency, the applicable written law and approved project requirements shall prevail. The Guide Book for Site Supervision Plan is intended to set out the principles, requirements and operation of site supervision plans, including supervision levels and activity-based checklists, and SS 515 sets out the minimum requirements for supervision of structural works.

4.7 Where a Firm seeks accreditation for a particular activity listed in Annex B, the Firm shall be able to demonstrate:

a) Access to the relevant procedures, checklists and reference standards
b) Availability of competent personnel for the activity
c) Implementation of the relevant supervision process on projects or through equivalent objective evidence acceptable to SAC
d) Maintenance of complete, traceable and auditable supervision records

5 TECHNOLOGIES AND EQUIPMENT

5.1 Firms shall have the processes to deploy the appropriate technologies and equipment for the supervision of works in their projects. As a general guide, the groups of commonly required technologies and equipment is shown in Annex A.1. Typical technologies and equipment required for the supervision of activities can be referenced from the Guidebook for Remote Site Supervision.

5.2 The Firm shall ensure that all technologies and equipment, including those not under their charge, used during the course of work are calibrated and traceable to the International System of Units (the SI unit). Calibration shall be performed by recognised SAC accredited laboratories or by the original manufacturer. For equipment not under the Firm's charge, the Firm may discharge this obligation by obtaining and retaining calibration certificates and records from the equipment owner. The Firm shall ensure that the acceptance of calibration reports be based on the measurement traceability as specified in SAC-SINGLAS 006 or any other recognised standards.

5.3 Where calibration facilities are not available, in-house calibration shall be validated using well-recognised methods endorsed by the approved signatory.

5.4 The Firm shall maintain an equipment register that includes equipment identification numbers, calibration schedules, maintenance records, and deployment tracking for audit verification.

5.5 For each piece of equipment listed in Annex A.1, the Firm shall maintain operating manuals, user competency records, and deployment logs showing which projects and personnel have utilised the equipment.

5.6 The Firm shall establish measurable performance criteria for equipment effectiveness and maintain records demonstrating equipment performance meets these criteria during site supervision activities.

6 OPERATION REQUIREMENTS

6.1 Management Responsibility

6.1.1 The authorised person(s) in charge of the management of SSF shall provide evidence of its commitment to ensuring safety and continually improving its effectiveness by:

a) Communicating to the organisation the importance of meeting customer as well as statutory and regulatory requirements.
b) Establishing the supervision Standard Operating Procedures.
c) Ensuring that supervision objectives are established.
d) Conducting management reviews.
e) Ensuring the availability and deployment of adequate resources in terms of supervisory personnel and tools/hardware necessary for adequate site supervision for any one project it undertakes.
f) Demonstrating the Firm's processes in ensuring the career stability as well as career progression of its supervisory personnel
g) Ensuring site supervisory personnel or team of such personnel are properly appraised for their professional performance after the completion of each project.

6.1.2 The Firm shall maintain records demonstrating resource allocation decisions and their adequacy for meeting supervision objectives.

6.2 Standard Operating Procedures

6.2.1 The Firm shall develop a set of SOPs to govern its site supervision activities. The purpose of the SOP is to show that these Firms are sufficiently prepared to deploy their technologies and manpower for works they are supervising.

6.2.2 The SOP should minimally cover the procedures on

a) Preparation for the submission of Site Supervision Plan to BCA.
b) Processes for deployment of technologies, equipment and personnel for common site supervision activities, including the requirements for site supervisors operating the technologies and equipment, in accordance with the applicable activity requirements in Annex B. Please refer to Annex B for the minimum conventional site supervision capability schedule.
c) Acceptance criteria for common site supervision activities, testing and examination conducted, including the review, verification and escalation processes applicable to each activity in Annex B.
d) Recording, interpretation and analysis of the results.
e) Documentation of site supervision records and carrying out data analytics of the site supervision findings and results.
f) Issuance of site supervision reports.
g) For Firms with capability to supervise specialised construction works, to also have SOPs for these activities.

6.2.3 Prior to carrying out site supervision activities, site supervisors shall review the logbook of the equipment or other documents as necessary for records of maintenance, repair or replacement of major parts, breakdown and incidents, if any. The review shall cover the records since the equipment was used in the last site inspection.

6.2.4 Firms shall maintain records of site supervisors' qualifications, training and experience. The records shall include how and when each site supervisor is authorised by the inspection bodies to perform specific site supervision works.

6.2.5 The SOP and Site Supervision Plans should also cover the items determined by prevailing codes, standards or legislations. Typical procedures and methods for supervising various generic construction activities listed in Annex B.1 can be found in the Guidebook for Remote Site Supervision.

6.2.6 Site supervision reports shall be issued to the Owner or their representative for project management and rectification purposes. The Firm shall retain all supervision reports and supporting evidence as auditable records and make them available to BCA or SAC upon request, assessment, investigation or incident review. Routine submission of inspection reports to BCA is not required, and only the final supervision summary report confirming closure of findings shall be submitted where stipulated.

6.2.7 The appointed QP(S) of the project shall sign on site supervision reports for supervision activities. The appointed QP(S) of the project shall also endorse the final report when all recommended rectification works have been completed to their satisfaction.

6.2.8 Each SOP shall include version control, approval signatures, distribution records, and evidence of staff acknowledgement and training on current versions.

6.2.9 The Firm shall maintain records of SOP effectiveness reviews, including performance metrics, incident analysis, and continuous improvement actions taken.

6.2.10 Site supervision plans submitted to BCA shall be retained with corresponding approval documentation and any subsequent amendments for audit verification.

6.2.11 The Firm shall maintain a register of all site supervision reports issued, including recipient acknowledgements and rectification completion records.

7 FIRM LEVEL REQUIREMENTS

7.1 The Firm shall maintain up-to-date codes, standards and other technical literature applicable to the design, construction, operation, inspection and repair of site supervision equipment and their components within the accredited scope of works and make these readily available to all staff.

7.2 Document Management System

7.2.1 The Firm shall have a document management system (digitalisation of record keeping) for keeping the:

a) Site Supervision records with relevant evidence including photos and videos.

b) Verification of Site Supervision plans with supporting documents.

c) Alternative solution record with project details including the risk assessment and approval

d) Incident investigation records with relevant evidence.

e) Calibration records of the tools.

f) Internal audit findings.

7.2.2 The site supervision reports shall be kept for a minimum of 5 years from the date of inspection/testing/approval.

7.2.3 The Firm shall ensure redundancy in record-keeping such that records remain accessible and recoverable in the event of loss, damage, or system failure.

7.3 Personnel Requirements

7.3.1 The Firm shall employ at least one Director on a full-time and exclusive employment contract with the Firm. The Director shall be a PE (Civil) holding a valid practising certificate and shall have a minimum of three (3) years of relevant experience within the last five (5) years acting as a QP (Design).

In the event that the Director is unavailable or unable to perform his/her duties, the Firm shall have at least one other PE(Civil) with the requisite qualifications, competency, and relevant experience to assume and discharge the responsibilities of the Director.

7.3.2 The Firm shall employ, on full-time and exclusive employment contracts, at least two (2) PE(Civil)s, excluding the Director referred to in Clause 7.3.1. These PE(Civil)s shall hold valid practising certificates and shall have practised as QP(D)s in the preceding three (3) years, evidenced by having submitted structural plans to the Building and Construction Authority (BCA) for approval.

7.3.3 The Firm shall maintain personnel files containing qualification certificates, experience verification letters, performance appraisals, and competency assessment records for each required position.

7.3.4 The Firm shall maintain a minimum number of site supervisors who satisfy the following requirements:

a) The Firm shall have either:

- One (1) RE and three (3) RTOs; or
- Two (2) REs and one (1) RTO,

all of whom must have been employed by the Firm on a full-time basis and exclusive employment contracts for at least the preceding 12 consecutive months.

b) The total number of REs and RTOs who have been employed by the Firm on a full-time basis and exclusive employment contracts for at least the preceding 12 consecutive months shall constitute not less than 30% of the Firm's total number of employed REs and RTOs.

For firms applying for new registration as SSFs, discretion may be exercised to waive the clause for the first 1 year of application.

7.3.5 All site supervision personnel shall be suitably qualified and have sufficient relevant experience in their scope of supervision. REs and RTOs shall have their JAC accreditation valid during the period of supervision. The firm shall maintain current JAC certification records for all REs and RTOs, including renewal dates and any disciplinary actions or conditions.

7.3.6 The Firm must ensure that there are an adequate number of persons with relevant knowledge and experience in the key competencies listed in section 4.3.1 and in additional competencies, where relevant.

7.3.7 The Firm shall assess and deploy competent and adequate number of site supervisor(s) for the site supervision works. Firms shall refer to the prevailing BC Act and Regulations for the minimum requirements of site supervisors. Notwithstanding this, the Firm should carry assessment to determine a sufficient number of site supervisor(s) for any project, depending on the scale and complexity of the structural works involved.

7.3.8 Vision deficiencies may prevent site supervisors from performing site supervision works satisfactorily in the field. Therefore, it is the responsibility of the Firms to ensure that all site supervisors deployed are in good visual health.

7.3.9 The Firm shall purchase adequate and comprehensive level of accident and workplace insurance for each of its supervisory personnel in accordance with the Work Injury Compensation Act (WICA) and its prevailing requirements.

7.3.10 The Firm shall maintain deployment records showing the assignment of competent personnel to specific projects and supervision activities, always demonstrating adequate coverage.

7.4 Approved Signatories

7.4.1 Approved Signatories shall be registered Professional Engineers (Civil) with a valid practising certificate.

7.4.2 The Approved Signatory shall have good knowledge of the relevant standards or codes such as SS:515 used in Site Supervision activities.

7.4.3 The Approved Signatory shall be full time employees of the appointed firm and may not act as signatories for other firms.

7.5 Competency Development Framework and Training Requirements

7.5.1 The Firm shall ensure that all Site Supervisors are familiar with the supervision of structural works. All supervision shall be carried out by Site Supervisors with appropriate knowledge, training & certification and proven experience in carrying out similar supervision.

7.5.2 The Firm shall have a HR plan for their site supervisors. The HR plan is to minimally include the following:

a) Competency development framework
b) Upskilling and reskilling programmes

7.5.3 The competency development framework shall provide guidance on the scope / type of works that a site supervisor is authorised to carry out based on their assessed level of competency.

7.5.4 The Firm shall provide a list of training programmes for the site supervisor to attend to acquire the requisite knowledge and practical experience for the levels of competency in the framework.

7.5.5 The Firm shall maintain progression tracking records showing each site supervisor's advancement through competency levels and role assignments over time.

7.5.6 The firm shall follow all prevailing guidelines from ACES/IES on the competency development framework for Site Supervisors employed by the firm.

7.5.7 Training log of each site supervisor shall be kept for at least 12 months after the site supervisor leaves the Firm. Collection of Samples for Spot Tests.

7.6 Monitoring of Supervision Process

7.6.1 The Firm shall establish, implement and maintain an effective supervision control system to ensure that works under its supervision are carried out in accordance with approved plans, applicable codes, standards and regulatory requirements.

For each batch of production sample, two samples shall be taken for testing. In addition, two backup samples shall be taken in case the first two samples fail the tests.

7.6.2 The system shall include documented procedures for deployment of personnel, supervision coverage, monitoring of works and escalation of non-compliances.

7.6.3 The Firm shall maintain documented procedures for identifying, reporting and managing non-conforming work. Records shall include incident descriptions, root cause analysis, corrective actions, effectiveness verification and closure.

7.6.4 Where non-conforming work is attributable to inadequate, ineffective or non-implemented supervision procedures, controls or implementation, this shall be considered a failure of the Firm’s supervision system.

7.6.5 The Firm shall monitor the performance of its supervision system through performance indicators such as supervision coverage, frequency and severity of non-conformities, and rectification timeframes, and shall take corrective actions where systemic weaknesses are identified.

7.6.6 The Firm shall conduct periodic internal audits to verify the implementation and effectiveness of its supervision procedures, including management review and follow-up actions.

7.6.7 Repeated or significant failures of supervision arising from deficiencies in the firm’s procedures, controls or implementation may be treated as a major non-conformity under the accreditation framework.

8. ASSESSMENT REQUIREMENTS

8.1 The Firm shall designate a responsible person to coordinate with SAC assessors and to demonstrate the implementation and effectiveness of the supervision control system described in Section 7.6.

8.2 The Firm shall make available all relevant records for assessment verification, including supervision reports, supporting evidence, incident investigations, internal audit records, corrective actions and management reviews.

8.3 All records required for assessment verification shall be maintained in English and be readily retrievable.

8.4 The Firm shall maintain a master list of all policies, procedures and records required under this technical note, including their locations and responsible custodians.

8.5 The Firm shall submit a comprehensive list of all ongoing projects, detailing the supervision activities undertaken for each project, to facilitate SAC assessors’ assessment of the firm's conventional supervision capability through implementation of applicable processes in accordance with the requirements set out in Annex B.1.

8.6 The Firm shall maintain at least one live project on hand in which Remote Site Supervision (RSS) is used for the supervision of structural works, to enable SAC to assess the Firm’s live capability to deploy RSS technologies, procedures and competent personnel in accordance with the applicable requirements in Annex B.1. Where the Firm is unable to demonstrate such a live project at the time of assessment, the Firm shall demonstrate a live project at the next annual surveillance assessment.

8.7 SAC assessment will include a review of the following areas:

a) Conventional supervision capability
b) Remote Site Supervision (RSS) capability
c) Technology and equipment requirements
d) Personnel and competency requirements
e) Standard Operating Procedures (SOPs)

f) Evidence of effective implementation, including internal audits, personnel deployment records, supervision coverage documentation, and corrective action implementation to verify that the Firm's supervision procedures are operationally effective
g) Document management requirements.

8.8 Where SAC assessments identify non-compliance with any requirements specified in this technical note, such findings shall be classified as non-conformities under the accreditation framework. The Firm shall submit the corrective actions with evidences addressing all identified non-conformities within 30 days of receiving the audit report.

8.9 During assessment activities, the Firm shall provide technical assessors with a suitable workspace, access to relevant personnel for interviews, and demonstrations of systems and procedures as required for verification.

8.10 The Firm shall undergo a full reassessment every 4 years, with annual surveillance assessments in the intervening years.

8.10.1 The continuous surveillance assessment covers selected areas including conventional site supervision capability, RSS capability, and personnel requirements.

8.10.2 For continuous surveillance assessments on conventional supervision capability, SAC may assess a sample of available activities, processes, personnel, records and projects from Annex B, taking into account risk, previous findings, project availability and the breadth of the Firm’s accredited scope.

8.10.3 SAC technical assessors may include additional scopes of supervision assessed into the accreditation schedule, if the firm is able to show additional capabilities previously not shown during the surveillance assessment or full reassessment.

9 REFERENCES

a) ISO/IEC 17020:2012 – Conformity Assessment-Requirements for the operation of various types of bodies performing inspection
b) ILAC P15:06/2012 – Application of ISO/IEC 17020:2012 for the Accreditation of Inspection Bodies.
c) SAC-SINGLAS 006 – Traceability of Measurement
d) JAC – Best Practices for Site Supervision
e) BCA Guidebook for Remote Site Supervision
f) SS515: Code of Practice for Supervision of Structural Works

Annex A

Annex A.1 Group of technologies and equipment the Firm is required to have process to deploy

S/N	Type of technologies/equipment	Purpose of tool/equipment
1	Monitoring equipment	Video recording / Live streaming
2	Measurement equipment	Measure distances on site
3	Digital supervision / documentation platforms	Record keeping and faster scheduling of works

Annex A.2 List of required codes and standards to be kept accessible by the firm for easy access by site supervisors.

S/N	Name of codes and standards
1	Building Control Act 1989
2	Building Control Regulations 2003 Part III
3	SS515: Code of Practice for Supervision of Structural Works
4	Guide Book for Site Supervision Plan
5	Guidebook for Remote Site Supervision
6	SAC-SINGLAS 006

Annex B – Minimum Conventional Site Supervision Capability Schedule

2.1. This Annex sets out the minimum conventional site supervision capability that a Firm shall demonstrate for accreditation for the activities within its applied or accredited scope.

2.2. This Annex is intended to standardise the minimum scope of supervision processes, competence and records expected across Site Supervision Firms, so as to reduce variability in firm submissions and provide a consistent basis for SAC assessment.

2.3. For each activity within its accredited scope, the Firm shall demonstrate competence in:

a) Understanding the critical hold points or witness points
b) Verifying compliance with approved plans, specifications and relevant standards
c) Identifying and escalating non-conforming work
d) Maintaining complete and traceable supervision records
e) Issuing supervision reports and follow-up records where applicable.

2.4. The activities listed in Annex B.1 are the minimum conventional activities. Additional project-specific activities may be included by the Firm where relevant to its scope. Specialist activities outside the conventional scope may be addressed separately under the applicable accredited scope.

2.5. The Firm may adopt project-specific checklists or procedures, provided that these are not less stringent than the minimum process requirements set out in this Annex and remain aligned with the approved plans, project specifications and applicable standards.

2.6. Activities outside the Firm’s accredited scope shall not be represented as accredited activities unless separately assessed and accepted under the applicable accreditation requirements

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
1	**Key Competency: Concreting works including Precast Concreting**	a. Review latest approved drawings, method statements and pour sequence. b. Check formwork, falsework interfaces where relevant, reinforcement, cover, inserts, cast-ins, embedded items and openings before pour. c. Verify readiness for concreting, including access, sequence and approved hold points. d. Witness concrete delivery checks and relevant field testing/sampling arrangements. e. Supervise casting operations, placement sequence, vibration, joint treatment and finishing. f. Verify curing, protection and immediate post-casting defects / non-conformities. g. Record findings, raise non-conformities and verify close-out. **Precast concrete** h. Verify component identification, dimensions / condition upon receipt where applicable, support / bearing arrangement, joints, connections and erection sequence. i. Check lifting inserts / connection details within the permanent works scope. j. Verify grouting / stitching / topping / closure pours where applicable. k. Record deviations and close-out.	RE / RTO with relevant concreting supervision experience.	Approved drawings used, checklists, inspection records, photos, pour records, concrete test / sampling references, NCRs, rectification and closure records, supervision report.	SSP Guide; SS 515; approved drawings / specs.

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
2	**Key Competency: Structural steelworks**	a. Verify member identification, orientation, fit-up and erection sequence. b. Check bolts, weld preparations, connections, splice details, holding-down bolts and tolerances as applicable. c. Witness critical erection stages and temporary stability arrangements insofar as they affect permanent works compliance. d. Verify protective treatment / fire protection interfaces where within structural scope. e. Record deviations and closure.	RE / RTO with structural steel supervision experience.	Steel erection checklists, bolt / weld inspection references where applicable, photos, marked-up drawings, NCRs, rectification / closure records, supervision report.	SSP Guide; SS 515; approved steel drawings / specs.
3	**Key Competency: Reinforcement in RC members**	a. Verify bar size, spacing, grade, laps, anchorage, bending details, links/stirrups, starter bars and couplers where used. b. Verify cleanliness, support chairs, cover blocks and stability before casting. c. Check against latest approved reinforcement drawings and approved deviations. d. Record non-conformities and closure before next stage.	RE / RTO experienced in RC reinforcement inspection.	Reinforcement checklists, marked-up drawings, photographs, approved deviations, NCR and rectification records.	SSP Guide; SS 515; approved drawings.

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
4	**Key Competency: Foundation works – bored pile**	a. Verify pile setting-out, platform / working conditions and approved piling details. b. Check boring depth, founding level / strata records, bore stability measures and reinforcement cage details. c. Witness critical stages including cleaning, cage installation, tremie setup and concrete placement where applicable. d. Verify pile records and deviations. e. Escalate anomalies and ensure closure.	RE / RTO with foundation / piling supervision experience.	Pile checklists, pile installation records, bore logs / relevant site records, concrete records where relevant, photos, deviation / NCR records, supervision report.	SSP Guide; SS 515 where applicable; approved pile drawings / specs.
5a	**Key Competency: Foundation works – displacement pile**	a. Verify setting-out and pile type / length / sequence. b. Witness installation parameters and compliance with approved procedures. c. Check cut-off levels, pile integrity / completion records where applicable. d. Escalate deviations.	RE / RTO with piling supervision experience.	Pile driving / installation records, setting-out references, checklists, photos, deviation records, supervision report.	SSP Guide; approved drawings / specs.
5b	**Key Competency:**	a. Verify founding level, founding stratum / bearing condition, dimensions and formation condition.	RE / RTO with foundation	Excavation / founding	SSP Guide; SS 515

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
	Foundation works – shallow foundation	b. Confirm reinforcement / embedment details before casting where relevant. c. Verify blinding / cleanliness / groundwater condition where applicable. d. Record findings and close out non-conformities.	inspection experience.	inspection records, checklists, photographs, approved drawings, NCRs and closure records.	where applicable; approved drawings / specs.
5c	**Key Competency: ERSS works**	a. Verify setting-out, excavation sequence, strut / waler / anchor / retaining element details relevant to the approved ERSS design. b. Check staged construction sequence and hold points. c. Verify conformity of key permanent / geotechnical structural elements within approved scope. d. Review monitoring / trigger interfaces insofar as relevant to supervision duties. e. Record deviations and closure.	RE / RTO with ERSS / geotechnical supervision experience.	ERSS inspection records, stage checklists, photographs, approved plans, relevant monitoring / action references, NCRs and closure records.	SSP Guide; approved ERSS drawings / specs.
6	**Key Competency: Safety barriers**	a. Verify alignment, level, anchorage, embedment / fixing details and interface with supporting structure. b. Check product / system used against approved plans and details.	RE/RTO experienced in barrier supervision.	Barrier installation records, checklists, photographs,	SSP Guide; approved drawings / specs.

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
		c. Record installation non-conformities and closure.		approved details, NCR and closure records.	
7	**Additional Competencies: Demolition works**	a. Review approved demolition sequence and limits of demolition. b. Check temporary support / sequencing interfaces insofar as they affect permanent works safety and compliance. c. Verify removal of structural elements in accordance with approved methodology. d. Record deviations, incidents and closure actions.	RE / RTO experienced in demolition supervision.	Approved demolition plans / sequence, site inspection records, photographs, incident / NCR records, closure records.	SSP Guide; approved demolition plans / conditions.
8	**Additional Competencies: Curtainwall and cladding (stick / unitised systems)**	a. Verify supporting brackets / anchors, setting-out, alignment and approved details. b. Check installation sequence, fixing details, interfaces with structural supports and tolerances. c. Record deviations and closure.	RE / RTO experienced in façade / cladding supervision.	Inspection checklists, approved details, photos, NCR / rectification / closure records.	SSP Guide; approved drawings / specs.
9	**Additional Competencies: Post-installed**	a. Verify approved system, location, hole size / depth, substrate condition, embedment and installation procedure.	RE / RTO experienced in anchor / rebar	Installation logs, checklists, test records where applicable,	SSP Guide; approved drawings / specs.

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
	anchors / rebars	b. Check installation records and witness critical installation stages where applicable. c. Verify testing / proof load records where required by approved plans or specifications. d. Record deviations and closure.	installation supervision.	photos, approved details, NCR / closure records.	
10	**Additional Competencies: PPVC Systems**	a. Verify component identification, dimensions / condition upon receipt where applicable, support / bearing arrangement, joints, connections and erection sequence. b. Check lifting inserts / connection details within the permanent works scope. c. Verify grouting / stitching / topping / closure pours where applicable. d. Record deviations and close-out.	RE / RTO with precast supervision experience.	Delivery / inspection records where applicable, erection checklists, photographs, approved drawings, NCR and closure records.	SSP Guide; SS 515; approved drawings / specs.
11	**Additional Competency: Post-tensioning works / concrete prestressing**	a. Verify tendon layout, ducts, anchorages, bursting reinforcement and embedded components before casting. b. Check stressing sequence, jacking procedures and required preconditions. c. Witness stressing operations and review stressing records.	RE / RTO with post-tensioning supervision knowledge and relevant experience	Pre-stressing checklists, stressing records, calibration references for jacks where relevant,	SSP Guide; SS 515; approved PT drawings / specs.

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
		d. Verify grouting / post-stressing protection works where applicable. e. Record deviations and verify closure.		photographs, NCRs, closure records, supervision report.	
12	**Additional Competency: Tunnelling**	a. Ensure compliance to latest approved drawings and method statements. b. For tunnel segment production at factory - inspect and keep Quality Control (QC) records, witness tests, carry out final inspection before delivery. c. For tunnel segment arrival onsite - inspect each tunnel segment and to prepare and maintain a Segment Inspection Report. d. During tunnel segment installation – to perform supervision during each ring built and verify measurements of Ring Build tolerances. e. Post tunnel segment installation – to perform inspection of each tunnel ring f. Carry out inspection on surrounding structures regularly to ensure stability and structural integrity. g. Witness the installation of instrumentation and verify the installation records are in accordance to the details stated in the approved plan.	Tunnel RE / RTO with relevant tunnelling experience	Approved drawings used, checklists, inspection records, photos, NCRs, rectification and closure records, supervision report, Tunnel Annex C-1 & C-2	SSP Guide; approved drawings / specific conditions of permit / Method statements/ BCA circular on “requirements of bored tunnelling works”

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
		h. Assess, analyse and interpret all instrumentation readings, factual reports submitted by the Instrumentation and Monitoring (I&M) Specialist Builder. i. Ensure that records of grout volume and pressure are recorded for each ring for tail void grouting. j. For Earth Pressure Balance Machine (EPBM) - ensure that testing of soil conditioning for each type of soil is carried out to ensure that it can provide an adequate plug in the screw conveyor and to control cutter head wear. k. For slurry Tunnel Boring Machine (TBM) - to ensure that relevant tests are conducted to verify the quality of the bentonite slurry for each ring built. l. To review compliance of Key Performance Indicators (KPI) during tunnelling including face pressure and excavation volume, and compliance to specific conditions of permit. m. To implement Tunnel Annex C-2 for each Cutter Head Intervention (CHI), and Tunnel Annex C-1 on restart of TBM after the CHI, and to ensure that the CHIs are done with compliance to specific conditions of permit.			

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
		n. To ensure compliance to BCA circular on "requirements of bored tunnelling works" issued on 15 Sep 2017 – table Annex 4. Note the percentage of over-excavation to follow the approved plan if the allowable percentage is more stringent.			
13	**Additional Competency: Reclamation**	**Bund with sand key** a. Ensure compliance to latest approved drawings, method statements, sampling intervals, dredging and filling sequence. b. Carry out impact assessment for works near existing infrastructure such as cables, revetment, jetty etc. c. Carry out preventive measures near existing infrastructure such as marker buoys, instrumentation. d. Carry out pre-dredging surveys. e. Carry out dredging until reach hard material or design sandkey depth. Inspection with RE/ RTO to witness and verify the sampling and testing of the samples.	RE / RTO with relevant supervision experience.	Approved drawings used, checklists, inspection records, photos, dredging and filling records, material test / sampling references, survey drawings and reports, rectification and	approved drawings / Method statements

S/N	Activity / Scope Item	Minimum supervision process / control stages	Minimum personnel competence to be demonstrated	Minimum records / objective evidence for SAC audit	Key reference documents
		f. Verify dredging non-conformities. g. Record findings, raise non-conformities and verify close-out. h. Post hydrographic survey of the dredged profile shall be verified by RE/ RTO i. Sand material for sandkey filling shall be sent for sampling witnessed by RE/RTO and lab testing. j. Sandkey shall be filled within the agreed days from the dredging completion. If sand filling has not been carried out, bathymetric survey shall be conducted again to verify there is no significant sedimentation. k. Post filling survey shall be carried out within agreed days after sandkey filling. **Caisson** a. Ensure compliance to latest approved drawings and method statements. b. To follow casting of concrete. c. For project with sand key to follow items listed above where applicable.		closure records, supervision report.	