SCHULTZ

PO Box 2620
Ballston Spa, NY 12020
Ph : 518 885-0060

Letter of Transmittal

To: Chris Williams
VTRANS
61 VALLEY VIEW
MENDON, VT 05701
Ph: (802)786-3812 Fax: (802)786-3810

Transmittal #: 10
Date: 4/7/2015
Job: M117 VTRANS CASTLETON BRF 015-2(10)

Subject: Submittal

WE ARE SENDING YOU ☑ Attached ☐ Under separate cover via the following items:

☑ Shop drawings ☐ Prints ☐ Plans ☐ Samples
☐ Copy of letter ☐ Change order ☐ Specifications ☐ Other

Document Type	Copies	Date	No.	Description
Submittal	1		505.155-6 Rev 1	Steel Piles 12 x 63

THESE ARE TRANSMITTED as checked below:

☑ For approval ☐ Approved as submitted ☑ Resubmit ___ copies for approval
☑ For your use ☐ Approved as noted ☐ Submit ___ copies for distribution
☑ As requested ☐ Returned for corrections ☐ Return ___ corrected prints
☑ For review and comment ☐ Other
☐ FOR BIDS DUE ☐ PRINTS RETURNED AFTER LOAN TO US

Remarks: Please see attached Resubmittal for Steel Piles from our Sub H B Flemming

Copy To: Jennifer Fitch (VTRANS), KEVIN TURE (W.M. SCHULTZ CONSTRUCTION)

Vermont Agency of Transportation
Reviewed by: CDW
Date: 4/21/2014
☑ CONFORMING
☐ CONFORMING AS NOTED
☐ NON-CONFORMING - RESUBMIT

From: MIKE GARN (W.M. SCHULTZ CONSTRUCTION **Signature:** Mike Garn

If enclosures are not as noted, kindly notify us at once.

PO Box 2620
Ballston Spa, NY 12020
Ph : 518 885-0060

Submittal

Job: M117
VTRANS CASTLETON BRF 015-2(10)
Castleton BRF 015-2
Route 30
Castleton, VT

Spec Section No: 505.155
Submittal No: 6
Revision No: 1
Sent Date: 4/7/2015

Spec Section Title:

Submittal Title: Steel Piles 12 x 63

Contractor:
W.M. Schultz Construction, Inc

Contractor's Stamp
SCHULTZ CONSTRUCTION, INC.
CONTRACT NO. BRF 015-2(10)
SUBMITTAL TITLE Piles
ITEM & SECT. NO. 505.155
LOCATION OF WORK VT RT 30
SUB NO. 6 DATE 4/7/15
REVIEWED BY MG

VTRANS
Chris Williams

Architect's Stamp

Engineer's Stamp

H. B. FLEMING, INC.
Contracting & Engineering
89 Pleasant Avenue
South Portland, ME 04106

Phone (207) 799-8514

LETTER OF TRANSMITTAL

DATE: 4/7/2015
JOB NO.:
ATTENTION:
RE: CASTLETON BRF 015-2(10) - H-PILES

TO: SCHULTZ CONSTRUCTION
ATTN: MIKE GARN
KEVIN TURE

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	4/7/15	1	REVISED PILE SUBMITTAL

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

MIKE,
ATTACHED IS OUR REVISED PILE SUBMITTAL.

THANKS, JOHN

COPY TO _____

SIGNED: _____

If enclosures are not as noted, kindly notify us at once.

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: Schultz Construction
Attention: Mike Garn/Kevin Ture

Date: 04/07/2015
Project: Bridge #93
Location: Castleton, 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)

- Either an APE D-19 or an MKT DE 42 may be used for this project. The details for each hammer are listed below respectfully.
- An APE D-19 open ended diesel pile hammer may be used to drive the piles. The D-19 has a ram weight of 4,190 lbs, a maximum stroke of 10-2", and a rated energy of 42,800 ft-lbs.
- An MKT DE-42 open ended diesel pile hammer may be used to drive the piles. 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 hammer cushioning material consists of 2 inches of Monocast MC901 material for both hammers.

Pile

- HP 12x63 ASTM A572 Gr. 50 steel piles
- The Nominal Pile Driving Resistance, which we based our analysis on is 288 kips (144 tons).
- Piles will be fitted with cast steel driving points

Results

- Piles will be driven until a blow count of 3 blows per inch with a 8.54' minimum ram stroke for 3 consecutive inches is obtained with the APE D19-42, and reach a minimum tip elevation of 25 feet below the bottom of the proposed abutment pile cap.
- Piles will be driven until a blow count of 4 blows per inch with a 7.9' minimum ram stroke for 3 consecutive inches is obtained with the MKT DE 42, and reach a minimum tip elevation of 25 feet below the bottom of the proposed abutment pile cap.
- These criteria are based upon the output generated from the WEAP analysis that follows. PDA testing of driven piles will determine whether the above criteria are used throughout the project or if any adjustments need to be made.

Signed: _____

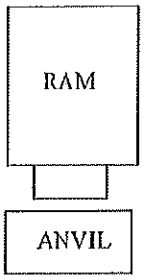
John Allen

H.B. FLEMING PILE EQUIPMENT DATA SHEET

Project: Bridge No. 93
Location: Castleton, VT

Date: 02/19/2015
Client: Schultz Construction

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 ksi
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

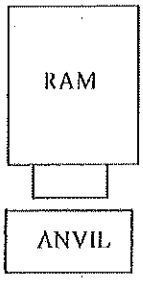
Pile Type:	HP 12x63
Length in Leads:	Up to 65'
Weight/LF:	63 lb
Wall Thickness:	.515"
Taper:	N/A
Cross Sectional Area:	18.4 in^2
Ultimate Capacity	288 kips
Splice Description:	Full Penetration Butt Weld
Tip Treatment Description:	Cast Steel Point

H.B. FLEMING PILE EQUIPMENT DATA SHEET

Project: Bridge No. 93
Location: Castleton, VT

Date: 02/19/2015
Client: Schultz Construction

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 ksi
Coefficient of Restitution:	0.8

DRIVE HEAD

Weight:	1200 lb

PILE CUSHION

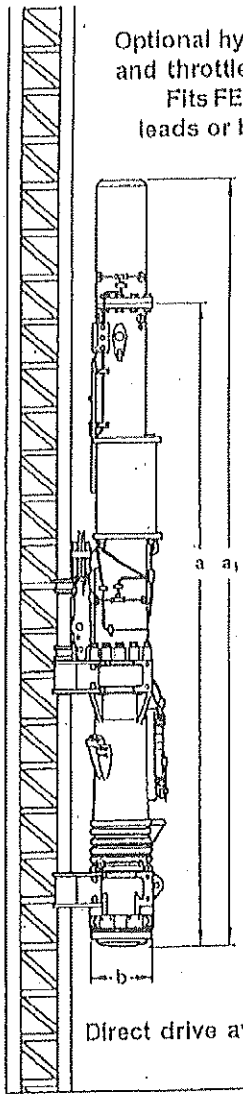
Cushion Material:	N/A
Thickness:	N/A
Modulus of Elasticity:	N/A
Coefficient of Restitution:	N/A

PILE

Pile Type:	HP 12x63
Length in Leads:	Up to 65'
Weight/LF:	63 lb
Wall Thickness:	.515"
Taper:	N/A
Cross Sectional Area:	18.4 in^2
Ultimate Capacity	288 kips
Splice Description:	Full Penetration Butt Weld
Tip Treatment Description:	Cast Steel Point

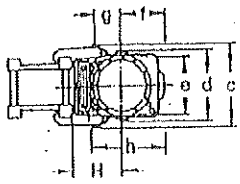
APE/SEMW Model D19-42 Single Acting Impact Hammer

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

a1	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

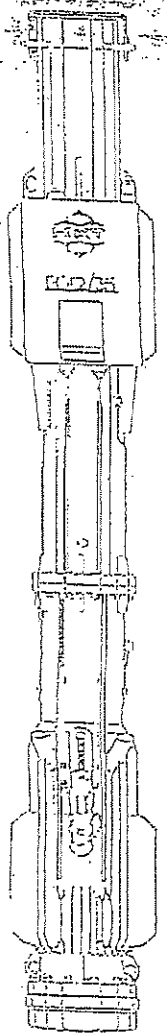
Fuel injection designed by APE engineers
Fuel and lube pumps with 50% less parts than ICE
Hardened piston needs no high maintenance wear rings
Direct drive available for maximum production on steel piles
Fuel pump mounted where heat will not harm it
Variable mechanical cam fuel pump- no air pistons or 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.

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



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]0	230
MAXIMUM OBTAINABLE STROKE	[illegible]'-6"	10'-6"
OVERALL LENGTH WITH DRIVE CAP	16'-7"	16'-7"
WEIGHT, HAMMER ONLY (LBS.)	8,800	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 FUNCTION OF THE OVERALL JOB CONDITIONS. BEARING RATINGS ARE BASED UPON ENGINEERING NEWS FORMULA, PILE SET EQUAL TO 0.1 IN/BLOW.

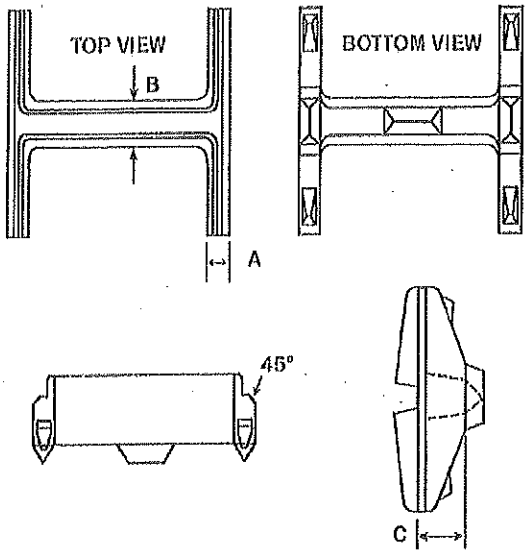
PRODUCT LIST

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

HARD-BITE™ – HP-77600-B 30#

Dimensions



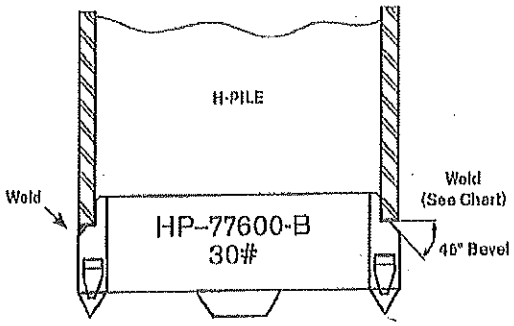
MATERIAL: CAST STEEL

ASTM A148 90/60

	12"
A	1"
B	1-5/16"
C	3"
Wt.	31#

Installation Instructions

1. Fit point onto the end of the square cut pile end.
2. Weld point to the pile in either flat or vertical position using E7018 electrodes.
3. Weld across full width of flange following chart below for minimum size weld.



Pile Size	Flange Thickness	Groove Weld
HP 12 x 84	.685	3/8
x 74	.610	3/8
x 63	.515	5/16
x 53	.435	5/16

ASSOCIATED PILE & FITTING

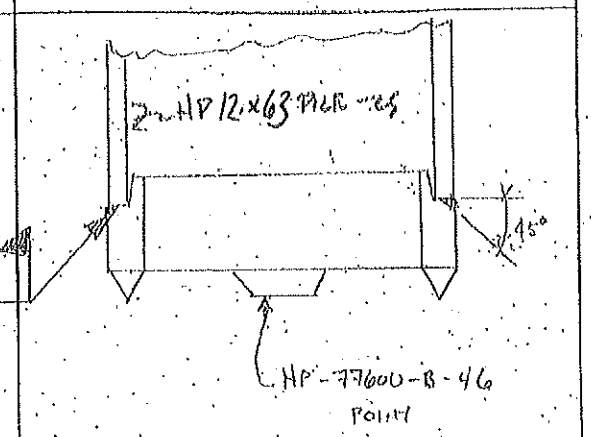
PO Box 5933 Parsippany, NJ 07054-5933
Tel: 973-773-8400
Fax: 973-428-5146
email: apf@associatedpile.com
www.associatedpile.com
Call Toll Free: 800-526-9047

(12/11)

JOINT WELDING
PROCEDURE SPECIFICATION

Material specification PILE = ASTM A572 Gr. 50 / EQUIVALENT + POINT = ASTM A27 65/35
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 D1.5
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.

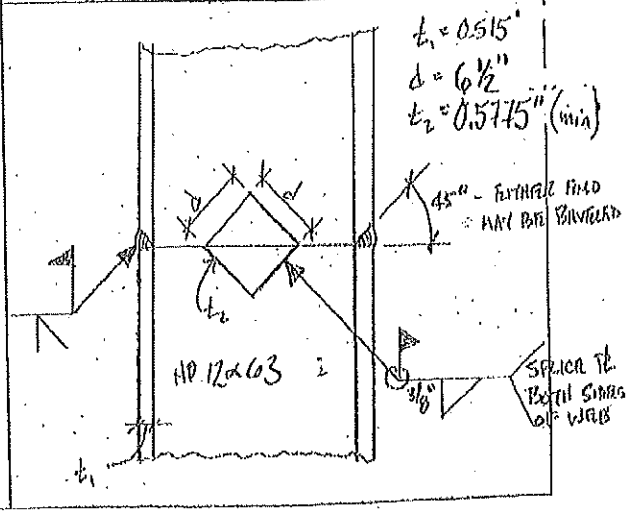
Procedure no. VAOT HP 12x63 POINT A-ATTACHMENT
Revision no. 0
Form E-2

Contractor H.B. FLEMING
Authorized by MH
Date 02/18/15

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: E7010
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: GRIND / BEVEL TO PROFILE
Preheat and interpass temperature: PER AWS D1.5
Postheat treatment: NONE

WELDING PROCEDURE

Pass no.	Electrode size	Welding current: Amperes	Welding current: Volts	Travel speed	Joint detail
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.

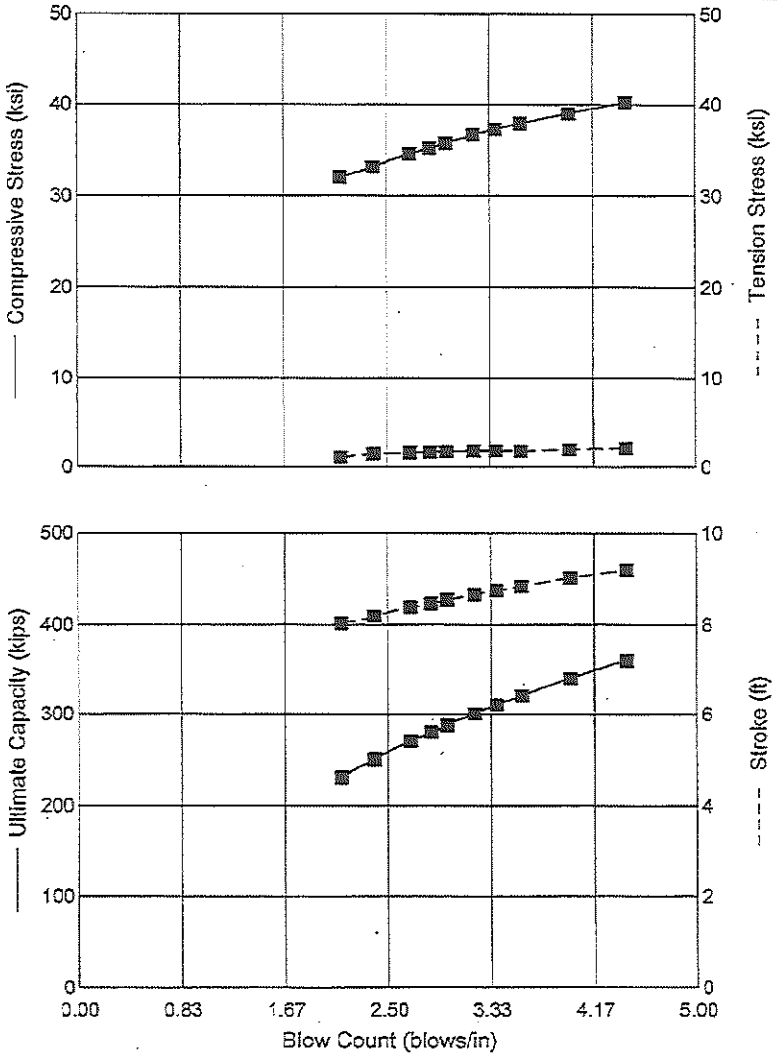
Procedure no.: VAGT WEB DIAMOND SPLICE
Revision no.: ∅
Form E-2

Contractor: H.B. FLEMING, INC.
Authorized by: [signature]
Date: 02/18/15

Form E-2 — Welding Procedure Specification

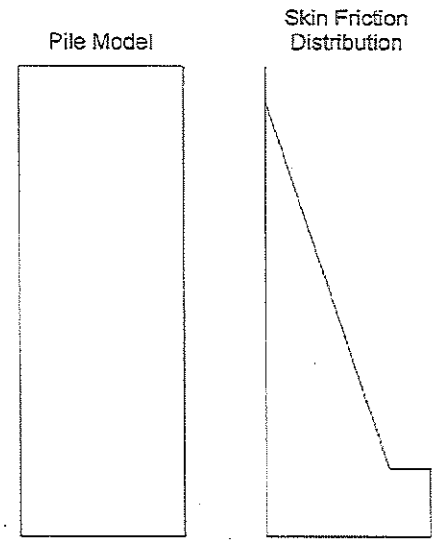
H.B. FLEMING
Castleton, VT

18-Feb-2015
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	0.100	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	70.00	ft
Pile Penetration	65.00	ft
Pile Top Area	18.40	in2



Res. Shaft = 25 %
(Proportional)

APE D19-42 Ultimate Capacity

ADE D19-42 VARIABLE CAPACITY

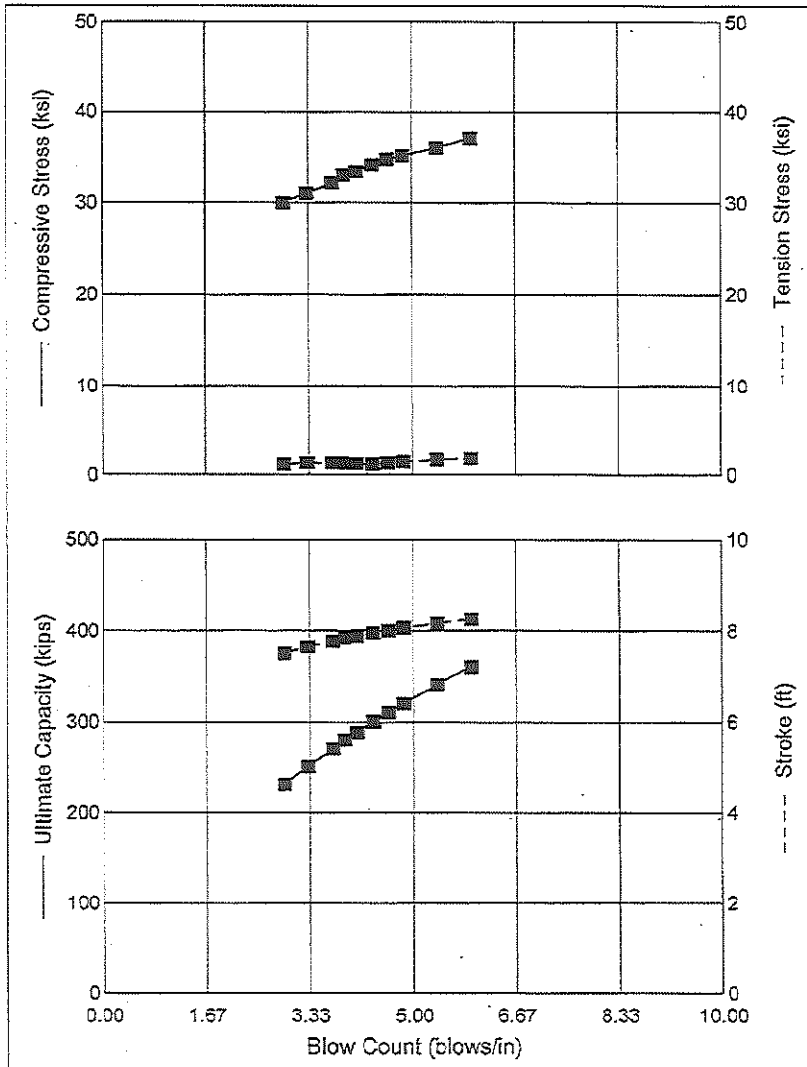
H.B. FLEMING
Castleton, VT

18-Feb-2015
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
230.0	32.02	1.02	2.1	8.02	22.22
250.0	33.09	1.41	2.4	8.17	22.28
270.0	34.59	1.58	2.7	8.38	22.56
280.0	35.22	1.65	2.9	8.46	22.63
288.0	35.74	1.71	3.0	8.54	22.74
300.0	36.61	1.78	3.2	8.65	22.97
310.0	37.24	1.79	3.4	8.74	23.22
320.0	37.88	1.78	3.6	8.83	23.37
340.0	39.02	1.93	4.0	9.02	23.82
360.0	40.16	2.08	4.4	9.19	24.14

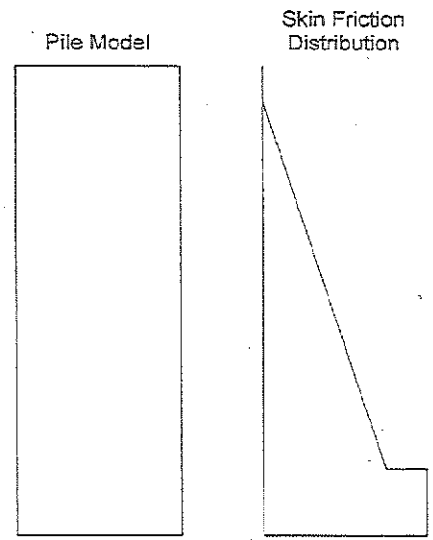
H.B. FLEMING
Castleton, VT

18-Feb-2015
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	0.100 in
Skin Damping	0.050 sec/ft
Toe Damping	0.150 sec/ft
Pile Length	70.00 ft
Pile Penetration	65.00 ft
Pile Top Area	18.40 in2



Res. Shaft = 25 %
(Proportional)

MKT DE 42 VARIABLE DAMPING

MKT DE 42 VARIABLE CAPACITY

H.B. FLEMING
Castleton, VT

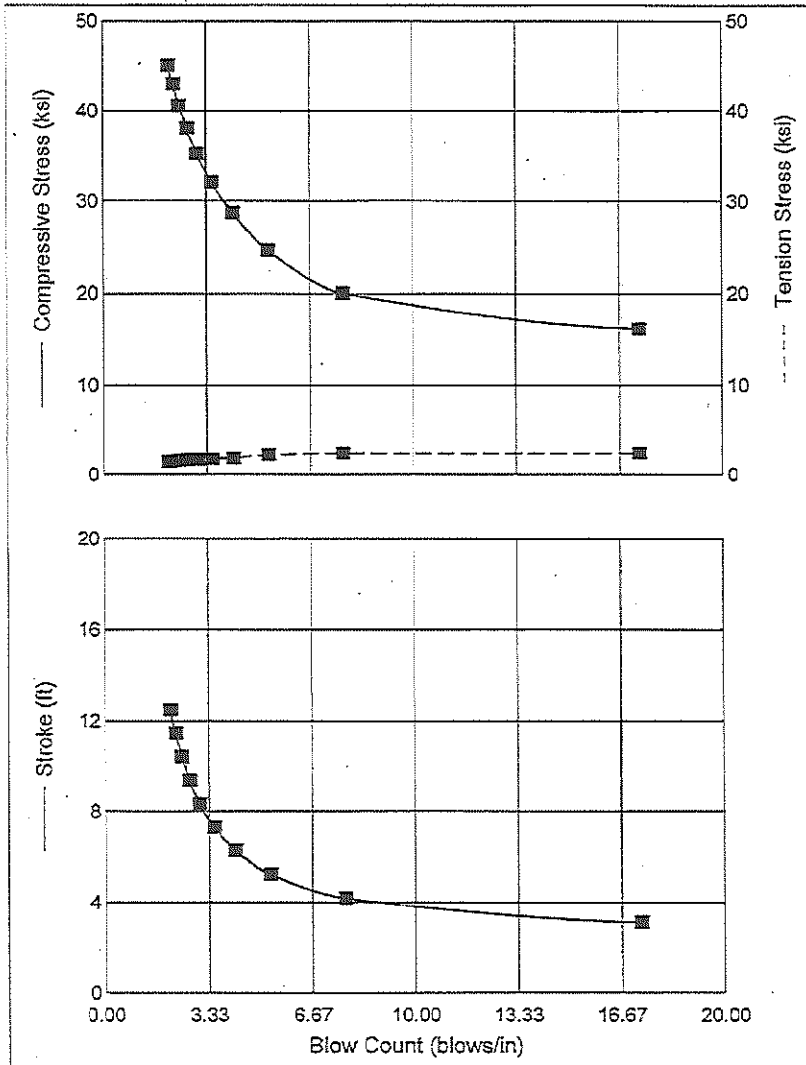
18-Feb-2015
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
230.0	29.93	1.18	2.9	7.49	17.76
250.0	30.96	1.30	3.3	7.64	17.92
270.0	32.16	1.28	3.7	7.76	18.13
280.0	33.00	1.25	3.9	7.83	18.33
288.0	33.32	1.23	4.1	7.87	18.38
300.0	34.16	1.18	4.4	7.95	18.62
310.0	34.71	1.28	4.6	8.00	18.75
320.0	35.10	1.43	4.8	8.06	18.88
340.0	35.99	1.67	5.4	8.16	19.04
360.0	37.03	1.84	6.0	8.25	19.32

H.B. FLEMING
Castleton, VT

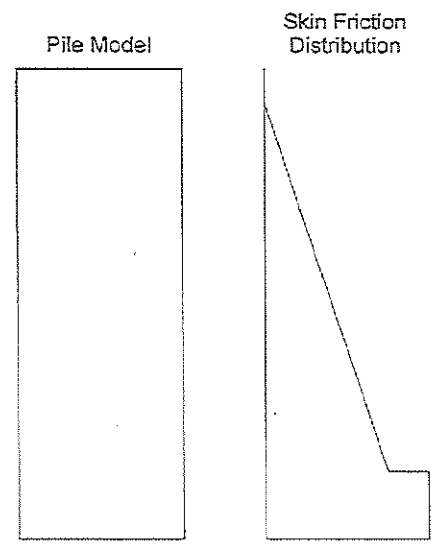
18-Feb-2015
GRLWEAP (TM) Version 2005

APE D19-42 Consistent Capacity



APE D 19-42

Capacity	288.0 kips
Efficiency	0.800
Helmet	1.20 kips
Hammer Cushion	40399 kips/in
Skin Quake	0.100 in
Toe Quake	0.100 in
Skin Damping	0.050 sec/ft
Toe Damping	0.150 sec/ft
Pile Length	70.00 ft
Pile Penetration	65.00 ft
Pile Top Area	18.40 in2



Res. Shaft = 25 %
(Proportional)

APE D19-92 Constant Capacity

H.B. FLEMING
Castleton, VT

18-Feb-2015
GRLWEAP (TM) Version 2005

Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
288.0	16.14	2.41	17.3	3.12	7.65
288.0	20.00	2.39	7.7	4.17	10.79
288.0	24.78	2.21	5.3	5.21	13.75
288.0	28.73	1.85	4.2	6.25	16.60
288.0	32.08	1.77	3.5	7.29	19.40
288.0	35.21	1.73	3.0	8.33	22.25
288.0	38.07	1.67	2.7	9.38	25.04
288.0	40.56	1.61	2.5	10.42	27.77
288.0	43.00	1.54	2.3	11.46	30.45
288.0	45.03	1.44	2.1	12.50	33.10

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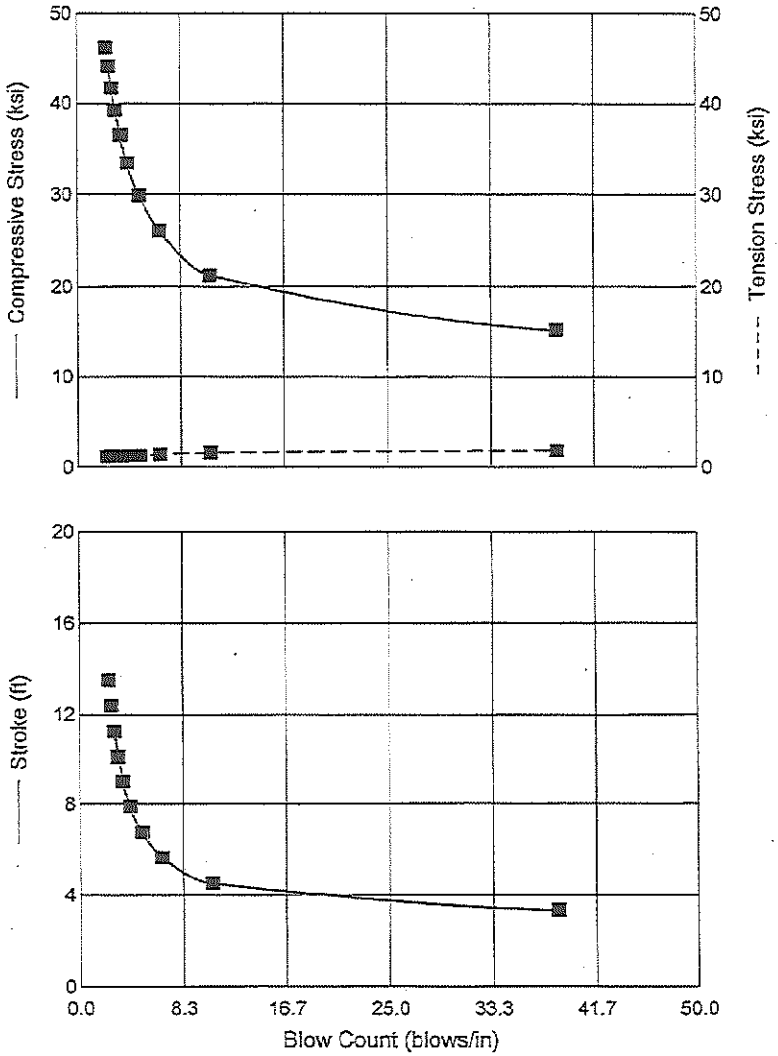
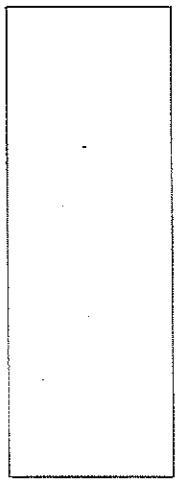
MKT DE 42 Constant Capacity



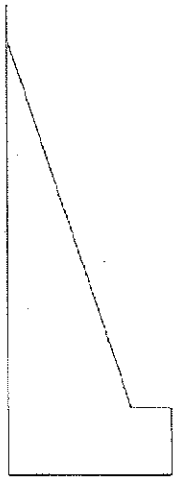
MKT DE 42/35

Capacity	288.0	kips
Efficiency	0.800	
Helmet	1.20	kips
Hammer Cushion	40399	kips/in
Skin Quake	0.100	in
Toe Quake	0.100	in
Skin Damping	0.050	sec/ft
Toe Damping	0.150	sec/ft
Pile Length	70.00	ft
Pile Penetration	65.00	ft
Pile Top Area	18.40	in2

Pile Model



Skin Friction Distribution



Res. Shaft = 25 %
(Proportional)

MKT D642 Constant Capacity

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Ultimate Capacity kips	Maximum Compression Stress ksi	Maximum Tension Stress ksi	Blow Count blows/in	Stroke ft	Energy kips-ft
288.0	15.16	1.85	38.6	3.38	6.18
288.0	21.27	1.62	10.7	4.50	9.40
288.0	26.03	1.42	6.6	5.62	12.48
288.0	29.88	1.26	5.0	6.75	15.45
288.0	33.40	1.23	4.1	7.88	18.47
288.0	36.42	1.18	3.5	9.00	21.38
288.0	39.19	1.20	3.1	10.12	24.21
288.0	41.64	1.22	2.8	11.25	27.04
288.0	44.10	1.20	2.6	12.38	29.81
288.0	46.10	1.17	2.4	13.50	32.57