



ACCREDITATION SCHEME FOR
CERTIFICATION BODIES

CT 29 SAC CRITERIA FOR PRODUCT CERTIFICATION BODIES (PRECAST CONCRETE PRODUCTS)

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1. OBJECTIVES

- 1.1 This document specifies the additional definitions and supplementary criteria for certification bodies (CBs) of Specialist Builders (Precast Concrete Works). The objective of the Scheme is to give confidence to the purchaser of precast concrete products, by ensuring that the precast factory or yard that produces the precast concrete products or structures complies with the appropriate specification. It involves the application of quality assurance principles to assess the precast concrete supplier's quality systems, and as appropriate to product testing, to ensure conformity with the requirements contained in this Scheme.

An applicant's new registration or renewal of Specialist Builder license under the precast concrete product fabricator will require a Certificate of Conformity issued by a CB under this Scheme.

- 1.2 The assessment and certification system employed in the Scheme has been developed around the following principles:

- a. The production of precast concrete products shall comply with the relevant product Standards and customers' specifications.
- b. The responsibility for complying with the Standards rests absolutely with the Specialist Builder (SB).
- c. The means of providing assurance of consistent compliance with the Standards shall be the formal management system for quality, including process control, which the SB is required to have documented and to be operating to the satisfaction of the CB. This system is subject to audit at periodic intervals.
- d. A key method of verifying compliance of the product is by independent assessment and surveillance of the SB's management system for quality, including as appropriate independent inspection and testing of the product. These activities are undertaken by the CB.

- 1.3 Product certification is an assurance of product quality and thus the requirements of this certification Scheme are rigorous. Nevertheless, the legal responsibility for compliance with the relevant published standards remains with the SB.

- 1.4 The Scheme provides for assessment by the CB, acting independently of the supplier, of the Quality Assurance procedures to ensure conformity to the appropriate Standards. This eliminates the need for the purchaser to carry out separate testing, but does not preclude the right of the purchaser to carry out independent testing if so required by the contract or project specification.

2. DEFINITION

The following definitions apply:

2.1 Minor non-conformity

Failure to meet one requirement of ISO 9001:2015, SS EN 1992, Technical Requirements for Certification of Specialist Builders (Factory Production Certification for Precast Concrete Products) or any of their normative reference documents, and which is considered not to constitute a major risk to the quality of the precast concrete products that the SB is supplying.

2.2 Major non-conformity

Deviation of product from specified requirements or the absence of, or failure to implement and maintain one or more required production control system requirements, or a situation which would on the basis of available objective evidence raise significant doubt as to the conformity of the precast concrete products to be supplied, and therefore considered to constitute a risk to the quality of the precast concrete products that the SB is supplying.

2.3 Precast concrete product

Product which is made of reinforced concrete and is manufactured in accordance with this Standard or a specific product standard in a place different from the final destination for structural use, protected from adverse weather conditions during production, and which is the result of an industrial process under a factory production control system and with the capability of segregating before delivery.

3. OPERATING PROCEDURES

3.1 General

A SB who is able to satisfy the qualifying requirements may apply for the recognition of his ability to manufacture precast concrete products in accordance with the relevant Standards.

3.2 Applying for a Certificate of Conformity

3.2.1 Applications for a Certificate of Conformity are made to the CB. Applications must be accompanied by the appropriate application form and fee, giving details of the products/services for which certification is being sought. The Application form contains a legally binding undertaking to comply with all the requirements laid down by the CB from time to time and the Applicant shall not use either of the Certification of Conformity or the agreed product marks / logos should approval be withheld or withdrawn.

3.2.2 The applicant is required to have and be able to demonstrate:

- a. The ability and resources required to manufacture precast concrete products to the relevant Standards.
- b. A quality management system which complies with the requirements of ISO 9001 and the relevant Quality and Operations Assessment Schedule in the production process. The system shall be described formally in the supplier's Quality Manual. When the application is approved, a Certificate Number will be issued.

3.3 Assessment of Application

3.3.1 The purpose of the assessment is to establish that the SB has the capability to manufacture precast concrete products to the relevant Standards.

3.3.2 The SB's application will be subjected to an initial review by the CB. This review will be based upon:

- a. The written description of the SB's quality system.
- b. Such additional evidence as may be required by the Scheme.

3.3.3 In order to validate that the described arrangements above are being implemented and are effective, a favourable review will be followed by the assessment of:

- a. The SB's factory practice and procedures, including records, resources, training, site controls and interfaces.
- b. Representative samples of the SB's factory practice and procedures, including records, resources, training and controls.

3.3.4 If at any stage the application does not, in the view of CB, justify the expense of proceeding further, the SB will be notified in writing detailing the reasons.

3.4 Class of Specialist Builder

3.4.1 The SB shall be assessed by CB and classified into four Classes, i.e. PCW1, PCW1A, PCW2 or PCW3 according to the assessment criteria shown in Table 3.

Table 3. Classification Criteria

Requirements	PCW1 ⁽⁴⁾	PCW1A ^{(4),(5)}	PCW2 ⁽⁴⁾	PCW3 ⁽⁴⁾
Precast Contract Track Record (3 years)	\$30M & above	\$30M & above	\$5M but less than \$30M	Less than \$5M
Precast Yard Facilities (Covered production area for precast structural works)	Min. 6,000m ² of covered production area for structural work (exclude storage and office/ administration area)	Min. 10,000m ² of covered production area for structural work (exclude storage and office/ administration area)	Min. 3000m ² of covered production area for structural work (exclude storage and office/ administration area)	Min. 1000m ² of covered production area for structural work (exclude storage and office/ administration area)
Professional Staff ⁽¹⁾	2	2	1	0
Supervisory Staff ⁽²⁾	4	4	2	1
Technical Staff ⁽³⁾	8	8	5	3
Management system	ISO 9001	ISO 9001	ISO 9001	ISO 9001
Quality Control Regime	BS EN13369	BS EN13369	BS EN13369	BS EN13369

(1) "Professional Staff" shall possess a recognized degree in Civil & Structural Engineering or equivalent qualifications approved by Professional Engineers Board or a degree in Civil & Structural Engineering from universities listed in Building Control Act and Regulations.

(2) "Supervisory Staff" shall possess a technical qualification with a polytechnic diploma in Architecture, Building, Civil/ Structural Engineering, Built Environment or a National Certificate in Construction Supervision (NCCS) or a minimum of 5 years of working experience in precast concrete works if he does not possess the minimum technical qualification stated.

(3) "Technical Staff" are skilled workers in precast concrete works and have the competency in precast and/or prestressed concrete works. Professional and Supervisory staff shall train the workers in-house and to ensure workers have the competent level of skills and knowledge. Alternatively, the workers shall have certificates (like the BCA Coretrade) from recognized and/or accredited institutions for training in concrete, rebar and formwork or precast concrete and/or prestressed concrete.

(4) Appointment of appropriate class of Specialist Builder (Precast Concrete Work) for the corresponding contract value of precast concrete:-

- PCW1/PCW1A is required for fabrication of precast concrete work of \$30 million and above
- PCW2 is required for fabrication of precast concrete work of \$5 million but less \$30 million
- PCW3 is required for fabrication of precast concrete work of less than \$5 million

A SB who is accredited for a class of higher contract value may carry out the work for a lower contract value.

⁽⁵⁾ For PCW1A, the precast yard Gross Plot Ratio (GPR) shall be of at least 1.4 and must have Pallet Circulation System or Carousel Tunnel Segment and Curing Chamber or equivalent system.

3.5 Assessment of Specialist Builder

3.5.1 The assessment will be conducted by the CB's competent auditor (Annex 3) and the programme will provide for:

- a. An introductory Stage 1 meeting with the Applicant during which the assessment procedures will be explained and an overview of their capabilities obtained.
- b. A timetable of activities so that arrangements can be made for appropriate staff to be available during the assessment.
- c. Full Stage 2 assessment in accordance with the relevant Quality and Operations Assessment Schedule:
 - The office activities and controls e.g., calibration, contract review, document control, product requirements and training.
 - The key factory activities e.g. material requirements, production requirements, finished product requirements, test methods, assessment and verification of constancy of performance, marking, and technical documentation.
 - Invariably, the factory audit days for each application will depend on the review undertaken at the stage 1 meeting.

Table 1. No. of Audits for Initial Assessment or Re-certification every 3 years in addition to Table 2

Type of Audits	No of Audits
Factory	1

- d. A final meeting with CB's auditors to present their findings to the Applicant.

3.5.2 SBs who are unable to undertake a satisfactory assessment of the SB's production practice because of a lack of a suitable contract, but whose factory QA&QC practice satisfies the Technical Requirements for Certification of Specialist Builders (hereafter called TRCSB) criteria, will be issued with a letter of pre-certification.

3.5.3 The letter will detail the scope of the activities assessed, including Factory Activities in relation to ISO 9001 and technical requirements of the TRCSB, as appropriate.

- a. The letter of pre-certification will only be issued when the SB has undertaken to inform CB when a suitable contract has been awarded to allow CB to assess representative samples of the SB's practice and procedures, including records, resources, training and controls.

The letter of precertification shall be valid for a period of 6 months but may be reissued for a further 6 months if necessary.

- b. When CB has been notified of a suitable contract, a factory audit will be conducted in accordance with 3.4 (c) above.

3.5.4 A recommendation for conformity will be produced when the factory practice has been assessed with all the above criteria satisfied, and all reported deficiencies have been addressed to the satisfaction of CB.

3.5.5 The SB's application, the assessment report and recommendation will then be considered together by the CB. When the CB is satisfied that the Applicant meets the requirements of the Scheme, a Certificate of Conformity will be issued.

3.5.6 If Certificate of Conformity is withheld the reasons for this will be communicated to the Applicant together with recommendations for any corrective action which needs to be implemented before the application can be reconsidered.

3.5.7 The flowchart on application process is shown in Annex 1.

3.6 Continuous Surveillance

3.6.1 The task for a CB during the surveillance visits will be detailed in prepared audit itineraries based on previous audits and findings with a standard checklist for each installation procedure, including a vertical audit of inspected records for completed levels.

3.6.2 The frequency of surveillance visits during the 3 years period shall be in accordance with Table 2.

Table 2. No. of Audits

Audit Type	Class of Specialist Builder		
	PCW1/1A	PCW2	PCW3
Announced	1	1	1
Unannounced	1	2	3
Total	2	3	4

3.6.3 The CB may request for more frequent visits from that given in Table 1, subjected to non-conformities identified during the periodic site assessment.

- 3.6.4 If major non-conformities are found, a follow up audit will be taken within 2 months of the date of the raised non-conformance. In the case of product non-conformities, consideration may be given to the switching rules for the rate of inspection as given in Table D.5 of EN 13369:2018.

3.7 Duration and Frequency of Audits

- 3.7.1 In determining the duration of an audit, a CB shall consider the complexity of the SB, their previous performance with respect to non-conformities and any records of complaints received by the SB from their clients. Please refer to Annex 4 for recommended minimum auditor inspection man-day.

3.8 Certificate of Conformity

- 3.8.1 The Certificate of Conformity is valid for three years with renewal subject to continuing satisfactory performance (Annex 2).

- 3.8.2 The certificate will state:
- a. The scope of the approval i.e. those products/services and relevant Standards which are within the assessed capability of the SB.
 - b. The name of the SB.
 - c. The certification number applicable to the fabrication plant of the SB.
 - d. The address of fabrication plant.
 - e. The Class of the SB.
 - f. The original date of issue (i.e., start of validity) and due date of the next surveillance shall be indicated clearly on the certificate. The certificate shall only be valid subject to continuous surveillance visits by the CB.
 - g. The period of validity.

- 3.8.3 SB granted with Certificates of Conformity are required to notify CB half yearly of all newly awarded precast production contracts using the Notification of Contracts form provided by the CB. This information together with the information derived from the Schedule of Operations will be used to determine the CB inspection regime. It is a condition of the granting of the Certificate that CB shall assess:

- a. The office activities once per year against the relevant assessment schedule including the training requirements.
- b. A representative sample of factory production practice at least one time per year. Assessments of factory production practice may be conducted on an unannounced basis in line with table 2.
- c. Where the SB has no precast production contracts that fall within the scope of this Scheme in one calendar year, the CB shall assess the factory activities at least once a year. The SB shall

notify the CB of the first suitable precast production contract which shall be assessed.

- d. Where the SB has no precast production contracts that fall within the scope of this Scheme for a period of three calendar years, the Certificate of Conformity shall be withdrawn.
- e. Approved SB shall undergo a reassessment every 3 years but not more than 6 months from the current certification expiry of their quality management system by CB. Depending on the activities reviewed during the previous 3 year period, in addition to the normal office audit, this may also include a site audit to review those activities not observed during the previous 3 year period.

3.8.4 The CB reserves the right to request further assessments deemed to be necessary. The results of the assessment shall be reported to the SB. If satisfactory, a renewal certificate will be issued.

3.9 Withdrawal of the Certificate of Conformity

3.9.1 The decision to withdraw a Certificate of Conformity is made by the CB. Examples of the reasons for withdrawal of the Certificate of Conformance are:

- a. Frequent non-compliance with any of the specified properties or other criteria specified in the relevant Standard.
- b. Uncorrected deficiencies noted during a surveillance visit.
- c. Misuse of either of the CB's, SAC or Certificate of Conformity or approved labelling or logos.
- d. Refusal or hindrance to allow the CB to verify inspection or testing records.
- e. Circumstances which may affect the confidence of the public or authorities on the reliability of the SB.

3.10 Records

3.10.1 The CB will maintain confidential records relating to assessment, auditing and approval of the Applicant for 5 years from the end date of the period of validity stated in the Certification of Conformity. These records are confidential and are not available for issue to third parties except Court Orders, or request by SAC or BCA, or with the expressed permission of the SB, which must be provided in writing to the CB.

3.11 Renewal of Specialist Builder Licence

3.11.1 At point of SB license renewal, the SB is to comply with all the submission requirements for the renewal of Specialist Builder Licence which may include the submission of Certificate of Conformity.

Flowchart on Application Process

Stage 1: Application

Complete application requires the following to be submitted to the CB:

- A Quality Manual / Quality Plan satisfies the requirements of ISO9001:2015, Technical and Administrative Requirements for Certification of Specialist Builder (Factory Production Certification for Precast Products)
- A completed application form to detail the scope of approval relevant to Factory Production Certification for Precast Products.
- The application fee.



Stage 2: Prelim Assessment by CB

On receipt of a completed application, the CB will proceed as follows;

1. Confirm that the application is correct in all respects. A file will be opened to record the assessment process.
2. The Quality Manual and / or Quality Plan / Method Statement and Inspection and Test plan shall be reviewed for its adequacy in terms of ISO 9001 and Technical and Administrative Requirements for Certification of Specialist Builder (Factory Production Certification for Precast Products) accordingly. Any deficiencies shall be discussed at the Preliminary Inspection (PI) Phase.
3. A Preliminary Inspection (PI) may be performed at the applicants company. This is to establish the technical resources of the applicant and to enable clarification of the application, requirements for the assessment and the maintenance of approval. In certain cases this may be performed at the time of the assessment.
4. As part of the PI an initial Assessment which will examine the company and its' installation procedures for compliance with the applicant's Quality System and Technical and Administrative Requirements for Certification of Specialist Builder (Factory Production Certification for Precast Products).

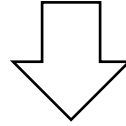


Stage 3 : Final Assessment

As an absolute minimum the following stages must be observed:

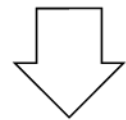
- a) Material, production and finished product requirements
- b) Test methods
- c) Assessment and verification of constancy of performance
- d) Marking
- e) Technical documentation

As part of the above there will be assessment of the adequacy of controls and records at each stage.



Stage 4: Certification of Conformity Granted

On satisfactory completion of all stages and approval by the CB, a Certificate of Conformity will be issued. If any stage is unsatisfactory, there will be no progression to the next stage until all outstanding issues have been resolved.



Stage 5: Application for Specialist Builder (Precast Concrete Works)

At point of SB license renewal, the SB is to submit Certificate of Conformity together with all audit reports for the past year.

[Name and address of CB]

Certificate of Conformity

[Certificate Number]

Fabricator	[Name of Fabricator Company] [Address of Fabricator Company]
Fabrication Plant	[Address(es) of Fabrication Plant(s)] The layout plan of each fabrication plant is attached
Specialist Builder	[Name of Company] [UEN of Company] [Address of Company]
Class of Specialist Builder	
Confirmation	This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in TRCSB, with the addition of management system auditing applied, and precast concrete material, where applicable are purchased from suppliers with factory production control which fulfils all the prescribed requirements stated therein.
Start of validity	[Original Issue Date]
Next surveillance date	[Date of Next Surveillance Audit] -1 year from date of issue
Period of validity	The certificate will remain valid for 3 years and/or the factory production requirements included of the declared characteristics do not change, and the product and the manufacturing conditions in the plant are not modified significantly. The period of validity shall end on dd-mm-yyyy.

[Signed by authorized CB person]

[Date of issue]

This Certificate remains the property of <name of CB> and shall be returned upon request. The fabricator is solely responsible for compliance of any product that has the same designation as the product type-tested. Persons relying on this Certificate should verify its validity by checking <name of CB>'s website at <CB website>.

Criteria for Auditors

The summary of the criteria for auditors is tabulated below:

Criteria	Auditors
Personal Attributes	Demonstrate personal attributes for effective and efficient performance of audits
Auditing Knowledge	Have attended and successfully completed an accredited ISO 9001:2015 Lead Auditors course
Formal Education	Relevant Diploma/Degree in Structural or Civil Engineering or other related construction field
Other Qualifications	Have knowledge of current regulatory requirements and applicable Codes of Practice
Work Experience	<p><u>Degree holders</u> Minimum 3 years full time working experience which includes</p> <ul style="list-style-type: none"> ✓ at least 2 years full time work experience in precast concrete structures or construction-related concrete industry in a technical, professional or supervision position OR ✓ minimum 2 years quality management system audit experience in construction-related concrete industry <p><u>Diploma holders</u> Minimum 5 years full time working experience which includes</p> <ul style="list-style-type: none"> ✓ at least 2 years full time work experience in precast concrete structures or construction-related concrete industry in a technical, professional or supervision position OR ✓ minimum 2 years quality management system audit experience in construction-related concrete industry
Audit Experience	<p><u>Lead Auditors</u> 5 factory certification audits for a Specialist Builder (Precast concrete or similar construction products) based on the requirements of ISO 9001:2015 and TRCSP (or similar) All audits to be performed in the capacity of Lead Auditor.</p>
Maintenance of qualification (every 3 years)	<p><u>Lead Auditors</u> As above with two-reassessment audits for similar construction products and process.</p>
Management of Personnel	As a <u>Lead Auditor</u> demonstrate personal attributes for effective and efficient management and control of other team auditors

Note

Audits can be initial, surveillance (include critical processes) or recertification audits.

Annex 4

Recommended minimum auditor inspection man-day per audit

Class of Specialist Builder	Minimum auditor inspection man-day
PCW1 & PCW1A	1.5
PCW2	1
PCW3	0.5