भारतीय मानक **IS 18299 : 2023**

Indian Standard

संरचनात्मक डिज़ाइन और संरचनाओं की प्रमाण जांच परामर्श सेवाएँ — अपेक्षाएँ

Structural Design and Proof Checking Consultancy Services for Structures — Requirements

ICS 91.010.01, 91.010.20, 91.010.30, 91.080.01, 93.010

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

August 2023 **Price Group 7**

Construction and Related Engineering Services Sectional Committee, SSD 06

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Construction and Related Engineering Services Sectional Committee had been approved by the Service Sector Division Council.

The need for correct structural design and proof checking of structural designs has been recognized as an important step in ensuring safety and durability of the structures and also for public safety in tandem with the rapid advancement in engineering and the fast pace of development that is happening in the country. Adding confidence and reducing risk through such a process is essential, since it provides risk mitigation on account of errors in the design stage and thus ensures safety.

The intent of this standard is to:

a) overcome the shortcomings of the current practices and terminologies being followed (in the government and private sectors) and suggest those that ought to be adopted and followed as a matter of good and sustainable practices;
b) eliminate subjectivity/arbitrariness and bring transparency, uniformity, and inclusiveness in the qualification requirements and appointment of a Principal Design Consultant (PDC) and a Proof Checking Consultant (PC);
c) remove ambiguities that are evident or implied, by defining and thus clarifying the various associated terms; and
d) elaborate the scope of services, deliverables, and associated responsibilities for the owner, PDC, PC and constructor so that all stakeholders can take informed decisions while procuring and/or delivering such services.

While preparing this standard, considerable assistance has been taken from Recommended Guidelines on Proof Consultancy Services for Buildings published by Indian Association of Structural Engineers.

This Indian Standard defines the scope and responsibilities of various stakeholders, different models of appointment of PDC, and different categories of proof checking based on project delivery modes. It also includes the minimum qualification and experience of team members and team leaders of PDC and PC.

This Indian Standard excludes peer reviewing of structural designs where the reviewer has not been appointed by the owner.

The educational qualification and experience of the team leader of PDC and PC mentioned in this standard are the minimum requirements. However, users of such services may take appropriate decisions on it based on the nature, importance and scope of work. A licensed/registered/empaneled structural engineer, where the practice exists, may be appointed to act as the team leader of PDC/PC if it meets the requirements of the standard. The intention of this standard is not to replace the registration and licensing system but to guide and bring uniformity.

The scope of the standard provides durability and sustainability aspects in services provided by PDC and PC apart from functionality, safety and economic aspects. Considering the current scenario for structural design and proof checking of structural designs, it is expected that PDC and PC should take up the project comprehensibly apart from traditional roles.

The composition of the Committee, responsible for the formulation of this standard is given in Annex A.

For deciding whether a particular requirement of this standard is complied with the final value, observed, or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

STRUCTURAL DESIGN AND PROOF CHECKING CONSULTANCY SERVICES FOR STRUCTURES — REQUIREMENTS

1 SCOPE

This standard covers requirements of structural design and proof checking consultancy services for all types of civil engineering structures. It also includes responsibilities, educational qualifications, and deliverables expected from all the stakeholders.

2 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

2.1 Comprehensive Design Consultant (CDC) — The individual or the organization responsible for comprehensive multidisciplinary engineering consultancy services including structural design services.

2.2 Constructor — The individual or organization appointed by the owner that is responsible for the execution of the construction works as per approved drawings and specifications.

2.3 Design-Bid-Build Mode (Traditional Mode) — The project delivery mode in which the owner is responsible for providing the design and drawings, technical specifications and Bill of Quantities (BOQ) to the constructor for the execution of the works.

NOTE — The constructor is responsible for the execution and delivery of the project.

2.4 Design and Build Mode — The project delivery mode in which the owner provides the detailed scope, performance specifications and design requirements at the time of bidding to the constructor.

NOTE — The design, execution and delivery are the responsibility of the constructor.

2.5 Design Service Life — Period considered for which a structure or a part of it is to be used for its intended purpose with periodic inspection and routine maintenance, but without major repair being necessary.

2.6 Field Work — Construction work related to structures.

2.7 Owner — The individual or organization that owns the project and engages the constructor, Principal Design Consultant (PDC), Comprehensive Design Consultant (CDC), and Proof Checking Consultant (PC), as required.

2.8 Principal Design Consultant (PDC) — The individual or the organization responsible for structural analysis and design of the structures.

2.9 Proof Checking — Checking of structural designs by an individual or organization that is not a part of the original design team.

2.10 Proof Checking Consultant (PC) — The individual or the organization responsible for proof checking.

2.11 Structural Design — Implies all the stages related to a structure that includes conceptualization, planning, analyses, designs, drawings, detailing, considering but not limited to serviceability, constructability, durability, sustainability, and maintainability, to ensure that the structure performs the functions specified over its intended design service life as per applicable standards.

NOTE — Structural design includes ensuring the completeness and correctness of parameters incorporated in the structural analysis, loading and load combinations, and design of the structure to ensure compliance with the structural design requirements of the construction contract, relevant safety standards, codes and best engineering practices as well as model studies where required and duly incorporating the requirements of the technology know-how suppliers, system and equipment vendors, specialist consultants, as engaged by the owner/constructor/CDC.

2.12 Team Leader — The person responsible for overseeing and coordinating the work of the team engaged in the structural analysis and design or its proof checking and having authority to sign on behalf of the team.

3 REQUIREMENTS FOR SERVICES

When determining the requirements for the structural design and proof checking consultancy services offered to the owner/constructor/CDC, the PDC and the PC shall ensure that the following

requirements, but not limited to, are complied with:

a) all applicable statutory and regulatory requirements;
b) functional requirements of the structure (inter alia of technology know-how suppliers, system and equipment vendors, specialist consultants, and others);
c) consideration of the relevant construction stage loadings;
d) design service life of the structure as per applicable standards;
e) delivery of services as per agreed timelines;
f) consideration of risks including multi-hazard risks; and
g) any specific requirements of the owner.

4 APPOINTMENT OF PDC

4.1 The owner/constructor/CDC (depending on project delivery mode) shall appoint the PDC for the structural design of the structures.

4.2 In case of contracts where the structural design is in the scope of the constructor/CDC and structural design is done in-house by constructor/ CDC, the constructor/CDC shall be responsible and accountable to provide structural design for sound, safe and durable structures. The design team of the constructor/CDC shall have the qualification and the experience of PDC as specified in **9.2**.

4.3 In case the PDC is appointed by the constructor/CDC externally, the agreement between the owner and the constructor/CDC shall clearly stipulate the conditions for the appointment of PDC in terms of role, responsibility, experience, fee payable, etc. It shall be the responsibility of the constructor/CDC to inform the owner about the appointed PDC along with qualifications, and terms and conditions of appointment. Constructor/CDC, whoever appoints the PDC, shall be primarily responsible and accountable to provide structural design for sound, safe and durable structures. The PDC appointed shall have qualification and experience as specified in **9.2**.

5 APPOINTMENT OF PC

5.1 The owner may appoint a PC for proof checking of the structural design of the structures prepared by PDC.

5.2 The PC shall in all cases be always appointed by the owner so that the PC is never subservient to the constructor/CDC.

5.3 In case the owner has an in-house design team having the qualification and experience as specified in **9.2**, the owner may either take up the responsibility of PDC or PC. The owner shall never be both PDC as well as PC simultaneously for the same project.

5.4 The constructor/CDC/PDC shall never act as a proof checking consultant for the same project.

6 MODELS OF APPOINTMENT OF PDC AND PC

The contractual model for the appointment of the PDC and the PC may vary according to the nature of the project and the project delivery mode.

6.1 Model 1 — Owner Appointed PDC and PC

The owner shall directly appoint both the PDC and the PC for structural designing and for proof checking, respectively. The good for construction (GFC) drawings shall be submitted by the PDC to the owner after approval by the PC as shown in Fig. 1.

6.2 Model 2 — Constructor Appointed PDC

A design and build constructor as well as a PC shall be independently appointed by the owner. The PDC shall be appointed by the constructor. The GFC drawings shall be submitted by the PDC to the constructor after approval by the PC. Thereafter, the constructor shall submit the design and GFC drawings to the owner for consent before execution of the work as shown in Fig. 2.

6.3 All communications between the PDC, PC and the owner/constructor/CDC shall be documented.

7 SCOPE AND RESPONSIBILITIES

7.1 Owner

The owner shall be responsible for the project either directly or through an appointed authorized representative or implementing agency. The owner shall also:

a) prepare the contractual stipulations for the PDC, PC and ensure that they have the qualification and required experience to carry out their respective assignments as specified in **9.2**;

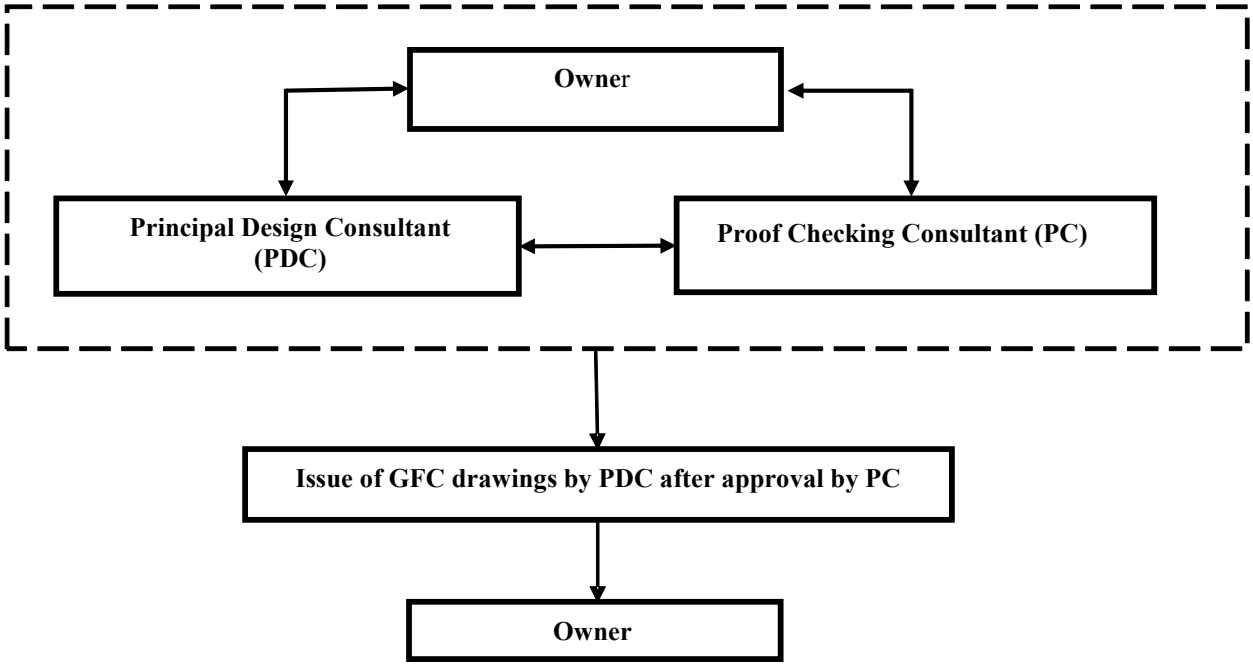

FIG. 1 FLOWCHART FOR COMMUNICATION UNDER MODEL 1

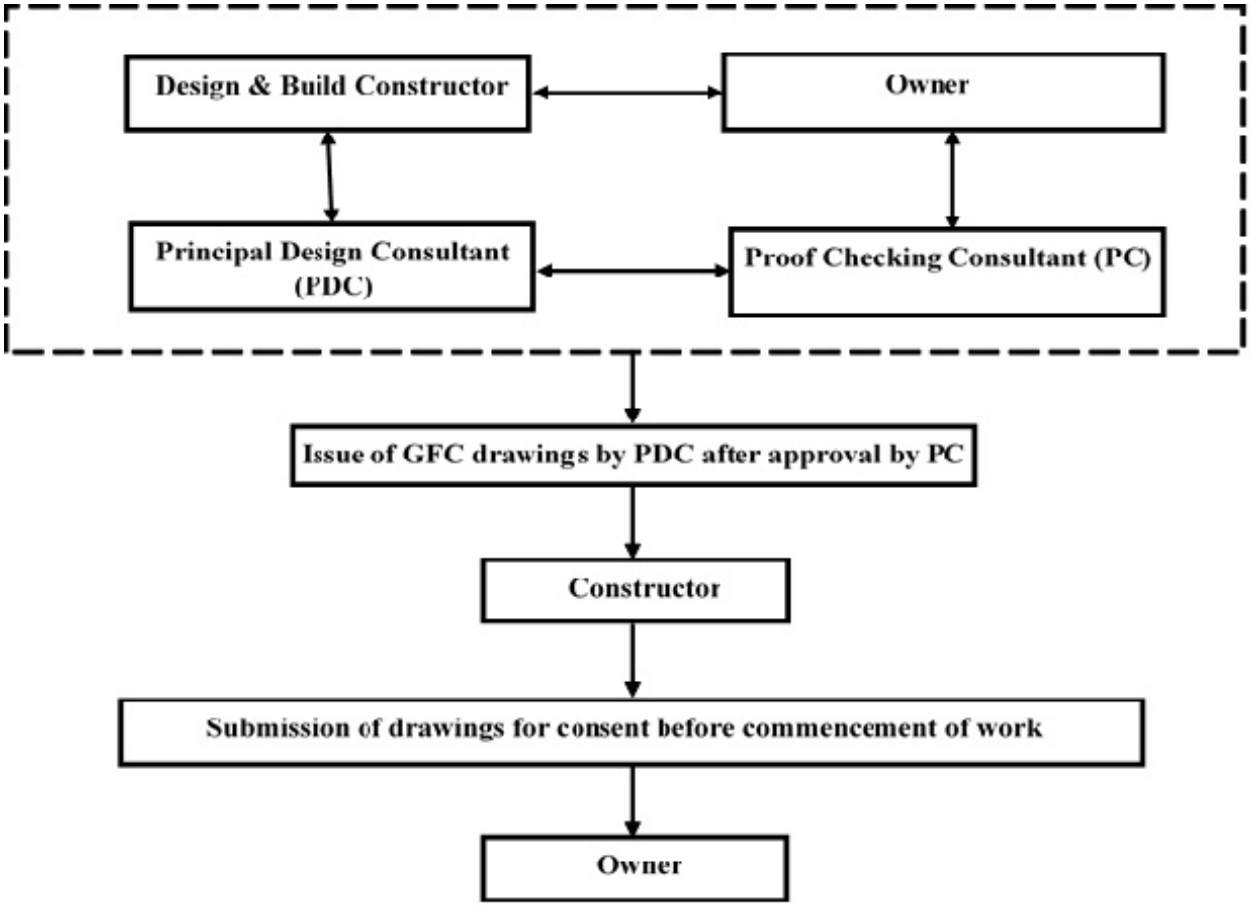

FIG. 2 FLOWCHART FOR COMMUNICATION UNDER MODEL 2

b) provide site specific data, design requirements like the design brief, the conceptual drawings, surveyed site plan, geotechnical investigation report, proposed materials and methods of construction, the relevant contractual conditions, the functional requirements, and constraints, if any, and any special construction loadings to the PDC in case of design- bid-build mode;

NOTE — The design brief should cover all the functional needs and aspirations as well as any other special needs of the owner. It should also address the issues related to the site and the situation that the owner wants the PDC to incorporate in the structural designs.

c) appoint the technology know-how suppliers, system and equipment vendors, and all specialist consultants as per project specific requirements;

d) ensure that the scope of work for PDC and PC, including deliverables from them, shall be well defined and a workable time schedule given for structural design and proof checking;

e) recognize that there can be differences of opinion between the PDC and the PC on the structural design issues that need to be resolved by the owner in consultation with the PDC and PC. In case of an unresolved difference in opinion, an independent third party view may be obtained by the owner. The third party shall also meet the qualification and experience criteria as specified in **9.2** for the PC. The decision of the owner shall be final;

f) ensure that adequate supervision and quality control are provided by the owner or by appointing a suitable agency during various stages of construction and that the construction materials and methods are as specified in the contract drawings and specifications;

g) ensure that the structure is used as intended and maintained adequately on a regular basis;

h) ensure to include the intention to appoint PC, if applicable, as a condition of the contract with the PDC, constructor, and specialist consultants;

j) ensure that the responsibilities of PDC/PC are clearly specified in the conditions of the contract to be made with them. The contract conditions between the stakeholders may have provisions regarding professional liability insurance; and

k) avoid revisions and corrections in design inputs, and architectural and service drawings, which may impact the structural design, subsequent to submission of structural design by PDC, in case of design-bid-build mode. Revision/corrections in architectural and service drawings and other design inputs should be done only in exceptional and unavoidable circumstances.

NOTE — The owner may issue a completion certificate to the PDC and the PC in relation to the requirements given in the design brief with reference to agreed functional requirements and deliverables.

7.2 Principal Design Consultant (PDC)

The involvement of PC shall not relieve the PDC of the responsibility towards the correctness, adequacy, and completeness of the structural designs. The PDC shall:

a) ensure completeness and correctness of the structural designs, incorporation of requirements of the technology know-how suppliers, system and equipment vendors, various specialist consultants appointed for the project, optimization of the structural designs and reviewing architectural and service designs/drawings of the proposed structure from structural engineering considerations;

b) ensure the availability and completeness of the information/reports from the owner/constructor /CDC as follows, and ensure that they are incorporated into the designs:

   1) the design brief, the functional requirements, and constraints if any, from the owner;
   2) topographical survey drawings;
   3) geotechnical investigations and recommendations;
   4) conceptual, detailed architectural and service drawings of the proposed structure;
   5) drawings for the proposed structures;
   6) proposed materials and methods of construction;
   7) relevant construction stage loadings;
   8) incorporation of notes/drawings regarding temporary safety requirements during construction;
   9) the relevant contractual conditions; and
   10) any other data relevant to the project and required for structural design;

c) ensure submission of comprehensive design documents and drawings to the owner for proof checking.The analysis and design calculations (consisting of input and output data of the software and manual calculations, if any) shall be presented in a manner that is easily comprehensible and can be checked. Every document shall be page numbered. Design calculations shall be presented with adequate cross referencing to standards, Design Basis Report (DBR), and other documents, wherever necessary. The design notes shall contain explanatory sketches of the structure and loadings. All documents and drawings shall be physically and/or digitally signed with the date and stamped by the team leader of the PDC;

d) ensure compliance with the observations raised by the PC. Differences of opinion between the PDC and the PC shall be resolved by the owner as specified in **7.1(e)**;

e) act independently of the PC, constructor, and any of their sub-constructors or consultants, and shall maintain confidentiality throughout;

f) declare conflict of interest, if any, prior to accepting the assignment for structural design. In case a conflict of interest arises during the assignment, it shall be declared by the PDC immediately;

g) enter into a written explicit agreement with the owner/constructor/CDC about the scope of work;

h) give clarification to the construction team on the design and drawings provided by him during the construction stage; and

j) prepare an inspection and maintenance manual pertaining to structural components, if desired by the owner.

7.3 Proof Checking Consultant (PC)

The PC shall not be part of the main team of structural design/PDC organization. The PC may be consulted by the PDC during the design process to provide preliminary thoughts, opinions, or comments on critical issues. The PC shall:

a) review the completeness and correctness of the structural design documents and drawings produced by the PDC;

b) act independently of the PDC, constructor, and any of their sub-constructors or consultants, and shall maintain confidentiality throughout;

c) declare conflict of interest, if any, prior to accepting the assignment for proof checking except where the PC and the owner are the same. In case a conflict of interest arises during the assignment, it shall be declared by the PC immediately;

d) enter into a written explicit agreement with the owner about the scope of work;

e) document all the technical interactions with the PDC;

f) thoroughly check the analysis and design calculation documents and structural drawings and be fully responsible (in addition and independent of the responsibilities of the PDC) for the accuracy and completeness of all the analyses, designs, and drawings of the structure, and issuing a certificate for proof checking.

g) ensure that the structural system/scheme chosen by the PDC meets the parameters as specifiedin **7.2 (b)**;

h) do independent calculations, if necessary, to form a basis for arriving at the conclusions. Independent calculations shall invariably be done for all large, complex, or important structures. All documents and drawings shall be physically and/or digitally signed with the date and stamped by the team leader of PC before submitting them to the owner; and

j) be responsible for the correctness of the design in case the independent design has been carried out by PC as given in **8.2**. The PC shall submit the calculations and certificate of proof checking to the owner.

7.4 Constructor

The constructor shall ensure proper supervision and quality control for each activity at the works by deputing qualified and experienced engineers and trained workers (skilled as well as unskilled) during all the stages of construction. The constructor shall also:

a) ensure proper document control is followed at the site. The latest GFC drawings shall always be available at the site and the same shall be used for construction;

b) ensure that the PDC shall have the qualification and experience as specified in **9.2** in case of design and build mode;

c) provide site specific data and design requirements like the design brief, the conceptual drawings, surveyed site plan, geotechnical investigation report, proposed materials and methods of construction, the relevant contractual conditions, the functional requirements, and constraints if any, and any special construction loadings, to the PDC in case

of design and build mode;

d) ensure all the contract conditions and specifications are followed, and the project shall be delivered as per the latest GFC drawings;

e) ensure the construction material, workmanship, and finish meet the requirements of the specifications as given in the contract and/or as per the relevant standards in case they are not specifically incorporated in the contract, whichever are more stringent;

f) ensure that all the fabrication drawings and the methodology of construction to be adopted by the constructor are as agreed under the contract;

g) avoid revisions and corrections in design inputs and architectural and services drawings, which may impact the structural design, after submission of structural design by PDC, in case of design and build mode. Revision/corrections in architectural and service drawings and other design inputs should be done only in exceptional and unavoidable circumstances; and

h) ensure submission of as-built drawings to the owner.

8 CATEGORIES OF PROOF CHECKING

Proof checking can be done using any of the two categories as given in **8.1** and **8.2**. The owner may decide the category of proof checking to be adopted depending on the type and complexity of the structure.

8.1 Category 1

a) The PDC shall prepare the DBR and framing plans, and discuss them with the PC, who shall review and then approve the same;

b) PDC shall also discuss with the PC, the method and mode of analyses and designs either manual or computerized, including the use of any specific computer programs, and idealization of the structure and its various elements, and the PC shall need to approve the same;

c) For structures for which model studies (physical or digital) must be performed, the same shall also be discussed by the PDC with the PC. The model studies to be carried out and the agency, to be appointed by the owner, shall be decided. The report of the model study shall be submitted to the owner, who shall forward the results/reports of the model studies for review and discussion by the PDC and the PC with the agency appointed for the same. The PDC and PC shall convey their acceptance of the model study report, separately in writing to the owner;

d) PDC shall carry out the analyses and designs, as discussed with and approved by the PC, and thereafter, prepare the structural drawings, and submit the entire package to the PC for the latter's scrutiny and approval;

e) This interaction between PDC and PC can be carried out periodically at various stages of the project to suit the construction requirements;

f) PC shall communicate approval for the analyses and later for the designs in writing; and

g) PC shall sign the structural GFC drawings after signing by the PDC. The signed drawings shall then be submitted to the owner.

8.2 Category 2

a) The PC and PDC shall discuss and finalize a mutually agreed DBR including conceptual structural system and schematic drawings;

b) The PDC shall have the freedom to analyze, design and detail the structure, and submit only the structural drawings to the PC;

c) The PC shall carry out independent analysis and designs and shall review and approve the structural drawings, in part, or of the complete structure and sign the GFC drawings. The PC shall submit the independent analysis and designs to the owner; and

d) The PC shall communicate approval in writing and sign the structural GFC drawings after signing by the PDC. The signed drawings shall then be submitted to the owner.

NOTE — In Category 2, if there is a difference in the final results of the analyses between those done by the PDC and the PC, then both shall discuss the same based on the available accepted literature and references, to resolve the matter and finalize the analyses and designs so that the drawings based on the agreed approach could be issued. In case, if any difference of opinion remains between the PDC and the PC, then the owner shall resolve them as specified in **7.1 (e)**.

9 SUPPORT

9.1 General

The PDC and PC shall have adequate resources which shall inter alia include competent manpower,

qualified and experienced structural design engineers, draftsmen, and other associated manpower, infrastructure, equipment, and environment for operation of all the processes and other facilities required to perform and complete the work effectively, accurately and within the timeframe mutually agreed to with the owner.

NOTE — Infrastructure should inter alia include the following:

a) Registered office and associated utilities;

b) Requisite computer hardware and software; and

c) Transportation resources.

9.2 Minimum Qualification and Experience of PDC and PC

9.2.1 The owner/constructor/CDC shall make sure that the PDC and the PC, as applicable, engaged for the project have the requisite minimum qualification and relevant experience in similar works for the structural analyses, designing, and drawing for the project concerned as given in Table 1.

NOTE — The owner may decide the additional qualification for PDC or PC based on the type of structure, health safety, and disaster (like an earthquake, flood, cyclone, etc.) vulnerability requirements.

9.2.2 The team leader of both the PDC as well as the PC shall be an engineer who is engaged in the practice of structural engineering and shall have experience in the design of structural systems comparable in type, size, and complexity to those under consideration.

9.2.3 All PDC and PC team members engaged in structural analysis and design shall possess a minimum educational qualification of B.E./B.Tech (Civil) or equivalent degree recognized by the All India Council for Technical Education/University Grants Commission.

Table 1 Minimum Qualification and Experience of Team Leader of PDC and PC

(*Clause* 9.2.1)

Sl No.	Type of Structure	Team leader of PDC	Team Leader of PC
(1)	(2)	(3)	(4)
i)	Buildings up to the height of 15 m and culverts (length up to 6 m).	B.E./B.Tech (Civil) with 5 years of experience in structural engineering practice with designing and field work of relevant structures. The 5 years of experience shall comprise a minimum of 3 years exclusively in structural designing.	B.E./B.Tech (Civil) with 7 years of experience in structural engineering practice with designing and field work of relevant structures. The 7 years of experience shall comprise a minimum of 5 years exclusively in structural designing.
ii)	Buildings of height more than 15 m and up to 50 m and minor bridges (bridge length up to 60 m).	B.E./B.Tech (Civil) with 7 years of experience in structural engineering practice with designing and field work of relevant structures. The 7 years of experience shall comprise a minimum of 5 years exclusively in structural designing.	B.E./B.Tech (Civil) with 10 years of experience in structural engineering practice with designing and field work of relevant structures. The 10 years of experience shall comprise a minimum of 7 years exclusively in structural designing.

Table 1 (*Concluded*)

Sl No.	Type of Structure	Team leader of PDC	Team Leader of PC
(1)	(2)	(3)	(4)
iii)	Buildings of height more than 50 m and specialized structures such as but not limited to tunnels, bridges, flyovers, elevated roads, dams, chimneys, industrial, marine, and special structures.	B.E./B.Tech (Civil) with 10 years of experience in structural engineering practice with designing and field work of relevant structures. The 10 years of experience shall comprise a minimum of 7 years exclusively in structural designing.	Master's degree with major in structural engineering and 10 years of experience in structural engineering practicewith designing and field work of relevant structures. The 10 years of experience shall comprise a minimum of 7 years exclusively in structural designing. OR B.E./B.Tech (Civil) with 15 years of experience in structural engineering practice with designing and field work of relevant structures. The 15 years of experience shall comprise a minimum of 10 years exclusively in structural designing.

NOTES

1 In case of Master's degree in structural engineering, the required minimum experience may be reduced by 1 year and in case of a doctoral degree in area of structural engineering, it may be reduced by 2 years. This note shall not be valid for Sl No. (iii) of Table 1.

2 The team leader of PDC and PC can be academic faculty member of recognized engineering institutions with relevant design experience as given above.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Construction and Related Engineering Services Sectional Committee, SSD 06

Organization	*Representative(s)*
Central Public Works Department, New Delhi	SHRI RANJIT SINGH **(*Chairperson*)**
B&S Engineering Consultants Private Limited, Noida	SHRI ALOK BHOWMICK
CII - Indian Green Building Company Council, Hyderabad	SHRI PRAVEEN KUMAR SOMA
Central Public Works Department, New Delhi	SHRI VINAYAK RAI SHRI PRADEEP GARG (*Alternate* I) SHRI AMRENDRA KUMAR JALAN (*Alternate* II)
Confederation of Construction Products and Services, New Delhi	SHRI AMIT MALHOTRA MS SARITA BALODHI (*Alternate*)
Construction Industry Development Council, New Delhi	DR P. R. SWARUP PROF NIRANJAN SWARUP (*Alternate* I) SHRI ASHUTOSH BHARDWAJ (*Alternate* II)
Construction Skill Development Council of India, Gurugram	SHRI NARENDRA DESHPANDE
Consulting Engineers Association of India, New Delhi	SHRI A. P. MULL
Creative Design Consultants and Engineers Private Limited, Ghaziabad	SHRI AMAN DEEP GARG
Delhi Development Authority, New Delhi	SHRI D. C. GOEL
Delhi Metro Rail Corporation Limited, Delhi	SHRI RAJ KUMAR GUPTA
Department of Delhi Fire Services, Govt of NCT of Delhi, New Delhi	SHRI ATUL GARG SHRI SANJAY KUMAR TOMAR (*Alternate*)
Hilti India Private Limited, New Delhi	SHRI SHOUNAK MITRA
Housing and Urban Development Corporation Limited, New Delhi	SHRI DEEPAK BANSAL
Indian Association of Structural Engineers, New Delhi	SHRI MANOJ K. MITTAL
Indian Geotechnical Society, New Delhi	PROF G. L. SIVAKUMAR BABU DR A. P. SINGH (*Alternate*)
Indian Institute of Architects, Mumbai	SHRI DIVYA KUSH
Indian Institute of Technology, Indore	PROF SANDEEP CHAUDHARY

Organization	*Representative(s)*
Indian Plumbing Skills Council, New Delhi	SHRI VINAY GUPTA SHRI ROHIT KUMAR SAHA (*Alternate*)
Institute for Steel Development and Growth, Kolkata	SHRI ARIJIT GUHA SHRI P. L. RAO (*Alternate*)
Institute of Engineers India, New Delhi	SHRI DINESH KUMAR SHRI K. P. SINGH (*Alternate*)
Ministry of Road Transport and Highways, New Delhi	SHRI B. K. SINHA SHRI BIDUR KANT JHA (*Alternate*)
National Accreditation Board for Certification Bodies, New Delhi	SHRI AJAY SHARMA SHRI PRATEESH TIWARI (*Alternate*)
National Buildings Construction Corporation Limited, New Delhi	SHRI NOVMAN AHMED SHRI MUDIT BHATNAGAR (*Alternate*)
National Council for Cement and Building Materials, Faridabad	DR B. P. RANGA RAO SHRI ARUP GHATAK (*Alternate*)
National Institute of Construction Management and Research, Pune	DR ANIL AGARWAL SHRI RAJESH GOYAL (*Alternate*)
Project Management Institute, New Delhi	SHRI SESHA SAI
Town and Country Planning Organisation, New Delhi	SHRI JAGDEEP KUMAR KAPOOR SHRI SUDEEP ROY (*Alternate* I) SHRI HARPAL DAVE (*Alternate* II)
In Personal Capacity (*Plot 22-A, Sector - 17 C, Palm Beech Marg Vashi, Navi Mumbai - 400705*)	SHRI V. N. HEGGADE
In Personal Capacity (*Grace Villa, Kadamankulam PO, Thiruvalla - 689583*)	SHRI JOSE KURIAN
BIS Directorate General	SHRI S. K. KANOGIA, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (SERVICE SECTOR) [REPRESENTING DIRECTOR GENEAL (*Ex-officio*)]

Member Secretary
SHRI UMANG JAGGI
SCIENTIST 'B'/ASSISTANT DIRECTOR
(SERVICE SECTOR), BIS

Subcommittee for drafting standard on Preconstruction Services, SSD 06 : 01

Organization	*Representative(s)*
Indian Association of Structural Engineers, New Delhi	SHRI MANOJ K. MITTAL **(*Convener*)**
Association of Consulting Civil Engineers India, Bengaluru	SHRI AVINASH D. SHIRODE SHRI SURYA PRAKASH (*Alternate*)
B&S Engineering Consultants Private Limited, Noida	SHRI ALOK BHOWMICK
Cengrs Geotechnica Private Limited, Noida	SHRI SANJAY GUPTA SHRI RAVI SUNDARAM (*Alternate*)
Central Public Works Department, New Delhi	SHRI PRADEEP GARG SHRI AMRENDRA KUMAR JALAN (*Alternate*)
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Creative Design Consultants and Engineers Private Limited, Ghaziabad	SHRI AMAN DEEP GARG
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Indian Institute of Architects, Mumbai	SHRI DIVYA KUSH
Indian Institute of Technology, Indore	PROF SANDEEP CHAUDHARY
L&T Construction, Chennai	SHRI C. K. SOMARAJU
National Buildings Construction Corporation Limited, New Delhi	SHRI NOVMAN AHMED SHRI MUDIT BHATNAGAR (*Alternate*)
Tandon Consultants Private Limited, New Delhi	SHRI VINAY GUPTA

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Review of Indian Standards

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

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