

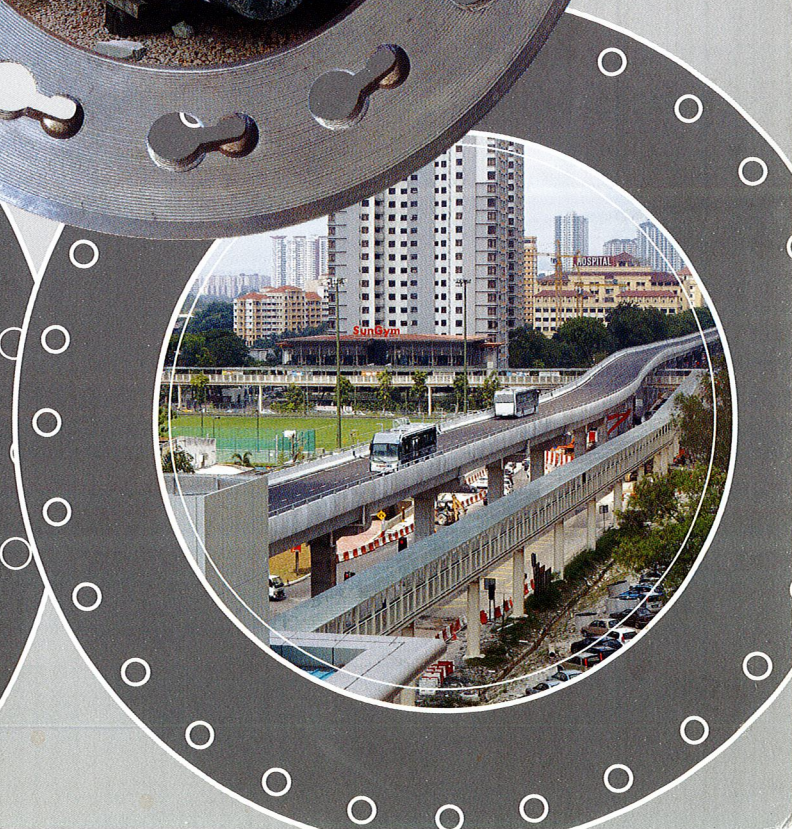
# **SUNWAY<sup>®</sup>**

## **SPUN PILES**

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### **Piling on Quality for Performance**

We specialise in providing high performance,  
high strength pretensioned spun concrete piles





# SUNWAY GROUP, THE LEADING CONGLOMERATE



Established in 1974 as a tin-mining company, Sunway has thrived and become one of Malaysia's largest and most formidable property-construction groups with a combined market capitalisation of close to RM12 billion. With 12 business divisions, Sunway spans 50 locations worldwide with a 14,000 strong employee base. Sunway has built a solid foundation on three core values: Integrity, Humility and Excellence.

The 12 business divisions are Property, Construction, Retail, Hospitality, Leisure, Healthcare, Education, Trading & Manufacturing, Quarrying, Building Materials, Commercial and Real Estate Investment Trust (REIT).

## SUNWAY SPUN PILES

Sunway started its spun pile factory in the year 2008 in Zhuhai, China; producing large diameter spun pile of 700 mm to 1400 mm, and up to 55 meters in length. Many of Sunway's experiences are landmark projects such as Tanjung Priok in Jakarta, ZZY Oil & Gas Terminal in Guangzhou, COSCO Shipyard in Dongguan and West Port in Shenzhen to name a few.

In 2015, Sunway built its first Malaysian spun pile plant at Batang Kali, Selangor, bringing together Asia, Southeast Asia and local Malaysian experiences to benefit its clients locally and globally.

### OUR STRENGTHS

- Our piles are produced with stringent QC control at each process and complies with the industry and country standards.
- Our piles can be customised to suit each project's requirement. Grade 80 or 90 allows for flexibility.
- Hydraulic jacking method is environmentally friendly with low noise, vibration and air pollution.
- The prestressing process enables the piles to have higher bending moment capacity as compared to just reinforced concrete.
- The spinning process compacts the concrete and allows for even distribution of aggregate; resulting in a strong, durable and high corrosion resistant end-product.
- The steam curing process enables the concrete to mature faster, thus cutting down the delivery period.

Sunway Group holds leadership positions in a multitude of industries, chiefly driven by its core businesses of property and construction. With a vision of becoming the region's leading property-construction group, we constantly innovate to deliver value, build synergistic and sustainable relationships and achieve the highest standards of quality and excellence.

As a master community developer, Sunway continues to build connected communities where people live, learn, work, play, stay healthy and safe through our construction, property, retail, leisure, health care, education components among others.

Our Batang Kali plant uses state of the art machinery and technology from Japan, the front-runner in the spun pile industry. Our production is able to produce **Grade 80 and 90 High Performance High Strength Pretensioned Spun Concrete Pile (PHC Piles)**.

Equivalently important, our people bring together more than 40 years of accumulative working experience in this industry.

Combined with Sunway's core values of Integrity, Humility and Excellence we believe in giving nothing but the best to our clients and the industry.

### APPLICATION FOR SUNWAY SPUN PILES

- Marine, ports and wharfs
- Bridges
- Flood defences
- Building and high-rise foundations
- Civil works



# TECHNICAL SPECIFICATIONS

## PROPERTIES OF STANDARD SPUN PILES (In compliance with MS 1314 : Part 4 : 2004)

### GRADE 80 CONCRETE

#### CLASS A (EFFECTIVE PRESTRESS $\geq 4.0$ N/mm<sup>2</sup>)

Outside Diameter mm	Nominal Thickness mm	Nominal Weight kg/m	Length m	Prestressing Bar		Effective Prestress N/mm <sup>2</sup>	Area of Concrete cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Section Modulus cm <sup>3</sup>	Bending Moment		Allowable Axial Load ton
				7.1 mm No.	9.0 mm No.					Cracking kNm	Ultimate kNm	
300	60	118	6 - 12	6	-	4.9	452	35,694	2,380	21.2	34.4	87
350	60	142	6 - 12	6	-	4.1	547	61,415	3,509	28.5	40.1	106
400	65	178	6 - 12	8	-	4.3	684	102,165	5,108	61.2	86.0	132
450	70	217	6 - 12	10	-	4.4	836	160,333	7,126	60.3	86.0	161
500	80	274	6 - 12	12	-	4.2	1,056	247,954	9,918	81.9	114.7	204
600	90	376	6 - 12	-	12	4.9	1,442	500,346	16,678	148.9	221.1	276

#### CLASS B (EFFECTIVE PRESTRESS $\geq 5.0$ N/mm<sup>2</sup>)

Outside Diameter mm	Nominal Thickness mm	Nominal Weight kg/m	Length m	Prestressing Bar		Effective Prestress N/mm <sup>2</sup>	Area of Concrete cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Section Modulus cm <sup>3</sup>	Bending Moment		Allowable Axial Load ton
				7.1 mm No.	9.0 mm No.					Cracking kNm	Ultimate kNm	
300	60	118	6 - 12	8	-	6.3	452	36,062	2,404	24.8	45.9	85
350	70	160	6 - 12	9	-	5.3	616	66,364	3,792	35.4	60.2	117
400	80	209	6 - 15	12	-	5.4	804	113,280	5,664	53.4	91.8	153
450	80	242	6 - 15	-	8	5.1	930	172,214	7,654	69.5	110.6	178
500	90	301	6 - 15	-	10	5.1	1,159	264,403	10,576	96.1	153.6	221
600	100	408	6 - 15	-	14	5.2	1,571	530,275	17,676	163.3	258.0	299

#### CLASS C (EFFECTIVE PRESTRESS $\geq 7.0$ N/mm<sup>2</sup>)

Outside Diameter mm	Nominal Thickness mm	Nominal Weight kg/m	Length m	Prestressing Bar		Effective Prestress N/mm <sup>2</sup>	Area of Concrete cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Section Modulus cm <sup>3</sup>	Bending Moment		Allowable Axial Load ton
				7.1 mm No.	9.0 mm No.					Cracking kNm	Ultimate kNm	
300	60	118	6 - 12	-	6	7.4	452	36,063	2,424	27.6	55.3	84
350	70	160	6 - 15	-	8	7.2	616	67,341	3,848	43.3	86.0	114
400	80	209	6 - 15	-	12	8.1	804	115,682	5,784	70.2	147.4	147
450	80	242	6 - 15	-	14	7.2	930	175,078	7,781	87.2	165.9	173
500	90	301	6 - 15	-	15	7.2	1,159	269,008	10,760	120.8	230.4	215
600	100	408	6 - 15	-	20	7.1	1,571	538,857	17,962	199.9	368.6	292

### GRADE 90 CONCRETE

#### CLASS A (EFFECTIVE PRESTRESS $\geq 4.0$ N/mm<sup>2</sup>)

Outside Diameter mm	Nominal Thickness mm	Nominal Weight kg/m	Length m	Prestressing Bar		Effective Prestress N/mm <sup>2</sup>	Area of Concrete cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Section Modulus cm <sup>3</sup>	Bending Moment		Allowable Axial Load ton
				7.1 mm No.	9.0 mm No.					Cracking kNm	Ultimate kNm	
300	60	118	6 - 12	6	-	4.9	452	35,636	2,376	21.8	34.4	98
350	60	142	6 - 12	6	-	4.1	547	61,335	3,505	29.4	40.1	120
400	65	178	6 - 12	8	-	4.4	684	102,026	5,101	61.2	86.0	149
450	70	217	6 - 12	10	-	4.5	836	160,098	7,115	62.1	86.0	182
500	80	275	6 - 12	12	-	4.3	1,056	247,592	9,904	84.4	114.7	231
600	90	375	6 - 12	-	12	4.9	1,442	499,443	16,648	153.2	221.1	313

#### CLASS B (EFFECTIVE PRESTRESS $\geq 5.0$ N/mm<sup>2</sup>)

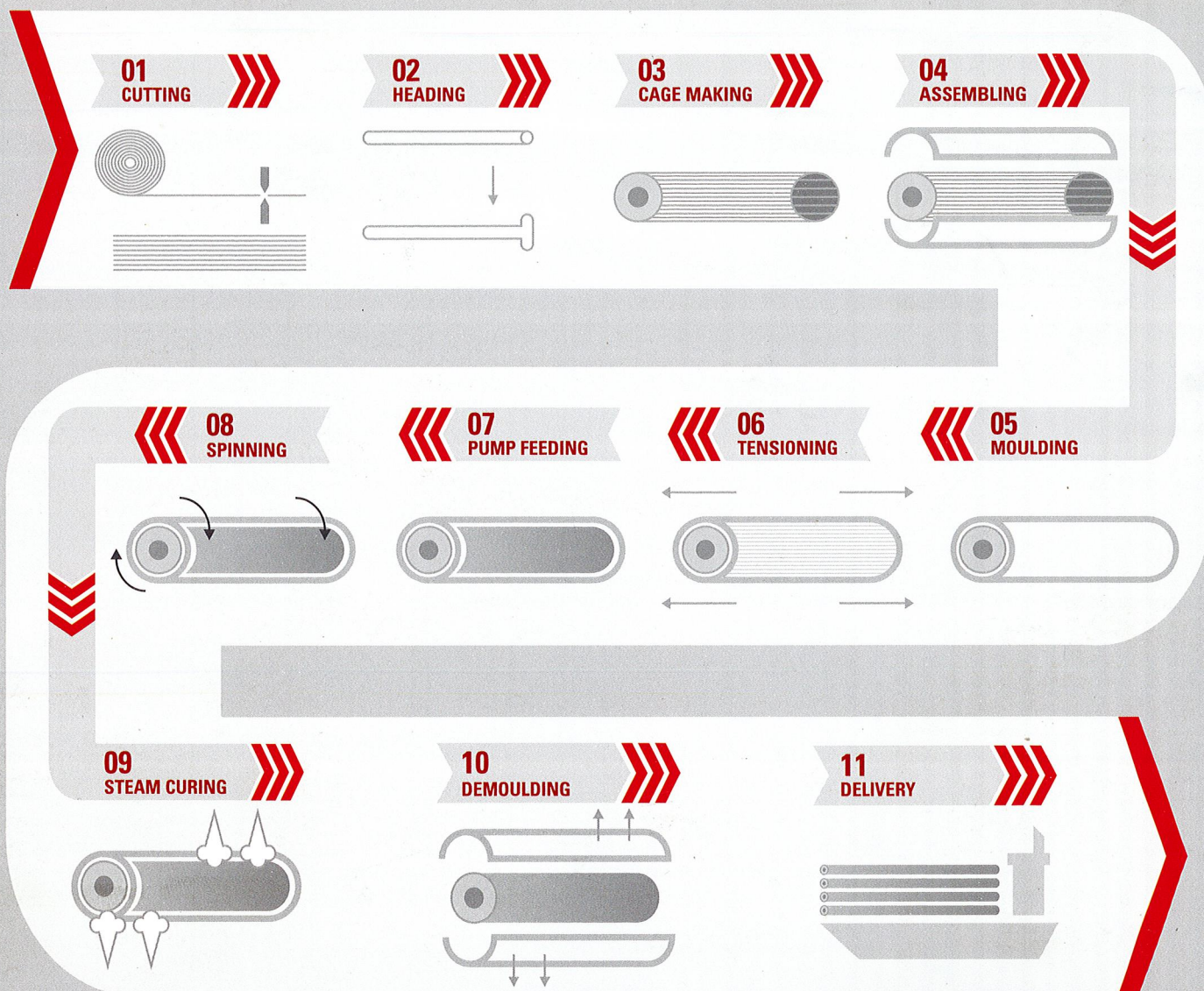
Outside Diameter mm	Nominal Thickness mm	Nominal Weight kg/m	Length m	Prestressing Bar		Effective Prestress N/mm <sup>2</sup>	Area of Concrete cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Section Modulus cm <sup>3</sup>	Bending Moment		Allowable Axial Load ton
				7.1 mm No.	9.0 mm No.					Cracking kNm	Ultimate kNm	
300	60	118	6 - 12	8	-	6.3	452	35,984	2,399	25.4	45.9	96
350	70	160	6 - 12	9	-	5.3	616	66,244	3,785	35.4	60.2	133
400	80	209	6 - 15	12	-	5.4	804	113,072	5,654	54.9	91.8	173
450	80	242	6 - 15	-	8	5.1	930	171,912	7,641	71.4	110.6	201
500	90	301	6 - 15	-	10	5.1	1,159	263,919	10,557	98.8	153.6	251
600	100	408	6 - 15	-	14	5.2	1,571	529,221	17,641	167.8	258.0	339

#### CLASS C (EFFECTIVE PRESTRESS $\geq 7.0$ N/mm<sup>2</sup>)

Outside Diameter mm	Nominal Thickness mm	Nominal Weight kg/m	Length m	Prestressing Bar		Effective Prestress N/mm <sup>2</sup>	Area of Concrete cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Section Modulus cm <sup>3</sup>	Bending Moment		Allowable Axial Load ton
				7.1 mm No.	9.0 mm No.					Cracking kNm	Ultimate kNm	
300	60	118	6 - 12	-	6	7.4	452	36,270	2,418	28.3	55.3	95
350	70	160	6 - 15	-	8	7.3	616	67,169	3,838	44.4	86.0	130
400	80	209	6 - 15	-	12	8.2	804	115,347	5,767	71.8	147.4	168
450	80	242	6 - 15	-	14	7.2	930	174,626	7,761	89.4	165.9	196
500	90	301	6 - 15	-	15	7.3	1,159	268,281	10,731	123.8	230.4	245
600	100	408	6 - 15	-	20	7.2	1,571	537,351	17,912	204.8	368.6	332



# PRODUCTION PROCESS



## STANDARDS

ITEM	STANDARD
PHC Pile	MS1314:Part 4:2004 Modified to suit BS 8004:1986 - Code of Practice for Foundations and BS8110:1997 - Structural Use of Concrete JIS A5337:1987
Cement	MS 522:2007
Prestressing Steel	JIS G 3137:1994
Aggregate	20mm granite for coarse aggregate and washed mining or clean river sand
Spiral Wire	Hard drawn wire

# MS = Malaysian Standard, SS EN = Singapore Standard, JIS = Japanese Industrial Standard, BS = British Standard

### SUNWAY SPUN PILE (M) SDN. BHD. (411837-T)

#### HEADQUARTERS

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#### Batang Kali Factory

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Information contained in this leaflet is correct at the time of printing (January 2016).

