PRESTRESSED SPUN CONCRETE PILE

SCIB CONCRETE MANUFACTURING SDN BHD

Company No: 554888-U

A Wholly Owned Subsidiary of Sarawak Consolidated Industries Berhad
- A Member of Bursa Malaysia Securities Berhad

QUALITY SYSTEM
SIRIM
UKAS QUALITY MANAGEMENT
074

MS ISO 9001 REG. NO AR 1476
MS ISO 9001 : 2008
Quality Systems • Model for Quality Assurance in Production, Installation and Servicing

FEATURES

High Bending Moment And Crack Resistance

SCM Spun Pile can be used in various types of soil condition because

- it is highly effective in resisting bending moment and axial tensile stress.
- the pile resist axial compressive stress because of the high compressive strength of concrete.

Strong Pile Joints - Easy Reliable Welding

The welded joint has a strength at least equal to that of the concrete portion of the pile. Moreover in order to enable easier and sounder work, a semi automatic welding method can be applied.

Driving Efficiency

With its hollowed, round geometry, SCM Spun Pile's lighter weight increases driving efficiency thus requiring smaller driving hammers.

Uniform Strength And Reliable Product

As SCM Spun Pile is a precast product manufactured by a centrifugal compaction process, it has a uniform and assured strength with high reliability.

Large Bearing Capacity

Spun Concrete compressive strength exceeding 60 N/mm^2 can be achieved which results in large bearing capacity for the same section.

Prevention from Cracking

The prestress effect prevents cracking in the pile. Even if cracking should appear in the pile owing to a sudden, temporary excessive tensile load, such cracks will disappear as soon as the load is removed. Therefore the prestressing bars are protected from corrosion.

INSTALLATION HANDLING

Installation and handling methods are very important in ensuring that spun piles are utilised to its maximum potentials and unneccessary damages do not occur.

Handling

SCM Spun Pile should be carefully handled to prevent any excessive loads. In the factory, large overhead gantry cranes are used to ensure that the finished products are handled safely to minimise risk of damage.

When lifting on site, sling pile by crane at two points marked on all piles at 2/10 of the length from the ends. Lifting is by wrapping wire rope around the piles at these points.

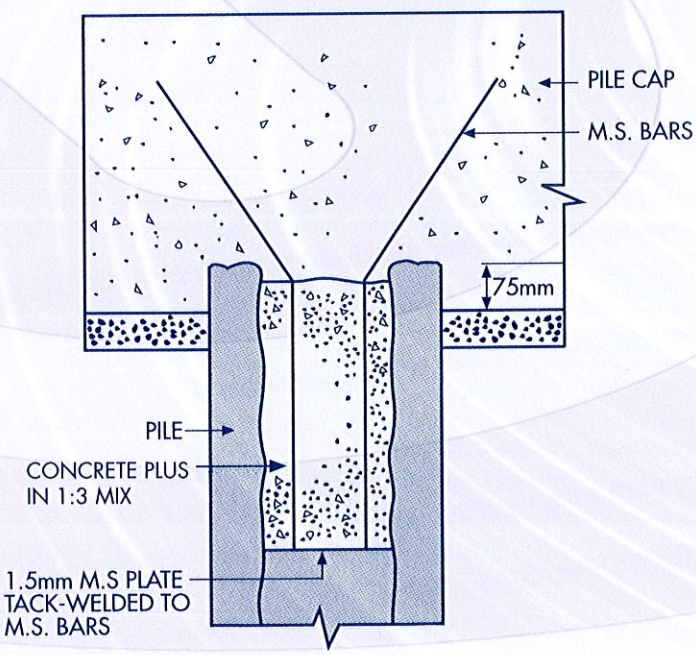
Driving

In cases where underground obstruction such as large boulders or hard layer are encountered, special pile shoes or preboring may be required.

Pile Capping

The spun pile should be bonded to concrete footing and pilecap as shown with the cut-off level of the pile projecting at least 75mm into the structure.

SCM Spun Pile is manufactured under factory controlled conditions with management and supervision by highly qualified professionals, thus ensuring the highest quality and reliability. The highly mechanised and automated production lines allow greater consistency in the production process thus providing a uniform and quality assured pile.



SECTIONAL DETAIL

PRESTRESSED CONCRETE SPUN PILE DESIGN TO MS 1314: 2004 STANDARD

** CLASS A *(Minimum 4.0 N/mm² Effective Prestress)*

EXTERNAL DIAMETER (mm)	WALL THICKNESS (mm)	CROSS SECTIONAL AREA (cm^2)	PRESTRESSING BARS DIAMETER mm	PRESTRESSING BARS NOS	EFFECTIVE PRESTRESS (N/mm^2)	NOMINAL WEIGHT (t/m)	SECTION MODULUS (cm^3)	CALCULATED BENDING MOMENT CRACKING (t-m)	CALCULATED BENDING MOMENT ULTIMATE (t-m)	*ALLOWABLE AXIAL LOAD (FOR SHORT STRUT) (t)
300	60	452	7.1	6	4.9	0.118	2378	2.54	3.54	80
350	60	547	7.1	6	4.1	0.142	3513	3.48	4.13	95
400	65	684	7.1	8	4.3	0.178	5118	5.20	6.30	120
450	70	836	9.0	6	4.3	0.217	7123	7.19	8.50	150
500	80	1056	9.0	8	4.5	0.274	9929	10.23	12.60	190
600	90	1442	9.0	12	4.9	0.375	16631	17.81	22.68	255

** Not Recommended for Diesel Hammer

CLASS B *(Minimum 5.0 N/mm² Effective Prestress)*

EXTERNAL DIAMETER (mm)	WALL THICKNESS (mm)	CROSS SECTIONAL AREA (cm^2)	PRESTRESSING BARS DIAMETER mm	PRESTRESSING BARS NOS	EFFECTIVE PRESTRESS (N/mm^2)	NOMINAL WEIGHT (t/m)	SECTION MODULUS (cm^3)	CALCULATED BENDING MOMENT CRACKING (t-m)	CALCULATED BENDING MOMENT ULTIMATE (t-m)	*ALLOWABLE AXIAL LOAD (FOR SHORT STRUT) (t)
250	55	337	7.1	6	6.3	0.088	1440	1.74	2.95	55
300	60	452	7.1	8	6.2	0.118	2402	2.90	4.72	75
350	70	616	9.0	6	5.7	0.160	3797	4.30	6.61	105
400	80	804	9.0	8	5.7	0.209	5762	6.55	10.08	140
450	80	930	9.0	8	5.1	0.242	7645	8.30	11.34	165
500	90	1159	9.0	10	5.1	0.301	10547	11.46	15.75	205
600	100	1571	9.0	14	5.2	0.408	17597	19.39	26.46	275
700	110	2039	9.0	19	5.4	0.530	27168	30.50	41.90	360

CLASS C *(Minimum 7.0 N/mm² Effective Prestress)*

EXTERNAL DIAMETER (mm)	WALL THICKNESS (mm)	CROSS SECTIONAL AREA (cm^2)	PRESTRESSING BARS DIAMETER mm	PRESTRESSING BARS NOS	EFFECTIVE PRESTRESS (N/mm^2)	NOMINAL WEIGHT (t/m)	SECTION MODULUS SECTION (cm^3)	CALCULATED BENDING MOMENT CRACKING (t-m)	CALCULATED BENDING MOMENT ULTIMATE (t-m)	*ALLOWABLE AXIAL LOAD (FOR SHORT STRUT) (t)
300	60	452	7.1	10	7.4	0.118	2398	3.19	5.91	75
350	70	616	9.0	8	7.2	0.160	3799	4.96	8.82	105
400	80	804	9.0	11	7.4	0.209	5723	7.65	13.86	135
450	80	930	9.0	12	7.1	0.242	7766	10.07	17.01	160
500	90	1159	9.0	15	7.1	0.301	10714	13.91	23.63	200
600	100	1571	9.0	20	7.1	0.408	17845	23.00	37.81	270
700	110	2039	9.0	26	7.1	0.530	27514	35.21	57.35	350

* These recommended maximum allowable axial working loads are only the structural capacity of piles. The actual working capacities are dependent on soil conditions and other considerations but shall not exceed the maximum structural working load. Higher axial working capacity can be specially designed if required.

FORMULA FOR AXIAL LOAD

$$Na = Ó_{ca}A$$
$$= 1/n\,(Ó_{cu} - Ó_{ce})A$$
$$= 1/4\,(Ó_{cu} - Ó_{ce})A$$

Where,

- Na = permissible axial load (KN)
- $Ó_{ca}$ = permissible compressive stress in concrete (N/mm^2)
- $Ó_{cu}$ = specified compressive strength of concrete (N/mm^2)
- $Ó_{ce}$ = effective prestress in concrete (N/mm^2)
- A = cross section area of concrete (mm^2)
- n = factor of safety

SPECIFICATIONS

1. Standards

SCM Spun Pile is generally designed and manufactured in accordance with Malaysian Standard MS 1314: 2004, Special design to BS 8110: Part 1: 1985, BS 8004: 1986, and JIS 5335: 1987 can be provided.

2. Materials

Cement	MS 522	:	Part 1 : 1989	Ordinary Portland Cement
Aggregate/Sand	BS 882	:	1992	10mm, 20mm granite, washed river
Prestressing Bar	JIS G3137	:	1994	ULBON / S-BOND
Links	BS 4482	:	1998	Harddrawn wire
	MS 144	:	2006	
Joint Plate/ Skirt Plate	BS4360	:	1990	Grade 43A

3. Concrete

Minimum compressive concrete cube strength shall be:

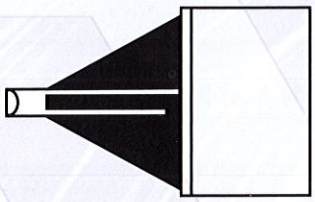
at transfer - 30N/mm^2
at 28 days - 80N/mm^2

4. Joint

SCM Spun Pile comes with mild steel plate joints that are butt welded at site.

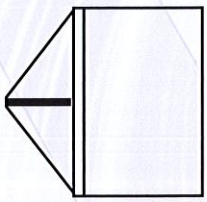
5. Pile Shoe

The pile shoe shall be either Flat Mild Steel Plate, X-Pointed Mild Steel Shoe, 8-Portion Shoe or OSLO Shoe.

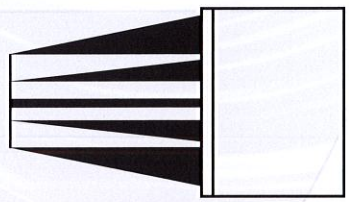


Oslo Pointed Shoe

Flat Mild Steel Plate



Standard X-Shoe



8-Portion Shoe

It is our policy to continuously review and improve products and their design. Information in this leaflet is therefore subject to change without notice.

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