ACCREDITATION SCHEME FOR INSPECTION BODIES

TECHNICAL NOTE: SS 01

SPECIFIC REQUIREMENTS FOR THE ACCREDITATION OF INSPECTION BODIES IN STRUCTURAL STEELWORK

Technical Note - SS 01, 30 January 2026
The SAC Accreditation Programme is managed by Enterprise Singapore

1. INTRODUCTION

1.1 The purpose of inspections is to (a) determine the condition of new structural steelwork for conformance with standards or other normative documents and/or general requirements, and (b) assess the quality system of suppliers/fabricators for reused steel materials for conformance with BC1 and/or general requirements.

1.2 The field of structural steelwork inspection covers the inspection of various stages of structural steelwork fabrication, erection and protection. It may include review of relevant procedures and processes prior to any inspection activities.

1.3 On the reuse of steel materials (refer to BC1 for the type of reused steel materials allowed), the inspection bodies shall assess and certify suppliers/fabricators for conformance with the quality system stipulated in the following document:

- BC1 – Design Guide for the Use of Alternative Structural Steel to Eurocode 3

1.4 This technical note (SS 01) should be read in conjunction with documents listed in the Reference section and government regulations when applicable.

1.5 Supplementary information for specific areas of inspection may be published as other Technical Notes.

1.6 The inspection report produced by an accredited inspection body for the scope of accredited inspection activities shall be a SAC accredited report.

2. EQUIPMENT

2.1 Equipment which affect results that are critical to the conclusion of the examination shall be appropriate for the particular inspection to be performed.

2.2 Inspectors shall ensure that all equipment, including equipment not under the charge of the inspection body, used during inspection work are calibrated and traceable to the SI unit. Calibration shall be performed by recognized accredited laboratories[1] or the National Measurement Institute who is a member of the BIPM[2] MRA where possible. The inspectors shall ensure that the acceptance of calibration reports be based on the measurement traceability as specified in SAC-SINGLAS 006: Traceability of Measurement.

2.3 Where calibration facilities are not available, in-house calibration shall be validated using well recognized methods.

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[1] *Recognised accredited laboratories refer to those accredited by SAC-SINGLAS or its MRA partners.*

[2] *BIPM MRA refers to listing of signatories maintained by the International Bureau of Weights and Measures (BIPM) and publicly available on the BIPM website: http://www.bipm.fr*

3. TESTING

3.1 Analytical testing is a laboratory activity and therefore does not come within the scope of ISO/IEC 17020. Examples of analytical testing are chemical or metallurgical analysis.

3.2 Where analytical testing is required to support the inspection activities, the inspection body shall ensure that the testing is performed by an accredited laboratory whenever possible and the tests performed are accredited. The inspection body shall ensure that it receives SAC accredited test reports from accredited laboratories where available.

3.3 When an organisation is providing analytical testing and inspection for the same project, the organisation has to ensure that there is sufficient independence between the two activities (e.g. results of inspection activities and testing activities should not be approved by the same person).

3.4 Functional testing forms a normal part of the activities of an inspection body and is therefore within the scope of ISO/IEC 17020. An example of functional testing is mock-up test.

4. INSPECTION PERSONNEL

4.1 INSPECTORS

4.1.1 Inspectors shall be suitably qualified and have sufficient relevant experience in their scope of inspection. Example: in welding metallurgies, fabrication and erection procedures and processes, destructive and non-destructive testing. Welding inspectors should have general knowledge in protective treatment systems.

4.1.2 Inspectors must be familiar with the relevant standards or codes used in the inspection activities.

4.1.3 Inspection bodies shall note that qualification requirements of inspectors may be superseded or limited by the regulatory requirements of the countries where the inspection is carried out.

4.1.4 Inspection bodies shall maintain records of inspectors' qualifications, training and experience. The records shall include how and when each inspector is authorized by the inspection bodies to perform specific inspection or testing.

4.1.5 All approved signatories shall be assessed by the assessment team prior to award of accreditation. Subsequent assessment will consist of sampling of approved signatories.

4.1.6 The assessment team will assess the nominated approved signatories. Those assessed to be competent in their area of inspection will be submitted to the Council Committee for Inspection for endorsement as approved signatories.

4.1.7 Approved signatories are to sign on accredited inspection report for inspection performed by themselves or where they have direct supervision of the inspection work.

4.2 QUALIFICATION CATEGORIES FOR INSPECTORS

4.2.1 Category A

Personnel need to meet the following criteria to be qualified as a Category A Inspector.

a. Valid personnel qualification/certification in either of the following:

International Welding Inspector at the Standard Level (IWI-S); or

Senior Welding Inspector Certification from one of the following:
- American Welding Society (AWS), Senior Certified Welding Inspector
- The Welding Institute (TWI), Senior Welding Inspector
- British Institute of Non-Destructive Testing (BINDT), Weld Inspection Level 3

b. Work experience:

Minimum 5 years inspection experience in structural steelwork; and at least 2 years of Senior Certified Welding Inspector experience in building structural steelwork fabrication and erection inspection in Singapore for Senior Welding Inspection Certification obtained from AWS, TWI and BINDT

c. Educational Qualifications:

Relevant degree or diploma

4.2.2 Category B

Personnel need to meet the following criteria to be qualified as a Category B Inspector.

a. Valid personnel qualification/certification in either of the following:

International Welding Inspector at the Basic Level (IWI-B), or

Welding Inspector Certification from one of the following;

- American Welding Society (AWS), Certified Welding Inspector
- The Welding Institute (TWI), Welding Inspector
- British Institute of Non-Destructive Testing (BINDT), Weld Inspection Level 2

b. Work experience:

Minimum 4 years inspection experience in structural steelwork; and at least 2 years of Certified Welding Inspector experience in building structural steelwork fabrication and erection inspection in Singapore for Welding Inspection Certification obtained from AWS, TWS and BINDT

c. Educational qualifications:

Relevant degree or diploma

4.2.3 Category C

Personnel need to meet the following criteria to be qualified as a Category C Inspector.

Valid personnel certification in one of the following:

Assistant Welding Inspector Qualification from one of the following;

- American Welding Society (AWS), Certified Associate Welding Inspector
- The Welding Institute (TWI), Visual Welding Inspector
- British Institute of Non-Destructive Testing (BINDT), Weld Inspection Level 1

4.2.4 Category C inspectors are to inspect under the direct supervision of either a Category B or Category A inspector.

4.2.5 Only Category A and Category B inspectors can be granted approved signatories.

5 SCOPE OF INSPECTION

5.1 GENERAL

5.1.1 The scope of inspection listed in Table 1 and Table 2 are for new Structural Steelwork. The scope of inspection listed in Table 3 is for reused steel materials.

5.1.2 The inspection list is not exhaustive, and users may add areas of inspection based on their own needs.

5.2 NEW STRUCTURAL STEELWORK INSPECTION

5.2.1 Table 1 below lists the typical scope of inspection performed by inspectors for new Structural Steelwork inspection.

Table 1 Typical scope of inspection performed by inspectors for new Structural Steelwork inspection

SN	Inspection Activities	Applicable Category of Inspector
1	Review the quality manual	• CAT A
2	Pre-inspection meeting and surveillance of fabricator facilities/plants	• CAT A
3	Review fabrication and erection procedures	• CAT A
4.	Review of welding procedures specification, procedure qualification records, welder and welding operator qualification records.	• CAT A & B
5	Verify weld joints for inspection and testing. Witness non-destructive testing if required.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
6	Review all documents and records including but not limiting to Dimensions, Procedures and Testing.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
7	Verify all welding procedure and welder qualification records at site.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
8	Review of material test certificates/records, verify or inspect material and witness pre-treatment processes, if any.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
9	Inspect delivered structural members for damage due to handling and transportation.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
10	Perform visual inspection and verify dimensional records.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)

11	Inspect the assembly of structural members at erection site prior to welding.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
12	Witness cutting/edge joint preparations, verify joint geometry and inspect fit-up conditions.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
13	Verify that welding processes are carried out in accordance with the approved welding procedures, codes/standards and relevant documents.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector) CAT A & B
14	Inspect all welds.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)
15	Final inspection of all structural members.	• CAT A & B • CAT C (under supervision of a CAT A or B inspector)

5.2.2 Category A inspectors are expected to perform the inspection listed under Item 1 to item 15 of Table 1.

5.2.3 Category B inspectors are expected to perform the inspection listed under Item 4 to Item 15 of Table 1.

5.2.4 Category C inspectors are expected to perform the inspection listed under Item 4 to Item 15 of Table 1 under the supervision of Category A or Category B inspector.

5.2.5 Table 2 below lists the additional scope of inspection for new Structural Steelwork which is not covered in Table 1. The inspectors are allowed to perform this scope of inspection provided they have the relevant qualifications or experiences.

Table 2 Additional scope of inspection for new Structural Steelwork which is not covered in Table 1

1	Review inspection & test plans.
2	Witness procedure trail of stud welding process.
3	Witness/check bolts tightening.
4	Witness fireproofing mock-up test as well as laboratory tests.

5	Witness and inspect the application of fireproofing works.
6	Witness blasting & painting processes.
7	Inspect painted product.
8	Witness galvanizing processes.
9	Inspect galvanizing works.
10	Inspect all remaining site painting/galvanizing and witness repairing of all protective treatment works.

5.3 REUSED STEEL MATERIALS INSPECTION

5.3.1 Table 3 lists the typical scope of inspections performed by inspectors for reused steel materials in compliance with the latest version of Section 6 in BC 1: 'Design Guide for the Use of Alternative Structural Steel to Eurocode 3'.

Table 3 Typical scope of inspections performed by inspectors for reused steel materials in compliance with the latest version of Section 6 in BC 1: 'Design Guide for the Use of Alternative Structural Steel to Eurocode 3'

1	Quality System a) Review quality system of the suppliers/fabricators for reused steel materials, covering the aspects listed in item 2 to 7 below b) Review inspection and test plan on reused steel materials
2	Reusability Assessment Assess the physical condition and reconditioning requirements of reused steel materials to ensure the ability of the used steel materials to be reused and to perform adequately as anticipated in the design. This includes but is not limited to the following (refer to BC1 for further details): a) Surface Condition (extent and depth of corrosion) b) Sectional Dimensions c) Shape & Straightness d) Bolts & Welded Connections e) Interlock of sheet piles
3	Material Reusability a) Verify records* and witness** maintenance and repair of damaged or corroded reused steel materials b) Review** modification works, welding and repair procedures c) Verify records* and witness** application of protective treatment where applicable

4	Material Traceability Verify records* and witness** identification and marking of reused steel materials with unique identification numbers
5	Review storage of reused steel materials with respect to the adequacy of control in place to prevent mixing of steel grades
6	Review inventory records of reused steel materials movement
7	Documentation Review a) Review all documentation, including factory production control certificates (if applicable), manufacturer test certificates (if applicable), and test and inspection records of the reused steel materials b) Verify that the unique identification of the reused steel materials can be traced back to the documentation listed above

*The verification of records of the supplier/fabricator must minimally cover the requirements stipulated in Section 6.3 of BC1. The verification shall also cover other aspects such as before and after images of the re-used steel, and records of rejected re-used steel where applicable.

**The inspector shall make the necessary arrangements with the supplier/fabricator for the procedures to be reviewed and witnessed.

5.3.2 The inspection bodies shall issue a certificate of assessment to the assessed suppliers/fabricators. The certificate shall at minimum include the scope, name and address of the suppliers'/fabricators' facility and certificate validity dates. The original date of issue (i.e. start of validity) and due date of the next surveillance shall be clearly indicated on the certificate.

5.3.3 The validity period of the certificate of assessment shall be 3 years. The certificate shall be renewed subject to the conformance with continuous surveillance requirements given in Section 5.3.4.

5.3.4 Surveillance audits shall be conducted at least once every 1 year. All verification details listed in Table 3 shall be covered in a surveillance visit at least once every 3 years.

5.3.5 A sample certificate of assessment is provided in Appendix 2.

6. INSPECTION METHODS AND PROCEDURES

6.1 The inspection body shall have detailed procedures and instructions for the application of the appropriate regulations, codes of practice, standards, specifications, guidance documents and customer requirements.

6.2 Where risk-based inspection (RBI) techniques are used to establish the nature and frequency of inspections, the inspection body shall document the techniques used in procedures including a demonstrable justification for using the technique.

6.3 Standards and codes, and other technical literature applicable to the design, construction, operation, inspection and repair of structural steelworks and their components within the accredited scope shall be maintained up to date and be readily available to the staff.

7. FORMAT OF ACCREDITATION SCOPE

The scope of accreditation is granted only for specific items, materials or systems being inspected. An example of the accreditation scope is attached in Appendix 1.

8. REFERENCE

a) ISO/IEC 17020:2012 – Conformity Assessment-Requirements for the operation of various types of bodies performing inspection
b) ILAC P15:05/2020 – Application of ISO/IEC 17020:2012 for the Accreditation of Inspection Bodies SAC-SINGLAS 006: Traceability of Measurement
c) IIW Guidelines – International Welding Inspection Personnel (IAB – 041r4 – 16)
d) American Welding Society (AWS – Standard for AWS Certification of Welding Inspector (AWS QC 1)
e) TWI Certification Ltd - Certification Scheme for Personnel (CSWIP-WI-6-92).
f) The British Institute of Non-Destructive Testing (BINDT) – Certification of Personnel for Weld Inspection (PCN WI)
g) BCA BC 1:2023 – Design Guide for the Use of Alternative Structural Steel to Eurocode 3
h) Workplace Safety and Health Act (Chapter 354A):2009
i) Workplace Safety and Health (General Provisions) Regulations 2011

Appendix 1

Inspection body: Type A or B or C

Type of Inspection	Type and Range of Inspection	Inspection Method, Codes or Standards Used
a. New Structural Steelwork Inspection	i) Project Quality Plan ii) Facilities /Plant Audit iii) Fabrication/erection procedures review iv) Welding procedures v) Welders' qualification vi) Dimensional inspection vii) Inspection of welds viii)Bolt tightening	
b. Coating Inspection	i) Fire proofing ii) Paint coating iii) Galvanised coating	
c. Reused Steel Materials Inspection	i) Review quality system ii) Conduct reusability assessment iii) Verify and witness material reusability iv) Verify and witness material traceability v) Review storage of reused steel materials vi) Review inventory records of reused steel materials movement vii) Review all documentation, including factory production control certificates (if applicable), manufacturer test certificate (if applicable), and test and inspection records of the reused steel materials	

Approved signatories

Mr [Signatory A] (Category A) - for item A, B & C

Mr [Signatory B] (Category B) - for item A(iv-viii)

NOTE :

Type A inspection body
The inspection body providing "third party" services.

Type B inspection body
The inspection body which forms a separate and identifiable part of an organisation involved in the design, manufacture, supply, installation, use or maintenance of the item it inspects and has been established to supply inspection services to its parent organisation.

Type C inspection body
The inspection body which is involved in the design, manufacture, supply, installation, use or maintenance of the items it inspects or of similar competitive items and may supply inspection services to other parties not being its parent organisation.

Appendix 2

Certificate of Assessment to BC1: 2023 Section 6

In compliance to the requirements of Section 6, BC1: 2023 - 'Design Guide for the Use of Alternative Structural Steel to Eurocode 3'

This is to certify that the quality system for reused steel materials of:

Name of the supplier/fabricator

in the factory located at:

Address of factory

has been assessed and meets the quality system requirements for reused steel materials in accordance with BC1: 2023 Section 6

***Conditions and period of validity**, where applicable*

This certificate is only valid when:

Certificate no.: *BC1-1234-56789*

First issue date: *21 February 2025*

Current issue date: *21 February 2025*

Expiry date: *20 February 2028*

LOGO

Name and address of the inspection body

Authorised signatory

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Name and position

on behalf of

name of the inspection body