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GB/T 13476-2009

Replacing GB/T 13476-1999

Pretensioned Spun Concrete Piles

(Translator Note: Please note that there is an Amendment Sheet for this Standard)

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Foreword

Clause 5.1.2, clause 5.1.3, clause 5.2, clause 5.3 and clause 5.6 in this Standard are mandatory; the rest are recommended.

Consistent degree between this Standard and Japanese industrial standard JIS A 5373:2004 "Precast Prestressed Concrete Products" is non-equivalent.

This Standard replaces GB 13476-1999 "Pretensioned Spun Concrete Piles".

Compared with GB 13476-1999, main differences of this Standard are as follows:

- Revise the representation method of normative references (chapter 2 in edition 1999; chapter 2 in this Standard);
- Revise the product classification (chapter 3 in edition 1999; chapter 3 in this Standard);
- Revise raw materials and general requirements (chapter 4 in edition 1999; chapter 4 in this Standard);
- Revise technical requirements (chapter 5 in edition 1999; chapter 5 in this Standard);
- Revise test method (chapter 6 in edition 1999; chapter 6 in this Standard);
- Revise inspection rules (chapter 7 in edition 1999; chapter 7 in this Standard);
- Revise marks (chapter 8 in edition 1999; chapter 8 in this Standard);
- Revise storage and transport (chapter 9 in edition 1999; chapter 9 in this Standard);
- Adjust the product certificate (chapter 10 in this Standard);
- Delete the provisions on product classification.
- Add pile specifications and minimum reinforcement area of prestressed steel (Table 1 in this Standard);
- Add the requirements for minimum thickness of end plate (Table 2 in this Standard);
- Add the requirements for aggregates used for piles that have anti-freeze, impermeability and other special requirements (4.1.2.3 in this Standard);
- Add quality requirements for silica sand powder, superfine slag powder, coal ash, silica fume and other admixtures (4.1.6.1 in this Standard);
- Add shear performance requirements and test methods of piles (4.2.3 in this Standard);

Wang Chong, Yu Yuanbao, Wei Yiling, Wang Xinxiang, Xu Xiangyuan, Yu Yachao, He Yaohui, Lang Wengang, Zhou Zhaodi, Xu Xinghua, Zhang Jiechun, Zhang Yao, Huang Haiyan, Xie Xiaofeng, Xie Biao and Liao Zhenzhong.

This Standard was first-time released in 1992 and first-time revised in 1999. This is the second revision.

Pretensioned Spun Concrete Piles

1 Scope

This Standard specifies the pretensioned spun concrete piles (hereinafter referred to as piles) - classification, raw materials and general requirements, technical requirements, testing methods, inspection rules, marking, storage and transportation, product certificate, etc.

This Standard applies to centrifugal shaping pretensioned concrete piles for industrial and civil buildings, ports, municipal works, bridges, railways, highways, water conservancy and other projects.

2 Normative references

The articles contained in the following documents have become part of this document when they are quoted herein. For the dated documents so quoted, all subsequent modifications (including all corrections) or revisions made thereafter do not apply to this Standard. However, the parties who reach an agreement according to this Standard are encouraged to study whether the latest versions of these documents may be used. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB 175 Common Portland cement

GB/T 700 Carbon structural steels

GB/T701 Hot rolled low carbon steel wire rods

GB 1499.2 Steel for the reinforcement of concrete - Part 2: Hot rolled ribbed bars

GB/T 1596-2005 Fly ash used for cement and concrete

GB/T 5223.3-2005 Steel bars prestressed concrete

GB 8076 Concrete admixtures

GB/T 14684 Sand for building

GB/T 14685 Pebble and crushed stone for building

GB/T 18046-2008 Ground granulated blast furnace slag used for cement and concrete

GB/T 18736-2002 Mineral admixtures for high strength and high performance concrete

GB/T 50081 Standard for test method of mechanical properties on ordinary concrete

GB 50164 Standard for quality control of concrete

GBJ 107 Standard for evaluation of concrete compressive strength

JC/T 540 Cold-drawn low-carbon wire for concrete products

JC/T 94 End plate for pretensioned spun concrete piles

JC/T 950-2005 Ground silica sand used for pretensioned spun high-strength concrete piles

JGJ 63 Standard of water for concrete

3 Product classification

3.1 Product class and code

Piles are divided into prestressed concrete piles and prestressed high-strength concrete piles. The code of prestressed concrete pile is PC; the code of prestressed high-strength concrete piles is PHC.

3.2 Product specifications and models

3.2.1 According to the outer diameters of piles, it is divided into 300 mm, (350 mm), 400 mm, (450 mm), 500 mm, (550 mm), 600 mm, 700 mm, 800 mm, 1 000 mm, 1 200 mm, 1 300 mm, 1 400 mm, etc.

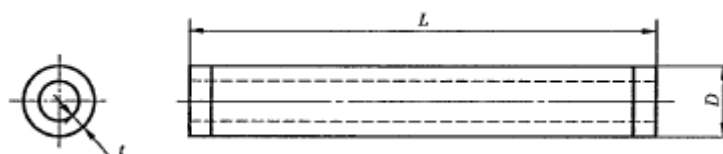
Note: Specifications in brackets are non-preferred series, the basic dimensions are shown in Annex A.

3.2.2 Piles are divided into type A, type AB, type B and type C according to effective prestressed value.

3.3 Structural dimensions

3.3.1 Structural shapes and basic dimensions of piles shall conform to the provisions in Figure 1 and Table 1.

3.3.2 Length of pile shall include pile body and joints.



t — Wall thickness;
L — Length;
D — Outer diameter.

Prestressed high-strength concrete piles of type A that have an outer diameter of 500 mm, wall thickness of 100 mm and length of 12 m are marked as follows:

PHC 500 A 100-12 GB 13476

4 Raw materials and general requirements

4.1 Raw materials

4.1.1 Cement

Use Portland cement, ordinary Portland cement and Portland slag cement of which the strength is not lower than 42.5; the quality shall conform to the provisions of GB 175.

4.1.2 Aggregates

4.1.2.1 Fine aggregates should adopt clean-natural hard medium-coarse sand or artificial sand; fineness modulus is preferably 2.5~3.2. When artificial sand is used, fineness modulus may be 2.5~3.5; the quality shall conform to relevant provisions in GB/T 14684; silt content of sand is not greater than 1%; chlorine ion content is not greater than 0.01%; sulfide and sulfate content is not greater than 0.5%.

4.1.2.2 Coarse aggregates should adopt gravels or crushed pebbles; the maximum particle size shall not exceed 25 mm and may not exceed 3/4 of clear distance of bars; quality shall conform to relevant provisions of GB/T 14685; silt content of stone is not greater than 0.5%; sulfide and sulfate content does not exceed 0.5%.

4.1.2.3 For piles that have anti-freeze, impermeability or other special requirements, the aggregates used shall conform to relevant provisions of corresponding standards.

4.1.3 Steel

4.1.3.1 Prestressed steel shall adopt steel bar for concrete. The quality shall conform to the provisions on low relaxation spiral channel steel bar in GB/T 5223.3; tensile strength is not less than 1 420 MPa; non-proportional extension strength is not less than 1 280 MPa; elongation after fracture shall not be greater than the stipulation on ductility grade 35 in Table 3 of GB/T 5223.3-2005.

4.1.3.2 Spiral ribs should adopt low-carbon steel hot-rolled wire rods; concrete products adopts cold drawn low-carbon steel wire; the quality shall respectively conform to the relevant provisions in GB/T 701/JC/T 540.

4.1.3.3 Generally piles have no end anchor bars. When end-anchor bar is required, anchor bars should adopt low-carbon steel hot-rolled wire rods or hot rolled ribbed steel bar for reinforced concrete; the quality shall respectively conform to the provisions of GB/T 701 and GB 1499.2.

4.1.3.4 Performance of end plate shall conform to the provisions of JC/T 947; the material

shall be of Q235B; thickness may not be lower than specifications in Table 1. The performances of tile hoop material shall comply with the provisions of Q235 in GB/T 700.

Table 2 Minimum thickness of end plate

Steel bar diameter/mm	7.1	9.0	10.7	12.6
Minimum thickness of end plate/mm	16	18	20	24

4.1.4 Water

The quality of water for concrete mixing shall comply with the provisions of JGJ 63.

4.1.5 Admixtures

Quality of admixtures shall conform to the provisions of GB 8076.

4.1.6 Mixtures

4.1.6.1 Mixtures should adopt silica sand, superfine slag powder, coal ash, silica fume, etc.; quality of silica sand powder shall be consistent with relevant provisions in Table 1 of JC/T 950-2005; quality of superfine slag powder shall not be lower than relevant specifications on grade S95 in Table 1 of GB/T 18046-2008; quality of coal ash shall not be lower than relevant provisions on grade II class F in GB/T 1596-2005; quality of silica fume shall conform to relevant provisions in Table 1 of GB/T 18736-2002.

4.1.6.2 When mixtures of other types are used, there shall have test for evaluation; the aggregates may be used only when being confirmed conforming to quality requirements of concrete.

4.2 General requirements

4.2.1 Prestressed steel processing

4.2.1.1 Steel bar oil shall be removed; the bars shall be kept straight before cutting and shall be free of local bending; end face after cutting shall be smooth. Relative difference of steel bar lengths in the same pile: it may not be greater than 1.5 mm when the length is less than or equal to 15 m; it may not be greater than 2 mm when the length is greater than 15 m.

4.2.1.2 Strength at steel bar head may not be lower than 90% tensile strength of this material.

4.2.2 Steel skeleton

4.2.2.1 Prestressed steel shall be uniformly reinforced along the distribution circle; minimum reinforcement ratio may not be lower than 0.4%; there shall have at least 6 pieces; permissible clearance deviation is ± 5 mm. Minimum reinforcement area of prestressed steel shall conform to the provisions in Table 1.

Note: Structural reinforcement corresponding to minimum reinforcement area of prestressed

6.4.6 Determination of anti-cracking load and ultimate load

6.4.6.1 When cracks appear for the first time during loading process, load value of previous level shall be taken as measured value of crack load; when cracks appear for the first time within the prescribed duration of load, average value for load value of this level and load value of previous level shall be taken as measured value of crack load; when cracks appear for the first time after prescribed load duration expires, load value of this level shall be taken as measured value of crack load.

6.4.6.2 When the circumstance listed in 5.6.3 occurs after prescribed load duration is over, load at this time shall be taken as measured value of ultimate load; when one of above circumstances occur during loading process, load value of previous level shall be taken as measured value of ultimate load; when one of above circumstances occur in prescribed load duration, the average value for load of this level and load of previous level shall be taken as measured value of ultimate load.

7 Inspection rules

7.1 Inspection classification

Inspection is divided into exit-factory inspection and type inspection.

7.2 Exit-factory inspection

7.2.1 Inspection items

It includes concrete compressive strength, appearance quality, permissible deviation in dimension, anti-cracking performance, etc.

7.2.2 Batching and sampling

7.2.2.1 Concrete compressive strength

Batching and sampling shall follow the relevant provisions of GBJ 107.

7.2.2.2 Appearance quality and permissible deviation in dimension

Taken 300 000 m of piles of the same-type, same-specification and same-model that are produced continuously as one batch; it shall still be deemed as one batch when the total production within three months is less than 300 000. Randomly draw 10 pieces for inspection.

7.2.2.3 Anti-cracking performance

Randomly draw two pieces from the products that pass inspection for appearance quality and permissible deviation in dimension for anti-cracking performance inspection.

7.2.3 Judgment rules

7.2.3.1 Concrete compressive strength

Check the original records of concrete compressive strength inspection; evaluate according to relevant provisions of GBJ 107.

7.2.3.2 Appearance quality

- a) For piles that all conform to the provisions of 5.4 or provisions of item 2, 4, 5, 6, 7, 8, 9 and 10 in Table 5 of 5.4, and other items can conform to corresponding provisions after repair, then the appearance quality is deemed as qualified.
- b) If all the 10 pieces of piles drawn conform to a), then the appearance quality is judged as qualified; if three or more pieces do not conform to a), then the appearance quality is judged as unqualified; if two or less pieces do not conform to a), then double pieces shall be drawn from the products of the same batch for re-inspection. If all products for re-inspection conform to a), then the appearance quality is judged as qualified; if one piece is still unqualified, then the appearance quality is judged as unqualified. For piles that do not conform to any one of items 2, 4, 5, 6, 7, 8, 9 and 10 in Table 5 of 5.4, then the appearance quality is judged as unqualified.

7.2.3.3 Permissible deviation in dimensions

If all the 10 pieces of piles drawn conform to the provisions of 5.5, permissible deviation in dimensions is judged as qualified; if three or more pieces do not conform to the provisions of 5.5, then the permissible deviation in dimension is judged as unqualified; if two or less pieces do not conform to the provisions of 5.5, then double pieces shall be drawn from products of the same batch for re-inspection. If all products for re-inspection conform to the provisions of 5.5, then the permissible deviation in dimension is judged as qualified; if one piece is still unqualified, then the permissible deviation in dimension is judged as unqualified.

7.2.3.4 Anti-cracking performance

If both pieces drawn conform to the provisions of 5.6.2, then the anti-cracking performance is judged as qualified; if one piece still does not conform to the provisions of 5.6.2, then double number shall be drawn from products of the same batch for re-inspection; if one piece is still not qualified, then anti-cracking performance is judged as unqualified; if both pieces drawn do not conform to the provisions of 5.6.2, then anti-cracking performance is judged as unqualified.

7.2.3.5 Overall judgment

On the basis that concrete compressive strength and anti-cracking performances are qualified, if appearance quality and permissible deviation in dimension are qualified, then the whole batch is qualified, otherwise it is deemed as unqualified.

7.3 Type inspection

7.3.1 Inspection conditions

Type inspection shall be carried out for any of the following circumstances:

- a) Trial-identification when new products are launched into production or old products are transferred to a new manufacturing plant;
- b) When structure, materials or process is significantly changed;
- c) It shall be conducted once every six months for normal production;
- d) When production is resumed after shutdown for half a year;
- e) When exit-factory inspection results are significantly different from previous type inspection.

7.3.2 Inspection items

It includes concrete compressive strength, appearance quality, permissible deviation in dimension, bending performance, etc. Test item may be increased upon mutual agreement if necessary.

Note: If there is no special requirement, bending test is not necessary for bending test pile joint.

7.3.3 Sampling

Randomly draw 10 pieces from qualified products of the same-type, same-specification and same-model that pass exit-factory inspection for inspections on appearance quality and permissible deviation in dimension; randomly draw 2 pieces from the 10 pieces for bending performance inspection. After bending test is completed, randomly draw one piece from both pieces; measure the thickness of protective cover at three different parts on the same cross section in the middle of pile.

7.3.4 Judgment rules

7.3.4.1 Concrete compressive strength

~~Check the original records of concrete compressive strength for concrete of the same batch.~~

7.3.4.1 is changed to: Check the original records of concrete compressive strength inspection for piles of the same batch. Evaluation shall follow the relevant provisions of GBJ107.

[Translator Note: 7.3.4.1. Please refer to "Amendment Sheet" for the latest modifications]

7.3.4.2 Appearance quality

If all the 10 pieces of piles conform to 7.2.3.2a), then the appearance quality is judged as

qualified; if three or more pieces do not conform to 7.2.3.2a), then the appearance quality is judged as unqualified; if two or less pieces do not conform to 7.2.3.2a), double number shall be drawn from the products of the same batch for re-inspection; if all re-inspected products conform to 7.2.3.2a), then the appearance quality is judged as qualified; if one of the pieces is still unqualified, then the appearance quality is judged as unqualified. For piles that do not conform to any one of items 2, 4, 5, 6, 7, 8, 9 and 10 in Table 5 of 5.4, then the appearance quality is deemed as unqualified.

7.3.4.3 Permissible deviation in dimension

If all the 10 pieces of piles drawn conform to the provisions of 5.5, then the permissible deviation in dimension is judged as qualified; if three or more pieces do not conform to the provisions of 5.5, permissible deviation in dimension is judged as unqualified; if two or less pieces do not conform to the provisions of 5.5, then double pieces shall be drawn from products of the same batch for re-inspection. If all products for re-inspection conform to the provisions of 5.5, then the permissible deviation in dimension is judged as qualified; if one piece is still unqualified, then the permissible deviation in dimension is judged as unqualified.

7.3.4.4 Bending performance

If both pieces drawn conform to the provisions of 5.6.2 and 5.6.3, then the bending performance is judged as qualified; if one piece still does not conform to the provisions of 5.6.2 and 5.6.3, then double number shall be drawn from products of the same batch for re-inspection; if one of the pieces is still unqualified, then the bending performance is judged as unqualified; if both pieces drawn do not conform to the provisions of 5.6.2 and 5.6.3, then the bending performance is judged as unqualified.

7.3.4.5 Protective layer thickness

If all three values of the piece drawn conform to the provisions of 5.3, then the protective layer thickness is judged as qualified. If one of the values does not conform to the provisions of 5.3, then double number shall be drawn from the products of the same batch for re-inspection. If one of the pieces still does not conform to the provisions of 5.3, then protective layer thickness is judged as unqualified and re-inspection is not allowed.

7.3.4.6 Overall judgment

On the basis that concrete compressive strength, protective layer thickness and bending performance are qualified, when appearance quality and permissible deviation in dimension are qualified, then the products of this batch are judged as qualified, otherwise it is judged as unqualified.

8. Mark

8.1 Marks shall be on outer surface of pile 1 000 mm~1 500 mm from end.

8.2 Mark content includes manufacturer name or product registered trademark, pile mark,

date of manufacture, conformity identification.

9 Storage and transportation

9.1 Storage

9.1.1 Pile stacking site shall be solid and smooth.

9.1.2 Pile stacking

For piles that are not more than 15 m long, the lowest layer is placed on skid based on the positions of two supporting points as shown in Figure 3; for piles and slicing piles that are more than 15 m long, the lowest layer shall be stacked through multiple skids and the skids shall be placed on the same horizontal plane.

Note: If stacking site has been reinforced, touchdown laying may also be adopted.

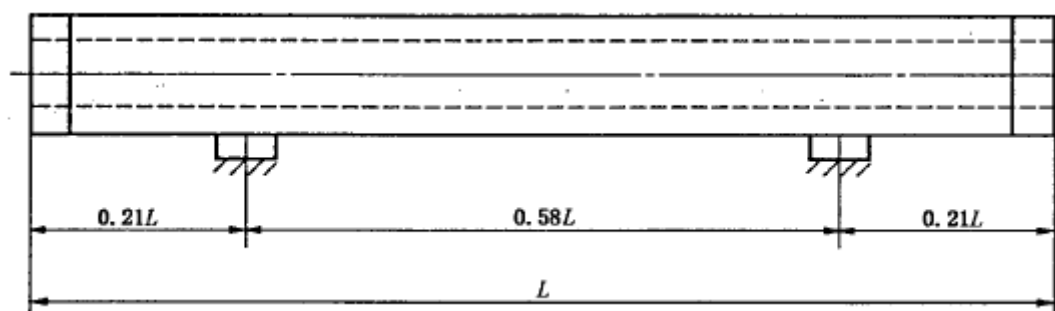


Figure 3 Schematic diagram of Two-point-method positions

9.1.3 Piles shall be respectively stacked based on specifications, type, model, wall thickness and length; reliable anti-slip, anti-roll and other safety measures shall be taken during stacking process. Stacking layers shall follow the specifications in Table 9.

Table 9 Pile stacking layers

Outer diameter /mm	300~400	500~600	700 ~1 000	1 200	1 300~1 400
Stacking layers	9	7	5(4)	4(3)	3(2)
Note: Figures in brackets are adopted when pile and splicing pile length exceeds 15m.					

9.1.4 Pile lifting

9.1.4.1 Piles that are less than 15 m long and conform to the length specification in Table 1, two-point (see Figure 4) or two-end hooking method is preferably adopted.

10 Product certificate

Product certificate shall include the following contents:

- a) Certificate No.;
- b) Adopted standard number;
- c) Pile type, specification, model, length and wall thickness;
- d) Product quantity;
- e) Strength grade of concrete;
- f) Date of manufacture or pile No.;
- g) Manufacturer name, date of production;
- h) Signature or seal of the inspector (code of inspection is available).

A.3 Test methods and inspection rules for mechanical properties of non-series series piles shall follow the provisions of chapter 6, chapter 7, C.2 and C.3.

Table A.2 Mechanical property indicators of non-preferred series piles

Outer diameter /mm	Model	Wall Thickness t/mm	Anti-cracking Bending Moment/(kN • m)	Ultimate Bending Moment(kN • m)	Anti-cracking Shear/kN
350	A	80	36	54	129
	AB		44	73	148
	B		51	92	166
	C		61	122	181
	A		79	120	204
450	AB	95	98	165	230
	B		117	210	259
	C		132	265	283
550	A	110	125	188	262
	AB		154	254	302
	B		182	328	337
	C		211	422	369
	A	125	137	207	316
	AB		169	279	364
	B		200	361	407
	C		232	464	445

Annex B

(Normative Annex)

Structure Reinforcement of Piles

Structure reinforcement of pile corresponding to minimum reinforcement area of prestressed steel in Table 1 is shown in Table B.1.

Table B.1 Structural reinforcement of piles

Outer Diameter D/mm	Model	Wall Thickness t/mm	Prestress ed Steel Distributio n Diameter D _p /mm	Prestressed Steel Reinforcement	Outer Diamete r D/mm	Model	Wall Thickness t/mm	Prestre ssed Steel Distribu tion Diamet er D _p /mm	Prestressed Steel Reinforcemen t
300	A	70	230	6Φ7.1	700	A	130	600 590	13Φ10.7
	AB			6Φ9.0		AB			26Φ9.0
	B			8Φ9.0		B			26Φ10.7
	C			8Φ10.7		C			26Φ12.6
400	A	95	308	10Φ7.1/7Φ9.0	800	A	110	700 690	15Φ10.7
	AB			10Φ9.0/7Φ10.7		AD			15Φ12.6
	B			10Φ10.7		B			30Φ10.7
	C			13Φ10.7		C			30Φ12.6
500	A	100	406	11Φ9.0	800	A	130	700 690	16Φ10.7
	AB			11Φ10.7		AB			16Φ12.6
	B			11Φ12.6		B			32Φ10.7
	C			13Φ12.6		C			32Φ12.6
	A	125		12Φ9.0	1 000	A	130	880	32Φ9.0
	AB			12Φ10.7		AB			32Φ10.7
	B			12Φ12.6		B			32Φ12.6
	C			15Φ12.6		C			32Φ14.0
600	A	110	506	14Φ9.0	1 200	A	150	1 060	30Φ10.7
	AB			14Φ10.7		AB			30Φ12.6
	B			14Φ12.6		B			45Φ12.6
	C			17Φ12.6		C			45Φ14.0
	A	130		16Φ9.0	1 300	A	150	1 160	24Φ12.6
	AB			16Φ10.7		AB			48Φ10.7

	B			16 Φ 12.6		B			48 Φ 12.6
	C			20 Φ 12.6		C			48 Φ 14.0
700	A	110	600	12 Φ 10.7	1 400	A	150	1 260	25 Φ 12.6
	AB			24 Φ 9.0		AB			50 Φ 10.7
	B			24 Φ 10.7		B			50 Φ 12.6
	C			24 Φ 12.6		C			50 Φ 14.0
Note 1: If bar diameter different from the specifications in Table B.1 is adopted for substitution, minimum reinforcement area of prestressed steel after substitution shall conform to the provisions in Table 1. Bar spacing is not less than 2 times bar diameter and shall be greater than 4/3 maximum particle size of coarse aggregates. Note 2: Since the maximum diameter of low-relaxation spiral channel steel is Φ 12. 6 mm, when C-type piles with a diameter of greater than 1 000 mm adopts Φ12. 6 mm steel bar reinforcement, too narrow spacing is not conducive to concrete pouring, it is recommended to use Φ4. 0 mm steel bars that the quality meets the requirements in 4.1. 3.1.									

[Translator Note: Table B.1. Please refer to "Amendment Sheet" for the latest modifications]

Annex C

(Normative Annex)

Share performances and test methods of piles

C.1 Sheer performances of pile

C.1.1 Sheer performances of pile are shown in Table C.1.

Table C.1 Shear performance of piles

Outer Diameter D/mm	Model	Wall Thickness t/mm	Anti-cracking Shear Force/kN	Outer Diameter D/mm	Model	Wall Thickness t/mm	Anti-cracking Shear Force/kN
300	A	70	96	700	A	130	435
	AB		111		AB		498
	B		124		15		556
	C		136		C		610
400	A	95	173	800	A	110	468
	AB		200		AB		520
	B		224		B		573
	C		245		C		652
500	A	100	239	1 000	A	130	526
	AB		271		AB		384
	B		302		B		648
	C		331		C		725
	A	125	284	1 200	A	150	695
	AB		327		AB		774
	B		364		B		858
	C		399		C		1262 930
600	A	110	316	1 300	A	150	946
	AB		362		AB		1 056
	B		404		B		1 175
	C		443		C		1 334
	A	130	362	1 400	A	150	1 018
	AB		417		AB		1 149
	B		465		B		1 302
	C		610		C		1 408
700	A	110	390	1 400	A	150	1 092
	AB		437		AB		1 236
	B		481		B		1 385
	C		545		C		1 511

National Standard of the People's Republic of China

ANNOUNCEMENT

2014 No.15

Announcement on Approving Issuance of GB 13476-2009

“Pretensioned Spun Concrete Piles” National Standard

No.1 Amendment Sheet

Standardization Administration of the People's Republic of China approves GB 13476-2009 “Pretensioned Spun Concrete Piles” National Standard No.1 Amendment Sheet. It shall be implemented on December 1, 2014. Hereby it is released (see attachment).

Standardization Administration of the People's Republic of China (sealed)

Standardization Administration of the People's Republic of China

July 7, 2014

Attachment

National Standard No.1 Amendment Sheet

GB 13476-2009 “Pretensioned Spun Concrete Piles”

a. clause 4.2.2.1

Changed to: Prestressed steel shall be uniformly reinforced along distribution circumference; the minimum reinforcement ratio shall be not smaller than 0.5% and not less than 6 pieces; allowable spacing deviation is $\pm 5\text{mm}$. Minimum reinforcement ratio of prestressed steel shall conform to the provisions in Table 1.

Note: Structural reinforcement corresponding to minimum reinforcement area of prestressed steel is shown in Annex B.

b. clause 4.2.2.2

Changed to: Spiral bar diameter shall not be lower than the provisions specified in Table 4. The length of spiral bar encrypted area at both ends of piles shall be 3 times ~ 5 times of the diameter and shall not be less than 2000mm. Clearance distance of spiral bar may not be greater than 45mm; screw pitch of the rest of spiral bars is 80mm. Allowable deviation of screw pitch is $\pm 5\text{mm}$.

C. clause 5.3 Concrete cover

Changed to: Thickness of concrete protective cover of pile prestressed steel for building (structure) foundation shall not be less than 40 mm. Concrete protective layer thickness of prestressed steel of piles for foundation treatment and temporary facilities may not be less than 25mm.

Note: For piles that are used in environment with special requirement, the thickness of protective cover refers to relevant standards or regulations.

d. clause 7.3.4.1 Compressive strength of concrete

Changed to: Check the original records of concrete compressive strength inspection for piles of the same batch. Evaluation shall follow the relevant provisions of GBJ107.

e. Distribution diameter D_p value “600” of prestressed steel with outer diameter of 700mm in Table B.1 is changed to “590”; distribution diameter D_p value “700” of prestressed steel with outer diameter of 800mm is changed to “690”;

f. Crack shear value “1262” for outer diameter 1000mm and model C in Table C.1 is changed to “930”.

_____**END**_____

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