H.B. FLEMING, INC.

CONTRACTING · ENGINEERING

89 Pleasant Ave. South Portland, ME 04106

Phone 207-799-8514 Fax 207-799-8538

www.hbfleming.com

PILE DRIVING BRIDGES SUBMARINE PIPELINES

SUBMITTAL

Submitted To:
Client: T-Buck Construction
Attention: Brian Emmons

Date: 01/21/2013
Project: VT. Bridge No.78 Pier
Location: Jamaica, VT

Subject: Pile Driving Criteria

H.B. Fleming Proposes to use the following driving criteria for the piles to be installed at the above location.

Hammer(s)

- An APE D19-42, MKT DE 42 or an APE D36-42 may be used for this project. The details for each hammer are listed below respectfully.
- The D19-42 has a ram weight of 4,190 lbs, a maximum stroke of 10'3", and a rated energy of 42,800 ft-lbs.
- The DE-42 has a ram weight of 4,200 lbs, a maximum stroke of 10'6", and a rated energy of 42,000 ft-lbs.
- The D36-42 has a ram weight of 7,938 lbs, a maximum stroke of 11'3", and a rated energy of 89,302 ft-lbs.
- The hammer cushioning material consists of 2 inches of Monocast MC901 material for the APE D19 and the MKT DE 42. The D36 cushioning material consists of 3.5" total, 2 EA 1" Micarta material and 3 EA ½" Aluminum material alternated and stacked.

Pile

- HP 14X102, ASTM A572 Gr. 50 steel piles.
- The Ultimate Capacity which we based our analysis on is 238.5 tons.
- Piles will be fitted with cast steel driving points.

Results

- Piles will be driven until a blow count of 8 blows per inch for three consecutive inches with the MKT DE 42.
- Piles will be driven until a blow count of 7 blows per inch for three consecutive inches with the APE D19-42.
- Piles will be driven until a blow count of 3 blows per inch for three consecutive inches with the APE D36.
- These criteria are based upon the output generated from the WEAP analysis that follows.

Signed: _____ PE.

John Linscott IV "Scotty"

STATE OF VERMONT JOHN S. LINSCOTT IV NO.85346 Civil LICENSED PROFESSIONAL ENGINEER

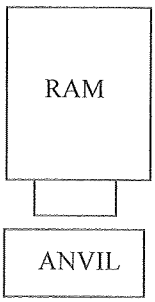
PIER

H.B. FLEMING PILE EQUIPMENT DATA SHEET

Project: Vermont Bridge No:78
Location: Jamaica, Vermont

Date: 01/19/2013
Client: T-Buck

HAMMER

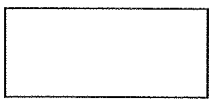


Manufacturer:	MKT
Model:	DE-42
Type:	Single Acting Diesel
Length of Stroke:	10' - 6"
Rated Energy at Given Stroke:	42,000 ft-lb
Modifications:	None

HAMMER CUSHION

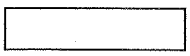
Material:	Monocast MC901
Thickness:	2"
Area:	283.5 in^2
Modulus of Elasticity:	285 psi
Coefficient of Restitution:	0.8

DRIVE HEAD



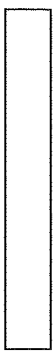
Weight:	1200 lb

PILE CUSHION



Cushion Material:	N/A
Thickness:	N/A
Modulus of Elasticity:	N/A
Coefficient of Restitution:	N/A

PILE



Pile Type:	HP 14x102
Length in Leads:	Up to 65'
Weight/LF:	102 lb
Wall Thickness:	.705"
Taper:	N/A
Cross Sectional Area:	30.0 in^2
Ultimate Capacity	238.5 Tons
Splice Description:	Full Penetration Butt Weld
Tip Treatment Description:	Cast Steel Point

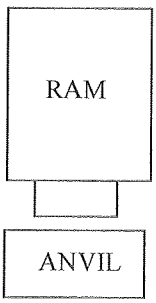
PIER

H.B. FLEMING PILE EQUIPMENT DATA SHEET

Project: Vermont Bridge No:78
Location: Jamaica, Vermont

Date: 01/19/2013
Client: T-Buck

HAMMER



Manufacturer:	APE
Model:	D-19
Type:	Single Acting Diesel
Length of Stroke:	10' - 2"
Rated Energy at Given Stroke:	42,800 ft-lb
Modifications:	None

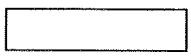
HAMMER CUSHION

Material:	Monocast MC901
Thickness:	2"
Area:	283.5 in^2
Modulus of Elasticity:	285 psi
Coefficient of Restitution:	0.8

DRIVE HEAD

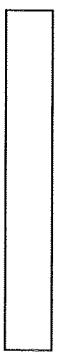
Weight:	1200 lb

PILE CUSHION



Cushion Material:	N/A
Thickness:	N/A
Modulus of Elasticity:	N/A
Coefficient of Restitution:	N/A

PILE



Pile Type:	HP 14x102
Length in Leads:	Up to 65'
Weight/LF:	102 lb
Wall Thickness:	.705"
Taper:	N/A
Cross Sectional Area:	30.0 in^2
Ultimate Capacity	238.5 Tons
Splice Description:	Full Penetration Butt Weld
Tip Treatment Description:	Cast Steel Point

PIER

H.B. FLEMING PILE EQUIPMENT DATA SHEET

Project: VT. Bridge No.78 Pier
Location: Jamaica, Vermont

Date: 01/21/2013
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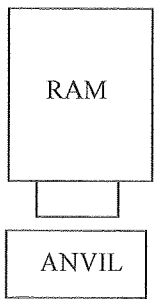
HAMMER



Manufacturer:	APE
Model:	D-36
Type:	Single Acting Diesel
Length of Stroke:	11' - 3"
Rated Energy at Given Stroke:	89,302 ft-lb
Modifications:	None

HAMMER CUSHION

Material:	Micarta and aluminum
Thickness:	3.5"
Area:	471 in^2
Modulus of Elasticity:	285 psi
Coefficient of Restitution:	0.8

DRIVE HEAD

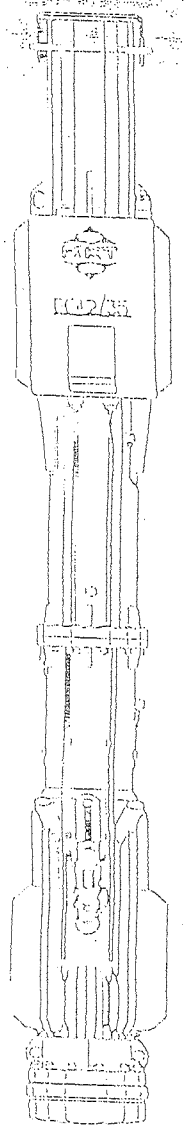
Weight:	1335 lb

PILE CUSHION

Cushion Material:	N/A
Thickness:	N/A
Modulus of Elasticity:	N/A
Coefficient of Restitution:	N/A

PILE

Pile Type:	HP 14x102
Length in Leads:	Up to 65'
Weight/LF:	102 lb
Wall Thickness:	.705"
Taper:	N/A
Cross Sectional Area:	30.0 in^2
Ultimate Capacity	238.5 tons
Splice Description:	Full Penetration Butt Weld
Tip Treatment Description:	Cast Steel Point



INTRODUCING THE NEW

DE42/35

MAXIMUM DIESEL HAMMER FLEXIBILITY FITTING IN 8 x 20 LEADS WITH RAM WEIGHTS TO 4,200 LBS.

ONE HAMMER... MULTIPLE RAM SIZES... AND ENERGY RANGES. ANOTHER MKT FIRST PROVIDING THE CONTRACTOR WITH HAMMER SIZE FLEXIBILITY AND REDUCED EQUIPMENT INVESTMENT COSTS. MKT DIESEL HAMMERS CONTINUE TO OFFER FEATURES WHICH INSURE DEPENDABLE AND PRODUCTIVE OPERATION. USING EITHER STANDARD OR REMOTE FUEL DELIVERY SYSTEMS.

SPECIFICATIONS DE-42/35		
RAM-PISTON WEIGHT (LBS.)	3,500	4,200
ENERGY RATING (FT.LBS.)	35,000	42,000
BEARING BASED ON ENGINEERING NEWS FORMULA (TONS)	[illegible]30	230
MAXIMUM OBTAINABLE STROKE	[illegible]'-6"	10'-6"
OVERALL LENGTH WITH DRIVE CAP	16'-7"	16'-7"
WEIGHT, HAMMER ONLY (LBS.)	8,600	9,300
WEIGHT, HAMMER AND UNIVERSAL DRIVE CAP (LBS.)	9,550	10,250

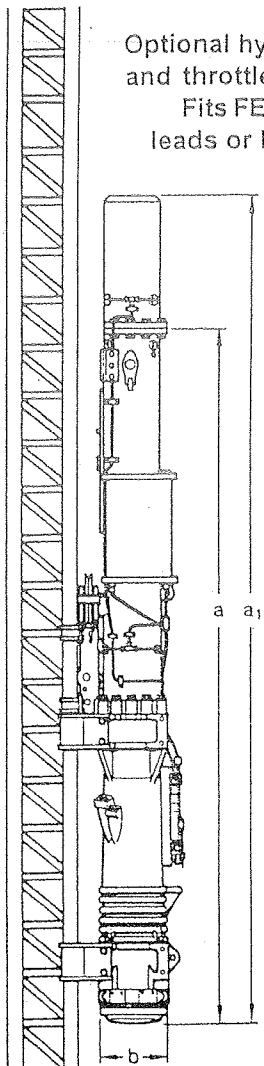
PUBLISHED ENERGY RATINGS ARE EQUAL TO RAM WEIGHT X 10.0 FT. RAM STROKE. ACTUAL ENERGIES DELIVERED ARE A FUCTION OF THE OVERALL JOB CONDITIONS. BEARING RATINGS ARE BASED UPON ENGINEERING NEWS FORMULA, PILE SET EQUAL TO 0.1 HR/BLOW.

PRODUCT LIST

- SINGLE ACTING DIESEL PILE HAMMERS
- AIR PILE HAMMERS
- VIBRATORY PILE DRIVERS/EXTRACTORS
- VIBRATORY HAMMER ACCESSORIES
- PILE DRIVING LEAD SYSTEMS
- CUSTOM ENGINEERED PRODUCTS
- DOUBLE ACTING DIESEL PILE HAMMERS
- DRIVE CAPS AND ACCESSORIES
- HYDRAULIC POWER UNITS
- HYDRAULIC AUGER SYSTEMS
- BOTTOM BRACES
- LEAD ACCESSORIES

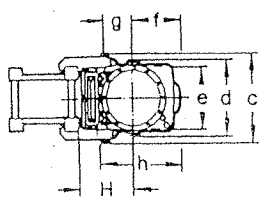
APE/SEMW Model D19-42 Single Acting Impact Hammer

operates on diesel or bio-diesel for all types of impact pile driving



Optional hydraulic trip and throttle available. Fits FEC tube leads or box type.

Direct drive available



MODEL D19-42 (1.9 metric ton ram)

SPECIFICATIONS

Maximum Rated energy	42,800 ft-lbs
Minimum rated energy	16,000 ft-lbs
Stroke at rated energy	10 feet 2 inches
Maximum obtainable stroke	10 feet 3 inches
Speed (blows per minute)	37-53

WEIGHTS

Ram	4190 lbs
Anvil	754 lbs
Hammer weight (includes trip device)	7,800 lbs
Typical operating (weight with drive cap)	9,600 lbs

CAPACITIES

Fuel tank (runs on diesel or bio -diesel)	8.5 gal
Oil tank	2.4 gal

CONSUMPTION

Diesel or Bio-diesel fuel	1.5 gal/hr
Lubrication	2.4 gal/hr
Grease	twice per day

DIMENSIONS OF HAMMER

a_1	Length overall	186.2 inches
a	Length over cylinder extension	219. 3 inches
b	Impact block diameter	17.3 inches
c	Width over bolts	22 inches
d	Hammer width overall	19 inches
e	Width for guiding- face to face	12.5 inches
f	Hammer center to pump guard	13.5 inches
g	Hammer center to bolt center	13.6 inches
h	hammer depth overall	26.2 inches
H	Minimum clearance for leads	14.2 inches

We reserve the right to modify specifications without notice. Contact APE directly for updated literature.

Features

Fuel injection designed by APE engineers
Fuel and lube pumps with 50% less parts than ICE
Hardened piston needs no high maintenance wear rings
Direct drive available for maximum production on steel piles
Fuel pump mounted where heat will not harm it
Variable mechanical cam fuel pump- no air pistons or rings
Optional hydraulic variable fuel remote control
Heavy duty trip system for years of fault free operation
Chrome rings for super long life
Low maintenance and extremely low parts pricing
German design at a reasonable price
Two year APE warranty

AMERICAN PILEDRIVING EQUIPMENT, INC. APE

SHANGHAI JINTAI CO., LTD.
Shanghai Engineering Machinery Works

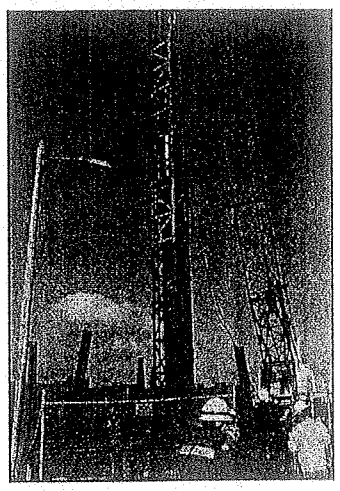
APE Corporate Offices
7032 South 196th
Kent, Washington 98032 USA
(800) 248-8498 & (253) 872-0141
(253) 872-8710 Fax

4/99

Visit our WEB site:
www.apevibro.com
e-mail: ape@apevibro.com

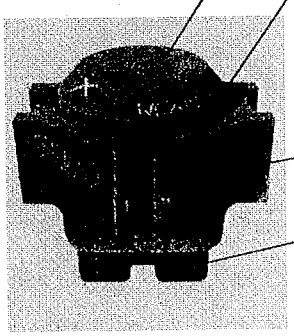
APE Model D36-26 Single Acting Diesel Impact Hammer

D36-26 Finishing Dolphin Piles.



Optional Variable Throttle Control.

Drive Base Assembly.



MODEL D36-26 (3.6 metric ton ram)

SPECIFICATIONS

Stroke at maximum rated energy	135 in (343 cm)
Maximum rated energy (Setting 4)	89,302 ft-lbs (121,076 Nm)
Setting 3	74,450 ft-lbs (100,939 Nm)
Setting 2	59,201 ft-lbs (80,265 Nm)
Minimum rated energy (Setting 1)	43,952 ft-lbs (66,911 Nm)
(Variable throttle allows for lower minimum energy and infinite fuel settings.)	
Maximum obtainable stroke	157 in (381 cm)
Maximum obtainable energy	103,855 ft-lbs (140,807 Nm)
Speed (blows per minute)	34-53

WEIGHTS

Ram	7,938 lbs (3,600 kg)
Anvil	1,358 lbs (616 kg)
Anvil cross sectional area	367.94 sq in (934.56 sq-cm)
Hammer weight (includes trip device)	14,894 lbs (6,754 kg)
Typical operating (weight with DB26 and H-beam insert)	17,546 lbs (7,811 kg)

CAPACITIES

Fuel tank (runs on diesel or bio-diesel)	17.7 gal (67 liters)
Oil tank	5 gal (19 liters)

CONSUMPTION

Diesel or Bio-diesel fuel	2.64 gal/hr (10 liters/hr)
Lubrication	.26 gal/hr (1 liters/hr)
Grease	8 to 10 pumps every 45 minutes of operation time.

STRIKER PLATE FOR DB 26

Weight	628 lbs (284 kg)
Diameter	22.5 in (57.15 cm)
Area	471 sq-in (696 sq-cm)
Thickness	6 inches (15.24 cm)

CUSHION MATERIAL

Type/Qty	Micarta/2 ea
Diameter-DB26	22.5 in (57.15 cm)
Thickness	1in (25.4 mm)

Type/Qty	Aluminum/3 ea
Thickness	1/2 in (12.7 mm)
Diameter	25 in (57.15 cm)
Total Combined Thickness	3.5 inches (8.89 cm)
Area	471 sq-in (696 sq-cm)
Elastic-modulus	285 ksi (1,965 mpa)
Coeff. of restitution	.8

DRIVE CAP

DB 26:	1,076 lbs (488 kg)

INSERT WEIGHT

H-Beam insert for 12" (305 mm) and 14" (355 mm):	948 lbs (430 kg)
Large pipe insert for sizes 12" to 24" diameter:	1,830 lbs (830 kg)

MINIMUM BOX LEAD SIZE/OPERATING LENGTH

Minimum box leader size	8 in x 26 in (3.14 cm x 66 cm)
Operating length as described above	354 in (9 m)

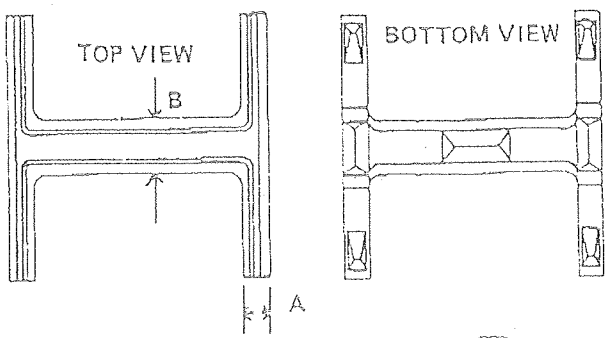
AMERICAN PILEDRIVING EQUIPMENT, INC.

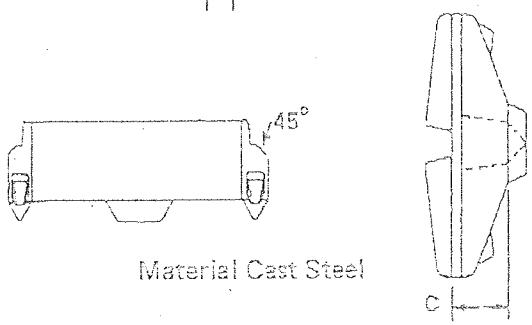
Corporate Offices
7032 South 196th
Kent, Washington 98032 USA
(800) 248-8498 & (253) 872-0141
(253) 872-8710 Fax

Visit our WEB site:
www.apeinc.com
e-mail: ape@apeinc.com

Note: All specifications are subject to change without notice 03-10-10

Dimensions





Material Cast Steel

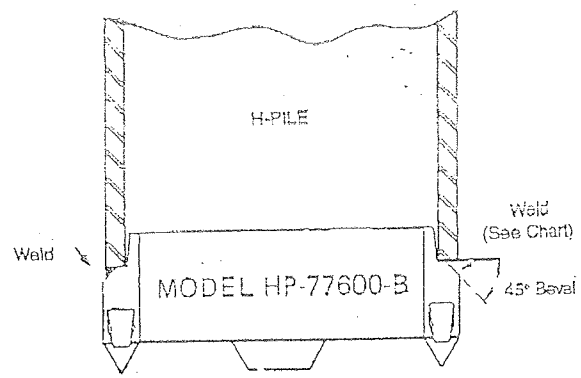
ASTM A27 65/35 - Heat Treated

	8"	10"	12"	14"
A	1-1/16"	1"	1"	1"
B	1"	1"	1-5/16"	1-1/4"
C	1-7/8"	2-1/16"	2-1/2"	2-3/4"

Installation Instructions

HARD-BITE POINT MODEL HP-77600-B

1. Fit point onto the end of a square cut pile end.
2. Weld point to the pile in either flat or vertical position using E60 or E70XX electrodes.
3. Weld across full width of flange following chart below for minimum size weld.



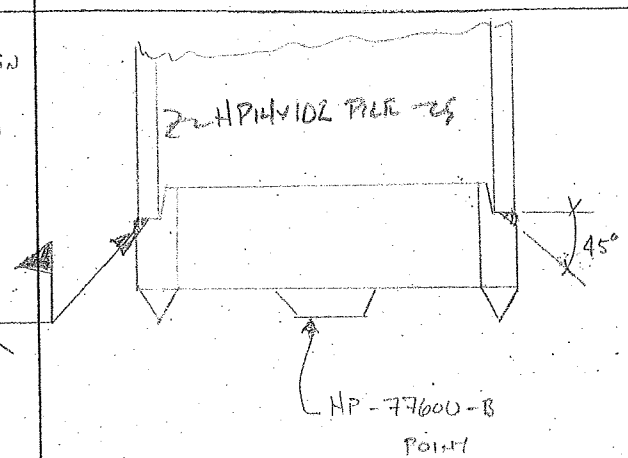
Pile Size	Flange Thickness	Min. Size Groove Weld
HP 14 x 117	.805	7/16
x 102	.705	3/8
x 89	.615	3/8
x 73	.505	5/16
HP 12 x 84	.685	3/8
x 74	.610	3/8
x 63	.515	5/16
x 53	.435	5/16
HP 10 x 57	.565	5/16
x 42	.420	5/16
HP 8 x 36	.445	5/16

Call toll free 800-526-9047
ASSOCIATED PILE & FITTING CORP.
BOX 1048, CLIFTON, N.J. 07014 ■ 201-773-8400 ■ 201-773-8442 (Fax)

JOINT WELDING PROCEDURE SPECIFICATION

Material specification: PILE = ASTM A572 GR. 50 / FRAMING ALLOY + POINT = ASTM A27 60/85
Welding process: SMAW
Manual or machine: MANUAL
Position of welding: HORIZONTAL OR VERTICAL
Filler metal specification: AWS A5.1
Filler metal classification: E7018
Flux: N/A
Shielding gas: N/A Flow rate: N/A
Single or multiple pass: MULTIPLE (IF REQUIRED)
Single or multiple arc: SINGLE
Welding current: D/C
Polarity: REVERSE
Welding progression: N/A
Root treatment: NONE - POINTS ARE PRE-BEVELED TO PROFILE
Preheat and interpass temperature: PER AWS D1.1
Postheat treatment: NONE

WELDING PROCEDURE

Pass no.	Electrode size	Welding current		Travel speed	Joint detail
		Amperes	Volts		
1	1/8"	120-150	12-24	1 Ft/min	
2+	5/32"	140-180	12-24	1 Ft/min	

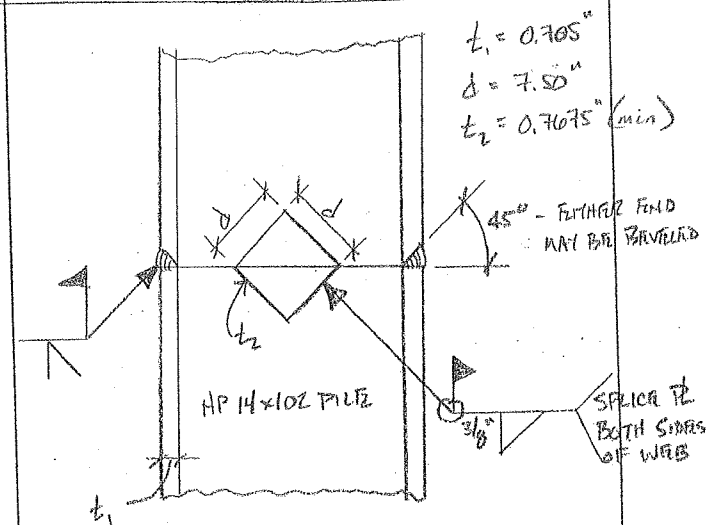
This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in Section 5.

Procedure no. VAOT HP14V89 POINT ATTACHMENT Contractor H.B. FLEMING
Revision no. Ø Authorized by [illegible]
Form E-2 Date 01/21/2013

JOINT WELDING
PROCEDURE SPECIFICATION

Material specification: ASTM A572 GR. 50 / EQUIVALENT
Welding process: SMAW
Manual or machine: MANUAL
Position of welding: HORIZONTAL
Filler metal specification: AWS A5.1
Filler metal classification: E7018
Flux: N/A
Shielding gas: N/A Flow rate: N/A
Single or multiple pass: MULTIPLE IF REQUIRED
Single or multiple arc: SINGLE
Welding current: DC
Polarity: REVERSE
Welding progression: N/A
Root treatment: GRIND / BEVEL TO PROFILE
Preheat and interpass temperature: PER AWS D1.1
Postheat treatment: NONE

WELDING PROCEDURE

Pass no.	Electrode size	Welding current		Travel speed	Joint detail
		Amperes	Volts		
1	1/8"	120-150	12-24	1 FT/MIN	
2+	5/32"	140-180	12-24	1 FT/MIN	

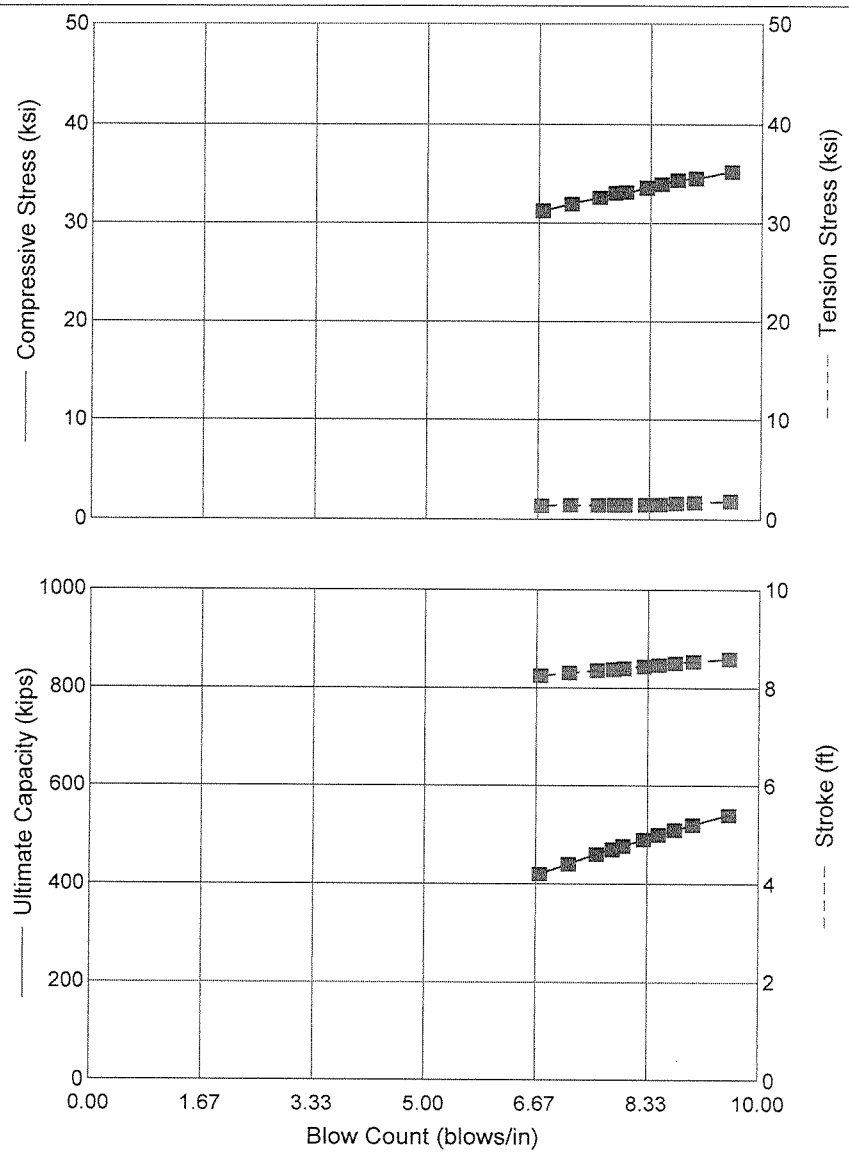
This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in Section 5.

Procedure no.: VA01 WEB DIAMOND SPLICE
Revision no.: Ø
Form E-2

Contractor: H.B. FLEMING, INC.
Authorized by: [signature]
Date: 12/1/2012

H.B. FLEMING
Enter Project Title Here

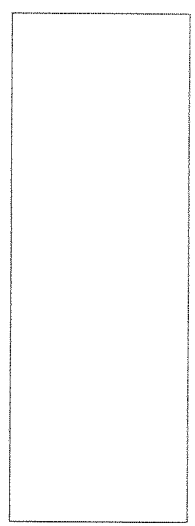
18-Jan-2013
GRLWEAP (TM) Version 2005



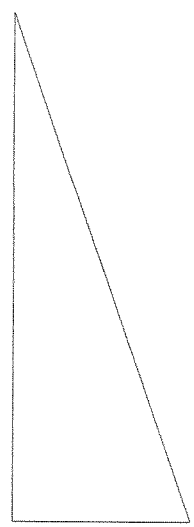
MKT DE 42/35

Efficiency	0.800
Helmet	1.20 kips
Hammer Cushion	40399 kips/in
Skin Quake	0.100 in
Toe Quake	0.060 in
Skin Damping	0.050 sec/ft
Toe Damping	0.150 sec/ft
Pile Length	60.00 ft
Pile Penetration	60.00 ft
Pile Top Area	30.00 in2

Pile Model



Skin Friction Distribution



Res. Shaft = 20 %
(Proportional)
2-Pile Analysis
Only Show 1st Pile

MKT DE 42 VARIABLE CAPACITY - PIER

MKT DE 42 VARIABLE CAPACITY - PIER

H.B. FLEMING
Enter Project Title Here

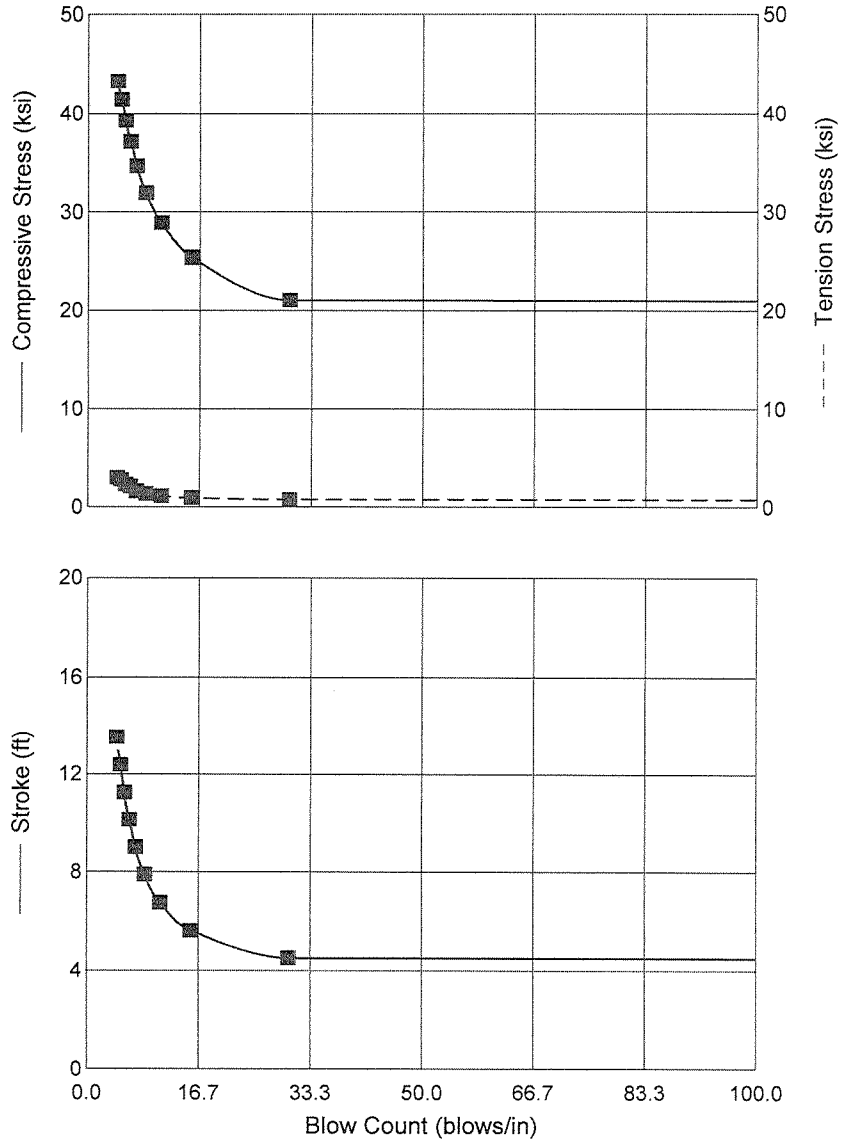
18-Jan-2013
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
420.0	31.16	1.34	6.7	8.24	17.28
440.0	31.88	1.41	7.2	8.30	17.39
460.0	32.52	1.41	7.6	8.35	17.53
470.0	32.98	1.43	7.8	8.37	17.58
→ 477.0	33.07	1.43	8.0	8.39	17.62
490.0	33.52	1.45	8.3	8.43	17.71
500.0	33.89	1.49	8.5	8.46	17.80
510.0	34.31	1.60	8.7	8.50	17.90
520.0	34.48	1.68	9.0	8.53	17.96
540.0	35.14	1.82	9.5	8.58	18.09

H.B. FLEMING
Enter Project Title Here

18-Jan-2013
GRLWEAP (TM) Version 2005

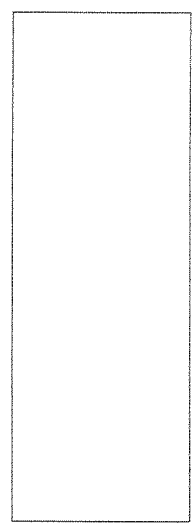
MKT DE 42 CONSTANT CAPACITY - PIER



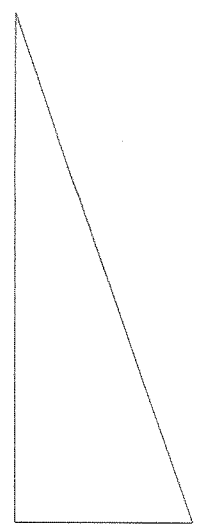
MKT DE 42/35

Capacity	477.0	kips
Efficiency	0.800	
Helmet	1.20	kips
Hammer Cushion	40399	kips/in
Skin Quake	0.100	in
Toe Quake	0.060	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	60.00	ft
Pile Penetration	60.00	ft
Pile Top Area	30.00	in2

Pile Model



Skin Friction Distribution



Res. Shaft = 20 %
(Proportional)
2-Pile Analysis
Only Show 1st Pile

MKT CONSTANT CAPACITY - PIER

H.B. FLEMING
Enter Project Title Here

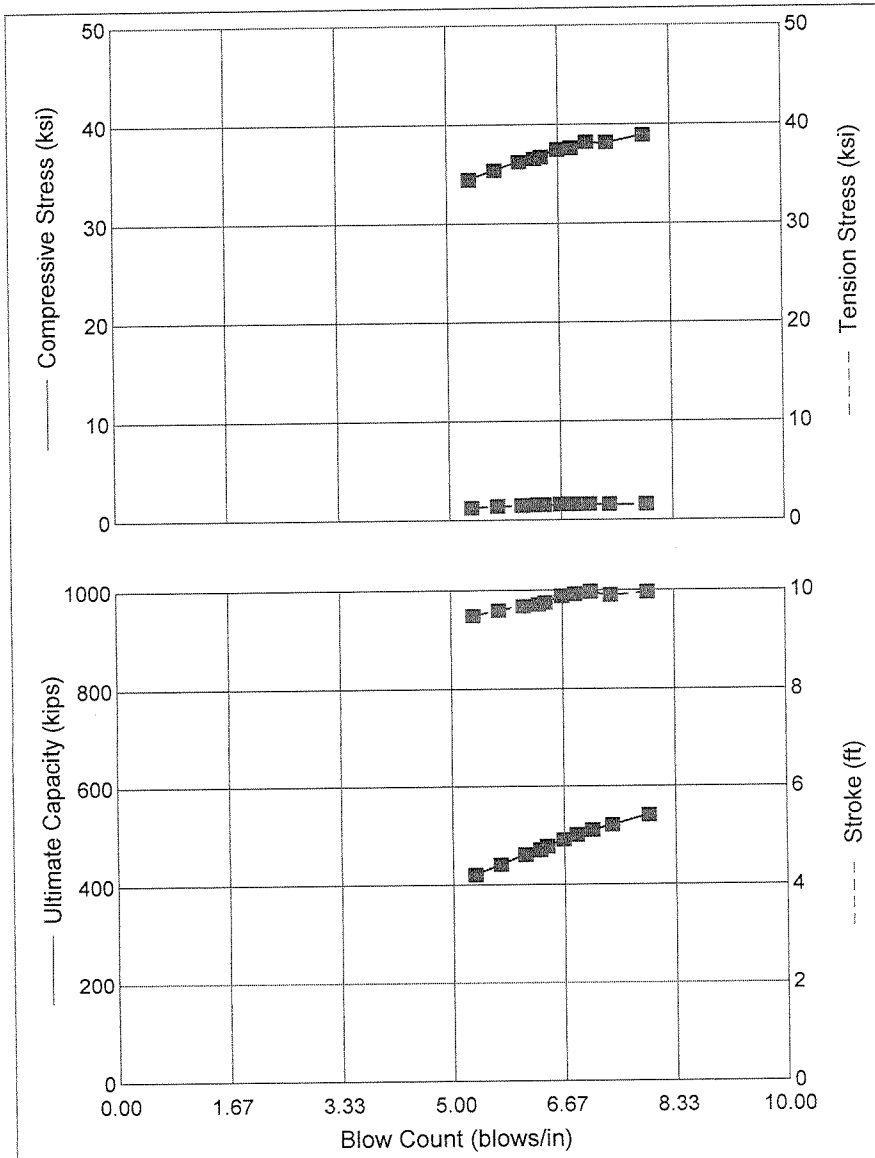
18-Jan-2013
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
477.0	15.11	0.63	9999.0	3.38	4.55
477.0	21.02	0.75	30.1	4.50	7.43
477.0	25.37	0.92	15.5	5.62	10.28
477.0	28.88	1.11	11.0	6.75	13.19
477.0	31.93	1.32	8.7	7.88	16.24
477.0	34.65	1.59	7.3	9.00	19.28
477.0	37.13	2.11	6.4	10.12	22.27
477.0	39.27	2.29	5.7	11.25	25.30
477.0	41.42	2.75	5.0	12.38	28.35
477.0	43.29	2.97	4.5	13.50	31.36

APE D42 VARIABLE CAPACITY - PIER

H.B. FLEMING
Enter Project Title Here

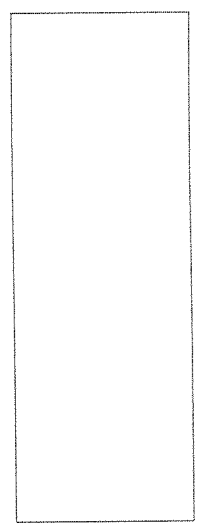
18-Jan-2013
GRLWEAP (TM) Version 2005



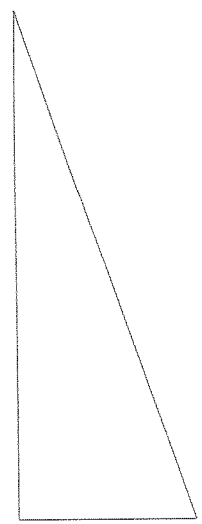
APE D 19-42

Efficiency	0.800	
Helmet	1.20	kips
Hammer Cushion	40399	kips/in
Skin Quake	0.100	in
Toe Quake	0.060	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	60.00	ft
Pile Penetration	60.00	ft
Pile Top Area	30.00	in2

Pile Model



Skin Friction Distribution



Res. Shaft = 20 %
(Proportional)
2-Pile Analysis
Only Show 1st Pile

APE D42 VARIABLE CAPACITY - PIER

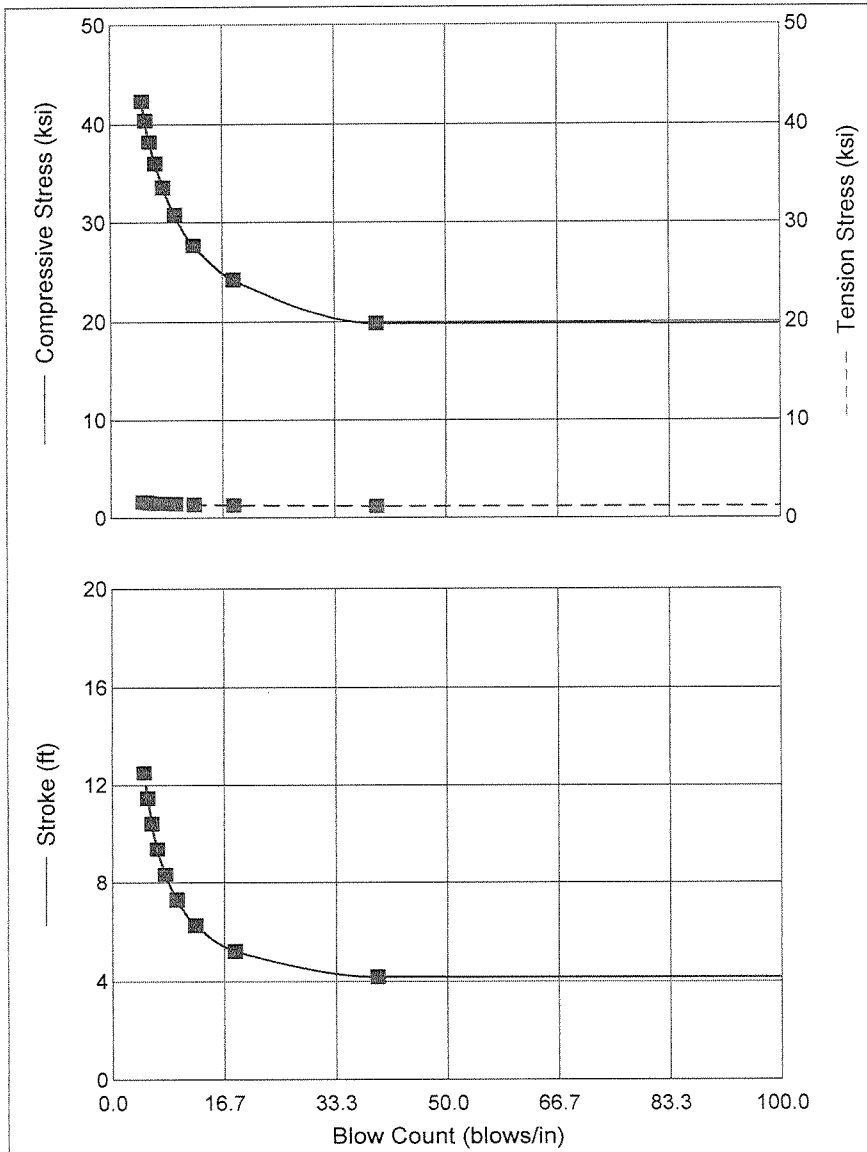
H.B. FLEMING
Enter Project Title Here

18-Jan-2013
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
420.0	34.40	1.23	5.3	9.47	21.38
440.0	35.33	1.39	5.7	9.58	21.57
460.0	36.16	1.43	6.1	9.67	21.78
470.0	36.47	1.50	6.3	9.70	21.83
→ 477.0	36.66	1.50	6.4	9.74	21.93
490.0	37.42	1.57	6.7	9.87	22.23
500.0	37.59	1.56	6.9	9.91	22.32
510.0	38.18	1.58	7.1	9.96	22.43
520.0	38.14	1.54	7.4	9.89	22.26
540.0	38.87	1.54	7.9	9.95	22.39

H.B. FLEMING
Enter Project Title Here

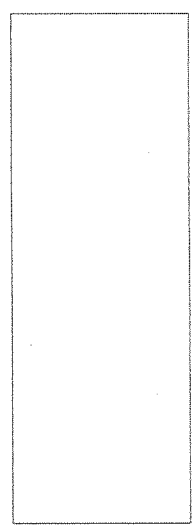
18-Jan-2013
GRLWEAP (TM) Version 2005



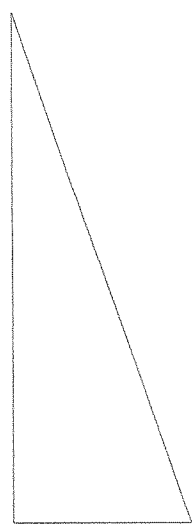
APE D 19-42

Capacity	477.0	kips
Efficiency	0.800	
Helmet	1.20	kips
Hammer Cushion	40399	kips/in
Skin Quake	0.100	in
Toe Quake	0.060	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	60.00	ft
Pile Penetration	60.00	ft
Pile Top Area	30.00	in2

Pile Model



Skin Friction Distribution



Res. Shaft = 20 %
(Proportional)
2-Pile Analysis
Only Show 1st Pile

APE D42 Constant Capacity - Pier

APE D42 CONSTANT CAPACITY - PIER

H.B. FLEMING
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18-Jan-2013
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
477.0	13.93	1.18	9999.0	3.12	5.28
477.0	19.82	1.20	39.6	4.17	8.00
477.0	24.19	1.29	18.3	5.21	10.62
477.0	27.66	1.37	12.4	6.25	13.25
477.0	30.76	1.44	9.6	7.29	15.85
477.0	33.52	1.47	7.9	8.33	18.39
477.0	35.95	1.48	6.7	9.38	21.02
477.0	38.19	1.55	5.9	10.42	23.69
477.0	40.36	1.62	5.3	11.46	26.44
477.0	42.31	1.64	4.8	12.50	29.18

H.B. FLEMING
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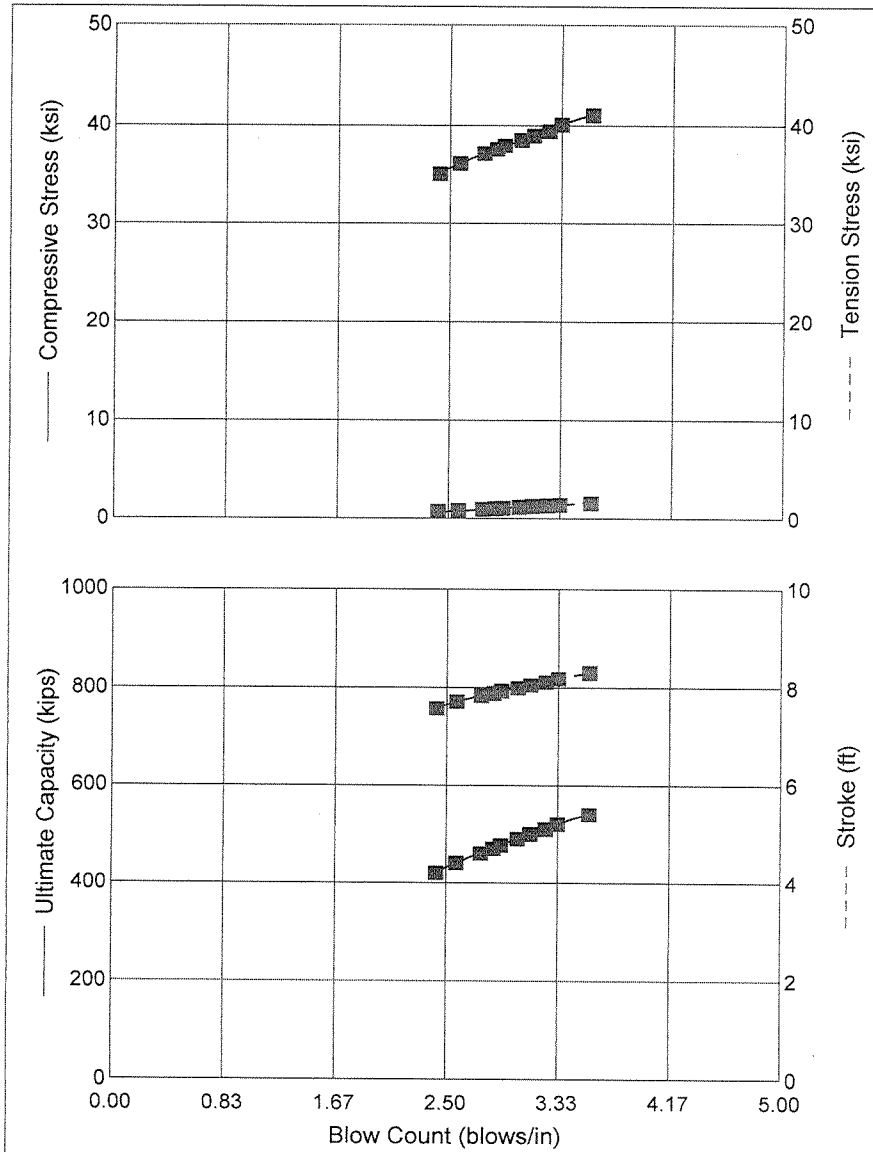
21-Jan-2013
GRLWEAP (TM) Version 2005

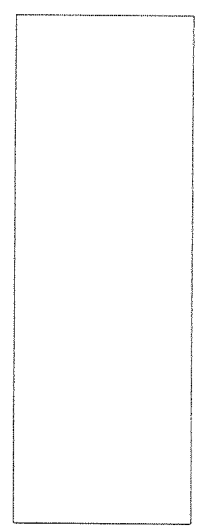
ARE D36 VARIABLE CAPACITY PIER



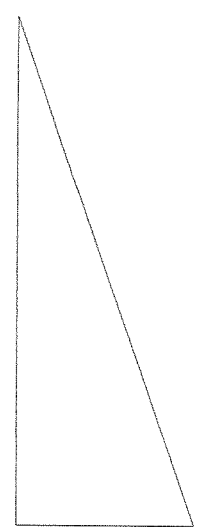
APE D 36-42

Efficiency	0.800	
Helmet	1.35	kips
Hammer Cushion	39981	kips/in
Skin Quake	0.100	in
Toe Quake	0.060	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	60.00	ft
Pile Penetration	60.00	ft
Pile Top Area	30.00	in2

Pile Model



Skin Friction Distribution



Res. Shaft = 20 %
(Proportional)
2-Pile Analysis
Only Show 1st Pile

APE D36 VARIABLE CAPACITY PIER

H.B. FLEMING
Enter Project Title Here

21-Jan-2013
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
420.0	35.02	0.68	2.4	7.57	33.31
440.0	36.09	0.79	2.6	7.71	33.61
460.0	37.08	0.91	2.8	7.83	33.66
470.0	37.54	0.98	2.9	7.88	33.78
→ 477.0	37.90	1.04	2.9	7.93	33.93
490.0	38.45	1.15	3.0	7.99	34.02
500.0	38.90	1.24	3.1	8.05	34.21
510.0	39.36	1.30	3.2	8.11	34.19
520.0	40.02	1.40	3.3	8.18	34.52
540.0	40.97	1.54	3.6	8.30	34.68

H.B. FLEMING
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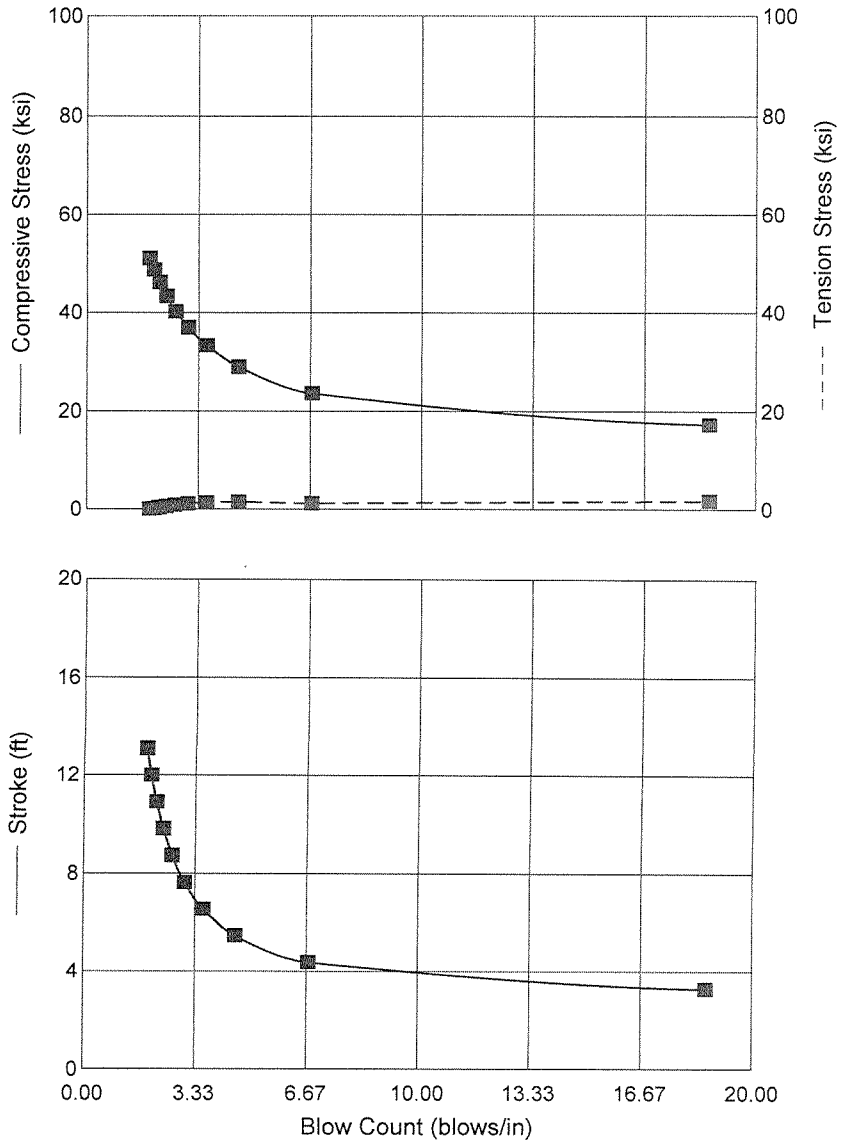
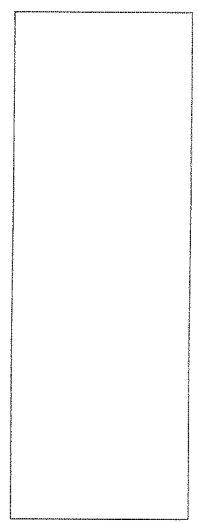
21-Jan-2013
GRLWEAP (TM) Version 2005



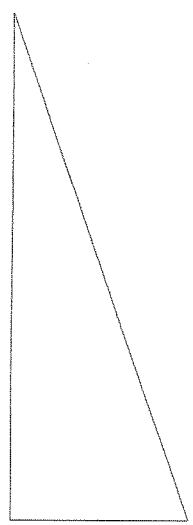
APE D 36-42

Capacity	477.0	kips
Efficiency	0.800	
Helmet	1.35	kips
Hammer Cushion	39981	kips/in
Skin Quake	0.100	in
Toe Quake	0.060	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	60.00	ft
Pile Penetration	60.00	ft
Pile Top Area	30.00	in2

Pile Model



Skin Friction Distribution



Res. Shaft = 20 %
(Proportional)
2-Pile Analysis
Only Show 1st Pile

APE D36 CONSTANT CAPACITY PIER

APE D36 CONSTANT CAPACITY PIER

H.B. FLEMING
Enter Project Title Here

21-Jan-2013
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
477.0	17.23	1.69	18.6	3.27	10.45
477.0	23.58	1.20	6.7	4.36	16.69
477.0	28.92	1.49	4.5	5.45	22.28
477.0	33.28	1.31	3.6	6.54	27.46
477.0	36.95	1.10	3.0	7.63	32.56
477.0	40.15	0.85	2.6	8.72	37.43
477.0	43.27	0.58	2.4	9.81	42.45
477.0	46.08	0.30	2.2	10.90	47.14
477.0	48.63	0.12	2.0	11.99	51.79
477.0	51.04	0.00	1.9	13.08	56.48