
Summary of Load Test Results

**Suncore ETF Temporary Cooler
Pipe Support,**

Fort McMurray, AB Canada

Prepared for
American Piledriving Equipment

March 2014

CH2MHILL®

1100 112th Ave. NE, Suite 500
Bellevue, WA 98004

Project	Suncor ETF Temporary Cooler Pipe Support
Location	Approx. 30 km north of Fort McMurray, AB Canada
Pile Designer	CH2M HILL
Geotechnical Explorations	Amec 2007, Thurber 2014
Installation Contractor	Aecon
Date	December, 2014

Subsurface summary:

very stiff clay shale fill and till over hard clay shale (Clearwater Formation)
(Boring TH14-3 located ~20 feet north)

Pile Parameters

Shaft O.D.	inch	12.0
Wall thickness	inch	0.582
Helix diameter	inch	28
Helix thickness	inch	1.0
Steel yield strength	ksi	110
Number of helixes		1
Distance between helix	feet	NA

Installation Equipment

APE HD200 Helical Driver
Caterpillar 374D L Excavator

Installation Parameters

Pile tip depth	feet	20
Torque at final depth	kip-feet	90
Average torque, full depth	kip-feet	39
Average torque, bottom 5 ft	kip-feet	50

Measured Pile Resistance

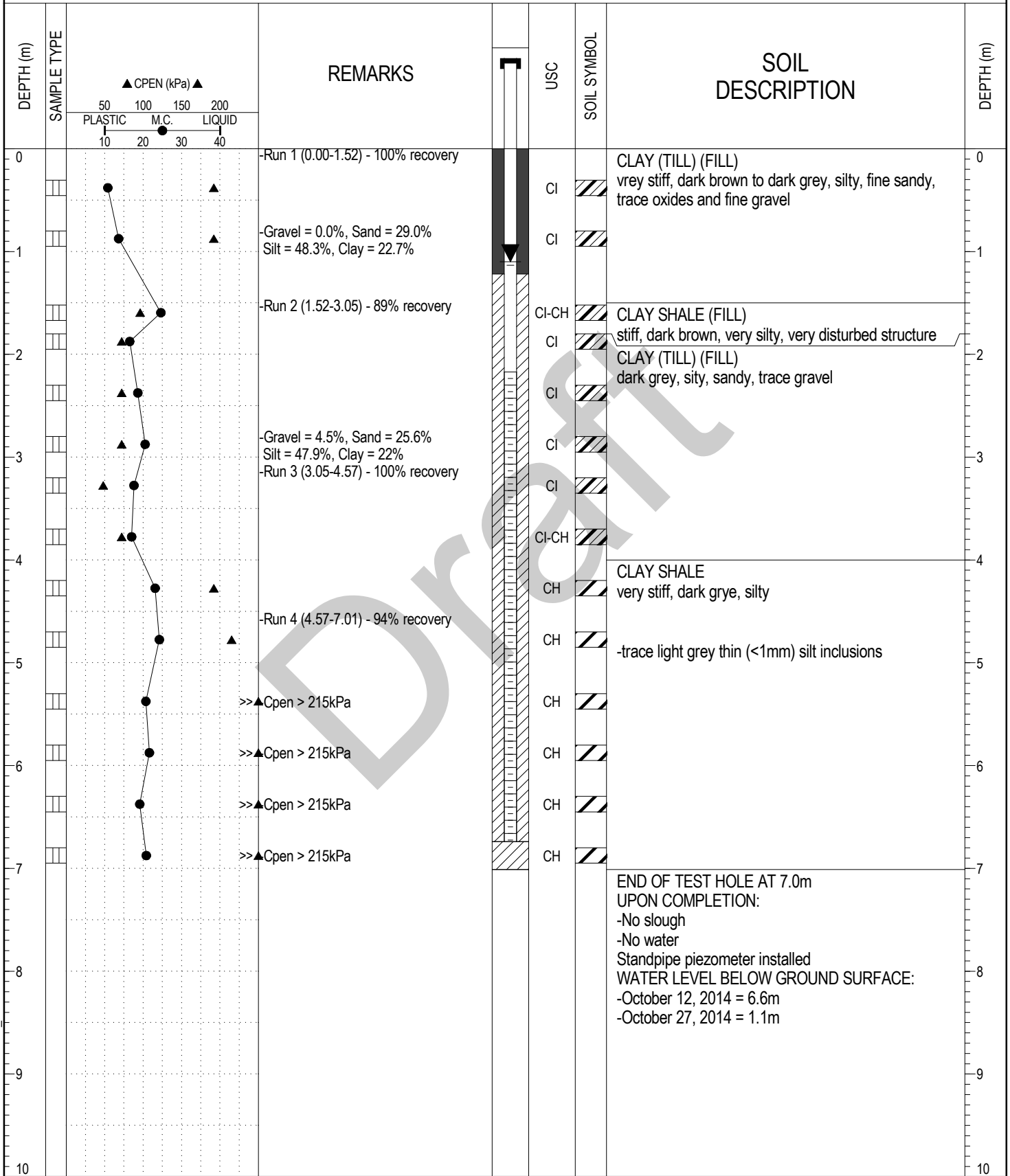
Ultimate Resistance from static load test in uplift	kips	140
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Estimates of Resistance

Soil mechanics based (Tappenden and Sego, 2007, cohesive)	kips	130
Empirical based on average torque (Sakr, 2013)	kips	80
Empirical based on average torque in bottom 5' (Sakr, 2013)	kips	100
Empirical based on end of driving torque (Perko, 2009)	kips	200

CLIENT: RALLY ENGINEERING LTD	PROJECT: SUNCOR EAST TANK FARM TEMPORARY CHILLER	BOREHOLE NO: TH14-3
DRILLING COMPANY: Mobile Augers & Research Ltd.	DATE DRILLED: October 11, 2014	PROJECT NO: 19-6797-0
DRILL/METHOD: Sonic (FS250 Resinence) / MD / XC	LOCATION: See Drawing 19-6797-0-1	ELEVATION: N/A

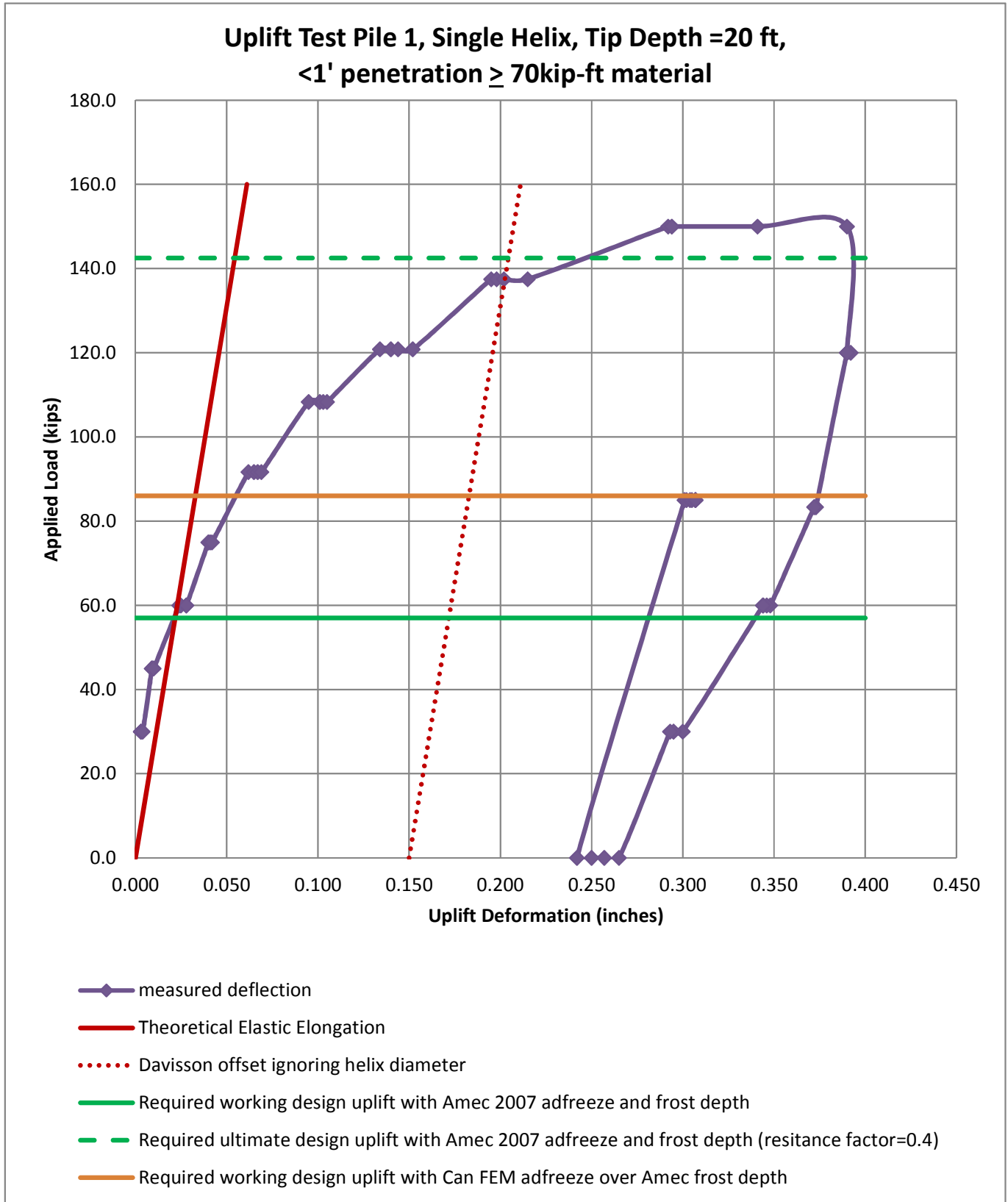
SAMPLE TYPE	<input type="checkbox"/> GRAB SAMPLE
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> DRILL CUTTINGS

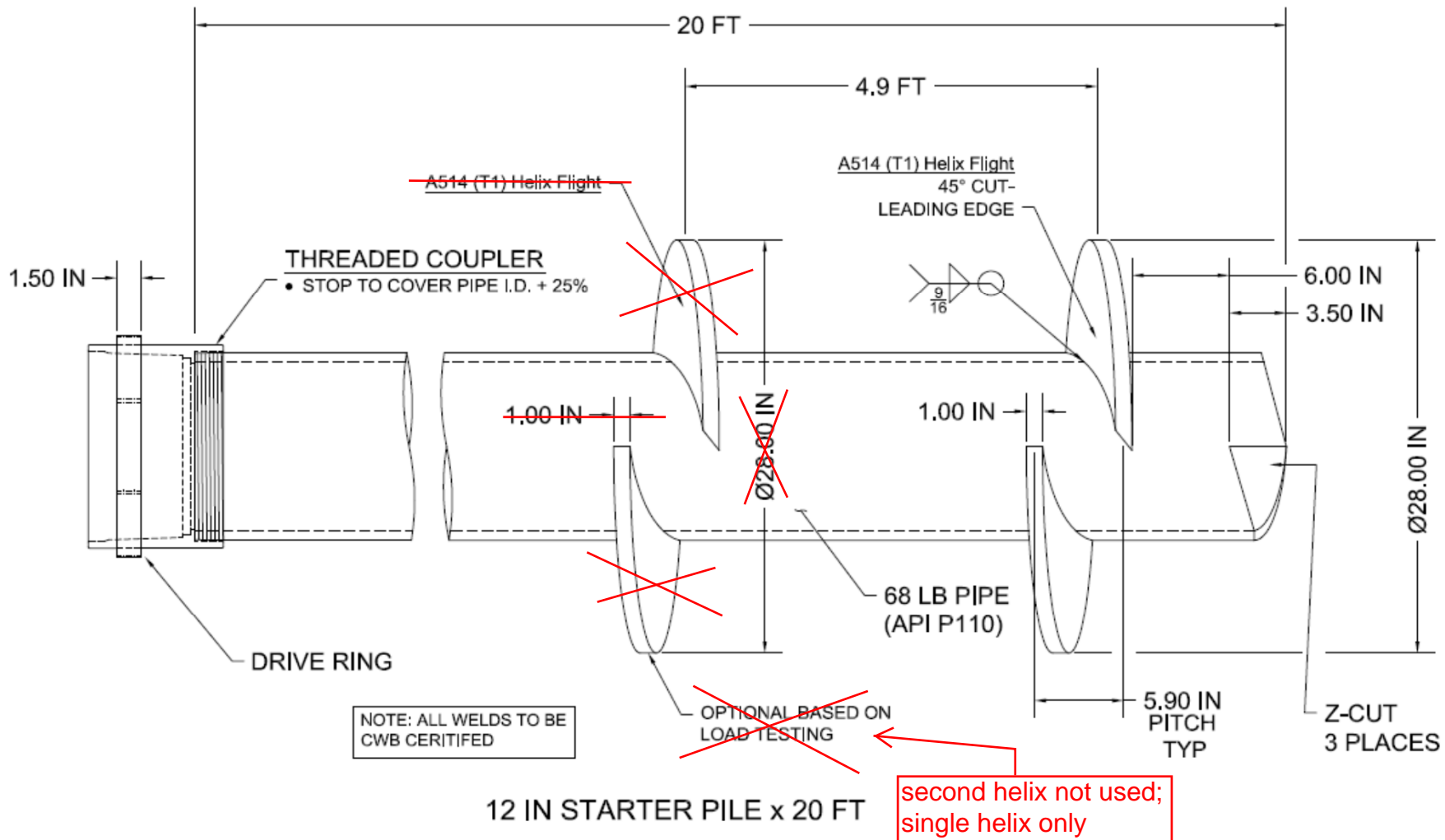


BOREHOLE LOG 19-6797-0.GPJ THRB, AB.GDT, 11/6/14- LIBRARY-NEW LOGO.GLB



FIELD LOGGED BY: TDC	COMPLETION DEPTH: 7.0 m
PREPARED BY: TME	COMPLETION DATE: 10/11/14
REVIEWED BY: DJL	





REV	COMMENTS	DATE	BY	REV	COMMENTS	DATE	BY
				D	ADDED MATERIAL CALLOUTS AND WELDING NOTES	11/24/14	JMK
				C	ADDED "OPTIONAL" NOTE	11/23/14	JMK
				B	CHANGED FLIGHT TO 1.00	10/21/14	JMK
				A	ADDED FLIGHT	7/16/14	JMK

AMERICAN PILEDIVING EQUIPMENT, INC.
 7032 SOUTH 196TH STREET
 KENT, WASHINGTON 98032

SCALE	DATE	BY
SCALE: DO NOT SCALE		
DRAWN	MSC	DATE 7/15/14
CHECKED		DATE 10/20/14
APPROVED		DATE 10/20/14

12" STEEL STARTER PILE
 VOYAGEUR EAST TANK FARM

SHEET	OF	DRAWING NO.
1	1	1001353
REV:	-	
PLUT INFO:		
BORDER SCALE:	1:8	

References

Perko, H.A., 2009. Helical Piles: A Practical Guide to Design and Installation. John Wiley & Sons. New York, N.Y.

Sakr, M., 2013. Relationship between Installation Torque and Axial Capacities of Helical Piles in Cohesive Soils. Deep Foundations Institute Journal Vol. 7, No. 1 August. pp 44-58.

Tappenden, K.M. and D.C. Segoo, 2007. Predicting the Axial Capacity of Screw Piles Installed in Canadian Soils. In Proceedings: OttawaGeo2007