See Appendix F for Wave Equation Example

FORM FHWA 17-348 (12/2007)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Western Federal Lands Highway Division
610 E. 5th St. Vancouver, Washington 98661

FP-03 109.01

Date Stamp

Copy Stamp

(a) Project Name:

Project Number:

(b) Item Number: 55101

Item Description: Driven Piles, steel H pile, in place, 310mm x 110mm

(c) Date work performed:

Daily Record Of Miscellaneous Items

(f) Calculations*:

Abutment No. 2 = 152.4m

(g) Supporting sketch and details*:

see attached pile layout and pile driving record

Summary of Quantities

(d) Location:	(e) Measured quantity:
8+143.037	152.4m

*Attach additional sheets if necessary.

Total Quantity: 152.4

Unit of Measurement: m

(h) Name of person measuring work:

(i) ■ Interim Measurement ☐ Final Measurement

I certify the above measurements and calculations are correct and the total quantity is subject to direct payment for the item identified.

(j) Contractor Representative

FHWA Use Only

Verified By:

Construction Inspector

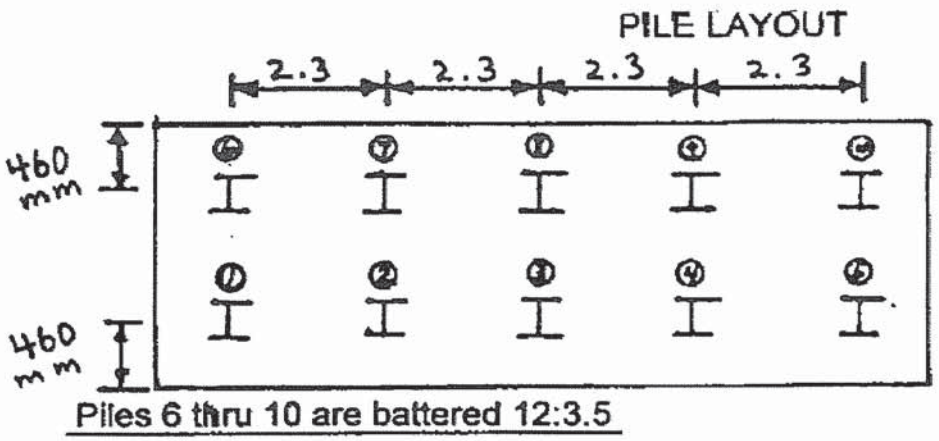
Approved

Entered To Record

Checked By:

FHWA Representative

Date:



Pile Driving Record

1/10/1998
Bolder Creek Bridge
Abutment #2

Pile Type: HP 250 x 85
Hammer Name/Model: Delmag D8-22

Hammer Energy: 23.87 kN-m
Req'D Bearing: 440 kN

Pile No.	Length in Leads (m)	Cut Off Length (m)	Cut Off Elev. (m)	Tip Elev. (m)
1	7.62	0.229	238.658	225.552
	7.62	1.905	238.658	
2	15.24	3.100	238.658	226.518
3	15.24	3.200	238.658	226.619
4	15.24	2.819	238.658	226.238
5	15.24	2.234	238.658	225.653
6	7.62	0.305	238.658	225.857
	7.62	1.600	238.658	
7	15.24	2.643	238.658	226.564
8	15.24	2.691	238.658	226.613
9	15.24	2.286	238.658	226.223
10	15.24	1.829	238.658	225.784
	152.4	24.841		

Pile No.	Ground Elev (m)	Blows per 25mm	55101 (m)	55106 (ea)
1	238.354	6	13.11	1
	238.354			
2	238.354	7	12.14	
3	238.354	7	12.04	
4	238.354	6	12.42	
5	238.354	6	13.01	
6	238.354	6	12.8	1
	238.354			
7	238.354	7	12.09	
8	238.354	7	12.05	
9	238.354	8	12.44	
10	238.354	6	12.87	
			125.0	2

DATE:_____ LINE:_____ PARTY:_____

PROJECT: ITEM - 55101

PROJECT STAMP: Steel H-Piles In Place

CAPACITY COMPUTATIONS

FP96 TABLE 551-1 PILE HAMMER MINIMUM ENERGY

CALCULATE ULTIMATE PILE CAPACITY (RU):

RU = 440 kN REQUIRED BEARING x

FACTOR OF SAFETY (3) = 1320 kN

FROM TABLE 551-1: 1320 kN => 21 kJ REQUIRED

HAMMER ENERGY (kJ = kN·m)

CHECK PROPOSED HAMMER ENERGY:

DELMAG D8-22 MAX. ENERGY RATING = 23.87 kN·m

DYNAMIC FORMULA:

RU= $7\sqrt{E}\ \log(10N) - 550$

RU= ULTIMATE PILE CAPACITY (kN) = 1320 kN

E= MANUFACTURER'S RATED HAMMER ENERGY IN JOULES AT THE FIELD OBSERVED RAM STROKE = 23870 JOULES (AT MAX. ENERGY)

N= NUMBERS OF HAMMER BLOWS PER 25mm AT FINAL PENETRATION

SOLVING FOR N: WHERE $N=10^X$

Therefore $X = \left(\frac{RU + 550}{7\sqrt{E}}\right) - 1$

WDFD-472
3/83

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
VANCOUVER, WASHINGTON

MISC. CONSTRUCTION NOTES

SUBSTITUTE VALUES AND SOLVE FOR X:

$$X = \left(\frac{1320 + 550}{7\sqrt{23870}}\right) - 1$$

X = 0.73

SOLVING FOR N:

$N = 10^X$

$N = 10^{0.73}$

N = 5.4 BLOWS PER 25 mm AT MAX. ENERGY *

NOTES: * 1) Hammers seldom operate at the maximum manufacturer's rated energy. Hammer energy values should be based on field observed ram stroke. Hammer manufacturers can provide tables of ram stroke versus hammer energy.

2) Use dynamic formula (FP96 Subsection 551.06(b) to determine ultimate capacity (blow per mm) unless the wave equation is required according to FP96 Subsection 551.03(b) If wave equation is used, WFLHD Geotech Branch will furnish the amount of blows required to obtain pile capacity.

COMPUTED BY: ABC CHECKED BY: JKD

DATE: DATE:

FORM FHWA 17-348 (12/2007)

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Western Federal Lands Highway Division
610 E. 5th St. Vancouver, Washington 98661

FP-03 109.01

Date Stamp

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(a) Project Name:

Project Number:

(b) Item Number: 55201

Item Description: Structural Concrete

(c) Date work performed:

Daily Record Of Miscellaneous Items

(f) Calculations*:

For Estimate #1:

Pier cap, abutment 1 = 4.27 x 11.4 x 0.88 = 42.84m3
Pier cap, abutment 2 = 4.27 x 11.4 x 0.88 = 42.84m3
Total = 85.68m3

per contract quantity

(g) Supporting sketch and details*:

Summary of Quantities

(d) Location:	(e) Measured quantity:
abutment 1 @ 8+357	42.84m3
abutment 2 @ 8+453	42.84m3
Total Quantity:	85.7
Unit of Measurement:	m3

*Attach additional sheets if necessary.

(h) Name of person measuring work:

(i) ■ Interim Measurement ☐ Final Measurement

I certify the above measurements and calculations are correct and the total quantity is subject to direct payment for the item identified.

(j) Contractor Representative

FHWA Use Only

Verified By:

Construction Inspector

Approved

Entered To Record

Checked By:

FHWA Representative

Date:

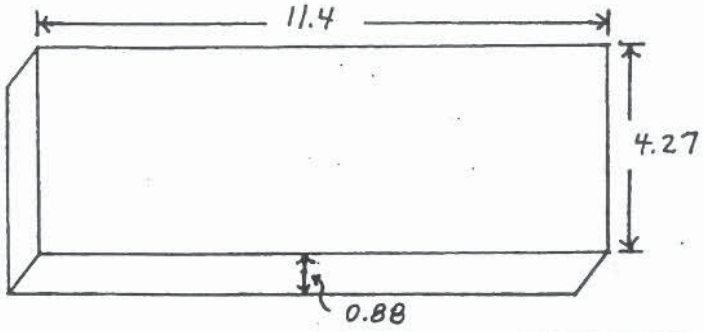
DATE: _____ LINE: _____ PARTY: Contractor

PROJECT:

PROJECT STAMP

Item 55201
Structural Concrete

Estimate No. 1				
Pier Cap Abut. No. 1				
	4.27 x 11.4 x .88 =		42.84	m3
Pier Cap Abut. No. 2				
	Same as Pier Cap Abut. No. 1		42.84	m3
Total Item 55201 Est. No. 1			85.68	m3



(Documentation for Progress Est.)