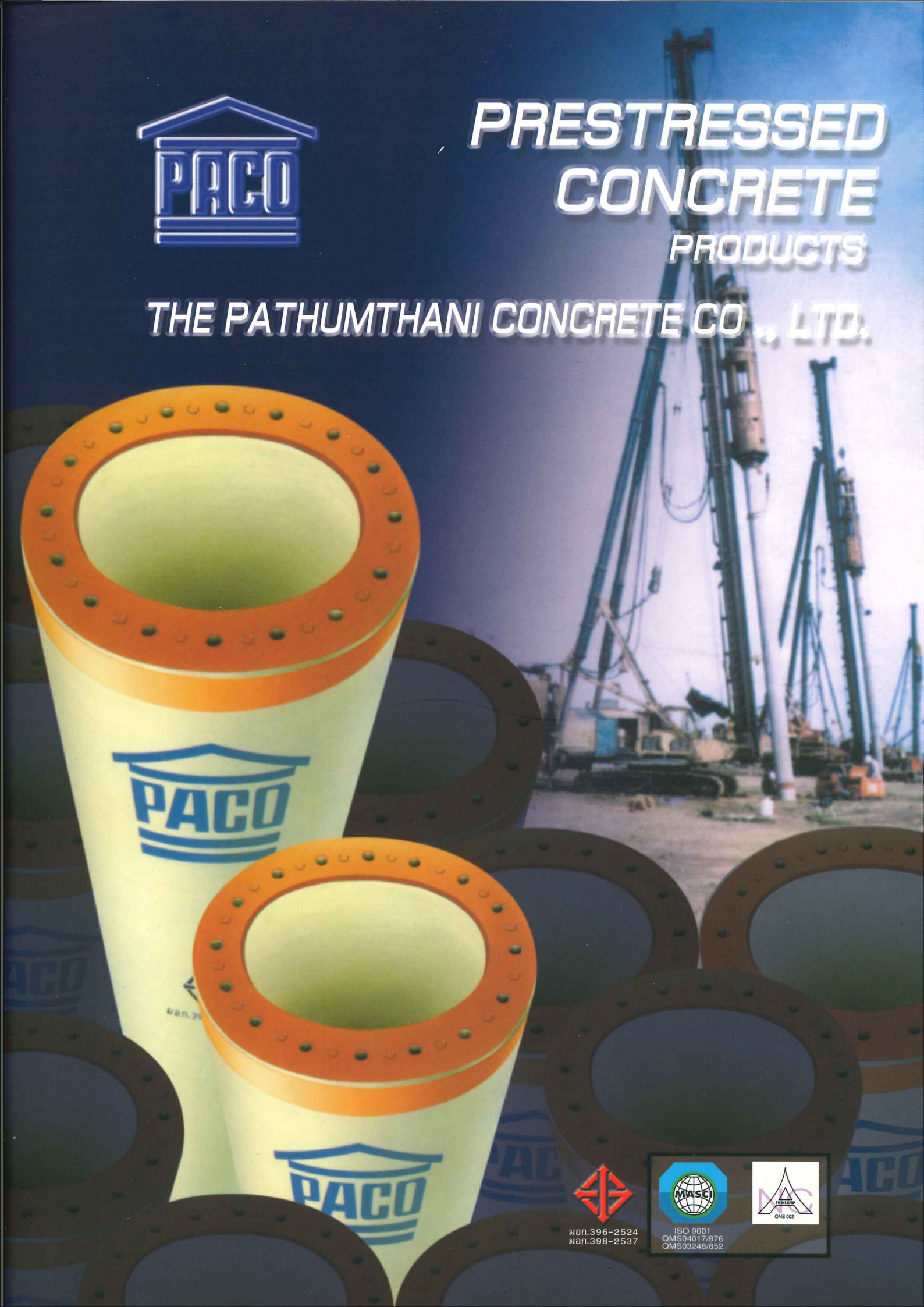
PRESTRESSED CONCRETE PRODUCTS

THE PATHUMTHANI CONCRETE CO., LTD.



มอก.396-2524
มอก.398-2537

ISO 9001
QMS04017/876
QMS03248/852

COMPANY PROFILE

Introduction

The Pathumthani Concrete Co., Ltd. was established in 1978 and is now one of Thailand's leading foundation contractors. From the beginning, we have been guided by our philosophy "Excellent quality at justifiable cost".

We have carried out piling and ground improvement works at major projects such as Airports, Expressways, Refineries and Petrochemical Plants, Hotels, Condominiums and Hypermarkets. Working on these type of projects inspired us to continually improve our quality and service.

ISO 9001

Certificate of Approval

This is to certify that

The Pathumthani Concrete Company Limited

Address of premise : 7 Moo 2, Pathumsainai Road, Bangkayaang, Muang District, Pathumthani 12000, Thailand

has been assessed and found to be conforming to the requirements of TIS/ISO9001:2000 for the scope :

1. Development and manufacture of prestressed concrete piles
2. Development and manufacture of prestressed concrete products (Girders and Sheet piles), Reinforced concrete products (Precast reinforced concrete piles and Precast reinforced concrete panels)

by Management System Certification Institute (Thailand)

Date of issue : 13 February 2004
Valid until : 12 February 2007

(Mr. Charnsak Soelgamas)
Executive Director
Management System Certification Institute (Thailand)

ACCREDITED BY MEMBER OF PAC/IAF MLA FOR QMS

Factories

One of our factories is situated on the banks of the Chaophraya river. We are the only pile manufacturer in Pathumthani able to transport piles and other concrete products by river. This enables us to easily and quickly install our piles in projects located by banks of the Chaophraya river and Canals located in the Bangkok and surrounding provinces.

International Standard Product ISO9001

In May 2001, PACO was accredited with TIS/ISO 9002. On the 19th. February, 2004 PACO was accredited with TIS/ISO 9001 for both factories. The awards of TIS/ISO 9001 and TIS/ISO 9002 are an important step emphasising that our products are of international standard quality.

ISO 9001

Certificate of Approval

This is to certify that

The Pathumthani Concrete Company Limited

Address of premise : 1/2 Moo 1, Pathum - Bangbua Road, Kookkwang, Ladlumkaew District, Pathumthani 12140, Thailand

has been assessed and found to be conforming to the requirements of TIS/ISO9001:2000 for the scope :

Manufacture of prestressed concrete spun piles

by Management System Certification Institute (Thailand)

Date of issue : 14 December 2003
Valid until : 13 December 2006

(Mr. Charnsak Soelgamas)
Executive Director
Management System Certification Institute (Thailand)

ACCREDITED BY MEMBER OF PAC/IAF MLA FOR QMS

We manufacture PC Spun piles, PC □ and I section piles for all kinds of construction works, at both of our factories to TIS and customers specifications and designs.

We also manufacture other concrete products such as: Concrete Floor Planks and Girders. We also provide services such as product installation and surveying.

PICTURE SHOWS OUR HEAD OFFICE "ARWAN BUILDING"

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PRESTRESSED CONCRETE PILES
Properties of Materials

Concrete

1. High early strength cement conforming to the ASTM Designation C 150 Type III.
2. Ultimate compressive stress shall not be less than 450 Kg./cm.^{2} (by 15x15 cm. cube test) or not less than 350 kg./cm.^{2} with Diameter 6″x12″ cylinder test at 28 days.
3. Prestressing force shall be released when the concrete strength is not less than 250 Kg./cm.^{2}
4. Prestressing by the pretensioning method.
5. Curing by water or steam.

High Tension Prestressing Wires

1. Uncoated stress-relieved steel wire indented round type Dia. 4 mm., 5 mm. and 7 mm.
2. single wire.
3. Ultimate tensile strength shall not be less than 17,500 Kg./cm.^{2}
4. The initial prestressing force per tendon after anchoring shall be 70-75% of ultimate strength.

Stirrups

1. Structural grade steel Dia 3mm., 5mm. and 6mm. in sizes.
2. Modulus of elasticity shall not be less than 2,300 Kg./cm.^{2}
3. Ultimate strength shall not be less than 4,200 Kg./cm.^{2}

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PICTURE SHOWS OUR FACTORY I, AMPHUR MUANG, PATHUMTHANI

TECHNICAL DATA OF PACO PILES

CODE	SECTION	TYPE (cm.)	LENGTH (m.)	CROSS SECTION ($cm.^2$)	PERIMETER (cm.)	WEIGHT (Kg./m.)	SAFE LOAD (Ton)
I - 18		18 x 18	12 - 21	235	83	56	8 - 20
I - 22		22 x 22 22 x 22	7 - 21 7 - 21	332 363	105 105	80 87	25 - 30 25 - 30
I - 26		26 x 26 26 x 26	21 - 24 21 - 24	460 485	126 124	110 116	30 - 35 30 - 55
I - 30		30 x 30 30 x 30	21 - 24 21 - 24	570 660	154 143	137 158	35 - 45 40 - 45
I - 35		35 x 35 35 x 37	21 - 25 21 - 25	808 880	166 168	194 211	50 - 55 60 - 65
I - 40		40 x 40	21 - 25	1240	180	297	55 - 70
I - 45		45 x 45	21 - 25	1455	219	349	70 - 100
I - 50		50 x 50	20 - 24	1950	245	468	80 - 120
S - 16		16 x 16	4 - 6	256	64	61	0.61 - 2.30
S - 18		18 x 18	7 - 10	324	72	78	8 - 10
S - 20		20 x 20	7 - 10	400	80	96	20 - 25
S - 22		22 x 22	7 - 24	484	88	116	25 - 30
S - 26		26 x 26	7 - 24	676	104	162	40 - 45
S - 30		30 x 30	7 - 24	900	120	216	45 - 50
S - 35		35 x 35	21 - 26	1225	140	294	60 - 80
S - 40		40 x 40	21 - 26	1600	160	384	80 - 100
S - 45		45 x 45	21 - 26	2025	180	486	100 - 120
S - 52.5		52.5 x 52.5	21 - 28	2756	210	661	120 - 150

Remarks: Recommended safe load depends on soil condition and total length of pile.
Pile can be manufactured in single or welded sectional length. All designs referred from TIS 396-2524 (1981) or PACO.

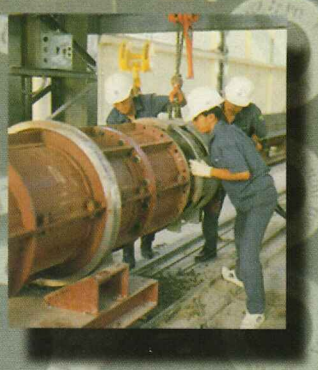
PRESTRESSED CONCRETE SPUN PILES
Properties of Materials

Concrete

1. Coarse Aggregate and Sand gradation as per TIS. 398 - 2537.
2. Portland Cement as per ASTM Designation C 150 TYPE I or TYPE III or as per TIS.15 - 2524/2517 Type I or Type III.
3. Ultimate compressive strength of concrete cylinder not less than 500 ksc as per TIS. 398 - 2537.
4. Compressive Strength of Concrete Cylinder at Transfer not less than 250 ksc. as per TIS. 398 - 2537.
5. Curing with Steam and / or Water.
6. Prestressing with the pretensioning method.

High Tension Prestressed Concerte Steel Wire

1. PC Wire Diameter 4 mm. , 5 mm. , 7 mm. , 9 mm. as per TIS. 95 - 2525.
2. Ultimate Tensile Stress not less than 16,500 - 17,500 ksc.
3. Initial Tensile Stress is 70 - 75% of the Ultimate Tensile Stress.



Cage Steel Wire

1. Steel Wire Diameter 3 mm. , 4 mm. or 5 mm. , as per TIS.194 - 2519.
2. Ultimate Tensile Stress not less than 4,100 ksc.

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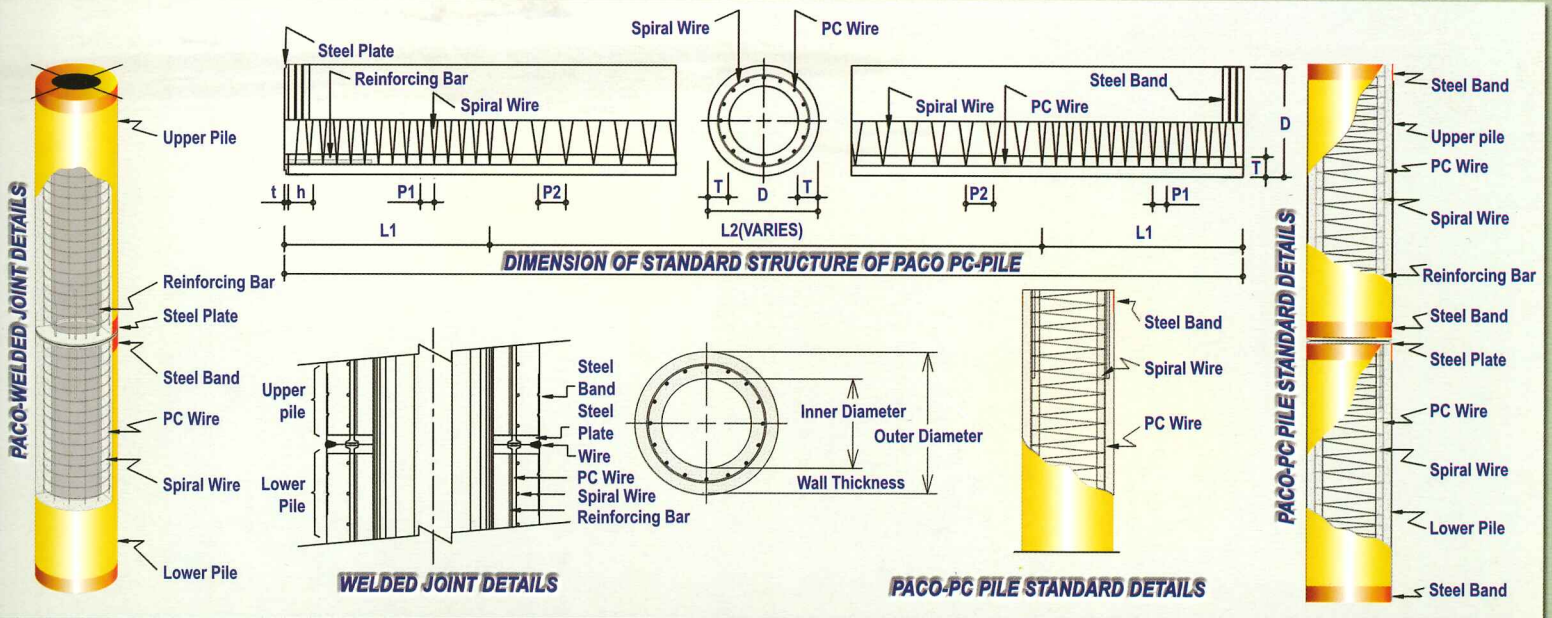
ADVANTAGES OF PC SPUN PILES

1) Ultimate Compressive Concrete Cylinder Strength is more than 500 ksc, therefore the pile has a higher load capacity than normal PC piles.
2) Piles with two or more sections are as strong as single piece piles, as the welded pile joint plates are prestressed to the pile body (using button heads on the PC wires). Normal dowel bars are also used for anchorage.
3) Two or more sectioned piles are more easily transported in narrow roads.
4) PC Spun piles can be installed by Center - Augering, Pre - Boring or FC-PTG method which is clean, reduce envivonmental problem and vibration at neighboring structures.
5) PC Spun piles can withstand higher Tension forces, which make them suitable for high rise buildings with wind load and earthquake problems.

TECHNICAL DATA OF PACO PC SPUN PILES

OUTER DIAM. (mm.)	WALL THICKNESS (mm.)	LENGTH PER PCE. (m.)	CONCRETE CROSS SECTION. AREA ($cm.^2$)	TOTAL CROSS SECTION AREA ($cm.^2$)	MOMENT OF INERTIA OF CONCRETE ($cm.^4$)	NOMINAL WEIGHT (Kg./m.)	ALLOWABLE AXIAL LOAD ON PILE (Ton)	RECOMMENDED SAFE LOAD (BKK AREA) (Ton)
250	55	7 - 17	337	491	17289	88	39	25 - 35
300	60	7 - 17	452	707	34608	117	52	35 - 50
350	65	7 - 18	582	962	62163	151	67	50 - 65
400	75	7 - 19	766	1257	106489	199	88	65 - 80
450	80	7 - 19	930	1591	166570	242	107	80 - 100
500	90	7 - 19	1159	1964	255324	301	133	90 - 120
600	100	7 - 19	1571	2828	510509	408	181	100 - 160
700	110	7 - 17	2039	3850	918012	530	234	140 - 210
800	120	7 - 17	2564	5028	1527870	667	295	180 - 270
900	130	7 - 13	3146	6358	2397072	820	360	230 - 310
1000	140	7 - 13	3782	7857	3589571	983	435	220 - 410

Remarks: Recommended safe load depends on soil condition and total length of pile. All designs referred from TIS 398-2537 (1994).



PILE DRIVING EQUIPMENT

PACO's pile driving equipment consists of the following:

CRAWLER TYPE BASE MACHINES

NISSHA 508, 408, 308, 207 and DHJ40 models.

HYDRAULIC HAMMERS

Twinwood, BSP and Hysinc, with ram weights up to 14 tonnes.

DIESEL HAMMERS

Kobe,Delmag type and Hera with ram weights up to 7.50 Tonnes.

AUGERS

Ø500 mm minimum.These are used for Center Augering, Preboring and FC-PTG method.

CONVENTIONAL FRAME RIGS WITH DROP HAMMERS

Hammer weights of more than 8.5 tonnes are available.

With this equipment, piles sizes of up to PC Spun Ø 800 mm or PC □ 52.5 cm. or larger can be driven.

Selecting Pile Driving Equipment and Installation Methods

Pile driving equipment is selected according to the site conditions. When required, PACO offers a surveying service to set out the piles. Piles are driven according to the agreed criteria. Pile Driving formulas such as Modified Hiley's, Danish and others as approved by The Engineering Institute of Thailand are used.

Our piles can be installed by using the following methods:

- Pure driving
- Center Auger or Pre-boring with Final Drive
- Non-Vibration Piling (NVP) System
- Full Center Auger with Pile Toe Grouting (FC-PTG) :
  Clean, non-Vibration, Environmentally Friendly System
  (Patent No. 8251, dated 6th August, 1998)

The subsoil conditions in Thailand, especially in Bangkok area, require specialized driven piling to provide technically superior and economical solutions.

Pile driving is supervised by PACO's experienced team of engineers.

CONTACTS :

Head Office :

The Pathumthani Concrete Co., Ltd.
1339 Arwan Building
Pracharat 1 Road, Bangsue,
Bangkok 10800
Telephone (662)587-0198 - 200 (32 lines)
FAX. (662)587-4774, (662)587-4763, (662)587-4761

Factory I Address :

7 moo 2, Tangkhao Changwat Sainai Road,
Bangkayaeng District, Amphur Muang,
Pathumthani 12000
Telephone (662)581-6112-5, (662)581-1950-4
Fax. (662)581-5816

Factory II Address :

1/2 moo 1 Pathum - Banglane Road,
Amphur Ladlumkaew,
Pathumthani 12000
Telephone (662)599-1274, (662)579-1672-3
Fax. (662)599-1654

Or Visit our Website: www.paco-group.com
Email: admin@paco-group.com

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Affiliated Companies :

S.R.R.
Saeng Roong Rojana Co.,Ltd

S.R.S.
Bangkok Wood Drying & Wood Preserving Co.,Ltd.

S.R.R.
Saeng Roong Ruang Co.,Ltd.

PACO Real Estate Co.,Ltd.