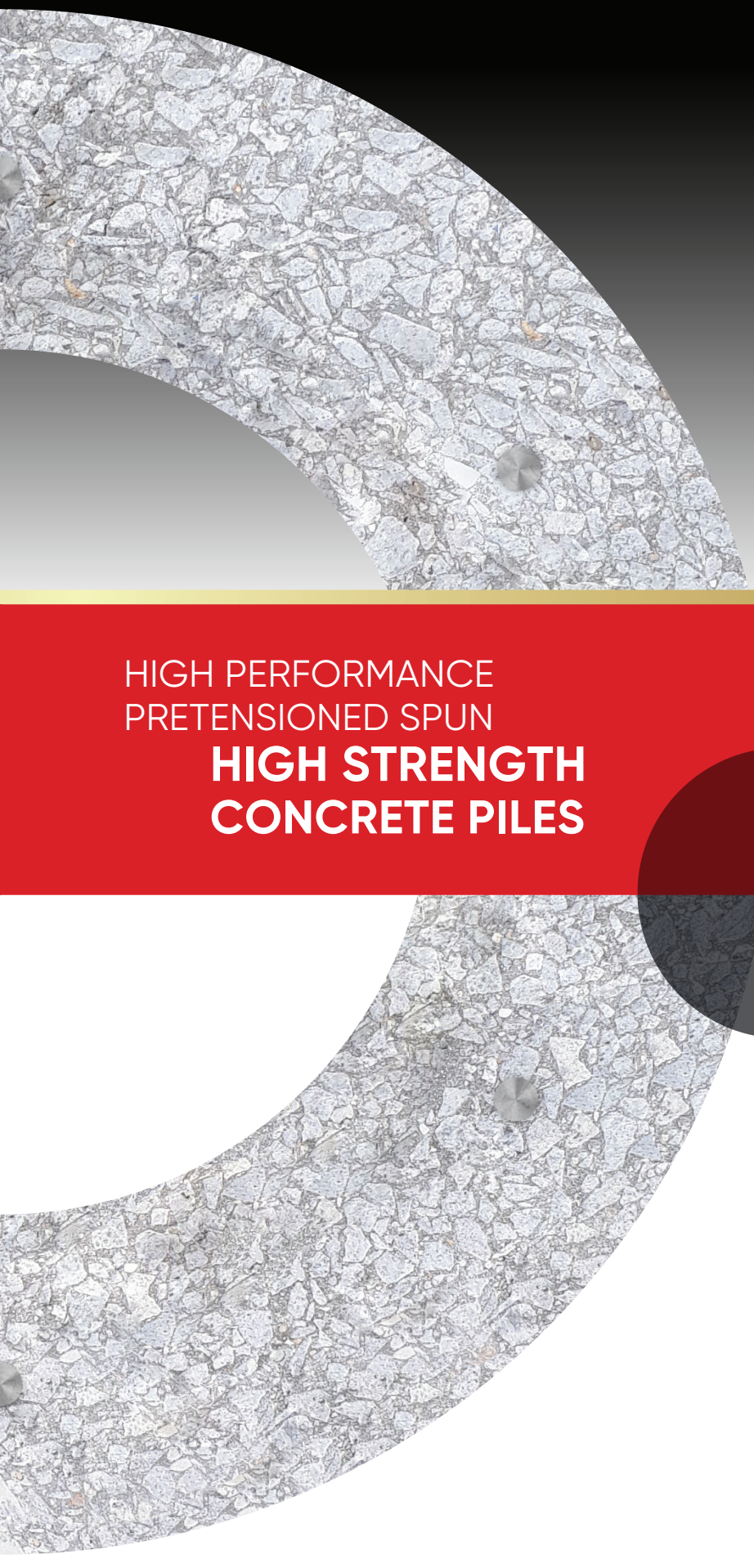


ICP PILES

HIGH PERFORMANCE
PRETENSIONED SPUN

HIGH STRENGTH CONCRETE PILES

WE DELIVER

An IJM Company

Introduction

INDUSTRIAL CONCRETE PRODUCTS SDN BHD (ICP) is the first commercial manufacturer of HIGH PERFORMANCE PRETENSIONED SPUN HIGH STRENGTH CONCRETE PILES (ICP PHC PILES) in Malaysia. Presently, ICP is the largest manufacturer in South East Asia. ICP Piles are circular hollow in cross-section and are manufactured in sizes ranging from diameter 250mm to 1,200mm with lengths varying from 6m to 46m in single piece. For large diameter piles, ICP has pile joining facility which is able to pre-join the piles up to 75m.

ICP Piles are exported to Brunei, Singapore, Bangladesh, Sri Lanka, the Middle East, Indonesia, Pakistan, Philippines, Vietnam, Myanmar, USA, Canada, New Zealand, Maldives and Samoa. ICP Piles are also supplied to numerous projects in Southern China from our plant in Jiangmen, China.

LOCATION OF ICP FACTORIES IN MALAYSIA

AREAS OF APPLICATION

- Bridges
- Piled Embankments
- Building Foundations
  - ▶ High rise, school and government projects.
- Marine Structures
- Civil Engineering Works
- Heavy Industries

PRODUCT ATTRIBUTES

- Steam curing enables faster production rate and delivery to project sites.
- Can be customized to suit project requirements.
- Spinning process results in more durable concrete with high resistance to corrosion.
- High strength concrete up to grade 100 enables piles to be driven through hard strata.
- Can be manufactured up to diameter 1200mm and a maximum single length of 46 metres. Big diameter piles can also be joined in factory up to the length of 75m.
- Environmental friendly installation by hydraulic jacking equipment which is free of noise, air pollution and vibration.
- Prestressed concrete provides higher bending moment capacity compared to conventional reinforced concrete piles.

STANDARDS

ICP PHC Piles comply with MS 1314:Part 4:2004 and also generally complies with JIS A 5337:1987. ICP PHC Piles are modified to suit BS 8004:1986 – Foundations and BS 8110:1997 – Structural Use of Concrete. Concrete complies with SS EN 206 : 2014 - Specification of Concrete.

MATERIALS

Aggregates – Coarse aggregates shall be 20mm granite. Fine aggregates shall be clean river sand or washed mining sand.
Cement – Portland cement complies with MS 522:2007.
Prestressing Steel – High frequency induction heat treated bars manufactured to JIS G 3137:1994 or equivalent.
Spiral Wire – Hard drawn wire.

CONCRETE STRENGTH

Minimum concrete cube strength:

at transfer of prestress		30N/mm^2
at 28 days	- Grade 80 pile	80N/mm^2
	- Grade 90 pile	90N/mm^2
	- Grade 100 pile	100N/mm^2

JOINT

The joint is designed to have the same performance as the main body particulary in respect of bending strength. All ICP PHC Piles have steel extension plates for splicing.

LIFTING POINTS

For piles up to 12m length, piles shall be lifted by using steel hooks at both ends. For piles exceeding 12m, piles shall be lifted by wrapping wire ropes around the piles at the marked lifting points.

PILE SHOE

All ICP PHC piles will be supplied either open ended, with a flat shoe or with other type of shoes such as x-pointed shoe, rock shoe and pipe shoe.

CURING

After casting, the piles are steam cured. When the concrete reaches the specified transfer strength, the piles are demoulded, marked and checked for quality. The piles can normally be transported and driven after three days from the date of casting, or when the cube strength reaches 70 N/mm^2.

IDENTIFICATION

All ICP PHC Piles have the typical markings as below:

Company's Initial	ICP
Malaysian Standard	MS1314: Part 4
Pile Size and Class	60B800
Date of Cast (yy/mm/dd)	190102
Serial No & Factory Code	001L3
Pile Length and Type	12E

Logo as Trademark

Other markings:
S - Starter (Flat Shoe/X-Pointed Shoe/ Rock Shoe/Pipe Shoe)
E - Extension
B8 - Class B, Grade 80
B9 - Class B, Grade 90
BX - Class B, Grade 100

STANDARD LENGTHS

ICP PHC Piles are available in lengths of 6m to 46m subject to certain limitations.

DELIVERY

ICP Standard Piles are normally available ex-stock. Custom made piles usually takes two to three weeks from date of confirmed order.

TECHNICAL DATA

Technical data of our standard piles are given in the tables on the next page. Please note that the axial loads represent the structural capacities of the piles. Actual working load depends on the soil conditions and the pile slenderness ratio. Appropriate reduction of axial loads should be applied for:

a) marine structures;
b) piles subjected to bending;
c) high upstand;
d) piles driven through very poor top stratum;
e) raking piles, etc.

DEFINITIONS

ICP PHC Piles: High Performance Pretensioned Spun High Strength Concrete Piles
MS: Malaysian Standard
JIS: Japanese Industrial Standard
BS: British Standard
SS EN: Singapore Standard

QUALITY SYSTEM SIRIM
UKAS MANAGEMENT SYSTEMS 074

CERTIFIED TO ISO 9001:2015
CERT. NO. : AR0122

Properties Of ICP Piles

STANDARD GRADE 80 PILES

CLASS A (EFFECTIVE PRESTRESS ≥ 4.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
350	60	6-12	142	8	-	54,664	3,533	32.9	54.1	104	5.3
400	65	6-12	178	8	-	68,408	5,106	42.7	61.8	132	4.3
450	70	6-12	217	10	-	83,566	7,113	60.4	86.9	161	4.5
500	80	6-12	274	12	-	105,558	9,888	82.3	115.9	204	4.3
600	90	6-12	375	-	12	144,199	16,586	148.8	222.5	276	5.0

CLASS B (EFFECTIVE PRESTRESS ≥ 5.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar			Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm	10.7mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
250	55	6-12	88	6	-	-	33,694	1,435	14.9	29.0	63	6.4
300	60	6-12	118	7	-	-	45,239	2,383	22.9	40.6	86	5.6
350	70	6-12	160	9	-	-	61,575	3,778	35.6	60.8	117	5.4
400	80	6-15	209	12	-	-	80,425	5,643	53.7	92.7	153	5.5
450	80	6-15	242	-	8	-	92,991	7,624	69.3	111.2	178	5.1
500	90	6-15	301	-	10	-	115,925	10,518	95.9	154.5	221	5.1
600	100	6-15	408	-	14	-	157,080	17,546	163.1	259.6	299	5.3
700	110	6-18	530	-	20	-	203,889	27,131	264.0	432.6	386	5.7
800	120	6-18	667	-	24	-	256,354	39,455	375.5	593.3	487	5.5
900	130	6-18	818	-	28	-	314,473	54,942	510.3	778.7	599	5.3
1000	140	6-18	983	-	-	24	378,248	74,056	688.9	1042.8	720	5.3
1200	150	6-18	1286	-	-	36	494,801	120,188	1198.5	1877.1	934	6.0

CLASS C (EFFECTIVE PRESTRESS ≥ 7.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar				Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm	10.7mm	12.6mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
250	55	6-12	88	7	-	-	-	33,694	1,443	16.2	33.8	63	7.2
300	60	6-12	118	10	-	-	-	45,239	2,416	28.0	57.9	84	7.6
350	70	6-15	160	-	8	-	-	61,575	3,826	43.0	86.5	114	7.2
400	80	6-15	209	-	12	-	-	80,425	5,748	69.7	148.3	147	8.1
450	80	6-15	242	-	12	-	-	92,991	7,734	86.9	166.9	173	7.2
500	90	6-18	301	-	15	-	-	115,925	10,670	120.3	231.7	215	7.3
600	100	6-30	408	-	20	-	-	157,080	17,773	198.0	370.8	292	7.1
700	110	6-46	530	-	-	20	-	203,889	27,498	320.6	608.3	376	7.6
800	120	6-46	667	-	-	24	-	256,354	39,966	454.7	834.3	475	7.4
900	130	6-46	818	-	-	28	-	314,473	55,622	616.2	1095.0	585	7.1
1000	140	6-46	983	-	-	36	-	378,248	75,188	862.8	1564.3	699	7.5
1200	150	6-36	1286	-	-	46	-	494,801	121,361	1376.5	2398.6	917	7.3
1000	140	6-46	983	-	-	-	34	378,248	76,247	961.1	2051.9	688	8.6
1200	150	6-36	1286	-	-	-	46	494,801	123,457	1583.1	3331.3	898	8.8

FORMULA FOR AXIAL LOAD

Based on BS 8004: 1986, the maximum allowable axial stress that may be applied to a pile acting as a short strut should be one quarter of specified works cube strength at 28 days less the prestress after losses.

$$N = f_{ca} \times A$$
$$= 1/4 (f_{cu} - f_{pe}) \times A$$

Where,

N = maximum allowable axial load

A = cross section area of concrete f_{ca}

f_{ca} = permissible compressive strength of concrete

f_{cu} = specified compressive strength of concrete

f_{pe} = effective prestress in concrete

STANDARD GRADE 90 PILES

CLASS A (EFFECTIVE PRESTRESS ≥ 4.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
350	60	6-12	142	8	-	54,664	3,533	33.8	54.1	118	5.3
400	65	6-12	178	8	-	68,408	5,106	44.0	61.8	149	4.3
450	70	6-12	217	10	-	83,566	7,113	62.3	86.9	182	4.5
500	80	6-12	274	12	-	105,558	9,888	84.9	115.9	231	4.3
600	90	6-12	375	-	12	144,199	16,586	153.2	222.5	313	5.0

CLASS B (EFFECTIVE PRESTRESS ≥ 5.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
250	55	6-12	88	6	-	33,694	1,435	15.3	29.0	72	6.4
300	60	6-12	118	7	-	45,239	2,383	23.6	40.6	97	5.6
350	70	6-12	160	9	-	61,575	3,778	36.6	60.8	133	5.4
400	80	6-15	209	12	-	80,425	5,643	55.2	92.7	173	5.5
450	80	6-15	242	-	8	92,991	7,624	71.3	111.2	201	5.1
500	90	6-15	301	-	10	115,925	10,518	98.7	154.5	251	5.1
600	100	6-15	408	-	14	157,080	17,546	167.7	259.6	339	5.3

STANDARD GRADE 100 PILES

CLASS A (EFFECTIVE PRESTRESS ≥ 4.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
350	60	6-12	142	8	-	54,664	3,533	34.7	54.1	132	5.3
400	65	6-12	178	8	-	68,408	5,106	45.2	61.8	167	4.4
450	70	6-12	217	10	-	83,566	7,113	64.0	86.9	203	4.5
500	80	6-12	274	12	-	105,558	9,888	87.3	115.9	257	4.3
600	90	6-12	375	-	12	144,199	16,586	157.3	222.5	349	5.0

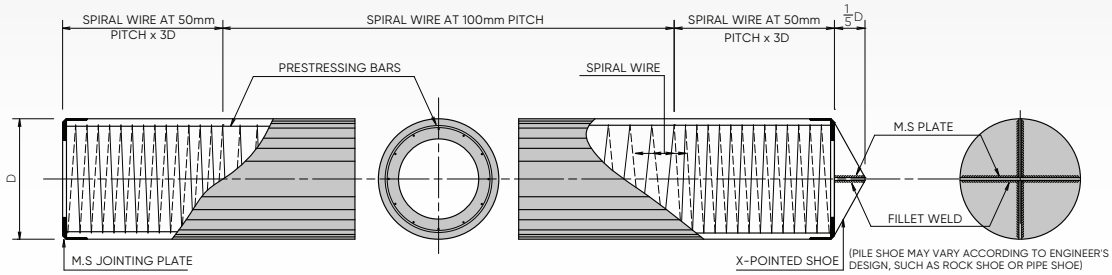
CLASS B (EFFECTIVE PRESTRESS ≥ 5.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
250	55	6-12	88	6	-	33,694	1,435	15.7	29.0	80	6.5
300	60	6-12	118	7	-	45,239	2,383	24.2	40.6	109	5.6
350	70	6-12	160	9	-	61,575	3,778	37.5	60.8	148	5.4
400	80	6-15	209	12	-	80,425	5,643	56.6	92.7	194	5.5
450	80	6-15	242	-	8	92,991	7,624	73.2	111.2	225	5.1
500	90	6-15	301	-	10	115,925	10,518	101.3	154.5	280	5.1
600	100	6-15	408	-	14	157,080	17,546	172.1	259.6	379	5.3

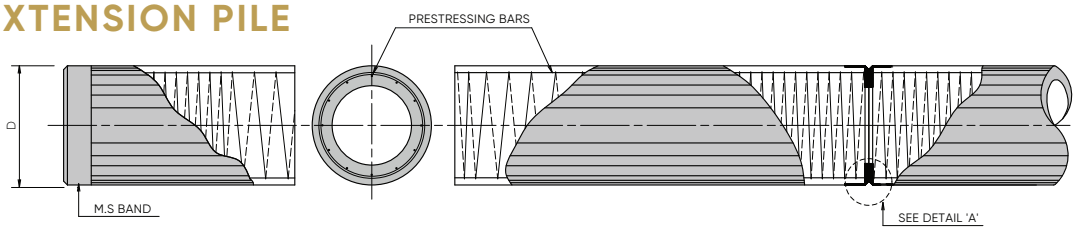
Sectional Details & Bonding Into Pile Cap

SECTIONAL DETAILS OF ICP PILES

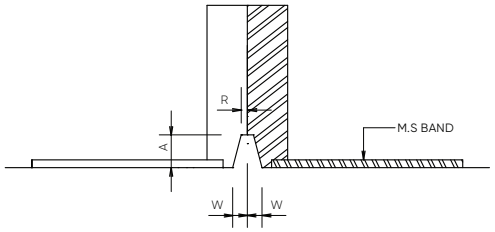
STARTER PILE



EXTENSION PILE



JOINT WELDING DETAILS

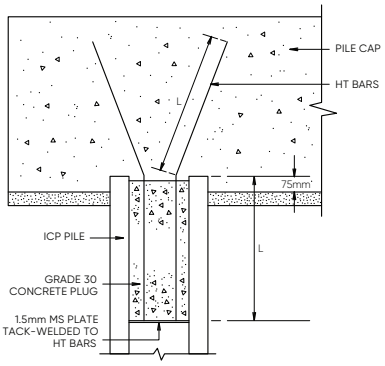


DETAIL 'A'

Dia Of Pile D mm	Throat Thickness A mm	W mm	Root R mm
250	8.5	4.0	2.0
300	8.5	4.0	2.0
350	8.5	4.0	2.0
400	10	4.5	2.0
450	10	4.5	2.0
500	12	5.0	2.0
600	12	5.0	2.0
700	14	6.0	2.0
800	14	6.0	2.0
900	14	6.0	2.0
1000	14	6.0	2.0
1200	14	6.0	2.0

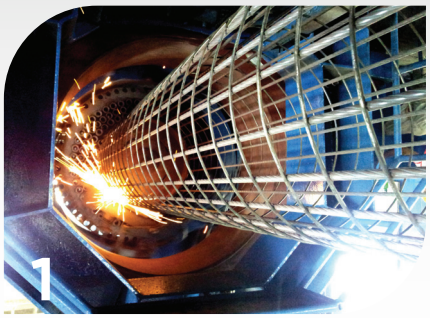
BONDING ICP PILES INTO PILE CAP

Dia Of Pile	HT Bars		
	Quantity	Dia.	L
mm	nos	mm	mm
250	4	12	500
300	4	12	500
350	5	12	550
400	5	12	700
450	5	16	800
500	6	16	900
600	8	16	1000
700	8	20	1200
800	8	20	1400
900	10	25	1500
1000	12	25	1500
1200	20	25	2000



As the PC bars are bonded with concrete, ICP Piles may be cut off at any point. The piles need not be stripped down to expose the bars and can be bonded to the pile cap as shown in the above sketch. If the piles are not subjected to tensile loads, the recommended H.T. bars are considered adequate.

Manufacturing Process

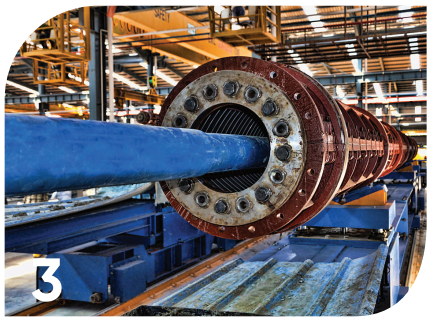


CAGE MAKING/MOULD SETTING

PC bars in coil form are straightened and cut to correct lengths. The ends are warm-headed to form button heads. The bars are passed through the cage forming machine where spiral wire is automatically spot-welded at the correct spacings. End plates are fitted to the cage. The whole cage is then placed onto the bottom half mould.

STRESSING

The PC bars are stressed against the mould through a central shaft and stressing plate. The stressing is being carried out in a single operation. This ensures uniformity of stress in all the PC bars and hence straightness of the pile.



CONCRETE FEEDING

Concrete from the computerised batching plant is discharged into a feeding hopper. The concrete is then fed into the mould by pumping.*

PILE SPINNING

The pile is then compacted by the centrifugal spinning machine. Spinning process squeezes out excess water, thus increases the concrete strength.

STEAM CURING

The pile is sent to the steam tank for rapid curing process in order to achieve the required transfer strength for early demoulding.

DEMOULDING

After demoulding, final QC inspection is carried out according to the quality manual specification.

*Note: For open concrete feeding, concrete is fed into the mould before stressing.

Project Photos

ICP Piles have been used extensively as foundation piles for power stations, highrise buildings, civil engineering works, bridges, marine structures, harbours, schools, government projects, etc. The piles are widely used in local and overseas construction industry, namely Brunei, Singapore, Bangladesh, Sri Lanka, the Middle East, Indonesia, Pakistan, Philippines, Vietnam, Myanmar, USA, Canada, New Zealand, Maldives and Samoa.

OMA 1, Commercial cum Residential Complex, Vancouver, Canada

Shenhua Coal Terminal Port, Zuhai, China

Gardens By The Bay, Singapore

10 Mont Kiara, Mont Kiara, Kuala Lumpur, Malaysia

Phoenix Hotel, Forest City, Johor, Malaysia

Temburong Bridge, Brunei

Park Green Condominium, SengKang East Ave, Singapore

One Kilometer Container Terminal, Chittagong Port, Bangladesh

Saigon International Container Terminal, Vung Tau, Vietnam

Ahlone International Port Terminal Phase 2 & 3, Yangon, Myanmar

330 Third Street South Condominium, St Peterburg, Florida, USA

2nd Penang Bridge, Penang, Malaysia

Tanjung Bin Power Plant, Johor, Malaysia

Aden Flour Mill Jetty, Aden, Yemen

Club Mediterranean, Maldives

Pengerang Project, Johor, Malaysia

Certificates

IKRAM QA CERTIFICATION
Certification Scheme Type 5

K-MARK
Product Certification Mark

PRODUCT CERTIFICATE OF CONFORMITY

This certificate has been approved and issued in compliance with IKRAM QA GUIDE 1

Name and Address of Certificate Holder

INDUSTRIAL CONCRETE PRODUCTS SDN. BHD.,
PT 2272, Kawasan Perindustrian Kg. Acheh,
32000 Sitiawan, Perak Darul Ridzuan, Malaysia.

Status Of Certificate Holder : Manufacturer

It is hereby certified that the product as detailed in this certificate has satisfactorily complied with the requirements of the appropriate Product Standard(s).

Particulars of Product

Product Name	Product Standard(s)
Precast Pretensioned Spun Concrete Piles	MS 1314 : PART 4 : 2004

Product Descriptions

Class : Class A, Class B & C
Size (Diameter) : 300mm - 1200mm, 250mm - 1200mm

Brand	Country of Origin
ICP	MALAYSIA

Name and Address of Manufacturer

INDUSTRIAL CONCRETE PRODUCTS SDN. BHD.,
PT 2272, Kawasan Perindustrian Kg. Acheh,
32000 Sitiawan, Perak Darul Ridzuan, Malaysia.

The use of this certificate is subjected to the terms and conditions of certification. This certificate remains the property of IKRAM QA SERVICES SDN. BHD. and shall be returned on request.

Certificate issued by
IKRAM QA SERVICES SDN. BHD.

AZMAN BIN IDRIS
Director

TAN SRI DATUK SERI OTHMAN BIN MOHD HJAL
Chairman

Certificate number :
IKRAM-A004-C0103-N3000

IKRAM QA Services Sdn. Bhd. (478643-A)
Address: Block 5, Level 1, Unipark Suria, Jalan Ryan - Ucsia, 43000 Kajang, Selangor Darul Ehsan, Malaysia.
Tel: +603 8738 1212 Fax: +603 8736 7254 email: ikramqa@ikram.com.my www.ikramqa.com.my
Copyright 2004 : IKRAM QA SERVICES SDN. BHD.

GUARDIAN INDEPENDENT CERTIFICATION

Certificate of Conformity

Ready-Mixed Concrete Certification
(Conditional)

This certificate is issued to

Industrial Concrete Products Sdn. Bhd.
Wisma IJM Annexe, Jalan Yong Shook Lin,
46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia

ICP Lumut Line 2 Batching Plant
PT 2272 Kawasan Perindustrian Kampung Acheh,
32000 Sitiawan, Perak Darul Ridzuan, Malaysia

For the product certification of

Ready- Mixed Concrete
(See Appendix for products' details)

Which has complied with the requirements of the scheme and based on the following:

SS EN 206: 2014; SS 544: Part 1 & 2: 2014;
SAC CT 06: 2015

Certificate No: GIC / 8842

Product conformity certificates are awarded on the basis of an assessment of conformity control system and process control covering contract review, products design, production facilities, quality control system and testing of the product, all coupled with assessment of the supporting quality management system.

Guardian Independent Certification Pte Ltd is accredited by the Singapore Accreditation council for certification in respect of Product Certification Systems (ISO / IEC Guide 17065: 2012 and SAC CT 05: 2015).

Certification Manager
Guardian Independent Certification Pte Ltd

10 Ubi Crescent #04-24 Ubi Techpark
Singapore 408564

ACCREDITED CERTIFICATION BODY
SAC

This Certificate is part of a full report and should be read in conjunction with it. This Certificate remains the property of Guardian Independent Certification Pte Ltd and shall be returned upon request. The use of this Certificate is subjected to the terms and conditions of the Ready - Mixed Concrete Scheme. The manufacturer 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 with Guardian Independent Certification Pte Ltd.

SIRIM QAS INTERNATIONAL

CERTIFICATE

QUALITY SYSTEM
SIRIM

SIRIM QAS International hereby certifies that

INDUSTRIAL CONCRETE PRODUCTS SDN. BHD.
SITE 6
KAWASAN PERINDUSTRIAN KAMPONG ACHEH
32000 SITIAWAN
PERAK DARUL RIDZUAN
MALAYSIA

has implemented a Quality Management System complying with

ISO 9001 : 2015

QUALITY MANAGEMENT SYSTEMS - Requirements

Scope of Certification

MANUFACTURE AND DELIVERY OF PRETENSIONED SPUN CONCRETE PILES.

UKAS
074

IQNet

Certification No. : AR 0122

SIRIM QAS International Sdn. Bhd.
Khalidah Mustafa
Managing Director
SIRIM QAS International Sdn. Bhd.

This certificate is granted subject to the terms and conditions as stated in the Certification Agreement.

CIDB MALAYSIA

No. Perakuan : A 001269

PERAKUAN PEMATUHAN STANDARD
(BAHAN BINAAN)

Adalah dengan ini Pengilang/Pengeluar yang dinyatakan di bawah ini telah mengeluarkan bahan binaan yang diperakui oleh Lembaga mengikut Bahagian VIIA Akta Lembaga Pembangunan Industri Pembinaan Malaysia (Pindaan 2011). Perakuan ini adalah tertakluk kepada syarat-syarat yang telah ditetapkan. Perakuan ini mengesahkan bahawa bahan atau produk binaan yang dinyatakan di bawah telah diperakukan

No. Pendaftaran : 1160524PK0125
Nama Pengilang / Pengeluar : INDUSTRIAL CONCRETE PRODUCTS SDN. BHD.
Alamat Kilang Berdaftar : PT 2272 & PLOT A1,A3 & A4, LUMUT PORT INDUSTRIAL PARK, KAWASAN PERINDUSTRIAN KG ACEH, SITIAWAN, PERAK. 32000 SITIAWAN PERAK

Kategori dan Jenis produk bahan binaan :
(Rujuk Lampiran A untuk butiran terperinci)

PRECAST CONCRETE PILES
- Spun Piles

Perakuan ini hendaklah diperbaharui selewat-lewatnya 30 hari sebelum tarikh tamat tempoh perakuan

Nota: Perakuan dikeluarkan setelah Lembaga menjalankan pemeriksaan dan pengesahan ke atas kilang dan produk-produk yang terkandung di dalam Pensijilan Produk (Product Certification) yang dikeluarkan oleh Badan Pensijilan yang diiktiraf. Pihak pengeluar/pengilang adalah bertanggungjawab untuk memastikan Pensijilan Produk (Product Certificate) sentiasa dalam tempoh sahlaku.

ISMAIL MAT NOR
PENGARAH
CIDB NEGERI PERAK
b.p Ketua Eksekutif

CIDB MALAYSIA

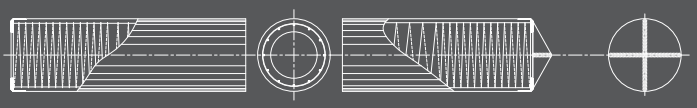
OTHER CERTIFICATES:

- OHSAS 18001
- ISO 14001: 2004
- ISO/IEC 17025: 2005

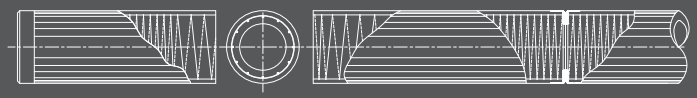
STANDARDS MALAYSIA

Certificate of Accreditation

PILE

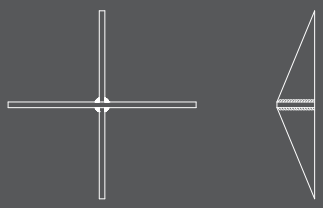


STARTER

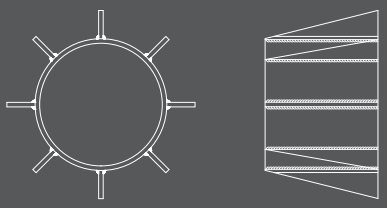


EXTENSION

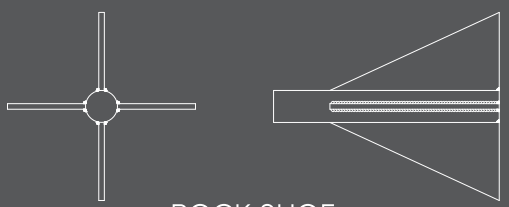
SHOES



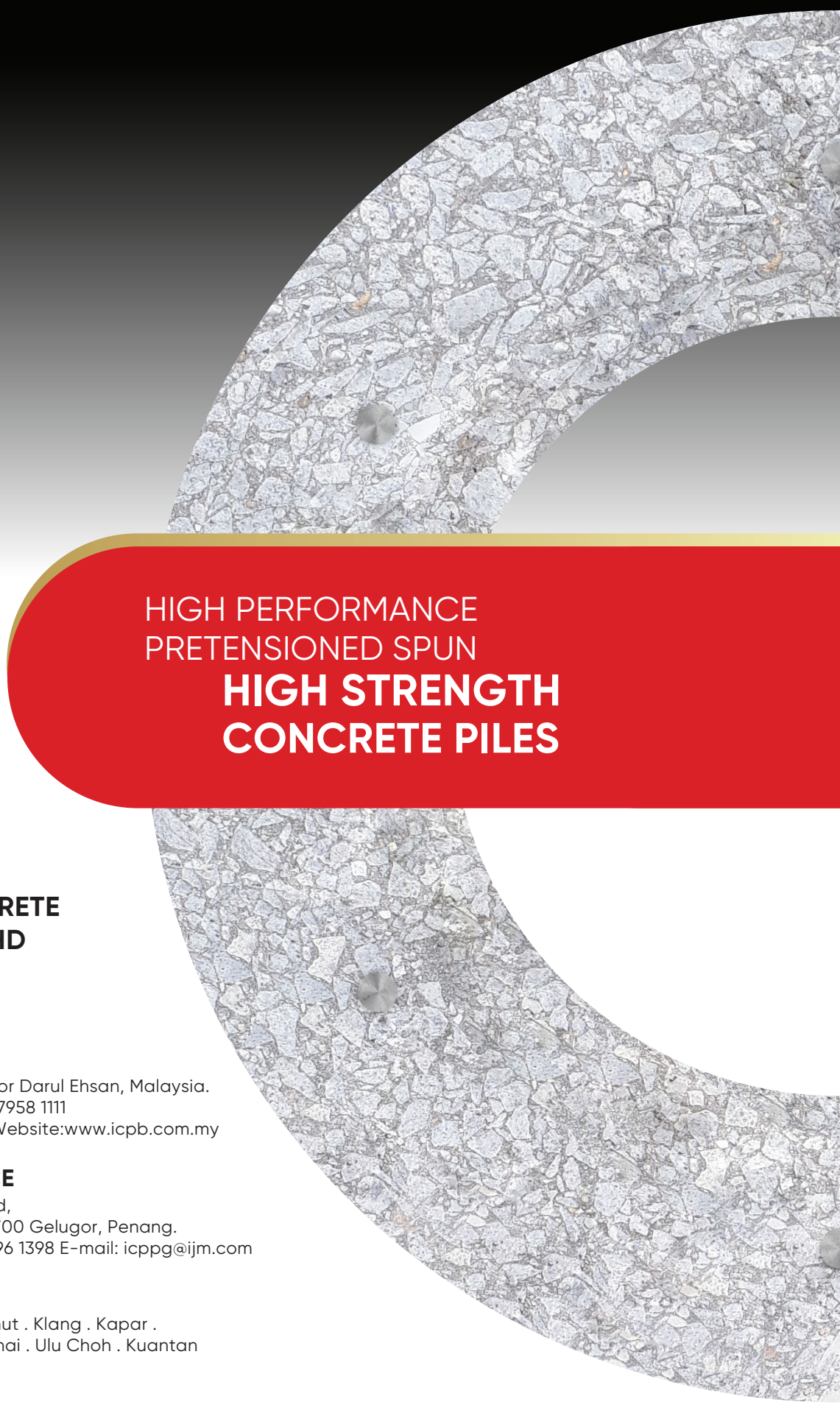
X-POINTED SHOE



PIPE SHOE



ROCK SHOE



HIGH PERFORMANCE PRETENSIONED SPUN HIGH STRENGTH CONCRETE PILES

INDUSTRIAL CONCRETE PRODUCTS SDN BHD

(CO. NO. 32369-W)

HEAD OFFICE

Wisma IJM Annexe,
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Tel: 603-7955 8888 Fax: 603-7958 1111
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PENANG SALES OFFICE

Unit 1-13-01, Menara IJM Land,
No, 1 Lebuh Tunku Kudin 3, 11700 Gelugor, Penang.
Tel: 604-296 1399 Fax: 604-296 1398 E-mail: icppg@ijm.com

PLANTS LOCATION

(MALAYSIA) . Jawi . Ipoh . Lumut . Klang . Kapar .
Nilai . Kuala Terengganu . Senai . Ulu Choh . Kuantan

(OVERSEAS) Jiangmen, China

An IJM Company

January 2019

ICP PILES

SPECIAL DESIGN PILES

GRADE 80 PILES

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short Strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm^2	x1000 mm^3	kNm	kNm	ton	N/mm^2
250	60	6 - 12	93	6		35,814	1,471	14.8	29.0	68	6.1
300	70	6 - 12	132	7		50,580	2,506	22.8	40.6	97	5.1
350	80	6 - 12	176	9		67,858	3,950	35.4	60.8	130	4.9
400	90	6 - 15	228	12		87,650	5,872	53.5	92.7	167	5.1
	100	6 - 15	245	12		94,248	6,044	53.1	92.7	181	4.8
450	90	6 - 15	265		8	101,788	7,996	69.5	111.2	195	4.7
	100	6 - 15	286		8	109,956	8,292	69.5	111.2	212	4.4
	105	6 - 15	296		8	113,804	8,414	69.4	111.2	220	4.2
500	100	6 - 15	327		10	125,664	10,972	96.2	154.5	241	4.7
	110	6 - 15	350		10	134,774	11,341	96.2	154.5	260	4.5
	115	6 - 15	362		10	139,094	11,497	96.0	154.5	268	4.3
600	110	6 - 15	440		14	169,332	18,302	163.9	259.6	324	4.9
	120	6 - 15	470		14	180,956	18,945	164.2	259.6	348	4.6
	125	6 - 15	485		14	186,532	19,228	164.3	259.6	359	4.5

SPECIAL DESIGN PILES

GRADE 90 PILES

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short Strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm^2	x1000 mm^3	kNm	kNm	ton	N/mm^2
250	60	6 - 12	93	6		35,814	1,471	15.2	29.0	77	6.1
300	70	6 - 12	132	7		50,580	2,506	23.5	40.6	109	5.1
350	80	6 - 12	176	9		67,858	3,950	36.5	60.8	147	5.0
400	90	6 - 15	228	12		87,650	5,872	55.0	92.7	190	5.1
	100	6 - 15	245	12		94,248	6,044	54.7	92.7	205	4.8
450	90	6 - 15	265		8	101,788	7,996	71.6	111.2	221	4.7
	100	6 - 15	286		8	109,956	8,292	71.7	111.2	240	4.4
	105	6 - 15	296		8	113,804	8,414	71.6	111.2	249	4.2
500	100	6 - 15	327		10	125,664	10,972	99.1	154.5	273	4.8
	110	6 - 15	350		10	134,774	11,341	99.1	154.5	294	4.5
	115	6 - 15	362		10	139,094	11,497	99.0	154.5	304	4.3
600	110	6 - 15	440		14	169,332	18,302	168.7	259.6	367	5.0
	120	6 - 15	470		14	180,956	18,945	169.2	259.6	394	4.7
	125	6 - 15	485		14	186,532	19,228	169.3	259.6	406	4.5

GRADE 100 PILES

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar		Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short Strut)	Effective Prestress
				7.1mm	9.0mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	mm^2	x1000 mm^3	kNm	kNm	ton	N/mm^2
250	60	6 - 12	93	6		35,814	1,471	15.6	29.0	86	6.1
300	70	6 - 12	132	7		50,580	2,506	24.1	40.6	122	5.1
350	80	6 - 12	176	9		67,858	3,950	37.4	60.8	164	5.0
400	90	6 - 15	228	12		87,650	5,872	56.5	92.7	212	5.1
	100	6 - 15	245	12		94,248	6,044	56.2	92.7	229	4.8
450	90	6 - 15	265		8	101,788	7,996	73.6	111.2	247	4.7
	100	6 - 15	286		8	109,956	8,292	73.7	111.2	268	4.4
	105	6 - 15	296		8	113,804	8,414	73.6	111.2	278	4.3
500	100	6 - 15	327		10	125,664	10,972	101.7	154.5	305	4.8
	110	6 - 15	350		10	134,774	11,341	101.8	154.5	328	4.5
	115	6 - 15	362		10	139,094	11,497	101.8	154.5	339	4.4
600	110	6 - 15	440		14	169,332	18,302	173.2	259.6	410	5.0
	120	6 - 15	470		14	180,956	18,945	173.8	259.6	440	4.7
	125	6 - 15	485		14	186,532	19,228	173.9	259.6	454	4.6

EURO CODE

GRADE 80 PILES

CLASS B (EFFECTIVE PRESTRESS ≥ 5.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar			Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm	10.7mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
250	55	6-12	88	6	-	-	33,694	1,435	16.7	30.2	67	6.5
300	60	6-12	118	7	-	-	45,239	2,383	25.3	42.6	90	5.7
350	70	6-12	160	9	-	-	61,575	3,778	38.4	63.7	122	5.4
400	80	6-15	209	12	-	-	80,425	5,643	57.0	97.0	160	5.5
450	80	6-15	242	-	8	-	92,991	7,624	72.5	117.9	185	5.1
500	90	6-15	301	-	10	-	115,925	10,518	98.3	163.4	230	5.1
600	100	6-15	408	-	14	-	157,080	17,546	160.5	276.1	312	5.3
700	110	6-18	530	-	20	-	203,889	27,131	262.9	462.0	405	5.9
800	120	6-18	667	-	24	-	256,354	39,455	372.7	635.4	510	5.6
900	130	6-18	818	-	28	-	314,473	54,942	504.9	835.9	625	5.4
1000	140	6-18	983	-	-	24	378,248	74,056	682.3	1122.6	752	5.4
1200	150	6-18	1286	-	-	36	494,801	120,188	1201.2	2035.0	984	6.2

CLASS C (EFFECTIVE PRESTRESS ≥ 7.0 N/mm²)

Nominal Diameter	Nominal Thickness	Length	Nominal Weight	Prestressing Bar			Area of Concrete	Section Modulus	Bending Moment		Recommended Max Structural Axial Working Load (For a short strut)	Effective Prestress
				7.1mm	9.0mm	10.7mm			Cracking	Ultimate		
mm	mm	m	kg/m	no.	no.	no.	mm²	x1000 mm³	kNm	kNm	ton	N/mm²
250	55	6-12	88	7	-	-	33,694	1,443	18.3	35.2	67	7.5
300	60	6-12	118	10	-	-	45,239	2,416	31.3	60.8	90	8.0
350	70	6-15	160	-	8	-	61,575	3,826	47.3	90.9	122	7.6
400	80	6-15	209	-	12	-	80,425	5,748	76.3	155.6	160	8.7
450	80	6-15	242	-	12	-	92,991	7,734	92.5	176.9	185	7.6
500	90	6-18	301	-	15	-	115,925	10,670	126.1	245.1	230	7.6
600	100	6-30	408	-	20	-	157,080	17,773	201.7	394.4	312	7.5
700	110	6-46	530	-	-	20	203,889	27,498	329.4	650.5	405	8.2
800	120	6-46	667	-	-	24	256,354	39,966	465.4	894.6	510	7.8
900	130	6-46	818	-	-	28	314,473	55,622	628.1	1176.7	625	7.5
1000	140	6-46	983	-	-	36	378,248	75,188	887.7	1683.9	752	8.0
1200	150	6-36	1286	-	-	46	494,801	121,361	1413.3	2600.3	984	7.8