PDA

Evaluation of Hammer Performance using PDA

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  1994   PDA(Pile Driving Analyzer)

(Dynamic Pile Testing)   (driving stress)

  (driving system perfermance),   (structural integrity)

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(DKH-#)

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 2.

 2-1.   /   (Hammer/Driving system performance)

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,   .

                               1   PE(Potential Energy :

          ,   KE(Kinetic Energy :   ) ,   EMX(Transferred Energy :

)   .

◦   (PE)

W   H

.

PE = W × H

· W : the ram weight

· H : the ram stroke

◦   (KE)

m(mass)   (v_i) $\frac{1}{2} m v_i^2$

                                                                   (PE＞KE).

KE = $\frac{1}{2} m v_i^2$

· m : the ram mass

· v_i : the ram velocity at impact

◦ PE = W×H   (ton－m)

◦ KE = 1/2mv^2 (ton－m)

◦ EMX = $\int$[F(t)·v(t)dt] (ton－m)

[   ] 말뚝에 전달되는 에너지

。   (EMX)

,   ,   ,

,

(KE>EMX).

PDA

(F)   (V)   .

$$EMX = \int F(t) \cdot V(t) dt$$

· F : the force at the gage location

· V : the velocity at the gage location

.

.

$(E_h$: Hammer Efficiency)

(ETR : Energy Transfer Efficiency)   .

-             (E_h)

$$E_h = \frac{KE}{PE} = \frac{1/2\,m v_i^2}{W \times H}$$

(E_h) (KE)   (PE)   ( )

(ETR)   .   PDA

(HPA:Hammer Performance

Analyzer)

.

(GRL, 1995)

95%   .

- (ETR)

$$ETR = \frac{EMX}{PE} = \frac{\int [F(t) \cdot V(t)dt]}{W \times H}$$

( )   (ETR)   .   ,

,

.

2-2.

1993   D   250

1   .

1

		DKH-7	DKH-10
		7.0 ton	10.0 ton
		0.2 m - 1.2 m	0.2 m - 1.2 m
CAP		1.2 ton	1.5 ton
		nylon / klinger	
		190 mm	190 mm
		2827	5026
	(E)	95 %	95 %

3.

(PHC), H

7 ton, 10 ton

(Dynamic Pile Test) , ,

2 3 11 .

2 15

. EOID(End Of Initial Driving)
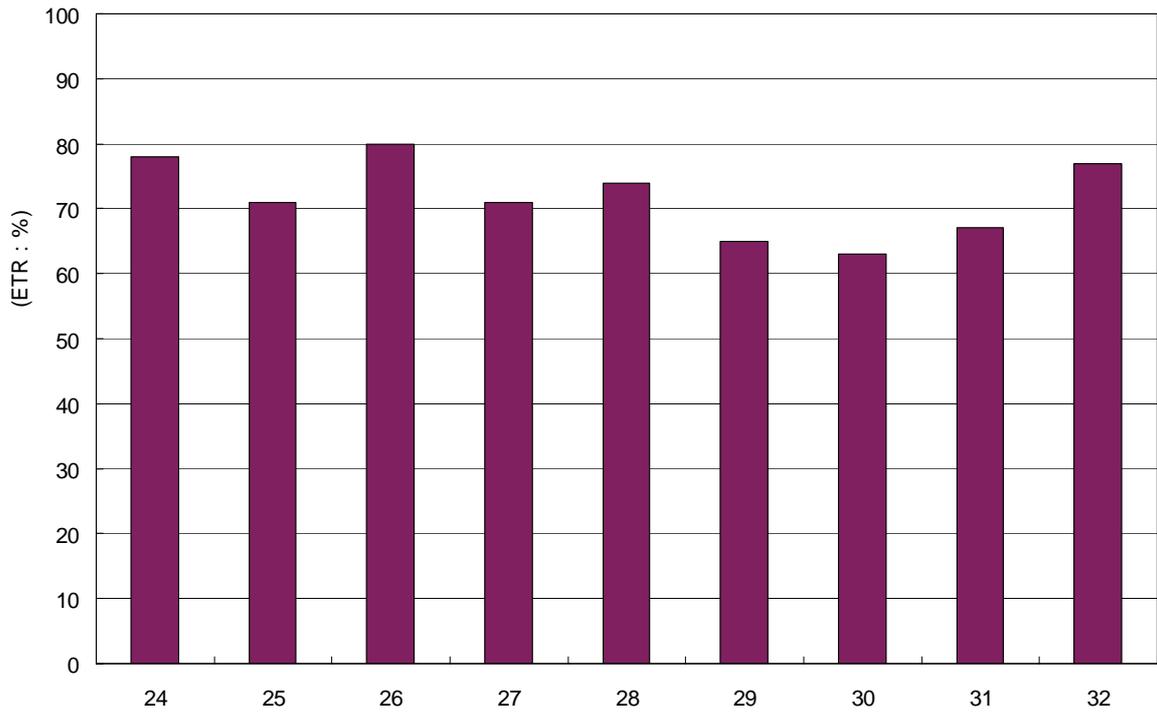
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100 .

PDAPLOT(PDA

) 2

. (PE) .

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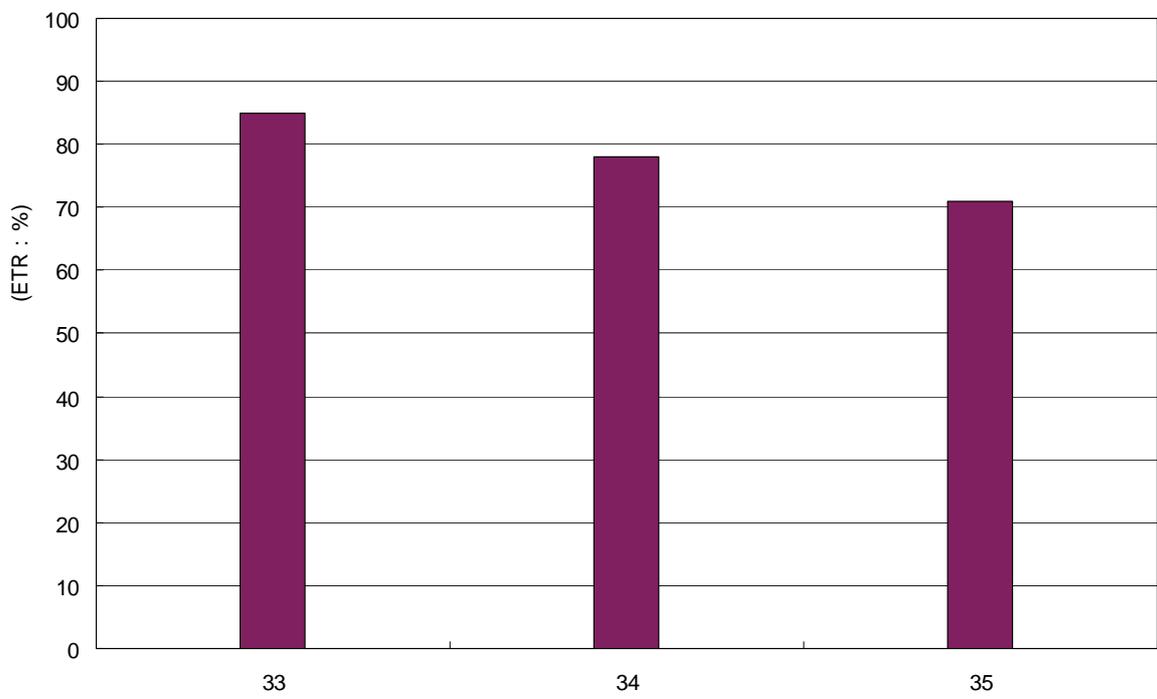|		( )	(m)	(ETR : %)
DKH-7 (7.0 ton)	406.4×10(t) mm	124.5	0.5	75 80
			0.8	75 82
			0.9	84 87
			1.2	72 75
	406.4×12(t) mm	148.7	1.0	80 92
			1.1	62 91
	406 mm PHC	684.0	0.8	71 78
			0.9	71 80
			1.0	62 67
			1.2	63 77
	300×305×15 H	134.8	0.5	85
			0.8	78
			1.2	71
DKH-10 (10.0 ton)	609.6×12(t) mm	225.3	1.0	84 95
			1.1	66 94
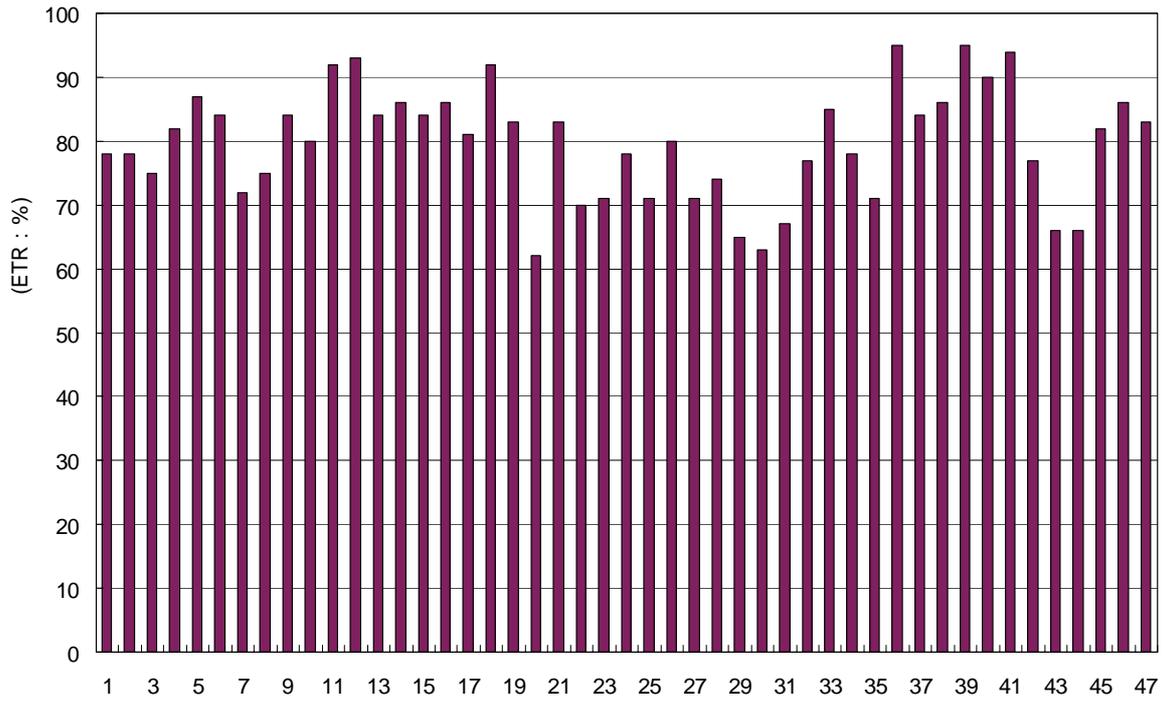
[3]   (DKH- 7, DKH- 10,   , PHC, H   )
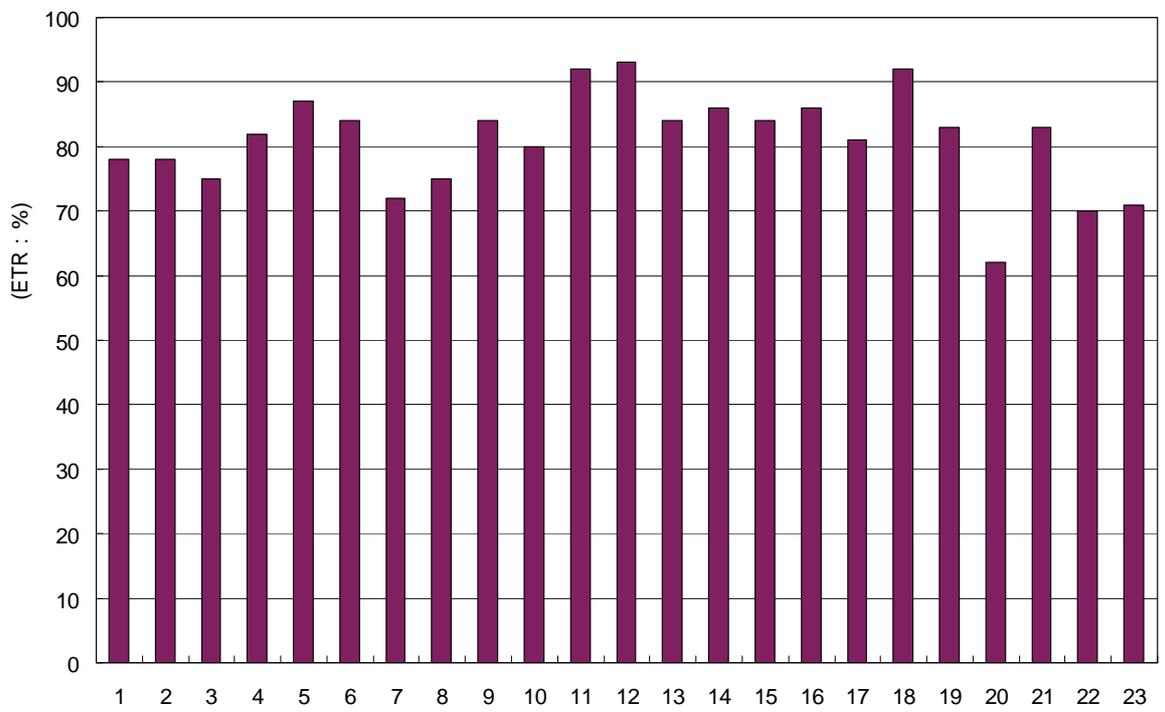
[4]   (DKH- 7,   406 mm   )

[5]   (DKH- 7,   400 mm PHC   )
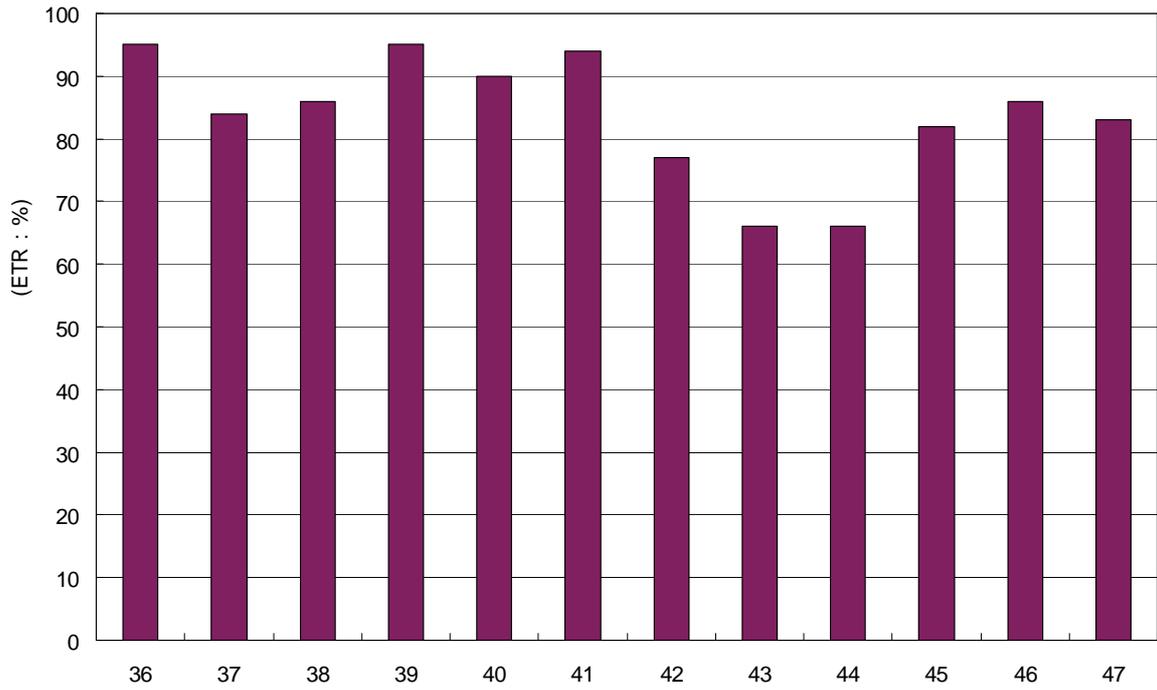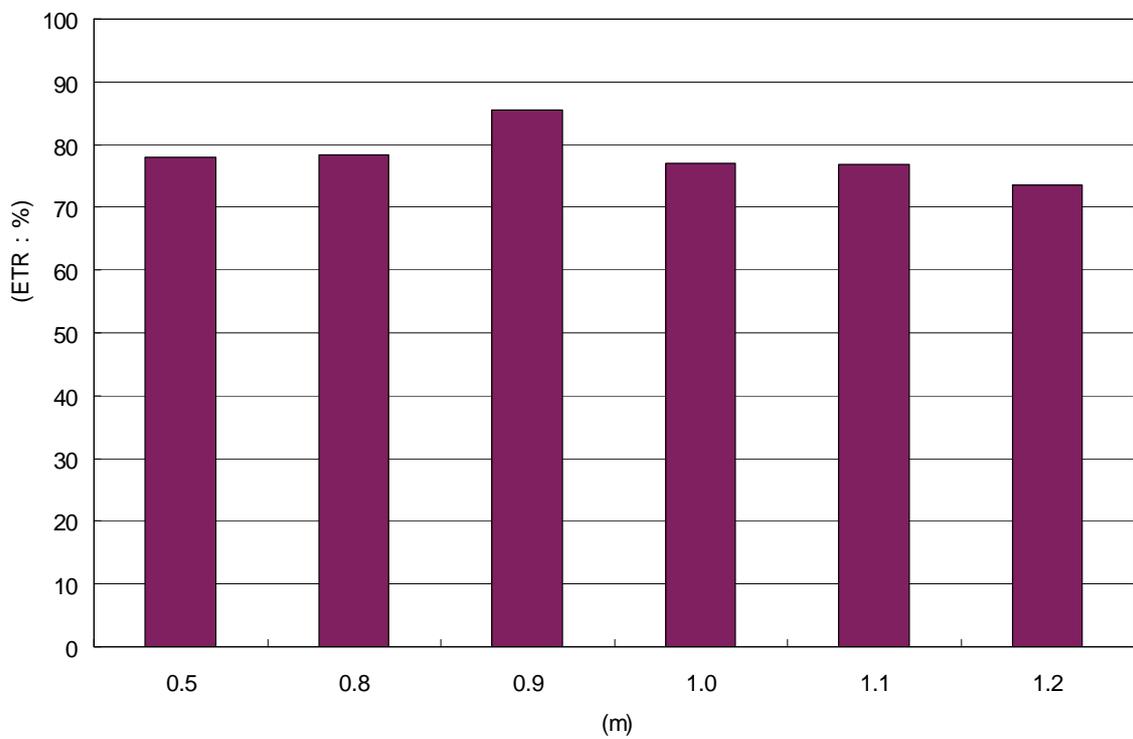

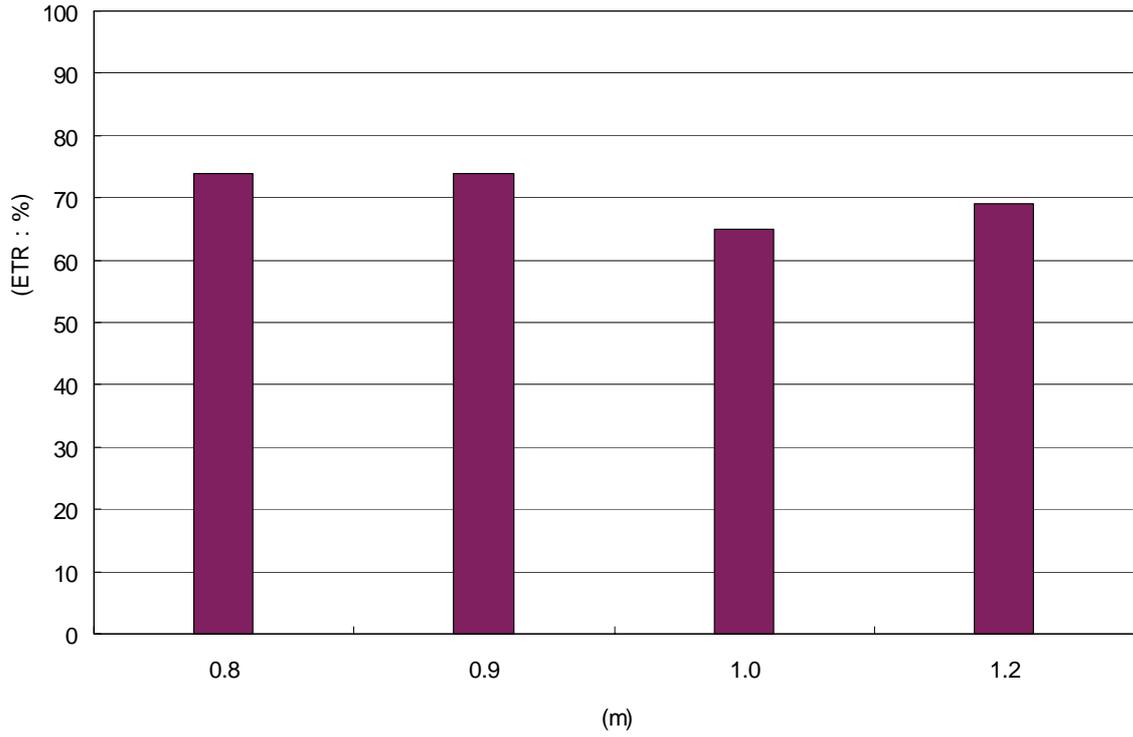[6]   (DKH- 7,   300 × 305 × 15(t) mm H   )

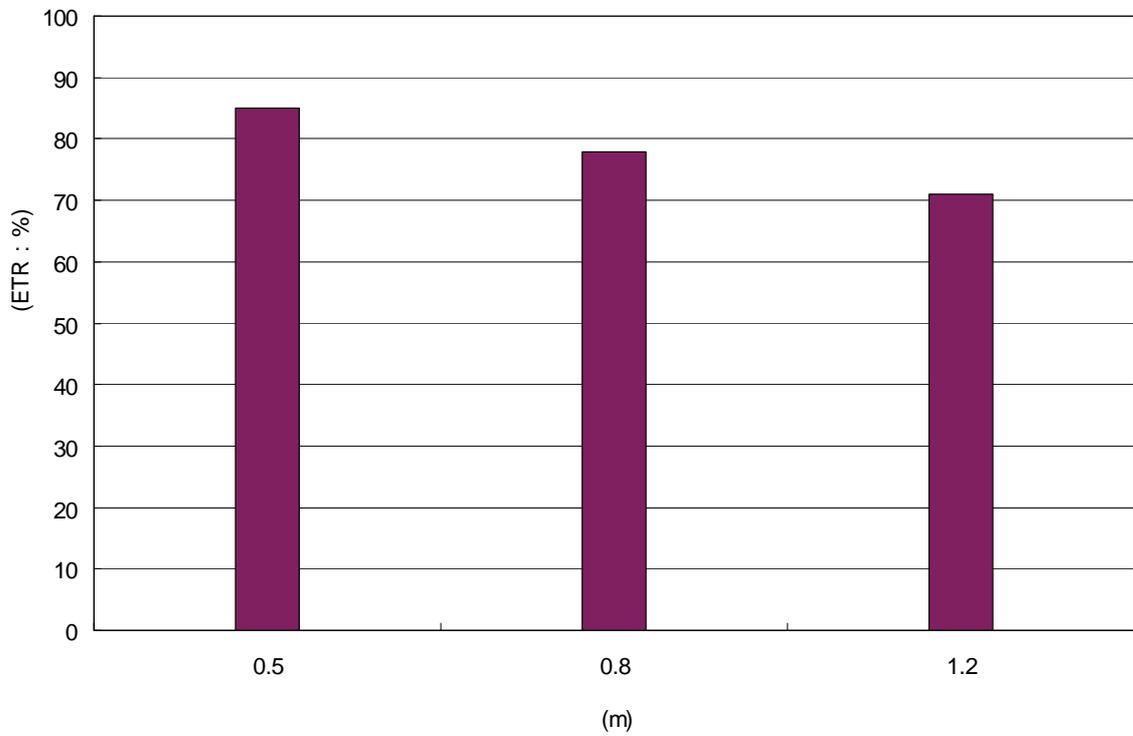[7]   (DKH- 7,   609.6× 12t mm   )
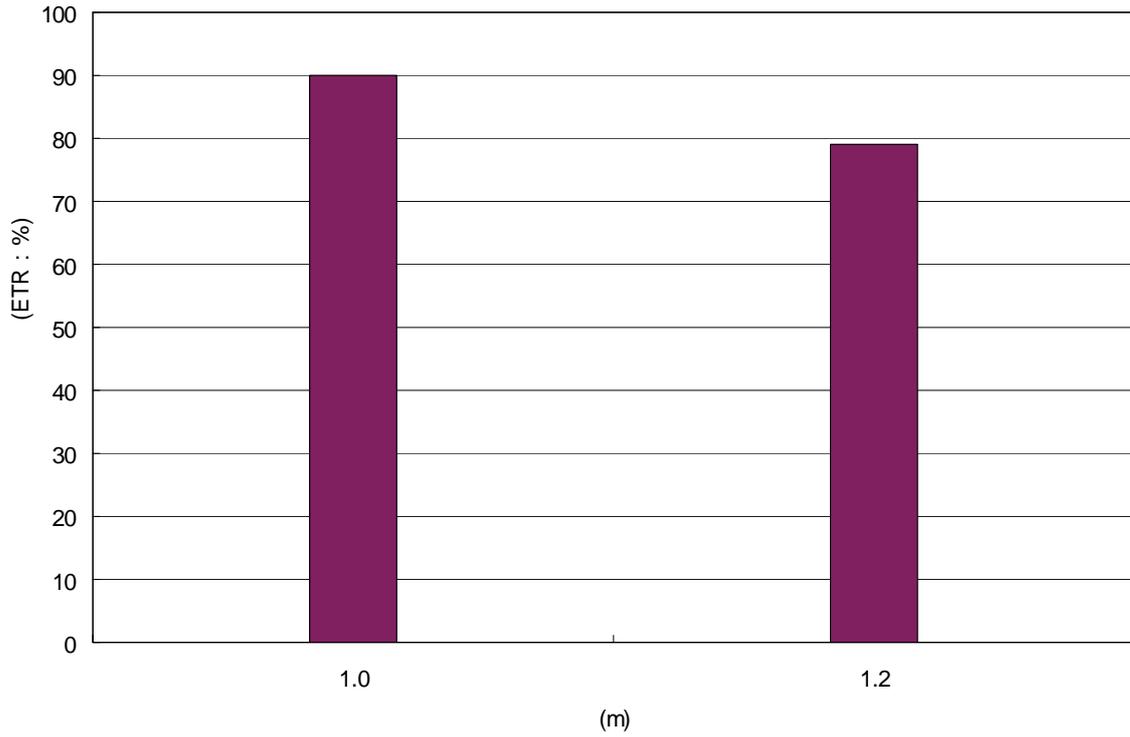

[8]   (DKH- 7,   406 mm   )

[9]   (DKH- 7,   400 mm PHC   )

[10]   (DKH- 7,   300 × 305 × 15 (t) mm H   )

(ETR : %)

1.0   1.2

(m)

[11]   (DKH- 7, D 609 mm   )

4.

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62 %   95%

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DKH- 7   406 mm   62 %   92 %   ,   80 %

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DKH- 7   400 mm PHC   63 %   92 %   ,   70%

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DKH- 10   609 mm   66 %   95 %   ,   80%

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(Nylon   klinger   )

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5.

DKH   .

                                        (,   ,   ,

,   ,   /   )   (WEAP)

                        .

Mohamad Hussein, Garland Likins "Dynamic Testing of Pile Foundations During Construction",
America and Beyond proceedings of structures. Congress XII.

Steve Abe, Gabriel Tendean "Hammer performance Evaluations" Fifth International conference
on The Application of Stress- Wave Theory To Piles

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    " 96   " p357 p362

                    "DKH   "