

## Serial report

### Terminologies in Press-in Engineering (Part 1)

IPA Editorial Committee

The “**Press-in retaining structures: a handbook (First edition, 2016)**” has been issued in December 2016 and the first seminar to utilize this handbook was held on 2<sup>nd</sup> March 2017 in Singapore. The Editorial Committee has sort out over 500 of terminologies and picked up 64 of key terminologies in conjunction with the handbook. IPA Editorial Committee introduce those as the Serial reports for your reference.

The first report introduces basic terms of “the Press-in Method” and related 12 terminologies as follows:

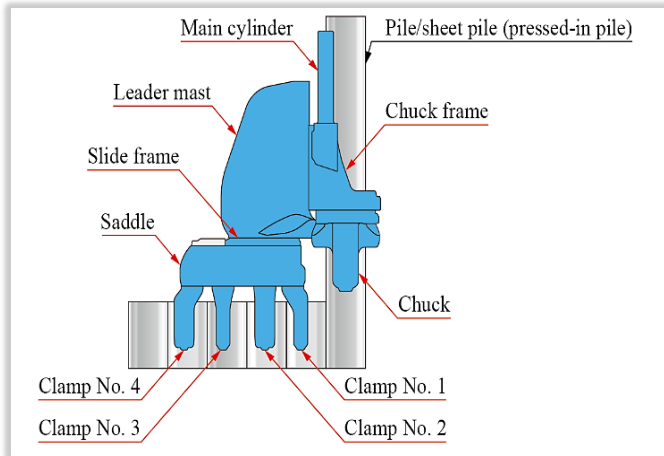
Terminologies	Definitions
jacking	generic term for pile installation techniques by means of static load, where the reaction force can be ensured either by heavy weight or extraction resistance of adjacent piles Note; “pressing” can be used as an equivalent term
pressing	generic term for pile installation techniques by means of static load, where the reaction force can be ensured either by heavy weight or extraction resistance of adjacent piles Note; “jacking” can be used as an equivalent term
jacking/pressing machine	general term of jacking/pressing machine that presses piles/sheet piles into the ground by a static load such as hydraulic pressure
the Press-in Method (pressing method by Silent Piler )	piling method to install piles/sheet piles with static load by Silent Piler, using extraction resistance of the previously installed piles/sheet piles as reaction force
Silent Piler	the jacking/pressing machine to install piles/sheet piles into the ground with a static load (hydraulic pressure), and also with a feature to use extraction resistance of previously installed piles/sheet piles by clamping them. This is a collective term for a variety of pressing machines such as Tubular Piler, Clear Piler and Zero Piler etc.
standard Press-in	pile installation by Silent Piler without driving assistance such as water jetting or augering
driving assistance	techniques to reduce the penetration resistance during pile installation by Press-in Method, such as water jetting, augering, augering, and rotary cutting for difficult ground conditions
water jetting	the driving assistance for the Press-in Method by in injecting high pressure water into the ground from the nozzle attached to the lower part of the pile/sheet pile to reduce pile toe resistance and shaft friction
augering	the driving assistance for the Press-in method by augering, used in hard ground
air system	system to inject air at the pile toe, used with a water lubrication system to reduce rotational resistance when the Gyro Piler is used
non-staging system	a press-in system that enables all the piling machineries necessary for the press-in operation to moves by itself (self-walking) on the previously installed piles/sheet piles
basic configuration of Press-in machines	basic configuration of the machine that is comprised of a power unit, a reaction stand, a radio controller and a pile laser for Silent Piler to carry out pile(s)/sheet pile(s) installation

(To be continued on the next issue)

## Serial Report

### Terminologies in Press-in Engineering (Part 2)

IPA Editorial Committee



The “**Press-in retaining structures: a handbook (First edition, 2016)**” was issued in December 2016 and the seminars on Press-in technology by utilizing this handbook were held 4 times in Singapore, Malaysia, Thailand and Philippines so far.

Following terminologies Press-in Engineering (Part 1) in Volume 2, Issue 1, Part 2 presents “Functions of each component on Silent Piler” as follows:

#### Functions of each component on Silent Piler

Components	Functions
Clamps	a component of Silent Piler for obtaining reaction force to press-in piles/sheet piles by clamping the previously installed piles/sheet piles (3 or 4 clamps, depending on the type of Silent Piler)
Saddle	a component to hold Leader mast with Slide frame and to connect with clamps.
Slide frame	a component to slide inside of Saddle and Leader mast are mounted. Function to decide the longitudinal location of the pile/sheet pile, sliding the leader mast in the forward/backward direction.
Leader mast	a component to guide pile/sheet pile for upwards and downwards movement with Main cylinder and to keep pile/ sheet pile in appropriate right and left direction. It is also a storage space for other mechanical and electrical components with important functions.
Main cylinder	Hydraulic cylinder to press piles/sheet piles into the ground by moving them up and down
Chuck frame	a component to hold rotating Chuck and move upward and downward together with Chuck by Main cylinder.
Chuck	a component of Silent Piler, which grips piles/sheet piles by claws to press piles/sheet piles into the ground. It can rotate inside of Chuck frame
Multi-purpose monitor	Monitor mounted on the side of Leader Mast to indicate the press-in force, inclination angle and the open/close state of Chuck for the operator to check the installation status during machine operation with either wired or wireless control device.

(to be continued on Part 3)

## Serial Report

### Terminologies in Press-in Engineering (Part 3)

IPA Editorial Committee

Following Terminologies Press-in Engineering (Part 2) in Volume 2, Issue 3, Part 3 presents "Press-in data" as follows:

#### Press-in data

<b>press-in data</b>	an equivalent term to monitoring data obtained during pile installation, such as actual press-in force, extraction force, penetration and extraction speed, and etc. Depending on the ground condition, they may/may not be different from those determined in advance for operation
<b>monitoring data</b>	items displayed and recorded on Press-in Data Monitoring System, such as press-in speed and to be used for proper piling control
<b>press-in force</b>	a static force generated by the in hydraulic pressure by the main cylinders of Silent Piler to press-in pile/sheet pile. The maximum value is determined as press-in parameter to control the operation. Actual data obtained as the press-in data are displayed on a monitor and recorded by Press-in Data Monitoring System
<b>penetration resistance</b>	force acting as resistance during press-in mainly due to toe resistance of piles/sheet piles, shaft friction and friction along the sheet pile interlocking
<b>reaction force</b>	a force required to either press-in or extract piles/sheet piles
<b>penetration length [<math>\ell_p</math>]</b>	penetration length of pile/sheet pile during penetration and extraction operation
<b>penetration speed</b>	the speed of a pile/sheet pile penetration. One of the important press-in parameters to control pile installation efficiency. Actual data obtained as press-in data are displayed on a monitor then recorded by the Press-in Data Monitoring System
<b>extraction force</b>	static force generated by the hydraulic pressure in the main cylinders of Silent Piler to extract pile/sheet pile. One of the press-in data to be displayed on a monitor and recorded by Press-in Data Monitoring System
<b>extraction length [<math>\ell_e</math>]</b>	extracted length of pile/sheet pile during a cycle penetration and extraction operation
<b>extraction speed</b>	the speed of a pile/sheet pile extraction. One of the important press-in parameters to control pile installation efficiency. Actual data obtained as press-in data are displayed on a monitor and recorded by Press-in Data Monitoring System
<b>repeated penetration and extraction</b>	an operation to repeat "penetration" and "extraction" of the pile/sheet piles during press-in operation, in the case where the penetration resistance is large. This will reduce shaft friction and toe resistance
<b>net pressed-in length [<math>\ell_p - \ell_e</math>]</b>	net pressed-in length of pile/sheet pile per single penetration and extraction operation
<b>Pile Penetration Test</b>	one of the systems to make the better use of the press-in data. The Pile Penetration Test analyzes monitored data and evaluates the ground condition. The term may be used as an equivalent term to Press-in Data Monitoring System

(to be continued on Part 4)

## Serial Report

### Terminologies in Press-in Engineering (Part 4)

IPA Editorial Committee

Following Terminologies Press-in Engineering (Part 3) in Volume 3, Issue 3, Part 4 presents “Press-in system” as follows:

#### Press-in system

<b>Press-in system</b>	general term for pile/sheet pile installation procedures by static load and systemized machines specially devised to reduce noise and ground vibration and also to cope with spatial construction constraints at a construction site, such as narrow space, headroom restriction and construction in the close proximity of adjacent structures
<b>Narrow space clear system</b>	A press-in system to overcome spatial constraints on the site. A system suitable for narrow spaces in dense urban areas, and narrow areas where a crane cannot be brought in.
<b>Headroom restriction clear system</b>	A press-in system to overcome spatial construction constraints. The piles/sheet piles installation can be carried out by "Clear Piler" under headroom restrictions.
<b>Adjacent press-in system to railway</b>	a press-in system to be used for areas adjacent to railway track without disrupting train service
<b>Ultra-adjacent press-in system</b>	a press-in system to be used for areas very close to adjacent building(s)/structure(s), even with zero clearance
<b>Skip lock system</b>	system to install steel tubular piles with a constant center-to-center spacing of 2.5 times the pile diameter
<b>Gyropress Method</b>	Press-in Method with rotary press-in with cutting bits to install steel tubular piles using the Gyro Piler
<b>Gyro Piler</b>	one of Silent Piler variations to install steel tubular piles with rotary cutting
<b>Rotary press-in with cutting bits</b>	Torque and axial force are applied simultaneously to install tubular piles by rotating them into the ground. This method is used for the hard ground with gravels, boulders, rocks, and even for existing concrete structures.
<b>Non-staging system</b>	a press-in system that enables all the piling machineries necessary for the press-in operation to move by itself (self-walking) on the previously installed piles/sheet piles
<b>Self-walking</b>	forward movement or reaction of Silent Piler during the installation of continuous wall/structure without the use of crane, made possible by a sequence of gripping a new pile, installing the pile to sufficient depth, releasing clams, lifting and sliding the Silent Piler a new location
<b>Self-walking backward</b>	backward movement of Silent Piler on the continuous wall/structure without the use of crane, made possible by the use of special attachment for self-walking backward
<b>Water lubrication system</b>	The system to discharge a small amount of water at the toe of steel tubular pile to reduce frictional resistance between a pile and the ground. It does not use a large volume of water as compared to a water jetting system.

(to be continued on Part 5)

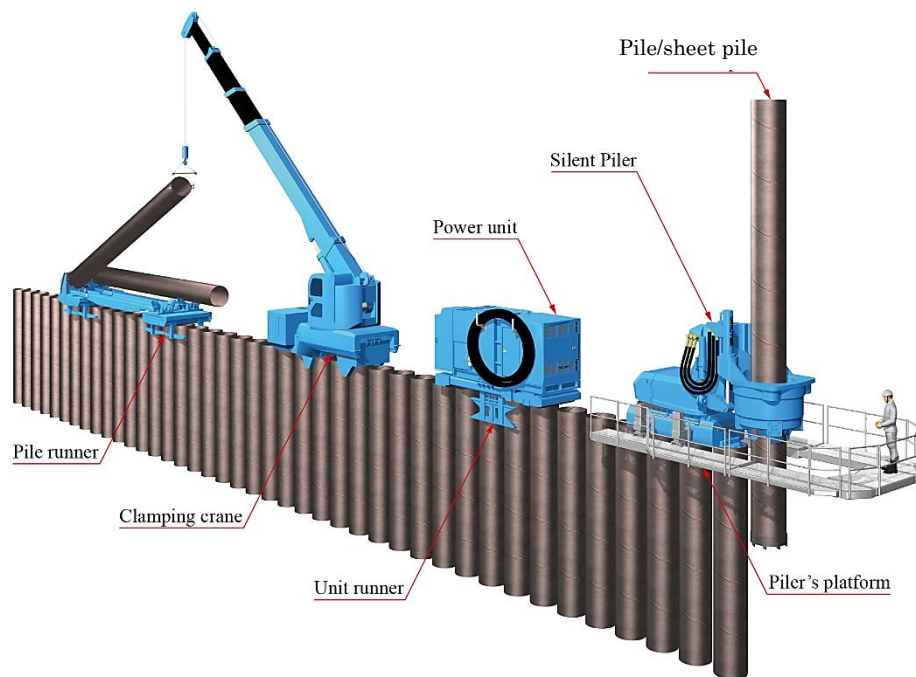
## Serial Report

### Terminologies in Press-in Engineering (Part 5)

IPA Editorial Committee

Following Terminologies Press-in Engineering (Part 4) in Volume 4, Issue 1, Part 5 presents “Non-staging system” and related piles” as follows:

#### Non-staging system



Non-staging system	a press-in system that enables all the piling machineries necessary for the press-in operation to move by itself (self-walking) on the previously installed piles/sheet piles
counter weight	weight to be placed on the reaction stand to obtain reaction force to commence the press-in operation
reaction stand	a stand for counter weights obtaining reaction force for the installation of a an initial few piles/sheet piles to commence press-in operation
Unit runner	one of the components of the Non-staging system with clumping mechanism to carry a power unit and travels on the previously installed piles/sheet piles
Pile runner	one of the components of the Non-staging system with clumping mechanism to transport piles/sheet piles and travels on the previously installed piles/sheet piles
Clamping crane	crane grips the previously installed piles/sheet piles with a clumping mechanism. An element of the Non-Staging system with self-walking function
pile(s) / sheet pile(s)	piles and/or sheet piles to be installed.

(to be continued on Part 6)

## Serial Report

## Terminologies in Press-in Engineering (Part 6)

IPA Editorial Committee

Following Terminologies Press-in Engineering (Part 5) in Volume 4, Issue 2, Part 6 is the last issue as follows:

press-in parameters	operational parameters, such as maximum press-in force, press-in speed and the penetration and extraction lengths during repeated and extraction operation, determined as target values for the control of Silent Piler during pile installation. Those are the items affecting the piling efficiency of the press-in operation and construction time control.
reaction pile	piles/sheet piles previously installed into the ground that are gripped by Silent Piler to obtain reaction force for the next pile installation
reaction stand	a stand for mounting counter weights to obtain reaction force during the installation of initial few piles/sheet piles to commence press-in operation
initial press-in	a piling process to install an initial few piles/sheet piles while reaction pile/sheet piles are not available
driving attachment	an equipment used for avoiding the chuck frame of the Gyro Piler from touching the steel tubular piles previously installed. It is used not only for the installation of steel tubular pile to the design elevation, but for the self-walking of the Gyro Piler. It is also used to install joint members such as equal angle steel between steel tubular piles.
embedded wall(s)/structure(s)	generic term for continuous body of embedded wall(s)/structure(s) with piles/sheet piles and it is mainly utilized for earth retaining function
cantilever type embedded retaining structure(s) / wall(s)	the structure(s)/wall(s) formed by simply embedding piles/sheet piles and steel tubular piles, without tie rods, anchors or braces, usually used as earth retaining structures
combined wall structure by Combi-Gyro Method	wall constructed with a combination of hat-shaped steel sheet piles and steel tubular piles by the Combi-Gyro Method
plugging	situation in which the inside of an open-ended pile is plugged with inner soil during pile installation. It also occurs in a concaved portion of the steel sheet pile. This causes an increase in penetration resistance to pile installation.
interlock/interlocking	a joint adjacent sheet piles in the longitudinal direction to form a continuous wall or structure
prefabricated pile(s)	piles/sheet piles commercially fabricated in a factory as a ready-made use on site
bored pile	pile formed with or without a pile casing by excavating or boring a hole in the ground and filling with plain or reinforced concrete. (EN 1536:2010)
driven pile	pile which is forced into the ground by impact/vibratory hammering
pile toe	bottom edge of pile/sheet pile
pile toe ring bits	a steel ring with cutting bits attached to the toe of a steel tubular pile, used for rotary Press-in with cutting bits
pile top	top edge of pressed-in pile/sheet pile
planned installation line	planned line for pile/sheet pile installation specified in construction plan
hollow bored piling method (pile installation method by inner excavation)	pile formed with a pile casing and installed with simultaneous excavation or displacement of soil inside the casing