

A new proposal for the appropriate quality control of driven piles by using set values

¹⁾, Myung-Whan Lee, ²⁾, Hun-Sung Hong
³⁾, Soung-Hoi Kim, ³⁾, Young-Suk Jun

¹⁾ () , Principal Researcher, Piletech Consulting Engineers
²⁾ () , Principal, Piletech Consulting Engineers
³⁾ () , Senior Researcher, Piletech Consulting Engineers

SYNOPSIS : Because of simplicity and easiness, dynamic pile driving formulae have long been used by most of the field engineers for pile quality control purposes. Yet their reliability have been repeatedly reported unsuitable and the results can lead to significant errors. According to the research results by the authors, the two most important sources of unreliability of dynamic pile driving formulae are uncertainty in the estimation of hammer efficiency and time dependent characteristics of pile bearing capacity. Based on this finding a new method is proposed. By using the actual value of hammer efficiency the pile bearing capacity at the time of driving could be reasonably estimated. By performing restrike test sometime after pile installation, time effect coefficient could be determined. The effectiveness of the proposed method was proven in the actual construction project.

Keywords : dynamic pile driving formula, hammer efficiency, time effect, quality control

1.

가 .

가 가 가 .
가

가 가
가 .

가 가

40 60% 가
20 25%
30%

가

가

가 가 1500mm
600 700ton 900mm 가

1990 가

(SIP, SAIP, PRD)

가

가

가

2.

. 가

가
가
가

가

가

(Tavenas & Audy, 1972/ Ramey

& Johnson, 1979/ , , 1992/ , 1997).

가

가

. 1994

PDA

10 20%

가

$$\left(\begin{array}{cc} & \end{array} \right)$$

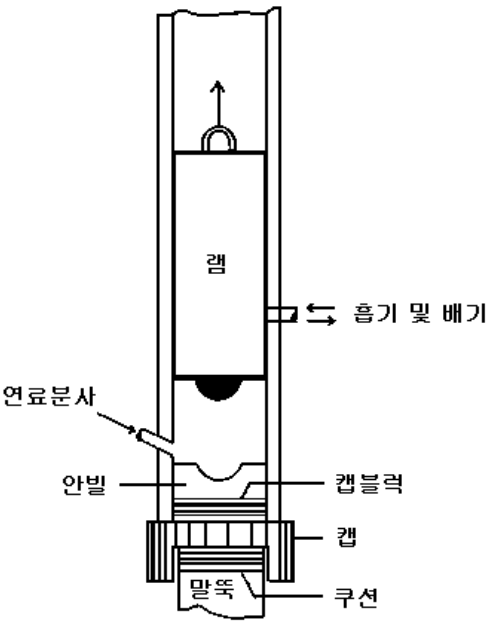
3.

「 (input energy) (work done) 」

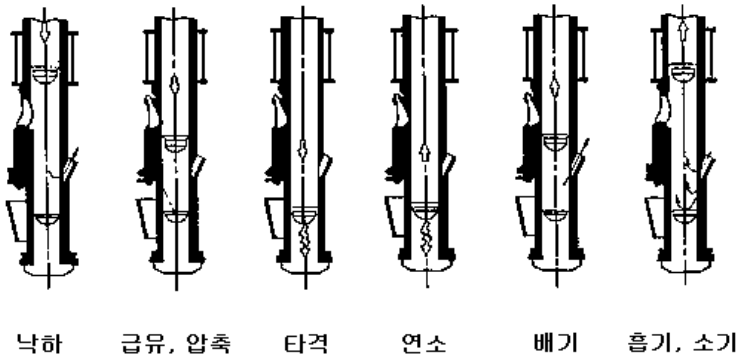
【 (W_h) x (H)】 (e_h)

가

1



(a) 구조



(b) 작동 원리

1 (, 1997)

,	0.8
	1.0
	0.72
	0.9

1

가

(preheating)

1

가

가

가

가

가 가

가

가

가

(preignition)

2

1

K25

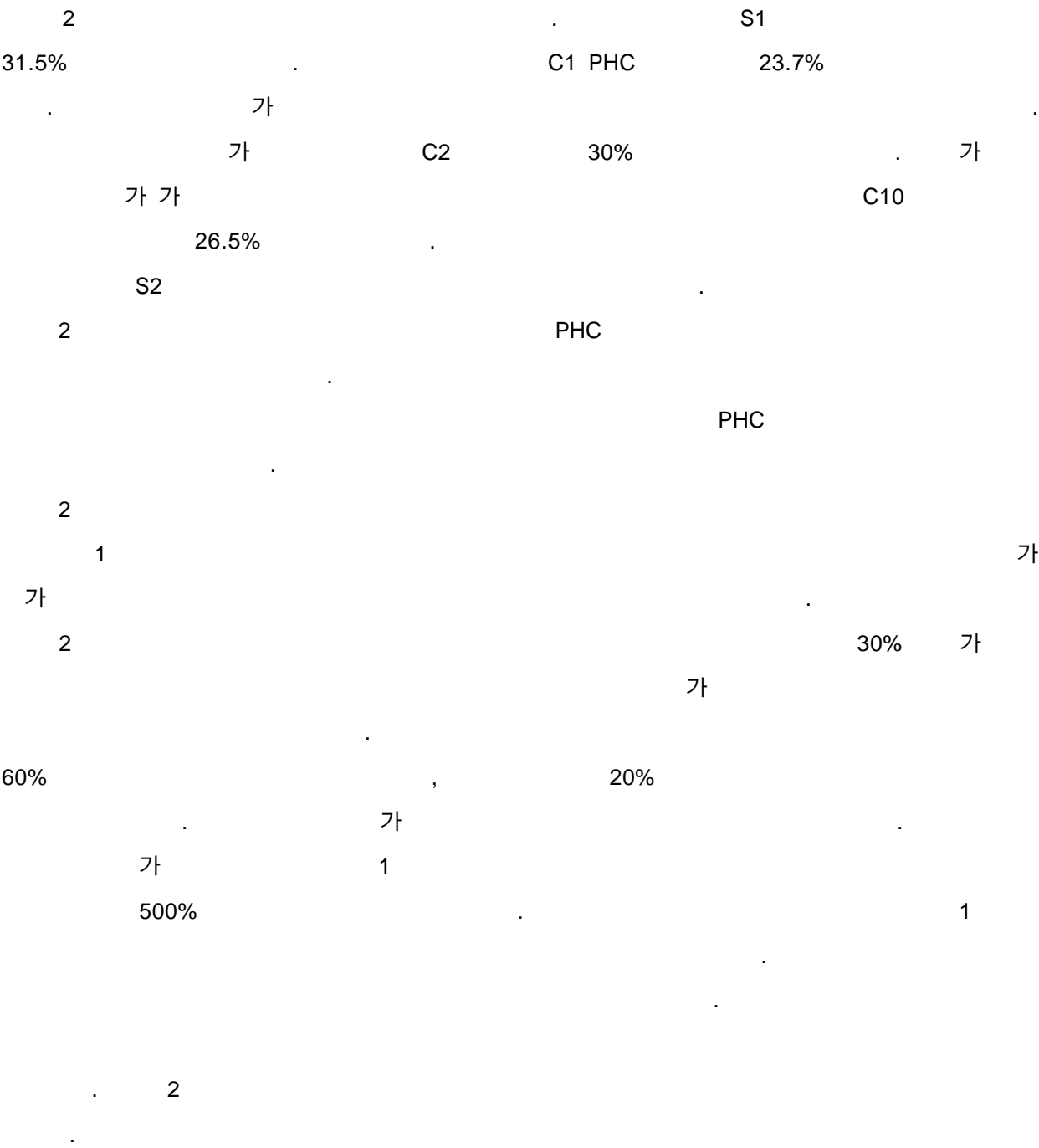
2

(S : ø406.4mm , C : ø400mm PHC)

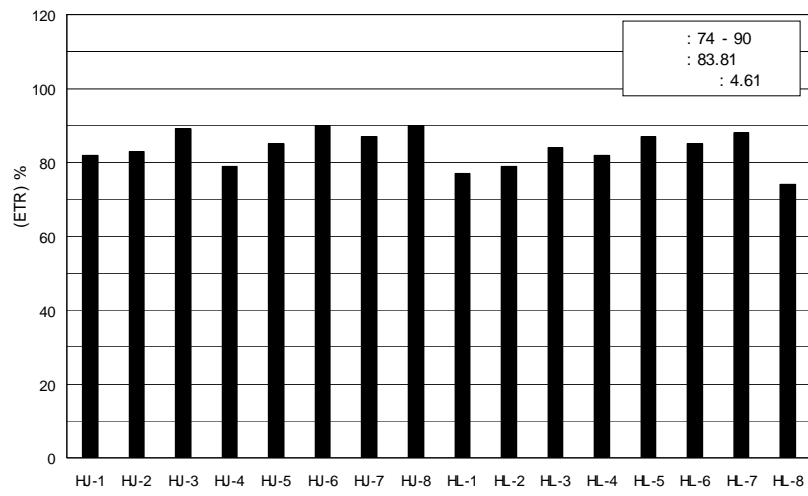
2 (, 2 , K25)

	S1	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	S2	S3
(t-m)	2.02	1.54	1,98	1.92	2.02	1.91	1.98	2.25	1.95	2.16	1.72	2.35	2.04
(%)	31.5	23.7	30.5	29.5	31.1	29.4	30.5	34.6	30.0	33.2	26.5	36.2	31.3

: 1. S , C PHC
2. S1 ,



1



2

가

,

가

1

가

1

가

가

%

가

4.

1990

가

가

1990

가

1994

가

가

(

, , , 1994).

3

case 1

가

가

1

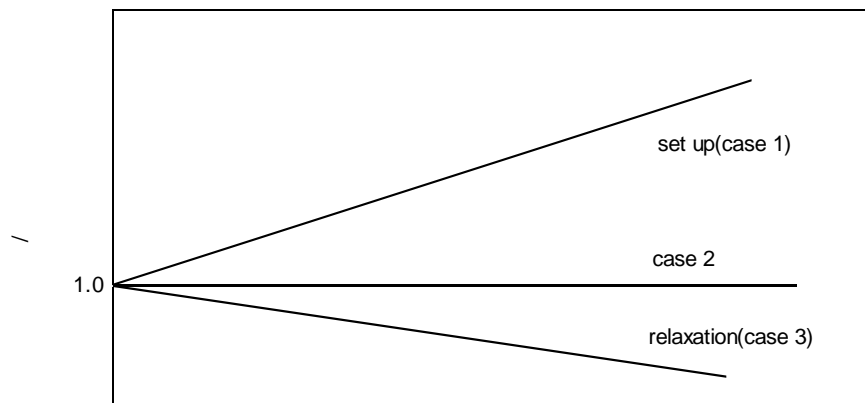
2

가

가

2

20 30%



3

가가

가

5

가

가가

가

가

가

(3 case 2).

1 2

가

가

가

3 case 3

가

가

가

가 가

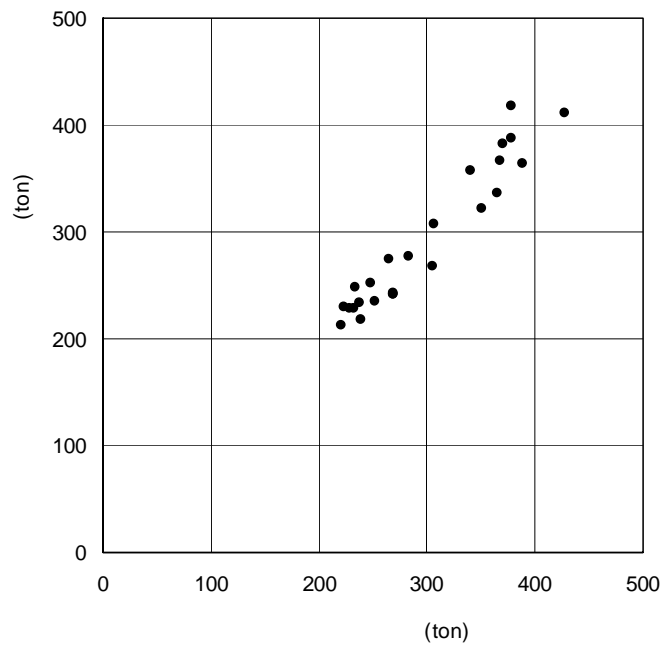
5.

가 ,

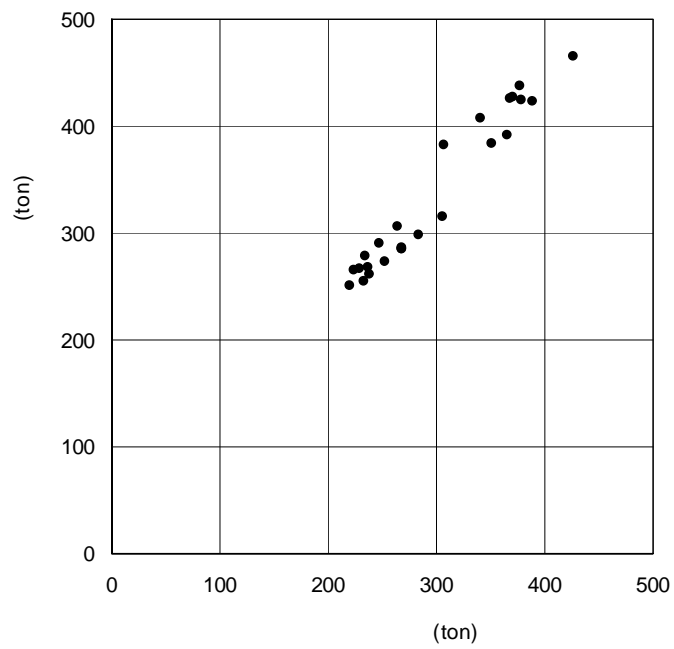
() , 가

PDA

4



Hiley (e_h =)



Danish (e_h =)

4 가 가 Hiley Danish
PDA
Davisson 가
10%

- PDA
- 가
- Hiley Danish
- (EOID) Davisson 가
- (
-)
-
- (2)
-
- (heaving)

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