

INDUSTRIAL CONCRETE PRODUCTS BERHAD

INDUSTRIAL CONCRETE PRODUCTS BERHAD (ICP) is the first commercial manufacturer of High Performance Pretensioned Spun Concrete Piles (ICP PC PILES) in Malaysia. Presently, ICP is the largest manufacturer in South East Asia. The company was incorporated in Malaysia on 6 April 1977 and commenced business in September 1977.

In September 1993, ICP started manufacturing High Performance Pretensioned Spun High Strength Concrete Piles (ICP PHC PILES) which offer an economical foundation system with consistent and superior quality compared to the ordinary concrete piles. With the vast experience in the manufacturing of pretensioned spun concrete piles and utilising the latest concrete technology, ICP is the market leader in concrete piles.

PRODUCTS

ICP Piles are circular in cross-section and are manufactured in sizes ranging from diameter 250mm to 1,200mm with standard lengths varying from 6m to 46m in single pieces. ICP Piles can be easily joined to any combination of length as per design requirement. ICP Piles are manufactured with steel end plates for splicing.

Today, with the state-of-the-art autoclave curing system, ICP Piles can be installed immediately after autoclaving.

Some of the advantages of ICP Piles are as follows:

- Spinning results in denser concrete, reduces water cement ratio and hence increases the concrete strength and durability of the pile;
- High strength concrete up to 78.5 N/mm² enables the piles to be driven through hard strata;



Shipment of Piles to Overseas

- With the state-of-the-art autoclave curing system, the piles can be installed immediately;
- High resistance to corrosion especially from sea water;
- Manufactured in longer lengths of up to 46m in a single piece;
- Consistent quality under factory conditions;
- High rate of production ensures early completion of projects.

ECONOMICAL

Due to the strategic locations and the high production capacities of the factories, ICP Piles are a more economical foundation system than other foundation systems, namely the traditional RC piles, H-piles, bored piles and micropiles. ICP Piles have been widely used as replacement to RC piles in many low-cost housings, residential buildings, schools and even for pedestrian crossings. With ICP piles, designers can meet the client's budget and expect superior performance from the precast concrete piles.

With the introduction of high capacity hydraulic injection piling systems (up to 800 tonnes), ICP piles can be installed in busy urban and congested areas like Kuala Lumpur where normal driving installation is not allowed. With this injection method, ICP Piles can be used in replacement of bored piles and micropiles. This system provides economical and speedy construction method that is environmental friendly which also meets the by-laws of the authorities.

Besides being used in busy urban areas, ICP Piles installed using hydraulic injection systems also have been used to replace bored piles and micropiles in limestone areas in Kuala Lumpur. This system has been successfully implemented with the help of additional boreholes to determine the hard lenses and cavities. In addition, by applying a sustained force of up to two times or more of the working load, the pile

axial load capacity for all the piles installed are proof tested. This system offers a solution to the high cost and slow construction speed of bored piles and micropiles.

DURABILITY

ICP piles are highly resistant to corrosion. This is achieved through the spinning process, high cement content and autoclave curing (high pressure steam curing). During the spinning process, the concrete is centrifugally compacted, excess water is squeezed out and hence produces a well compacted and dense concrete.



Railway Link Connecting Existing Railway Line to West Port, Pulau Indah, Klang, Selangor

ICP piles were also tested in accordance with the ASTM C1202-Rapid Chloride Permeability Test. In this test, concrete samples immersed in chloride solution were tested for rate of chloride ion penetration over a 6 hours period. The results showed that the cumulative charges passed during the specified period were less than 1000 coulomb. These results showed that the concrete samples possessed a low permeability property and thus meets the durability performance characteristic.

In pursuit to achieve excellence, ICP has set up a research and development laboratory to further

enhance the performance and quality of the piles. In 1999, ICP Central Research and Development Laboratory was accredited as a calibration laboratory by Department of Standards, Malaysia. As a result of ICP's continuous improvement programme, a product using silica powder as partial replacement to ordinary Portland cement and cured under an autoclave process was produced. This product possesses superior resistance to corrosion.

Public Works Department, Port and Harbour Divisions have been designing the Pretensioned Spun Concrete Piles for their port and jetty projects for the last twenty years due to high durability against corrosion.

APPLICATIONS

ICP Piles have been used extensively as foundation piles for power stations, high rise buildings, civil engineering works, bridges, marine structures, harbours, schools and government projects, etc.

Since their introduction to Malaysia in 1976, ICP Piles have been recognized as the most superior concrete piles available locally. For this reason, ICP Piles were specifically designed for the following prestigious projects:

- Penang Bridge, Penang;
- Jambatan Baru Kuala Kurau, Perak;
- Permaisuri Tuanku Bainun Bridge, Lumut, Perak;
- North-South Expressway;
- KESAS Highway;
- Lebuhraya Damansara Puchong (LDP) Highway;
- East-West Highway;
- KLIA Perimeter Road, Sepang, Selangor;
- Sultan Salahuddin Abdul Aziz Power Station, Phase 1 and 2, Kapar, Selangor;
- Tanjung Bin Power Station, Johor;
- Perlis Combined Cycle Power Station, Perlis;



PPR Low Cost Flats at Taman Wahyu, Selayang, Selangor

- Prai Power Station, Penang;
- Segari Power Station, Lumut, Perak;
- Manjung Power Station, Lumut, Perak;
- Tuanku Jaafar Power Station, Port Dickson, Negeri Sembilan;
- Malacca Power Station, Alor Gajah, Malacca;
- North Butterworth Container Terminal, Phase 2 and 3, Penang;
- West Port, Phase 1, 2 and 3, Pulau Lumut, Klang, Selangor;
- Conversion of Berths 12 & 13 into Multi-Purpose Berths at North Port, Klang, Selangor.
- Sejangkat Wharf, Kuching, Sarawak;
- Sepang Bay Container Terminal, Kota Kinabalu, Sabah;
- Bar and Wire Rod Mill, Sepang, Selangor;
- Gas Processing Plant Phase 5 & 6, Terengganu;
- Southern Steel Factory, Prai, Penang;
- Petronas Urea Export Terminal, Butterworth, Penang;
- 23 schools in Perak, Selangor and Negeri Sembilan;

The above are only some of the many government and private projects that ICP had supplied.



Pulau Bunting Crossing, Yan, Kedah



Suter Harbour Marina, Kota Kinabalu, Sabah

OTHER APPLICATIONS AND MARKETS

Through market development, ICP Piles are presently used in non-traditional applications. ICP Piles are no longer considered only for foundation system but also for other applications such as breakwater structures and marinas. The breakwater structure at Royal Langkawi Yacht Club, was really an eye opener to many designers of this unique application of ICP Piles.

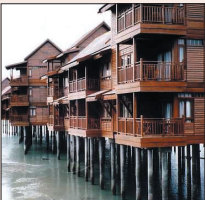
In its ambition to be a global player, ICP has ventured into the overseas market as far as North America ie, United States of America and Canada. ICP Piles were also exported to Brunei, Singapore, Sri Lanka, the Middle East, Indonesia, Vietnam, Philippines and Myanmar. The major overseas projects that we had supplied to are:

- Pulau Semakau Offshore Landfill Project, Singapore;
- Pasir Panjang Wharves Eastern Extension, Singapore;
- Pasir Panjang Container Terminal, Phase 1, Singapore;
- Muara Port Extension, Brunei;
- Thilawa Port Berths 10 & 11, Myanmar;
- Piled Pier at Galle Port, Sri Lanka;
- Feeder Berth at Colombo Port, Sri Lanka;
- FLDC Container Port, Ho Chi Minh City, Vietnam;
- Masinloc to Labrador Transmission Lines, Philippines;
- Philippines Inter Electronics Factory, Subic, Philippines;
- Barelang Bridge, Batam, Indonesia;
- Yacht Club at Port Manatee, Florida, USA;
- Greater Vancouver Regional District Sewage Project, Vancouver, Canada;

QUALITY CONTROL

The Group has established in each of its factories a laboratory for quality control on incoming raw materials and for monitoring the quality of the finished products. Being independent from the production department, the quality control department provides a useful check on the end products and the quality control at every stage of the production process.

As a testimony of its quality management



Langkawi Lagoon Resort, Langkawi Island, Kedah

system, ICP is the first PC Piles manufacturer in Malaysia to have obtained the ISO 9002 certification in 1992 for its plant located in Prai Industrial Estate, Penang and subsequently for all its other factories. Under 9002 certification, regular internal audits are conducted to ensure that the quality management system is continuously maintained, improved and upgraded.

In 2000, all ICP factories were upgraded to the prestigious quality system MS ISO 9001: 2000.

AWARD

In the course of fulfilling customers' requirement, ICP has produced very long piles of up to 46 meter in a single length. Last year this feat has earned ICP an entry in The Malaysian Book of Records for producing the longest pile. These very long piles were used as foundation system for construction of berths at North Butterworth Container Terminal in Penang, Lumut Maritime Terminal in Perak and West Port in Selangor. ■