

GRL Engineers, Inc.

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TRANSMITTAL

To: Mr. Kevin Weber	From: Travis Coleman
Company: Lunda Construction Co.	No. of Sheets: 23
E-mail: kweber@lundaconstruction.com	Date: March 31, 2015

RE: Dynamic Testing Results – USH 10 over Little Lake Butte des Morts
Structure B-70-403 - Pier 14
Winnebago County, Wisconsin

On March 27, 2015, Pier 14 #1, Pier 14 #36, and Pier 14 #44 at the above structure were dynamically tested during initial driving. The piles were tested during restrrike on March 30. Project plans indicated the exterior row piles have a required driving resistance, or ultimate capacity, of 480 kips (240 tons) and the interior row piles have a required driving resistance of 400 kips (200 tons). The reference elevation for the piles was the top of the ring at EL 740.3. We understand the pier was excavated to an elevation of EL 716.97. The piles have a required minimum tip elevation of EL 670.5. The HP 14x73 H-piles were equipped with driving shoes and were driven with an APE D30-42 hammer (number PD 0256) reportedly operated on fuel setting 4.

Pier 14 #1 was driven to a depth of 74.4 feet, which corresponds to a pile tip elevation of EL 665.9. The blow count over the final increment of driving was 10 blows for 4 inches of penetration at an average hammer stroke of 7.1 feet. The blow count at the beginning of restrrike was 10 blows for 2 ½ inches of penetration at an average hammer stroke of 6.9 feet.

Pier 14 #36 was driven to a depth of 73.0 feet, which corresponds to a pile tip elevation of EL 667.3. The blow count over the final increment of driving was 10 blows for 5½ inches of penetration at an average hammer stroke of 6.9 feet. The blow count at the beginning of restrrike was 10 blows for 2 ¾ inches of penetration at an average hammer stroke of 6.8 feet.

Pier 14 #44 was driven to a depth of 74.8 feet, which corresponds to a pile tip elevation of EL 665.5. The blow count over the final increment of driving was 10 blows for 3 ⅞ inches of penetration at an average hammer stroke of 7.1 feet. The blow count at the beginning of restrrike was 10 blows for 3¼ inch of penetration at an average hammer stroke of 6.5 feet

We recommend the production piles at Pier 14 of Structure B-70-403 driven with the APE D30-42 hammer PD0256 obtain the minimum recommended blow count, noted below, based on the field observed hammer stroke. We recommend maintaining the minimum blow count for **three consecutive inches** of driving at the recommended average hammer stroke. Additionally, all production piles should achieve the minimum pile tip elevation of EL 670.5 for uplift, as indicated on the plans.

March 24, 2014

Field Observed Hammer Stroke (feet)	Exterior Piles (480 kips) Recommended Minimum Blow Count (blows per inch)	Interior Piles (400 kips) Recommended Minimum Blow Count (blows per inch)
6.5	5	3
7.0	5	3
7.5	4	3
8.0	4	3
8.5	4	3

We recommend immediately terminating driving **if the blow counts exceed 10** blows over an increment of one inch or less at hammer strokes of 8.0 feet, after satisfying any minimum tip requirements. We anticipate the production piles will terminate at depths similar to those of the test piles.

Please note the tested piles did not meet the recommended driving criteria. Pier 14 #36 did achieve the required capacity, thus we do not recommend re-driving. Pier 14 #1 and #44 should be re-driven to the recommended driving criteria.

These criteria should not be used for acceptance of piles under restrrike and/or redrive conditions. After splicing or any other delays, we recommend not applying the criteria until a full foot of driving has occurred beyond the termination depth associated with the delay, unless the blow count exceeds 10 blows per inch.

Please call if you have any questions on these recommendations.

GRL Engineers, Inc.



Travis Coleman, P.E.

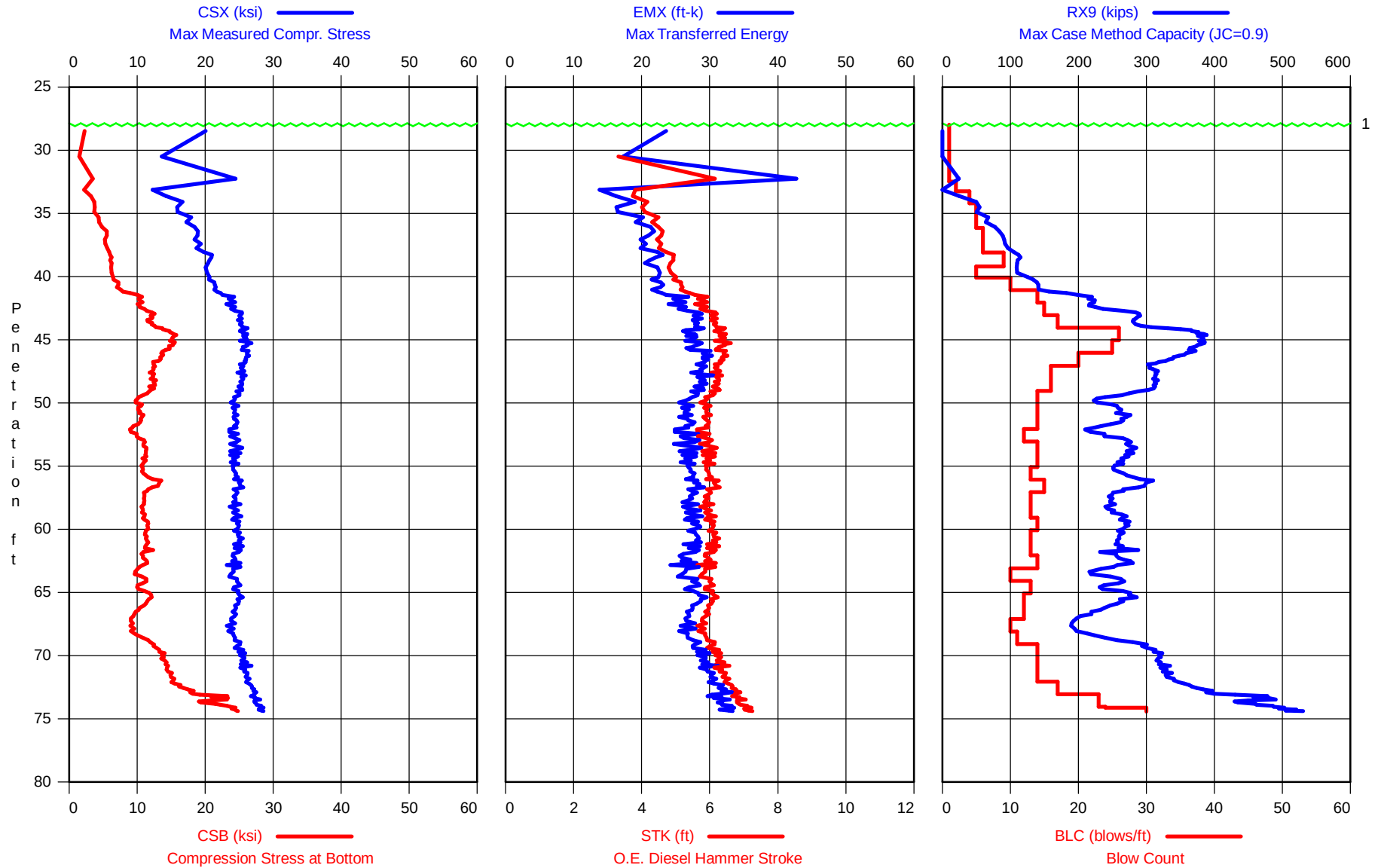


Alexander McCaskill, E.I.

cc: Jeff Horsfall – jeffrey.horsfall@dot.wi.gov

Attachments:

Dynamic Test Results - (pages 4 – 23)

USH 10 over Little Lake Butte des Morts - Pier 14 #1
APE D30-42, HP 14 x 73

USH 10 over Little Lake Butte des Morts - Pier 14 #1
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

AR: 21.40 in² SP: 0.492 k/ft³
LE: 91.42 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 1.20

CSX: Max Measured Compr. Stress STK: O.E. Diesel Hammer Stroke
CSB: Compression Stress at Bottom BPM: Blows per Minute
EMX: Max Transferred Energy RX9: Max Case Method Capacity (JC=0.9)

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
1	28.00	1	AV1	20.0	2.4	18	**	**	0
			MAX	20.0	2.4	18	**	**	0
			MIN	20.0	2.4	18	**	**	0
2	29.00	1	AV1	20.1	2.2	30	**	**	0
			MAX	20.1	2.2	30	**	**	0
			MIN	20.1	2.2	30	**	**	0
3	30.00	1	AV1	15.3	1.5	21	3.5	61.9	0
			MAX	15.3	1.5	21	3.5	61.9	0
			MIN	15.3	1.5	21	3.5	61.9	0
4	31.00	1	AV1	11.9	1.4	14	3.1	64.8	0
			MAX	11.9	1.4	14	3.1	64.8	0
			MIN	11.9	1.4	14	3.1	64.8	0
5	32.00	1	AV1	23.5	3.2	50	**	**	0
			MAX	23.5	3.2	50	**	**	0
			MIN	23.5	3.2	50	**	**	0
7	33.00	2	AV2	20.9	3.3	29	5.0	53.2	25
			STD	4.5	0.4	6	1.1	5.7	25
			MAX	25.4	3.7	35	6.1	58.9	49
			MIN	16.5	2.8	22	3.9	47.4	0
11	34.00	4	AV4	13.3	2.9	14	3.8	59.2	23
			STD	3.1	0.8	5	0.2	1.3	15
			MAX	16.5	3.6	20	4.2	60.4	42
			MIN	8.1	1.6	5	3.7	57.0	0
16	35.00	5	AV5	16.1	3.7	17	4.1	57.5	54
			STD	0.3	0.1	1	0.1	0.4	3
			MAX	16.8	3.8	18	4.2	58.0	57
			MIN	15.9	3.6	16	4.0	56.9	48
21	36.00	5	AV5	17.6	4.5	20	4.4	55.6	66
			STD	1.0	0.2	1	0.2	1.0	3
			MAX	19.3	4.8	22	4.7	56.4	70
			MIN	16.5	4.2	19	4.3	53.7	63
27	37.00	6	AV6	18.8	5.4	21	4.6	54.5	87
			STD	0.3	0.3	1	0.1	0.5	3
			MAX	19.3	5.7	22	4.7	55.2	90
			MIN	18.5	4.8	19	4.5	53.6	83
33	38.00	6	AV6	19.0	5.5	21	4.5	54.7	95
			STD	0.7	0.2	1	0.1	0.6	5
			MAX	19.8	5.9	22	4.7	55.8	102
			MIN	17.7	5.2	19	4.4	54.0	91
42	39.00	9	AV9	20.7	6.1	22	4.9	52.8	112
			STD	0.4	0.2	1	0.1	0.3	3
			MAX	21.4	6.4	24	5.0	53.3	117
			MIN	20.2	5.8	20	4.8	52.2	108
47	40.00	5	AV5	20.1	6.2	22	4.8	53.1	112
			STD	0.3	0.1	1	0.1	0.5	4
			MAX	20.5	6.3	23	5.0	53.7	120
			MIN	19.7	6.0	22	4.7	52.4	108
57	41.00	10	AV10	21.3	7.0	23	5.1	51.7	138
			STD	0.5	0.4	1	0.1	0.6	4
			MAX	22.1	7.5	24	5.3	52.7	143
			MIN	20.4	6.5	21	4.9	50.9	132

USH 10 over Little Lake Butte des Morts - Pier 14 #1

APE D30-42, HP 14 x 73

OP: MR

Test date: 27-Mar-2015

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
71	42.00	14	AV14	22.9	9.6	24	5.6	49.6	197
			STD	1.2	1.1	2	0.3	1.2	28
			MAX	24.5	11.0	27	6.0	51.8	230
			MIN	20.8	7.4	20	5.1	47.9	145
86	43.00	15	AV15	24.3	11.1	26	5.9	48.4	246
			STD	1.0	0.9	2	0.3	1.0	29
			MAX	25.7	12.6	29	6.3	50.2	293
			MIN	22.3	10.0	23	5.4	46.9	210
103	44.00	17	AV17	25.2	12.1	28	6.1	47.5	286
			STD	0.4	0.4	1	0.1	0.4	6
			MAX	25.8	13.0	29	6.3	48.3	302
			MIN	24.4	11.3	27	5.9	46.8	279
129	45.00	26	AV26	25.8	14.8	27	6.4	46.7	370
			STD	0.5	0.8	1	0.1	0.5	20
			MAX	26.5	15.9	29	6.5	48.1	391
			MIN	24.6	12.5	25	6.0	46.0	313
154	46.00	25	AV25	25.9	14.7	28	6.4	46.6	374
			STD	0.6	0.6	1	0.2	0.6	9
			MAX	26.8	15.7	31	6.7	47.9	391
			MIN	24.7	13.7	25	6.0	45.6	354
174	47.00	20	AV20	25.9	13.2	29	6.4	46.6	334
			STD	0.5	0.6	1	0.1	0.5	18
			MAX	26.5	14.2	31	6.5	48.4	361
			MIN	24.1	12.0	27	5.9	46.1	297
190	48.00	16	AV16	25.4	12.3	29	6.2	47.2	312
			STD	0.4	0.4	1	0.1	0.4	5
			MAX	26.0	12.9	31	6.4	48.3	323
			MIN	24.2	11.6	26	5.9	46.5	302
206	49.00	16	AV16	25.3	12.3	29	6.2	47.1	311
			STD	0.4	0.4	1	0.1	0.5	5
			MAX	25.8	13.1	30	6.4	48.5	322
			MIN	24.0	11.7	26	5.9	46.4	300
220	50.00	14	AV14	24.5	10.6	27	6.0	48.1	249
			STD	0.5	0.8	1	0.2	0.6	25
			MAX	25.5	12.1	29	6.2	49.3	293
			MIN	23.5	9.7	25	5.7	47.2	219
234	51.00	14	AV14	24.4	10.5	27	5.9	48.2	260
			STD	0.7	0.4	1	0.2	0.8	9
			MAX	25.9	11.1	29	6.3	49.3	283
			MIN	23.5	9.9	25	5.7	46.9	247
248	52.00	14	AV14	24.5	10.1	27	5.9	48.3	253
			STD	0.6	0.6	1	0.2	0.6	17
			MAX	25.3	10.8	29	6.1	49.6	277
			MIN	23.1	9.2	25	5.6	47.4	216
260	53.00	12	AV12	24.2	9.9	26	5.8	48.7	241
			STD	0.7	0.7	2	0.2	0.7	23
			MAX	25.1	11.3	29	6.1	49.7	278
			MIN	23.2	8.8	24	5.6	47.6	208
274	54.00	14	AV14	24.5	11.2	27	6.0	48.0	277
			STD	0.8	0.2	2	0.2	0.8	6
			MAX	25.6	11.6	29	6.3	49.5	289
			MIN	23.1	10.8	24	5.6	47.0	263
288	55.00	14	AV14	24.2	11.0	27	6.0	48.1	264
			STD	0.7	0.3	1	0.2	0.7	8
			MAX	25.0	11.6	29	6.2	49.2	276
			MIN	23.0	10.4	25	5.7	47.2	247

USH 10 over Little Lake Butte des Morts - Pier 14 #1
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
301	56.00	13	AV13	24.3	11.1	27	5.9	48.2	265
			STD	0.4	0.4	1	0.1	0.3	12
			MAX	24.9	11.9	28	6.1	48.9	287
			MIN	23.6	10.6	26	5.8	47.7	248
316	57.00	15	AV15	25.0	12.6	28	6.1	47.5	290
			STD	0.5	0.8	1	0.1	0.5	16
			MAX	25.9	13.6	30	6.4	48.3	315
			MIN	24.0	11.4	27	5.9	46.6	257
329	58.00	13	AV13	24.4	11.0	27	5.9	48.2	249
			STD	0.5	0.1	1	0.1	0.6	5
			MAX	25.2	11.2	29	6.1	49.3	256
			MIN	23.4	10.8	25	5.7	47.6	240
342	59.00	13	AV13	24.5	10.9	27	6.0	48.1	253
			STD	0.8	0.3	1	0.2	0.8	12
			MAX	25.4	11.3	29	6.2	49.5	272
			MIN	23.2	10.4	26	5.6	47.2	236
356	60.00	14	AV14	24.6	11.4	28	6.0	47.8	268
			STD	0.6	0.3	1	0.2	0.6	6
			MAX	25.3	11.8	29	6.2	49.4	278
			MIN	23.1	10.8	25	5.6	47.1	257
369	61.00	13	AV13	24.9	11.3	28	6.1	47.5	260
			STD	0.7	0.2	1	0.2	0.7	5
			MAX	25.8	11.6	30	6.4	49.2	269
			MIN	23.2	11.0	26	5.7	46.6	249
382	62.00	13	AV13	24.8	11.3	28	6.1	47.7	259
			STD	0.9	0.6	2	0.2	0.9	17
			MAX	25.5	12.8	30	6.3	49.6	294
			MIN	22.9	10.2	24	5.6	46.8	225
396	63.00	14	AV14	24.3	11.0	26	6.0	48.1	264
			STD	0.8	0.4	2	0.2	0.9	11
			MAX	25.4	11.5	29	6.3	49.5	283
			MIN	23.0	10.0	24	5.6	47.0	248
406	64.00	10	AV10	24.0	10.3	26	5.9	48.6	236
			STD	1.0	0.7	2	0.3	1.0	19
			MAX	25.4	11.3	29	6.2	50.0	267
			MIN	22.6	9.3	24	5.5	47.1	206
419	65.00	13	AV13	24.6	10.6	27	6.0	48.0	251
			STD	0.6	0.6	1	0.1	0.5	16
			MAX	25.5	11.5	29	6.2	48.9	273
			MIN	23.7	9.8	26	5.8	47.1	226
431	66.00	12	AV12	24.9	11.7	28	6.1	47.7	269
			STD	0.7	0.4	1	0.2	0.7	13
			MAX	25.8	12.2	30	6.3	49.7	291
			MIN	22.9	10.9	25	5.6	46.7	244
443	67.00	12	AV12	24.4	9.9	27	5.9	48.2	223
			STD	0.6	0.5	1	0.2	0.6	15
			MAX	25.8	11.0	30	6.3	49.2	249
			MIN	23.5	9.1	25	5.7	46.7	201
453	68.00	10	AV10	23.9	9.2	27	5.8	48.8	192
			STD	0.7	0.3	1	0.2	0.7	4
			MAX	24.8	9.8	29	6.0	49.8	200
			MIN	22.6	8.9	25	5.5	48.0	188
464	69.00	11	AV11	24.4	10.6	27	5.9	48.2	239
			STD	0.7	1.0	1	0.2	0.6	26
			MAX	26.0	12.2	30	6.3	49.0	284
			MIN	23.5	8.9	25	5.7	46.8	204

USH 10 over Little Lake Butte des Morts - Pier 14 #1

APE D30-42, HP 14 x 73

OP: MR

Test date: 27-Mar-2015

BL#	depth	BLC	TYPE	CSX	CSB	EMX	STK	BPM	RX9
end	ft	bl/ft		ksi	ksi	ft-k	ft	**	kips
478	70.00	14	AV14	25.1	13.1	28	6.1	47.5	309
			STD	0.6	0.6	1	0.2	0.6	11
			MAX	26.2	14.1	31	6.4	48.8	330
			MIN	23.9	12.3	26	5.8	46.5	287
492	71.00	14	AV14	25.7	14.1	29	6.3	46.8	321
			STD	0.6	0.3	1	0.2	0.6	7
			MAX	27.1	14.7	32	6.7	47.6	336
			MIN	25.0	13.5	28	6.1	45.5	309
506	72.00	14	AV14	26.1	14.9	30	6.4	46.4	333
			STD	0.4	0.4	1	0.1	0.4	7
			MAX	26.7	15.5	32	6.6	47.2	345
			MIN	25.2	13.9	28	6.2	45.7	321
523	73.00	17	AV17	26.9	16.8	32	6.7	45.6	373
			STD	0.5	1.1	1	0.1	0.5	16
			MAX	27.6	18.3	34	6.9	46.7	399
			MIN	25.7	14.9	29	6.3	44.8	342
546	74.00	23	AV23	27.4	21.3	32	6.9	45.0	458
			STD	0.5	1.8	1	0.2	0.5	24
			MAX	28.3	23.7	34	7.1	45.8	497
			MIN	26.6	18.2	30	6.6	44.2	413
548	74.08	24	AV2	28.2	23.7	33	7.1	44.3	488
			STD	0.6	0.1	1	0.2	0.5	4
			MAX	28.8	23.8	33	7.2	44.8	491
			MIN	27.5	23.6	32	6.9	43.8	484
558	74.42	30	AV10	28.3	24.4	33	7.1	44.1	511
			STD	0.4	0.4	1	0.1	0.4	17
			MAX	28.7	25.3	34	7.3	44.9	547
			MIN	27.6	23.6	31	6.9	43.7	485
Average				24.5	11.9	27	6.0	48.1	276
Std. Dev.				2.4	3.9	3	0.6	2.6	93
Maximum				28.8	25.3	50	7.3	64.8	547
Minimum				8.1	1.4	5	3.1	43.7	0

Total number of blows analyzed: 558

BL#	depth (ft)	Comments
1	28.00	Depth reference at El. 740.3; Mud line at El. 717.0

Time Summary

Drive 12 minutes 19 seconds 12:23:29 PM - 12:35:48 PM (3/27/2015) BN 1 - 558



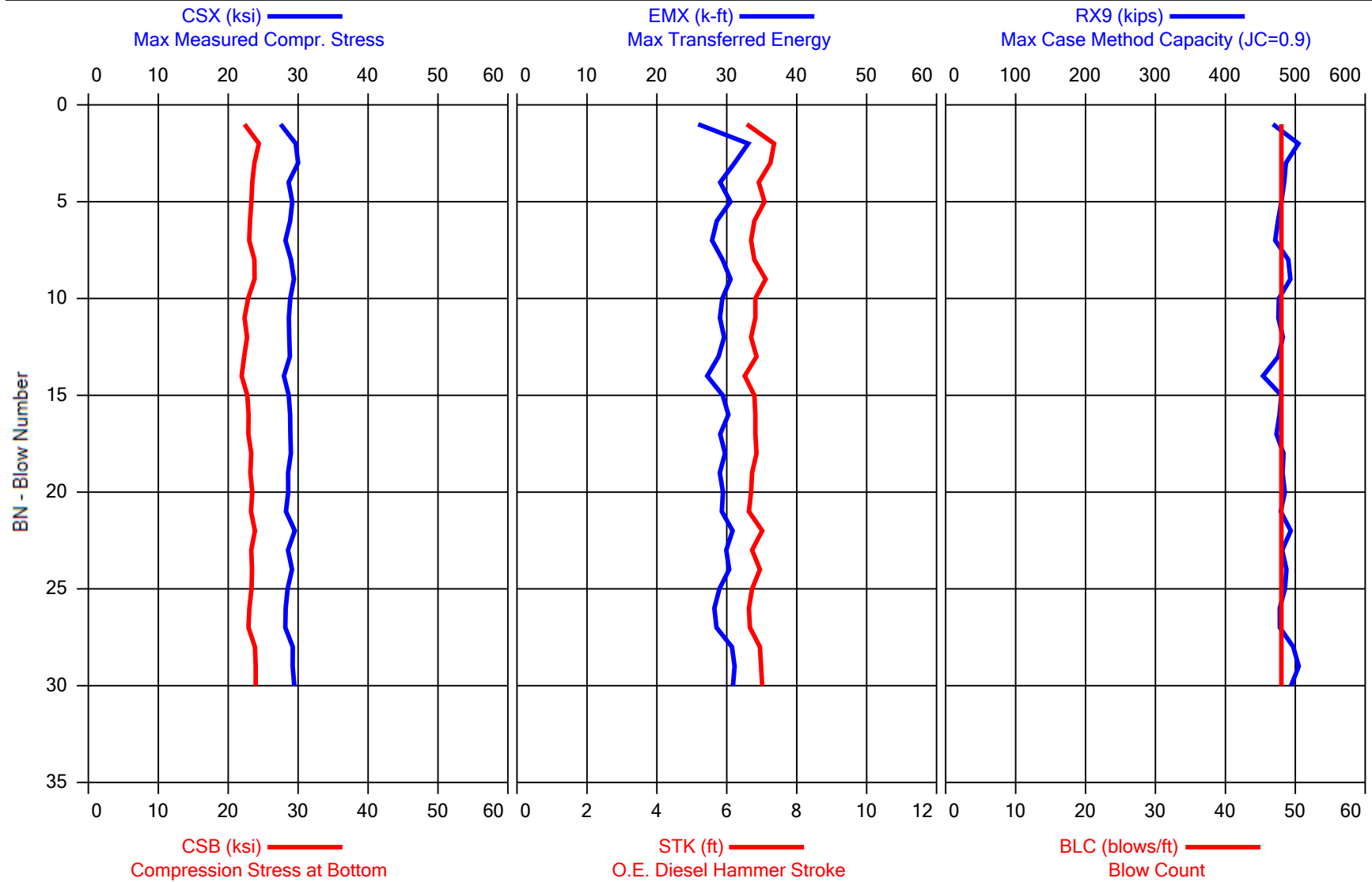
Printed: 31-March-2015

GRL Engineers, Inc. - PDIPLOT2 Ver 2014.2.48.1 - Case Method & iCAP® Results

Test started: 30-March-2015



USH 10 over Little Lake Butte des Morts - Pier 14 #1 Restrike
APE D30-42, HP 14 x 73



USH 10 over Little Lake Butte des Morts - Pier 14 #1 Restrike
OP: AM

APE D30-42, HP 14 x 73
Date: 30-March-2015

AR: 21.40 in² SP: 0.492 k/ft³
LE: 78.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 1.00

CSX: Max Measured Compr. Stress
CSB: Compression Stress at Bottom
EMX: Max Transferred Energy

STK: O.E. Diesel Hammer Stroke
BPM: Blows per Minute
RX9: Max Case Method Capacity (JC=0.9)

BL#	depth	BLC	TYPE	CSX	CSB	EMX	STK	BPM	RX9
	ft	blows/ft		ksi	ksi	k-ft	ft	bpm	kips
10	74.63	48	AV10	28.9	23.4	30	6.9	44.8	483
			STD	0.7	0.5	2	0.2	0.7	10
			MAX	30.0	24.4	33	7.4	45.9	504
			MIN	27.5	22.3	26	6.6	43.5	468
20	74.83	48	AV10	28.7	22.8	29	6.8	45.3	477
			STD	0.3	0.5	1	0.1	0.3	8
			MAX	29.0	23.4	30	6.8	46.1	485
			MIN	28.0	21.9	27	6.5	45.0	454
30	75.04	48	AV10	28.8	23.5	30	6.8	45.1	488
			STD	0.5	0.4	1	0.2	0.5	9
			MAX	29.5	23.9	31	7.0	45.7	505
			MIN	28.2	22.9	28	6.6	44.5	478
			Average	28.8	23.2	30	6.8	45.0	482
			Std. Dev.	0.5	0.6	1	0.2	0.6	10
			Maximum	30.0	24.4	33	7.4	46.1	505
			Minimum	27.5	21.9	26	6.5	43.5	454

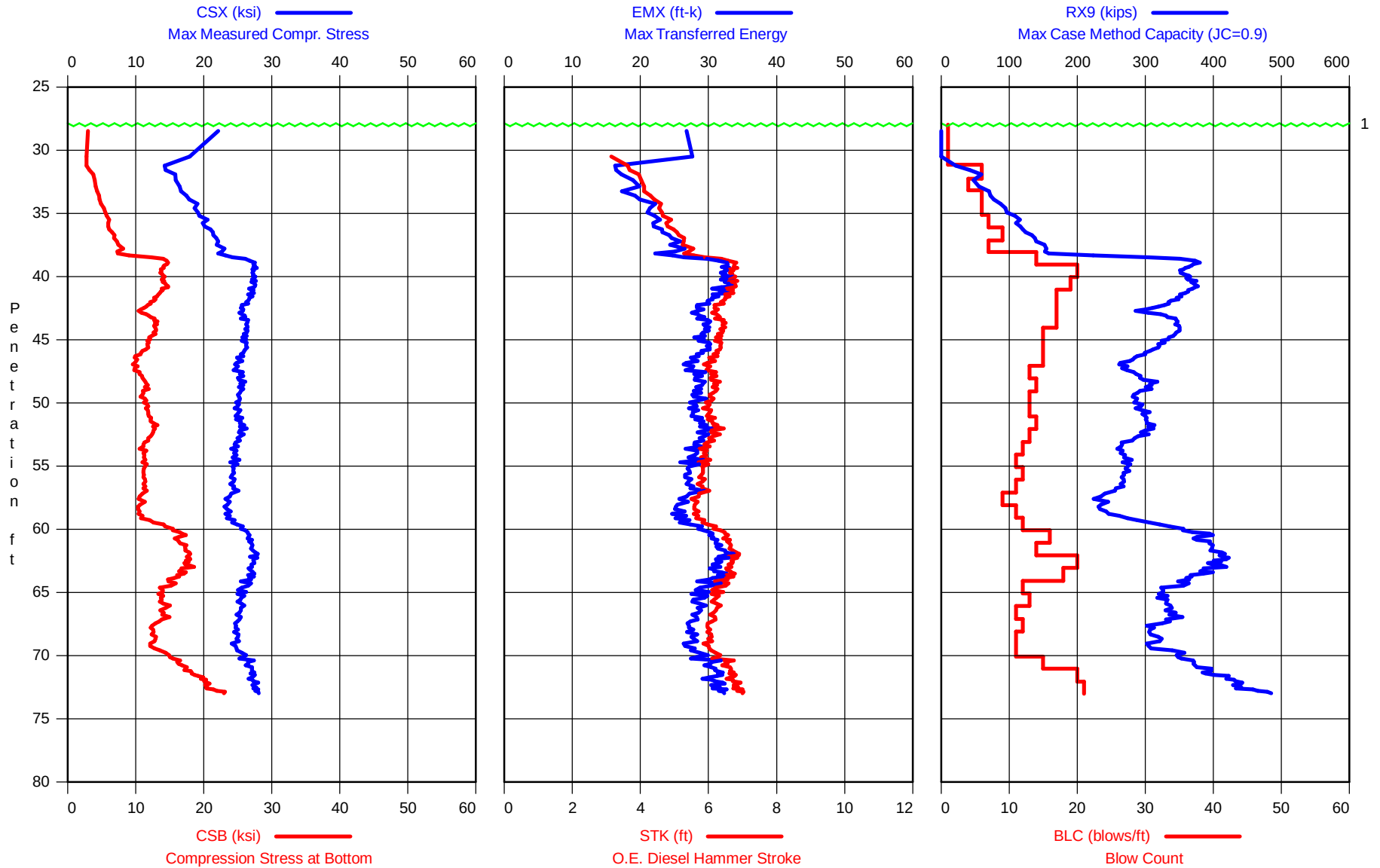
Total number of blows analyzed: 30

BL# Sensors

1-30 F3: [F607] 93.6 (1.00); F4: [D815] 93.0 (1.00); A3: [K2524] 360.0 (1.00); A4: [K3550] 360.0 (1.00)

Time Summary

Drive 38 seconds 7:55 AM - 7:56 AM BN 1 - 30

USH 10 over Little Lake Butte des Morts - Pier 14 #36
APE D30-42, HP 14 x 73

1 - Depth reference at El. 740.3; Mud line at El. 717.0

USH 10 over Little Lake Butte des Morts - Pier 14 #36
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

AR: 21.40 in² SP: 0.492 k/ft3
LE: 90.25 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 1.20

CSX: Max Measured Compr. Stress STK: O.E. Diesel Hammer Stroke
CSB: Compression Stress at Bottom BPM: Blows per Minute
EMX: Max Transferred Energy RX9: Max Case Method Capacity (JC=0.9)

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
1	28.00	1	AV1	21.7	3.1	21	**	**	0
			MAX	21.7	3.1	21	**	**	0
			MIN	21.7	3.1	21	**	**	0
2	29.00	1	AV1	22.5	2.9	32	**	**	0
			MAX	22.5	2.9	32	**	**	0
			MIN	22.5	2.9	32	**	**	0
3	30.00	1	AV1	12.5	2.0	15	3.1	64.9	0
			MAX	12.5	2.0	15	3.1	64.9	0
			MIN	12.5	2.0	15	3.1	64.9	0
4	31.00	1	AV1	23.3	3.4	40	**	**	0
			MAX	23.3	3.4	40	**	**	0
			MIN	23.3	3.4	40	**	**	0
10	32.00	6	AV6	14.8	3.2	17	3.8	59.8	41
			STD	1.0	0.4	1	0.2	1.2	18
			MAX	16.5	4.0	18	4.0	61.4	63
			MIN	13.4	2.6	15	3.5	57.7	9
14	33.00	4	AV4	16.2	4.0	19	4.1	57.6	52
			STD	0.8	0.1	1	0.1	0.7	5
			MAX	17.2	4.2	21	4.2	58.6	60
			MIN	15.2	3.9	17	3.9	56.8	47
20	34.00	6	AV6	17.3	4.5	19	4.3	56.3	73
			STD	0.6	0.2	1	0.1	0.8	3
			MAX	18.0	4.8	20	4.5	57.8	79
			MIN	16.2	4.3	17	4.0	55.1	69
26	35.00	6	AV6	18.9	5.2	22	4.6	54.4	93
			STD	0.4	0.3	1	0.1	0.4	4
			MAX	19.5	5.7	23	4.7	54.9	97
			MIN	18.3	4.9	21	4.5	53.9	84
33	36.00	7	AV7	19.9	5.9	22	4.8	53.4	111
			STD	0.6	0.2	1	0.1	0.6	3
			MAX	20.8	6.2	23	4.9	54.5	119
			MIN	18.9	5.5	21	4.6	52.6	108
42	37.00	9	AV9	21.3	6.5	23	5.1	51.9	128
			STD	0.6	0.4	1	0.2	0.8	8
			MAX	22.1	6.9	25	5.3	53.3	141
			MIN	20.1	6.0	21	4.8	50.9	115
49	38.00	7	AV7	22.4	7.6	26	5.4	50.5	149
			STD	0.5	0.4	1	0.1	0.7	7
			MAX	23.1	8.3	27	5.6	51.5	155
			MIN	21.5	7.1	24	5.2	49.6	133
63	39.00	14	AV14	25.0	11.8	28	6.1	47.8	294
			STD	2.0	3.1	4	0.6	2.2	87
			MAX	27.5	14.9	34	6.8	51.3	389
			MIN	21.9	7.0	22	5.2	45.1	156
83	40.00	20	AV20	27.3	13.9	32	6.7	45.4	359
			STD	0.4	0.3	1	0.1	0.4	7
			MAX	28.1	14.5	34	6.9	46.4	372
			MIN	26.4	13.4	30	6.4	44.7	348
102	41.00	19	AV19	27.3	14.2	33	6.7	45.4	370
			STD	0.3	0.4	1	0.1	0.4	6
			MAX	27.7	15.2	34	6.9	46.3	380
			MIN	26.4	13.6	30	6.5	44.9	359

USH 10 over Little Lake Butte des Morts - Pier 14 #36

APE D30-42, HP 14 x 73

OP: MR

Test date: 27-Mar-2015

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
119	42.00	17	AV17	26.9	13.2	31	6.6	45.9	352
			STD	0.4	0.5	1	0.1	0.4	10
			MAX	27.5	14.1	33	6.8	46.6	366
			MIN	26.2	12.3	30	6.4	45.2	334
136	43.00	17	AV17	25.7	11.3	29	6.2	47.1	315
			STD	0.5	0.6	1	0.1	0.5	16
			MAX	26.8	12.4	30	6.5	48.2	339
			MIN	24.6	10.4	26	5.9	46.2	282
153	44.00	17	AV17	26.2	12.7	29	6.4	46.5	343
			STD	0.4	0.4	1	0.1	0.4	8
			MAX	26.8	13.4	31	6.6	47.3	355
			MIN	25.4	11.8	28	6.2	45.7	326
168	45.00	15	AV15	26.1	12.5	29	6.3	46.7	343
			STD	0.3	0.4	1	0.1	0.4	7
			MAX	26.6	13.2	30	6.5	47.6	352
			MIN	25.2	11.8	27	6.1	46.0	333
183	46.00	15	AV15	26.1	11.5	30	6.3	46.8	317
			STD	0.4	0.5	1	0.1	0.4	9
			MAX	26.7	12.1	32	6.5	47.7	333
			MIN	25.0	10.6	28	6.1	46.2	297
198	47.00	15	AV15	25.2	10.1	28	6.1	47.6	281
			STD	0.7	0.4	1	0.2	0.7	14
			MAX	26.4	11.0	30	6.4	48.6	303
			MIN	24.2	9.4	26	5.8	46.4	259
211	48.00	13	AV13	25.1	10.4	28	6.1	47.7	280
			STD	0.8	0.5	1	0.2	0.8	12
			MAX	26.1	11.1	30	6.3	48.9	296
			MIN	23.6	9.5	25	5.8	46.7	258
225	49.00	14	AV14	25.6	11.5	29	6.2	47.1	306
			STD	0.5	0.4	1	0.2	0.6	9
			MAX	26.4	12.3	31	6.4	48.2	326
			MIN	24.7	10.9	27	5.9	46.4	293
238	50.00	13	AV13	25.1	11.1	28	6.1	47.7	286
			STD	0.5	0.4	1	0.1	0.5	5
			MAX	26.0	11.9	31	6.3	48.7	295
			MIN	24.3	10.5	27	5.8	46.7	278
251	51.00	13	AV13	25.0	11.7	28	6.0	48.0	296
			STD	0.4	0.3	1	0.1	0.4	8
			MAX	25.7	12.3	29	6.2	48.8	315
			MIN	24.2	11.3	26	5.8	47.3	282
265	52.00	14	AV14	25.4	12.5	29	6.1	47.4	305
			STD	0.7	0.4	1	0.2	0.7	7
			MAX	26.6	13.3	31	6.5	48.2	321
			MIN	24.6	11.9	28	5.9	46.0	296
278	53.00	13	AV13	25.4	12.3	29	6.2	47.4	294
			STD	0.5	0.3	1	0.2	0.6	10
			MAX	26.2	12.8	31	6.5	48.4	309
			MIN	24.5	11.7	28	5.9	46.2	276
290	54.00	12	AV12	24.6	11.1	28	5.9	48.3	264
			STD	0.6	0.4	1	0.2	0.6	5
			MAX	25.5	11.8	31	6.1	49.6	272
			MIN	23.4	10.4	26	5.6	47.4	256
301	55.00	11	AV11	24.6	11.3	28	5.9	48.4	273
			STD	0.6	0.2	1	0.2	0.7	7
			MAX	25.3	11.6	30	6.1	49.6	281
			MIN	23.5	10.9	26	5.6	47.6	261

USH 10 over Little Lake Butte des Morts - Pier 14 #36

APE D30-42, HP 14 x 73

OP: MR

Test date: 27-Mar-2015

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
313	56.00	12	AV12	24.3	11.2	27	5.8	48.7	270
			STD	0.3	0.2	1	0.1	0.3	6
			MAX	24.8	11.5	28	6.0	49.1	286
			MIN	23.9	10.9	26	5.7	48.1	264
324	57.00	11	AV11	24.4	11.3	28	5.8	48.6	264
			STD	0.5	0.3	1	0.1	0.6	6
			MAX	25.2	11.9	30	6.1	49.2	272
			MIN	23.8	10.8	26	5.7	47.6	253
333	58.00	9	AV9	23.8	10.9	27	5.7	49.3	237
			STD	0.4	0.4	1	0.1	0.5	9
			MAX	24.3	11.6	28	5.8	50.3	252
			MIN	22.9	10.4	25	5.4	48.7	222
344	59.00	11	AV11	23.4	10.5	25	5.6	49.5	242
			STD	0.5	0.3	1	0.1	0.5	12
			MAX	24.4	11.4	27	5.9	50.4	268
			MIN	22.8	10.2	24	5.4	48.5	230
356	60.00	12	AV12	24.7	13.2	27	5.9	48.2	314
			STD	1.0	1.6	2	0.2	0.9	29
			MAX	26.2	16.4	30	6.4	49.6	369
			MIN	23.3	10.6	25	5.6	46.5	271
372	61.00	16	AV16	26.6	16.3	30	6.5	46.2	380
			STD	0.4	0.6	1	0.1	0.5	15
			MAX	27.2	17.9	32	6.8	46.9	407
			MIN	25.9	15.5	29	6.3	45.3	353
386	62.00	14	AV14	27.3	17.4	32	6.7	45.5	402
			STD	0.5	0.6	1	0.1	0.5	11
			MAX	28.1	18.3	35	6.9	46.5	419
			MIN	26.2	16.2	30	6.4	44.7	381
406	63.00	20	AV20	27.3	17.7	32	6.7	45.5	410
			STD	0.6	0.5	1	0.2	0.6	11
			MAX	28.6	19.0	34	7.1	46.5	431
			MIN	26.2	16.9	30	6.4	44.2	390
424	64.00	18	AV18	27.0	16.3	31	6.6	45.8	378
			STD	0.5	0.8	1	0.1	0.5	14
			MAX	27.7	17.4	33	6.8	46.6	402
			MIN	26.1	14.7	29	6.4	45.1	352
436	65.00	12	AV12	26.0	14.5	30	6.3	46.7	341
			STD	0.7	0.9	1	0.2	0.7	17
			MAX	27.0	16.1	32	6.7	47.6	375
			MIN	24.9	13.6	28	6.1	45.6	319
449	66.00	13	AV13	25.5	13.8	29	6.2	47.2	329
			STD	0.6	0.5	1	0.1	0.5	12
			MAX	26.4	15.1	31	6.5	48.0	347
			MIN	24.7	13.2	27	6.0	46.2	314
460	67.00	11	AV11	25.3	14.3	28	6.2	47.3	340
			STD	0.5	0.6	1	0.1	0.5	11
			MAX	26.1	15.2	29	6.4	48.2	362
			MIN	24.3	13.4	27	5.9	46.5	327
472	68.00	12	AV12	24.9	12.9	27	6.0	47.8	319
			STD	0.5	0.7	1	0.2	0.6	16
			MAX	25.7	14.2	29	6.3	49.1	347
			MIN	23.7	11.8	26	5.7	47.0	291
483	69.00	11	AV11	24.9	12.6	28	6.0	47.8	314
			STD	0.4	0.4	1	0.1	0.4	12
			MAX	25.5	13.4	29	6.2	48.5	336
			MIN	24.1	12.0	27	5.9	47.2	299

USH 10 over Little Lake Butte des Morts - Pier 14 #36
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

BL#	depth	BLC	TYPE	CSX	CSB	EMX	STK	BPM	RX9
end	ft	bl/ft		ksi	ksi	ft-k	ft	**	kips
494	70.00	11	AV11	25.1	13.4	28	6.1	47.6	329
			STD	0.7	1.1	1	0.2	0.7	23
			MAX	26.4	14.9	30	6.4	48.9	369
			MIN	23.8	11.8	26	5.8	46.5	298
509	71.00	15	AV15	26.4	16.3	30	6.5	46.3	367
			STD	0.8	0.8	2	0.2	0.8	13
			MAX	27.8	18.1	33	6.9	48.0	384
			MIN	24.8	14.7	27	6.0	45.0	337
529	72.00	20	AV20	27.1	18.8	31	6.7	45.5	408
			STD	0.4	1.1	1	0.1	0.4	16
			MAX	27.8	20.7	32	6.9	46.3	433
			MIN	26.3	16.9	28	6.5	44.8	381
550	73.00	21	AV21	27.7	21.2	32	6.9	44.9	450
			STD	0.5	1.1	1	0.2	0.5	20
			MAX	28.4	23.7	34	7.1	46.0	492
			MIN	26.6	19.9	29	6.5	44.2	421
Average				25.3	12.9	29	6.2	47.6	311
Std. Dev.				2.4	3.7	3	0.6	2.7	88
Maximum				28.6	23.7	40	7.1	64.9	492
Minimum				12.5	2.0	15	3.1	44.2	0
Total number of blows analyzed: 550									

BL#	depth (ft)	Comments
1	28.00	Depth reference at El. 740.3; Mud line at El. 717.0

Time Summary

Drive 12 minutes 11 seconds 12:54:19 PM - 1:06:30 PM (3/27/2015) BN 1 - 550



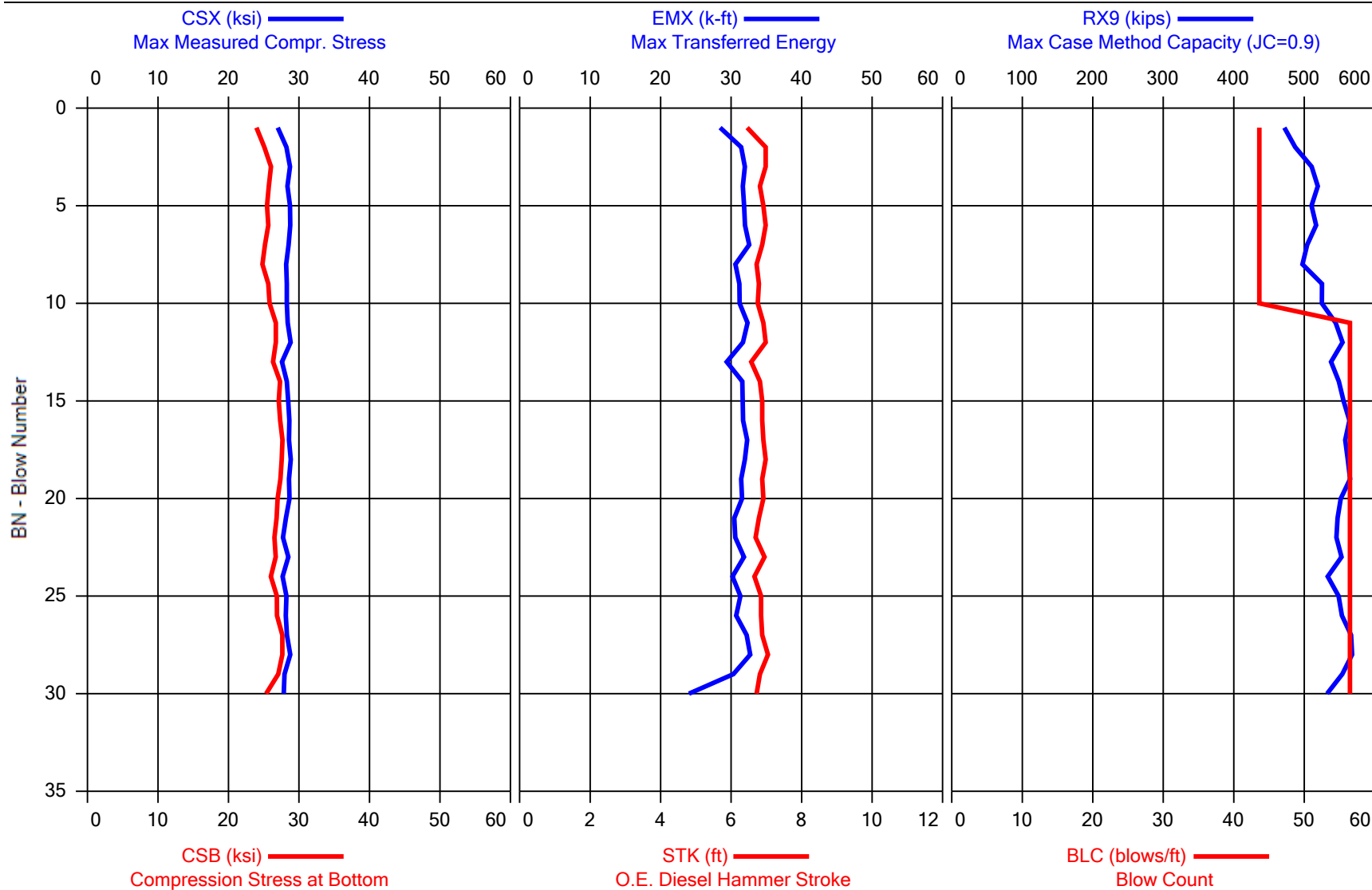
Printed: 31-March-2015

GRL Engineers, Inc. - PDILOT2 Ver 2014.2.48.1 - Case Method & iCAP® Results

Test started: 30-March-2015



USH 10 over Little Lake Butte des Morts - Pier 14 #36 Restrike
APE D30-42, HP 14 x 73



USH 10 over Little Lake Butte des Morts - Pier 14 #36 Restrike
OP: AM

APE D30-42, HP 14 x 73
Date: 30-March-2015

AR: 21.40 in² SP: 0.492 k/ft³
LE: 77.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 1.00

CSX: Max Measured Compr. Stress
CSB: Compression Stress at Bottom
EMX: Max Transferred Energy

STK: O.E. Diesel Hammer Stroke
BPM: Blows per Minute
RX9: Max Case Method Capacity (JC=0.9)

BL#	depth ft	BLC blows/ft	TYPE	CSX ksi	CSB ksi	EMX k-ft	STK ft	BPM bpm	RX9 kips
10	73.23	44	AV10	28.3	25.3	31	6.8	45.1	507
			STD	0.5	0.6	1	0.2	0.5	16
			MAX	28.8	26.0	33	7.0	46.3	525
			MIN	27.0	24.0	28	6.5	44.6	472
20	73.41	56	AV10	28.5	27.1	32	6.9	44.9	554
			STD	0.3	0.4	1	0.1	0.4	8
			MAX	28.8	27.7	32	7.0	45.9	565
			MIN	27.6	26.3	29	6.6	44.6	538
30	73.58	56	AV10	28.1	26.7	30	6.8	45.1	550
			STD	0.3	0.7	2	0.1	0.3	11
			MAX	28.8	27.6	33	7.0	45.6	568
			MIN	27.7	25.3	24	6.7	44.4	532
Average				28.3	26.4	31	6.8	45.0	537
Std. Dev.				0.4	0.9	2	0.1	0.4	25
Maximum				28.8	27.7	33	7.0	46.3	568
Minimum				27.0	24.0	24	6.5	44.4	472

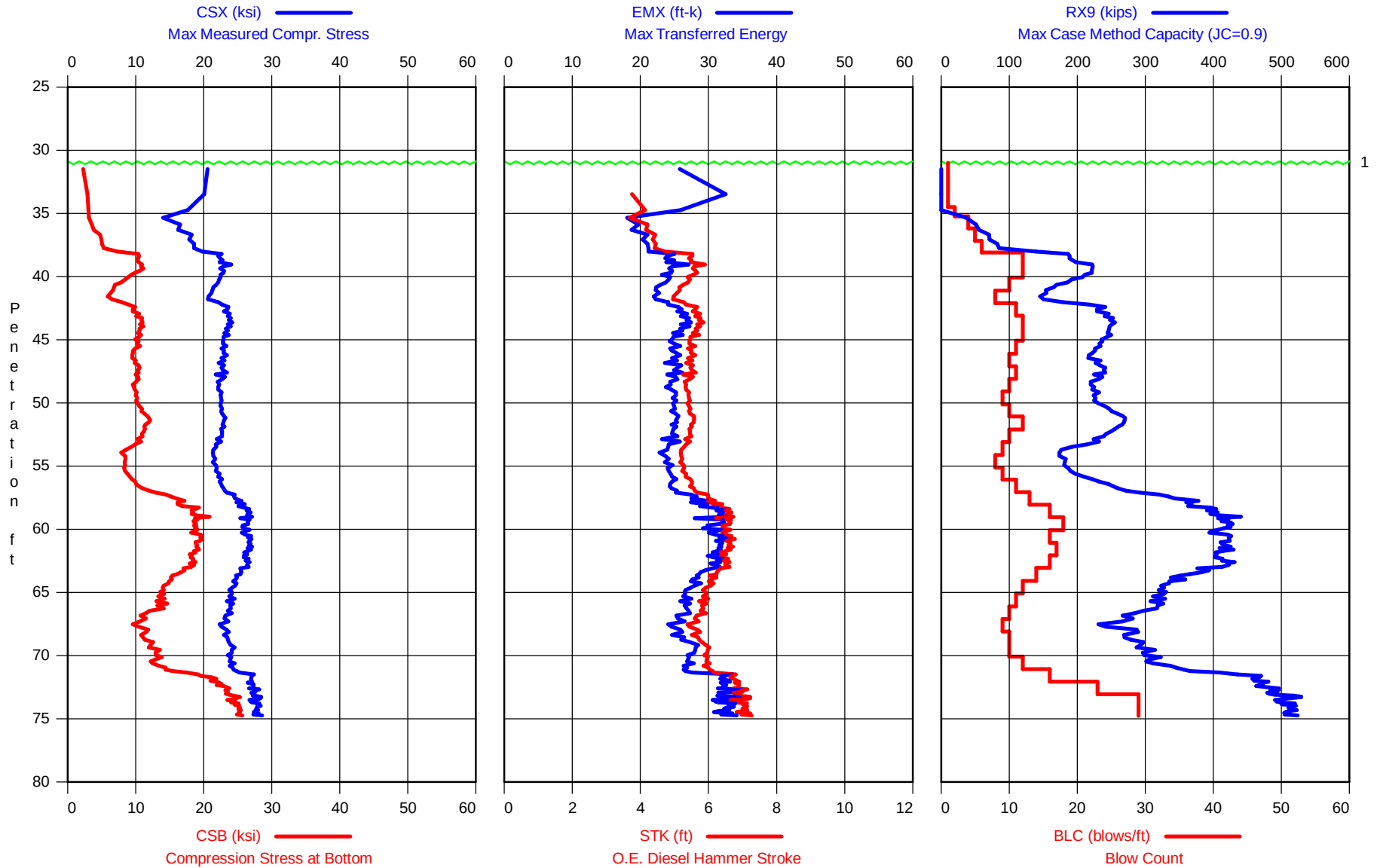
Total number of blows analyzed: 30

BL# Sensors

1-30 F3: [F607] 93.6 (1.00); F4: [D815] 93.0 (1.00); A3: [K2524] 360.0 (1.05); A4: [K3550] 360.0 (1.05)

Time Summary

Drive 38 seconds 8:03 AM - 8:04 AM BN 1 - 30

USH 10 over Little Lake Butte des Morts - Pier 14 #44
APE D30-42, HP 14 x 73

USH 10 over Little Lake Butte des Morts - Pier 14 #44
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

AR: 21.40 in² SP: 0.492 k/ft3
LE: 91.08 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 1.20

CSX: Max Measured Compr. Stress STK: O.E. Diesel Hammer Stroke
CSB: Compression Stress at Bottom BPM: Blows per Minute
EMX: Max Transferred Energy RX9: Max Case Method Capacity (JC=0.9)

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
1	31.00	1	AV1	20.0	2.2	17	**	**	0
			MAX	20.0	2.2	17	**	**	0
			MIN	20.0	2.2	17	**	**	0
2	32.00	1	AV1	21.2	2.3	35	**	**	0
			MAX	21.2	2.3	35	**	**	0
			MIN	21.2	2.3	35	**	**	0
3	33.00	1	AV1	17.4	2.5	23	3.7	59.8	0
			MAX	17.4	2.5	23	3.7	59.8	0
			MIN	17.4	2.5	23	3.7	59.8	0
4	34.00	1	AV1	22.8	3.3	42	**	**	0
			MAX	22.8	3.3	42	**	**	0
			MIN	22.8	3.3	42	**	**	0
6	35.00	2	AV2	17.7	3.0	26	4.1	57.3	0
			STD	2.6	0.1	4	0.4	2.6	0
			MAX	20.3	3.1	30	4.5	59.9	0
			MIN	15.1	3.0	21	3.7	54.7	0
10	36.00	4	AV4	15.3	3.3	19	3.9	58.5	44
			STD	1.4	0.3	2	0.3	2.0	8
			MAX	17.6	3.9	22	4.4	60.4	57
			MIN	14.0	3.0	17	3.7	55.5	36
15	37.00	5	AV5	17.3	4.4	20	4.3	56.1	64
			STD	1.0	0.5	1	0.1	0.8	8
			MAX	18.4	5.0	22	4.5	57.3	70
			MIN	15.7	3.6	18	4.1	55.0	47
21	38.00	6	AV6	18.5	5.4	21	4.4	55.3	88
			STD	0.4	0.6	1	0.0	0.2	13
			MAX	19.1	6.6	22	4.5	55.5	117
			MIN	18.0	4.9	19	4.4	55.0	76
33	39.00	12	AV12	22.5	10.2	24	5.5	50.0	191
			STD	0.8	0.7	2	0.2	1.1	12
			MAX	24.2	11.1	28	6.0	52.6	219
			MIN	20.8	7.9	21	4.9	47.8	161
45	40.00	12	AV12	22.8	10.3	24	5.6	49.6	220
			STD	0.7	0.7	1	0.2	0.7	6
			MAX	24.1	11.3	27	5.9	50.7	229
			MIN	21.8	9.1	22	5.3	48.3	207
55	41.00	10	AV10	21.9	7.6	23	5.3	50.8	178
			STD	0.6	0.7	1	0.2	0.7	15
			MAX	23.0	8.7	25	5.7	51.8	201
			MIN	21.3	6.7	21	5.1	49.3	154
63	42.00	8	AV8	21.0	6.4	23	5.0	52.1	152
			STD	0.5	0.5	1	0.1	0.5	6
			MAX	22.2	7.3	25	5.3	52.7	156
			MIN	20.5	5.9	21	4.9	50.9	140
74	43.00	11	AV11	23.2	9.6	25	5.6	49.8	230
			STD	0.7	0.7	2	0.2	0.9	14
			MAX	24.4	10.8	28	5.9	51.1	247
			MIN	22.0	8.5	23	5.2	48.4	201
86	44.00	12	AV12	23.8	10.8	27	5.7	49.0	249
			STD	0.5	0.4	1	0.1	0.6	6
			MAX	24.2	11.3	28	5.9	50.3	259
			MIN	22.9	9.8	25	5.4	48.3	235

USH 10 over Little Lake Butte des Morts - Pier 14 #44

APE D30-42, HP 14 x 73

OP: MR

Test date: 27-Mar-2015

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
98	45.00	12	AV12	23.2	10.4	25	5.6	49.6	245
			STD	0.6	0.3	1	0.2	0.8	6
			MAX	24.5	11.1	28	6.0	50.5	256
			MIN	22.5	9.9	24	5.4	48.0	234
109	46.00	11	AV11	22.9	10.1	25	5.5	50.1	231
			STD	0.3	0.4	1	0.1	0.4	5
			MAX	23.9	10.7	27	5.8	50.5	241
			MIN	22.5	9.5	24	5.4	48.9	223
119	47.00	10	AV10	22.7	9.7	25	5.5	50.2	224
			STD	0.6	0.3	1	0.2	0.7	7
			MAX	24.0	10.3	27	5.8	50.9	236
			MIN	22.0	9.4	23	5.3	48.9	215
130	48.00	11	AV11	22.9	10.4	25	5.5	49.9	237
			STD	0.8	0.3	1	0.2	0.8	8
			MAX	23.9	10.7	27	5.8	51.1	248
			MIN	21.7	9.8	23	5.2	48.8	223
140	49.00	10	AV10	22.3	9.9	24	5.3	50.7	224
			STD	0.4	0.3	1	0.1	0.4	5
			MAX	23.3	10.5	26	5.6	51.2	236
			MIN	21.8	9.5	23	5.2	49.7	217
149	50.00	9	AV9	22.5	10.1	25	5.4	50.4	227
			STD	0.5	0.2	1	0.1	0.6	6
			MAX	23.6	10.4	27	5.7	51.4	240
			MIN	21.6	9.8	23	5.2	49.2	222
159	51.00	10	AV10	22.7	10.9	25	5.5	50.1	251
			STD	0.3	0.4	1	0.1	0.3	10
			MAX	23.5	11.7	26	5.7	50.4	271
			MIN	22.3	10.3	24	5.4	49.2	239
171	52.00	12	AV12	22.9	11.7	25	5.5	49.9	266
			STD	0.3	0.4	0	0.1	0.3	5
			MAX	23.5	12.5	26	5.7	50.4	274
			MIN	22.3	11.1	24	5.4	49.3	255
181	53.00	10	AV10	22.4	10.9	24	5.4	50.4	239
			STD	0.7	0.4	1	0.1	0.6	12
			MAX	23.5	11.4	27	5.7	51.4	256
			MIN	21.2	10.1	23	5.2	49.2	224
190	54.00	9	AV9	21.8	9.2	24	5.3	50.9	195
			STD	0.8	1.0	1	0.2	0.7	22
			MAX	23.9	11.1	28	5.7	51.5	240
			MIN	21.2	7.8	23	5.2	49.0	170
198	55.00	8	AV8	21.5	8.4	24	5.2	51.3	180
			STD	0.2	0.1	1	0.1	0.3	5
			MAX	21.9	8.6	25	5.4	51.7	186
			MIN	21.3	8.3	23	5.1	50.6	171
207	56.00	9	AV9	22.0	8.8	24	5.3	50.9	198
			STD	0.5	0.4	1	0.1	0.6	11
			MAX	23.1	9.4	26	5.6	51.9	218
			MIN	21.1	8.3	23	5.1	49.6	185
218	57.00	11	AV11	22.8	10.6	25	5.5	49.8	250
			STD	0.5	0.8	1	0.1	0.5	15
			MAX	23.5	12.3	26	5.7	50.6	274
			MIN	21.9	9.6	23	5.4	49.0	227
231	58.00	13	AV13	24.6	15.4	28	6.0	48.0	341
			STD	0.9	1.3	2	0.2	0.9	30
			MAX	26.5	17.6	32	6.5	49.3	380
			MIN	23.4	12.5	24	5.7	46.3	279

USH 10 over Little Lake Butte des Morts - Pier 14 #44
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

BL# end	depth ft	BLC bl/ft	TYPE	CSX ksi	CSB ksi	EMX ft-k	STK ft	BPM **	RX9 kips
247	59.00	16	AV16	26.3	18.4	31	6.5	46.2	396
			STD	0.6	1.2	2	0.2	0.7	20
			MAX	27.2	20.8	34	6.8	48.5	440
			MIN	24.2	16.2	26	5.9	45.3	359
265	60.00	18	AV18	26.2	18.9	31	6.5	46.1	420
			STD	0.6	0.5	2	0.2	0.6	10
			MAX	27.3	20.9	33	6.8	47.6	441
			MIN	25.0	18.4	27	6.1	45.2	404
281	61.00	16	AV16	26.4	19.2	32	6.6	45.9	415
			STD	0.7	0.7	1	0.2	0.6	15
			MAX	27.4	20.5	34	6.9	47.8	440
			MIN	24.4	17.4	28	6.0	44.9	381
298	62.00	17	AV17	26.6	18.8	32	6.6	45.9	414
			STD	0.4	0.4	1	0.1	0.4	10
			MAX	27.2	19.4	33	6.7	47.0	435
			MIN	25.7	17.9	30	6.3	45.4	397
314	63.00	16	AV16	26.3	18.3	31	6.5	46.2	415
			STD	0.6	0.4	2	0.2	0.6	10
			MAX	27.6	19.3	33	6.9	47.4	432
			MIN	25.2	17.7	27	6.1	45.0	398
328	64.00	14	AV14	25.1	16.1	29	6.2	47.1	367
			STD	0.5	0.8	1	0.2	0.6	20
			MAX	25.6	17.5	31	6.5	48.5	400
			MIN	24.0	14.9	26	5.9	46.2	329
340	65.00	12	AV12	24.3	14.3	27	6.0	48.0	329
			STD	0.8	0.5	2	0.2	0.9	9
			MAX	25.4	15.0	30	6.3	49.6	346
			MIN	22.9	13.1	24	5.6	46.8	316
351	66.00	11	AV11	24.0	13.9	27	5.9	48.4	321
			STD	0.7	0.6	1	0.2	0.7	10
			MAX	25.5	14.7	29	6.2	49.4	338
			MIN	23.1	12.9	25	5.6	47.1	306
361	67.00	10	AV10	23.6	12.1	26	5.8	48.9	293
			STD	0.6	1.2	1	0.2	0.6	17
			MAX	24.2	14.5	28	5.9	50.1	323
			MIN	22.6	10.6	24	5.5	48.2	265
370	68.00	9	AV9	23.0	10.7	25	5.6	49.7	259
			STD	0.6	1.0	1	0.2	0.7	23
			MAX	23.9	12.5	27	5.8	50.9	289
			MIN	22.2	9.5	24	5.3	48.7	228
380	69.00	10	AV10	23.5	11.5	26	5.7	49.1	281
			STD	0.5	0.9	1	0.2	0.6	17
			MAX	24.2	13.5	29	6.0	50.0	321
			MIN	22.9	10.5	24	5.5	47.9	263
390	70.00	10	AV10	24.1	12.7	28	6.0	48.1	298
			STD	0.5	0.7	1	0.1	0.6	12
			MAX	24.9	14.2	29	6.2	49.1	330
			MIN	23.0	11.7	26	5.7	47.2	282
402	71.00	12	AV12	24.1	13.2	27	6.0	48.1	321
			STD	0.7	0.8	1	0.2	0.8	21
			MAX	25.0	14.5	29	6.2	49.7	359
			MIN	22.6	12.0	24	5.6	47.3	282
418	72.00	16	AV16	26.2	18.7	30	6.5	46.2	428
			STD	1.3	2.6	3	0.4	1.2	44
			MAX	27.9	21.9	35	6.9	48.5	481
			MIN	23.4	13.6	25	5.9	44.7	342

USH 10 over Little Lake Butte des Morts - Pier 14 #44
OP: MR

APE D30-42, HP 14 x 73
Test date: 27-Mar-2015

BL#	depth	BLC	TYPE	CSX	CSB	EMX	STK	BPM	RX9
end	ft	bl/ft		ksi	ksi	ft-k	ft	**	kips
441	73.00	23	AV23	27.2	23.0	33	6.9	44.9	481
			STD	0.6	0.8	1	0.2	0.5	14
			MAX	28.3	24.1	35	7.2	45.7	501
			MIN	25.9	21.0	31	6.6	43.9	451
470	74.00	29	AV29	27.8	24.5	33	7.0	44.5	508
			STD	0.7	0.7	1	0.2	0.6	15
			MAX	28.8	26.0	35	7.4	45.6	537
			MIN	26.7	23.4	30	6.7	43.5	487
492	74.75	29	AV22	27.8	25.2	33	7.1	44.3	513
			STD	0.5	0.3	1	0.2	0.5	10
			MAX	28.9	26.1	35	7.4	45.2	545
			MIN	26.7	24.5	31	6.8	43.3	495
Average				24.2	14.3	28	6.0	48.4	315
Std. Dev.				2.5	5.8	4	0.7	2.8	120
Maximum				28.9	26.1	42	7.4	60.4	545
Minimum				14.0	2.2	17	3.7	43.3	0

Total number of blows analyzed: 492

BL#	depth (ft)	Comments
1	31.00	Depth reference at El. 740.3; Mud line at El. 717.0

Time Summary

Drive 10 minutes 50 seconds 1:23:19 PM - 1:34:09 PM (3/27/2015) BN 1 - 492



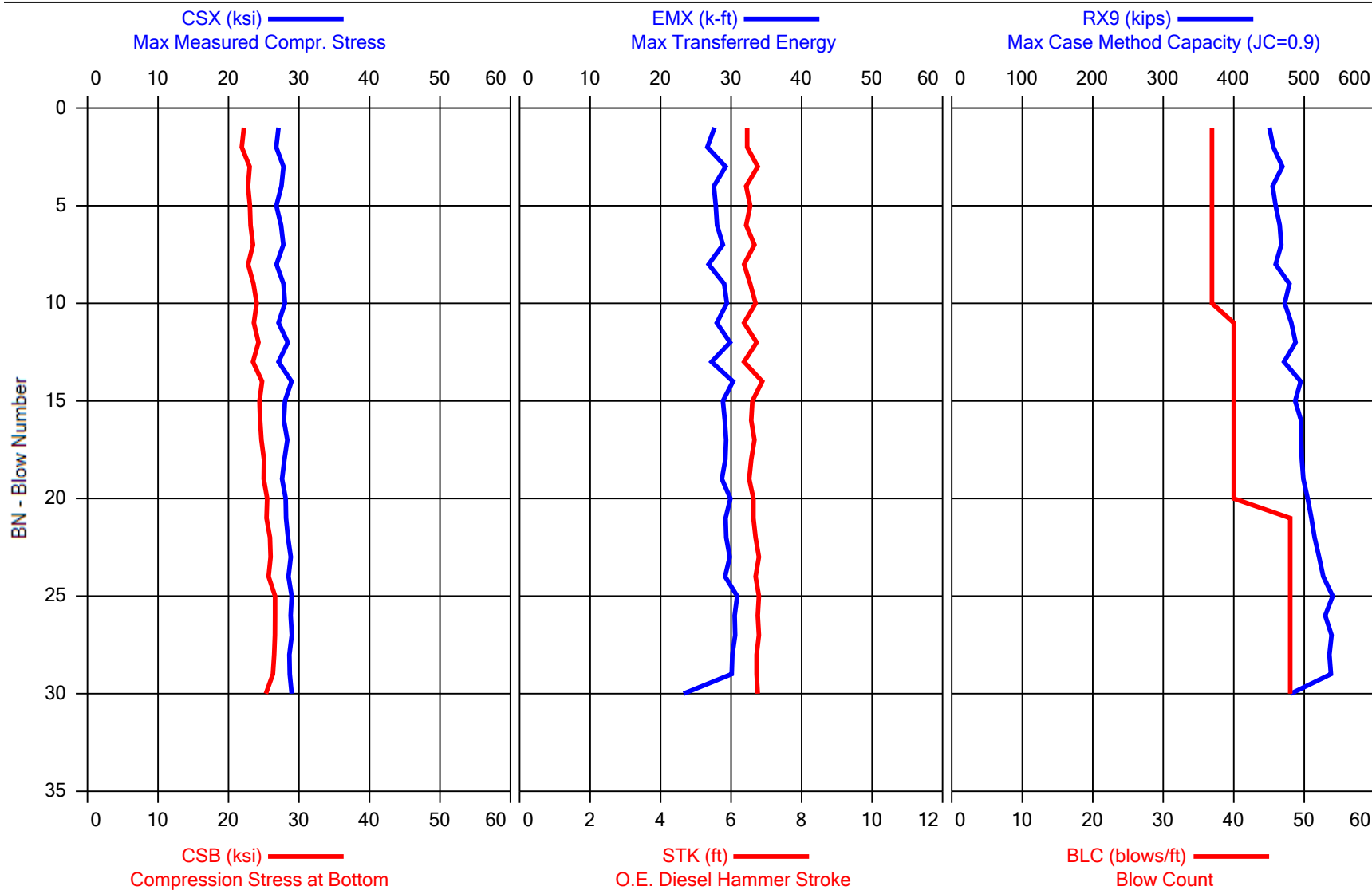
Printed: 31-March-2015

GRL Engineers, Inc. - PDILOT2 Ver 2014.2.48.1 - Case Method & iCAP® Results

Test started: 30-March-2015



USH 10 over Little Lake Butte des Morts - Pier 14 #44 Restrike
APE D30-42, HP 14 x 73



USH 10 over Little Lake Butte des Morts - Pier 14 #44 Restrike
OP: AM

APE D30-42, HP 14 x 73
Date: 30-March-2015

AR: 21.40 in² SP: 0.492 k/ft³
LE: 78.00 ft EM: 30,000 ksi
WS: 16,807.9 f/s JC: 1.00

CSX: Max Measured Compr. Stress STK: O.E. Diesel Hammer Stroke
CSB: Compression Stress at Bottom BPM: Blows per Minute
EMX: Max Transferred Energy RX9: Max Case Method Capacity (JC=0.9)

BL#	depth	BLC	TYPE	CSX	CSB	EMX	STK	BPM	RX9
	ft	blows/ft		ksi	ksi	k-ft	ft	bpm	kips
10	75.02	37	AV10	27.4	23.0	28	6.5	46.0	463
			STD	0.5	0.6	1	0.1	0.4	8
			MAX	28.0	24.0	29	6.8	46.6	479
			MIN	26.8	21.9	27	6.4	45.3	451
20	75.27	40	AV10	27.9	24.5	29	6.6	45.9	491
			STD	0.5	0.6	1	0.1	0.5	9
			MAX	28.9	25.5	30	6.9	46.6	505
			MIN	27.1	23.5	27	6.4	44.9	471
30	75.48	48	AV10	28.7	26.1	29	6.7	45.4	524
			STD	0.3	0.5	2	0.0	0.2	17
			MAX	29.0	26.6	31	6.8	45.7	540
			MIN	28.2	25.3	23	6.6	45.2	481
			Average	28.0	24.5	29	6.6	45.8	493
			Std. Dev.	0.7	1.4	2	0.1	0.5	27
			Maximum	29.0	26.6	31	6.9	46.6	540
			Minimum	26.8	21.9	23	6.4	44.9	451

Total number of blows analyzed: 30

BL# Sensors

1-30 F3: [D815] 93.0 (1.00); F4: [F607] 93.6 (1.00); A3: [K3550] 360.0 (1.00); A4: [K2524] 360.0 (1.00)

Time Summary

Drive 38 seconds 8:10 AM - 8:10 AM BN 1 - 30