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**NATIONAL STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA**

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GB 50204-2015

**Code for Quality Acceptance of Concrete
Structure Construction**

混凝土结构工程施工质量验收规范

Issued on: December 31, 2014

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NOTICE

This code is written in Chinese and English. The Chinese text shall be taken as the ruling one in the event of any inconsistency between the Chinese text and the English text.

Announcement of Ministry of Housing and Urban-Rural Development of the People's Republic of China

No. 705

Announcement of Publishing the National Standard *Code for Quality Acceptance of Concrete Structure Construction*

Code for Quality Acceptance of Concrete Structure Construction has been approved as a national standard with serial number of GB 50204 – 2015, and it shall be implemented from September 1, 2015. Herein, Articles 4.1.2, 5.2.1, 5.2.3, 5.5.1, 6.2.1, 6.3.1, 6.4.2, 7.2.1 and 7.4.1 are compulsory provisions and must be enforced strictly. The original national standard GB 50204 – 2002 *Code for Acceptance of Constructional Quality of Concrete Structures* shall be abolished simultaneously.

Authorized by the Research Institute of Standards and Norms of Ministry of Housing and Urban-Rural Development of the People's Republic of China, this code is published by China Architecture & Building Press.

Ministry of Housing and Urban-Rural Development of the People's Republic of China
December 31, 2014

Foreword

This code is amended on GB 50204 – 2002 *Code for acceptance of constructional quality of concrete structures* according to the requirements of Ministry of Housing and Urban-Rural Development in the *Notice on Printing 2011 Development and Revision Plan of National Engineering Construction Standards and Codes* (Jian Biao [2011] No. 17). The amendment is well based on the extensive investigations and practices, the full references to the related international standards and advanced foreign standards, and the wide and public consultations.

The main technical contents of this code include: general provisions, terms, basic requirements, form item project, reinforcement item project, prestressed item project, concrete item project, cast-in-situ structure item project, precast structure item project, concrete structure sub-part project and relevant appendixes.

The main amendments in technical contents are as follows:

1. Basic requirements for acceptance are improved;
2. The requirements for expanding inspection lot capacity of certified products or eligible products in continuous inspection are added;
3. Requirements for acceptance of formwork stripping are deleted;
4. Requirements for acceptance of new technology applied to rebars like fabricated rebar are added;
5. Requirements for acceptance of fully-enclosed waterproof performance of unbonded prestressed tendon are added;
6. Requirements for site acceptance of premixed concrete are improved;
7. Requirements for site acceptance of precast members are improved;
8. Requirements for entitative inspection over positional and dimensional deviation of structure are added;
9. Methods to inspect the structure entity concrete strength by rebound-core drilling method are added.

In this code, the provisions printed in bold type are compulsory and must be enforced strictly.

Ministry of Housing and Urban-Rural Development of the People's Republic of China is in charge of the administration of this code and the explanation of the compulsory provisions, and China Academy of Building Research is responsible for the explanation of specific technical contents. During the process of implementing this standard, the relevant opinions and advice, whenever necessary, can be posted or passed on to China Academy of Building Research (Address: No.30, North 3rd Ring East Road, Chaoyang District, Beijing 100013, China; E-mail: GB 50204@163.com).

Chief Development Organization:

China Academy of Building Research

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1 General Provisions

1.0.1 This code is developed in order to strengthen the construction engineering quality management, unify acceptance of concrete structure engineering construction quality and guarantee project construction quality.

1.0.2 This code is applicable to construction quality acceptance of concrete structure.

1.0.3 Quality acceptance of concrete structure shall not only comply with those specified in this code, but also comply with those in the current national relevant standards.

2 Terms

2.0.1 Concrete structure

The structure mainly made of concrete, including plain concrete structure, reinforced concrete structure and prestressed concrete structure, which may be classified into cast-in-situ concrete structure and precast concrete structure according to the construction method.

2.0.2 Cast-in-situ concrete structure

The concrete structure is made by erecting formwork in situ and integral casting, hereinafter referred to as cast-in-situ structure.

2.0.3 Precast concrete structure

The concrete structure is made by assembling and connecting the precast concrete members or parts, hereinafter referred to as precast structure.

2.0.4 Defect

Inspection items or points of concrete structure construction quality failing to follow the requirements are classified into serious defects and common defects according to the degree.

2.0.5 Serious defect

Defects having dominating influence on the stressing property, durability or installation and service property of structural members.

2.0.6 Common defect

Defects without dominating influence on the stressing property, durability or installation and service property of structural members.

2.0.7 Inspection

Activity in which the features and performances of the inspected item are determined, inspected and tested, and the results are compared with the requirements specified in standards so as to decide the acceptance of each performance.

2.0.8 Inspection lot

A group of samples as a whole produced under the same conditions or gathered according to specific provisions for sampling inspection.

2.0.9 Site acceptance

The process in which the materials, members and accessories, instruments and semi-finished products into the construction site are inspected according to relevant standards and confirmation shall be given to their quality, mainly including appearance inspection, quality certificate documents inspection and sampling inspection.

2.0.10 Inspection of structural performance

The inspection over the structural members for the indexes of bearing capacity, deflection and crack control performance.

2.0.11 Entitative inspection of structure

The inspection over a sample taken from a structure entity, which is conducted on site or delivered to the inspection body with qualification.

2.0.12 Quality certificate document

Effective documents, in accompany with approaching materials, members and accessories, instrument and semi-finished products, provided to certify the quality.

3 Basic Requirements

3.0.1 Concrete structure sub-part project, may be classified into item projects of formwork, reinforcement, prestressed work, concrete, cast-in-situ structure and precast structure. Each item project may be classified into several inspection lots according to approaching lots, shift, storey, structural joint or construction section in the principle of consistence with production and construction mode and being convenient for construction quality control.

3.0.2 The quality acceptance of concrete structure sub-part project shall cover quality control data inspection, appearance quality acceptance and entitative inspection of structure stipulated in section 10.1 provided that the acceptance of item projects concerning reinforcement, prestressed work, concrete, cast-in-situ structure and precast structure is eligible.

3.0.3 Quality acceptance of item projects shall cover quality acceptance of inspection lots and record inspection.

3.0.4 Quality acceptance of inspection lot shall cover substance inspection and record checking and shall meet the following requirements:

1 The quality of all dominant items shall be qualified for sampling inspection.

2 The general items shall be qualified for the sampling inspection; for the sampling inspection by attributes, general items shall match this code, which reach 80% or above rate of conformity points and serious defects shall be avoided.

3 Complete quality inspection records shall be provided and complete construction and operation record shall be provided for important procedure.

3.0.5 The sampling shall be carried out randomly in inspection lot and distributed evenly and typically.

3.0.6 Treatment of non-conforming inspection lot shall meet the following requirements:

1 It shall not use non-conforming inspection lot of materials, members and accessories, appliance and semi-finished products;

2 Non-conforming inspection lot in construction quality before concreting shall be reworked or repaired and then re-accepted;

3 Non-conforming inspection lot in construction quality after concreting shall be treated according to the relevant requirements of this code.

3.0.7 The certified products or the products with stable source and which are qualified for inspection in continuous three lots may be expanded double of the inspection lot capacity when entering the site for inspection according to the relevant requirements of this code. For expanded inspection lot, in case of non-conformity, the acceptance shall be carried out again according to the capacity of inspection lot before the expansion and this lot of products shall not be expanded for its capacity.

3.0.8 Materials, members and accessories, appliance and semi-finished products applied in concrete structure construction project shall be inspected according to the lot number on site. For more than one unit projects in the same construction project and executed at the same period, the

same lot of materials, members and accessories, appliance and semi-finished products produced by the same manufacturer may be accepted by uniform inspection lot.

3.0.9 Quality acceptance of inspection lot, item project and concrete structure sub-part project may be recorded according to Appendix A of this code.

4 Formwork Item Project

4.1 General Requirements

4.1.1 Formwork shall be prepared with a construction scheme. Technology demonstration shall be carried out for the special construction schemes of climbing formwork, tool-type formwork and tall formwork support.

4.1.2 Formwork and support shall be designed according to the installation, service and dismantling conditions and shall meet the requirements of bearing capacity, rigidity and robustness.

4.1.3 Formwork and support shall be removed according to GB 50666 *Code for construction of concrete structures* and construction scheme.

4.2 Formwork Installation

Dominant items

4.2.1 Technical index of formwork and support materials shall comply with the requirements of the current national relevant standards. The formwork and support materials shall be sampled for inspection over the appearance, specification and dimension when entering the site.

Inspection quantity: determined according to the requirements of the current national relevant standards.

Inspection method: check quality certificate documents; observe, measure with ruler.

4.2.2 Installation quality of formwork and support of cast-in-situ concrete structure shall comply with the requirements of the current national relevant standards and the construction scheme.

Inspection quantity: determined according to the requirements of the current national relevant standards.

Inspection method: executed according to the requirements of the current national relevant standards.

4.2.3 Formwork and support of post poured joint shall be arranged separately.

Inspection quantity: 100% inspection.

Inspection method: observe.

4.2.4 Support upright and vertical formwork, when installed on the soil layer, shall meet the following requirements:

1 Soil layer shall be solid and leveled, and its bearing capacity or compactness shall comply with construction scheme;

2 Waterproof and drainage measures shall be provided; freezing and thawing prevention measures shall be provided for frost heaving soil;

3 Pedestal or subplate shall be set under support upright.

Inspection quantity: 100% inspection.

Inspection method: observe; check soil layer compactness test reports, soil layer bearing capacity evaluation or site test reports.

General Items

4.2.5 Formwork installation shall meet the following requirements:

- 1 The joints of the formwork shall be tight;
- 2 Formwork shall be free from sundries, seepers, ice and snow inside;
- 3 The contact surface between formwork and concrete shall be smooth and cleaned up;
- 4 The terrace and moulding bed used as formwork shall be smooth, and free of sinking, cracking, dusting or bulking that influences the member quality;
- 5 As for fair-faced concrete and architectural concrete members, the formwork applied shall be able to satisfy the design properties.

Inspection quantity: 100% inspection.

Inspection method: observe.

4.2.6 Release agent shall comply with the construction scheme in the variety and application methods. Release agent shall not influence the structural performance and decoration construction, also shall not contaminate rebar, prestressed tendon, embedded parts, and joints of concrete or pollute the environment.

Inspection quantity: 100% inspection.

Inspection method: check quality certificate documents; observe.

4.2.7 Formwork shall be arched according to the requirements of the current national standard GB 50666 *Code for construction of concrete structures* and shall comply with design and construction scheme.

Inspection quantity: within the same inspection lot, as for beams with span longer than 18m, 100% inspection shall be carried out while as for the beams with span being 18m or less, 10% of the members and not less than 3 members shall be subjected to random inspection; as for slabs, 10% of the representative natural rooms and not less than 3 rooms shall be subjected to random inspection; as for large-space structures, inspection surface may be such divided for the slabs by the longitudinal and transverse axes, 10% and not less than 3 surfaces shall be subjected to random inspection.

Inspection method: measure with level gauge or ruler.

4.2.8 As for cast-in-situ concrete structure, continuous formwork among multilayer shall comply with the construction scheme. The upright of formwork support between two layers should be directed at each other. The lower subplate of upright shall be arranged according to the requirements of construction scheme.

Inspection quantity: 100% inspection.

Inspection method: observe.

4.2.9 The embedded parts and reserved holes fixed to the formwork shall not be missed and shall be firmly installed. The embedded parts in the concrete structure required to be impervious shall be provided with anti-seepage measures according to the design and construction scheme.

Embedded parts and reserved holes shall be located to meet the requirements of design and construction scheme. If there are no requirements in the design, the position deviation shall be in accordance with those specified in Table 4.2.9.

Inspection quantity: within the same inspection lot, as for beams, columns and independent

foundations, 10% of the members and not less than 3 members shall be subjected to random inspection; as for walls and slabs, 10% of the representative natural rooms and not less than 3 rooms shall be subjected to random inspection; as for large-space structures, inspection surface may be such divided for walls every other about 5m in height between adjacent axes and for the slabs by the longitudinal and transverse axes, 10% and not less than 3 surfaces shall be subjected to random inspection.

Inspection method: observe, measure with ruler.

Table 4.2.9 Allowable Deviation of Embedded Parts and Reserved Hole Installation

Item		Allowable deviation (mm)
Center line position of embedded plate		3
Center line positions of embedded pipe and reserved hole		3
Joint bar	Center line position	5
	Exposed length	+10,0
Embedded bolt	Center line position	2
	Exposed length	+10,0
Reserved opening	Center line position	10
	Dimension	+10,0

Note: The center line position shall be measured along both the longitudinal and the horizontal directions and the larger deviation value shall be taken.

4.2.10 Deviation and inspection method of cast-in-situ structure formwork installation shall be in accordance with those specified in Table 4.2.10.

Inspection quantity: within the same inspection lot, as for beams, columns and independent foundations, 10% of the members and not less than 3 members shall be subjected to random inspection; as for walls and slabs, 10% of the representative natural rooms and not less than 3 rooms shall be subjected to random inspection; as for large-space structures, inspection surface may be such divided for walls every other about 5m in height between adjacent axes and for the slabs by the longitudinal and transverse axes, 10% and not less than 3 surfaces shall be subjected to random inspection.

Table 4.2.10 Allowable Deviation and Inspection Method of Cast-in-situ Structure Formwork Installation

Item		Allowable deviation(mm)	Inspection method
Position of axial line		5	Measure with ruler
Top surface elevation of bottom formwork		±5	Level gauge, pulling line or measure with ruler
Inside dimension of formwork	Foundation	±10	Measure with ruler
	Column, wall and beam	±5	Measure with ruler
	Adjacent staircase treading height difference	5	Measure with ruler
Verticality of column and wall	Story height≤6m	8	Theodolite, plumbing or measure with ruler
	Story height>6m	10	Theodolite, plumbing or measure with ruler
Height difference between two adjacent formwork surfaces		2	Measure with ruler
Surface evenness		5	Measure with 2m guiding ruler and feeler gauge

Note: The axes position shall be measured along both the longitudinal and the horizontal directions and the larger deviation value shall be taken.