To: Colin McCullough
3M Company

KINECTRICS NORTH AMERICA INC. TEST REPORT FOR 3M COMPANY TENSILE TESTS ON 795 KCMIL ACCR COMPRESSION DEAD-ENDS WITH SIMULATED SLACK FROM POOR INSTALLATION PROCEDURE

Kinectrics North America Report: 9513-004-RC-0003-R00
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Three (3) tensile load tests were performed for 3M Company on their 795 kcmil ACCR conductor. The test was performed by Kinectrics North America Inc. personnel at 800 Kipling Avenue, Toronto, Ontario, M8Z 6C4, Canada.

OBJECTIVE

The objective of the tests was to determine if the tensile strength of the conductor/dead-end clamp system was adversely affected if outer strand looseness or "slack" was introduced in the conductor due to the clamp being improperly installed.

Test Conductors

3M supplied three(3) conductor samples with pre-installed compression fittings. The conductors were designated with markings "5 ft", "10 ft", and "15 ft" at the compression end of each sample. The other ends of each sample were terminated with spelter type fittings. The sample lengths were 40 feet. The bowing was simulated by tightly clamping a hose clamp on the conductor 5ft, 10ft or 15ft from the deadend before compression. The compressing action forced the outer conductor strands to be "pushed" away from the deadend. The hose clamp prevented migration of the strands further into the span, thereby causing looseness or "slack". The bowing was greatest for the 5 ft sample and least for the 15 ft sample.

Test Apparatus

Each conductor sample was installed in a hydraulically activated horizontal test machine. The tests were carried out in a temperature-controlled laboratory at 20ºC ± 2ºC.

Instrumentation and Data Acquisition

The conductor tension as measured by the load cell were monitored continuously using a digital data logging system.

The measuring instruments and equipment used in this test are listed in Appendix C.

TEST PROCEDURE

Each conductor test sample was loaded at a rate of 5000 lbf/minute until failure occurred.

TEST RESULTS

Table 1 shows the breaking load results.

Table 1: Breaking Load Results

Conductor Designation	Breaking Load (lbf)	Percent of RTS
“5 ft” sample	31,640	101.6 %
“10 ft” sample	30,368	97.5 %
“15 ft” sample	31,002	99.6 %

The "5 ft" sample had a clean break about 4 ft from the compression fitting. The "10 ft" sample had a clean break about 3 ft from the compression fitting. The "15 ft” sample had a clean break about 4 ft from the compression fitting. All conductors broke at the end that had the designated markings. Figures 1a, 2a, and 3a show the area of the conductor at the end with the designated marking. Figures 1b, 2b, and 3b show the conductor after breaking.

Figure 1a – “5 ft” sample before breaking

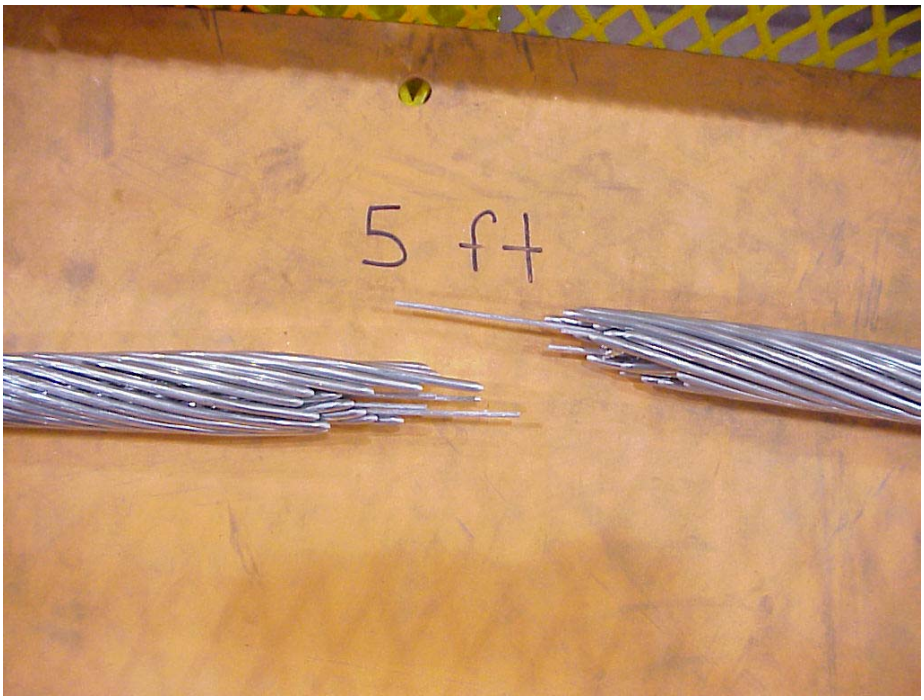

Figure 1b – “5 ft” sample after breaking

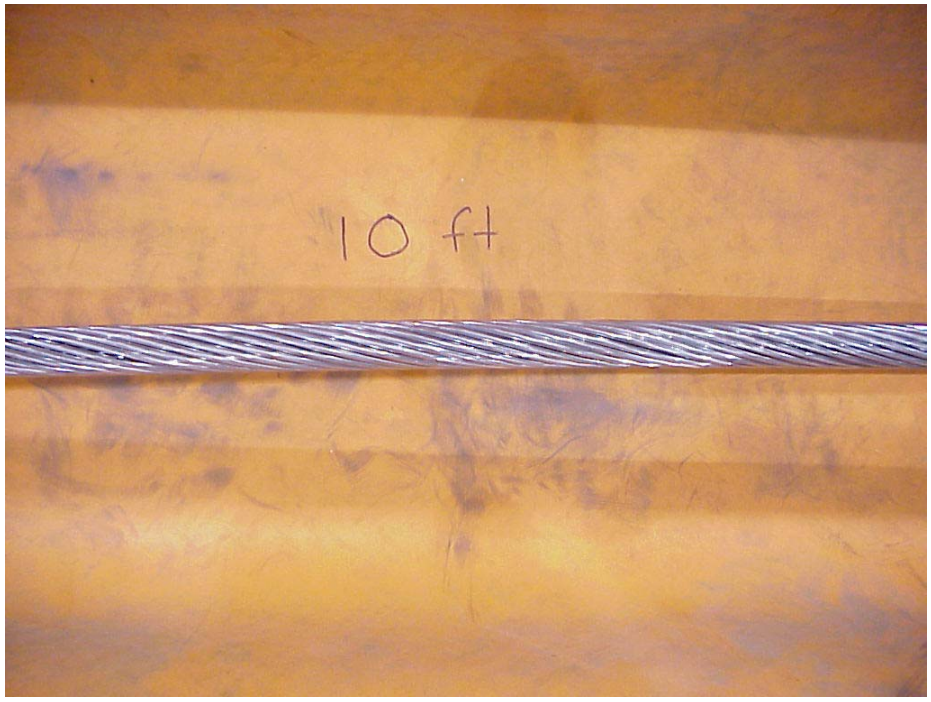

Figure 2a – “10 ft” sample before breaking

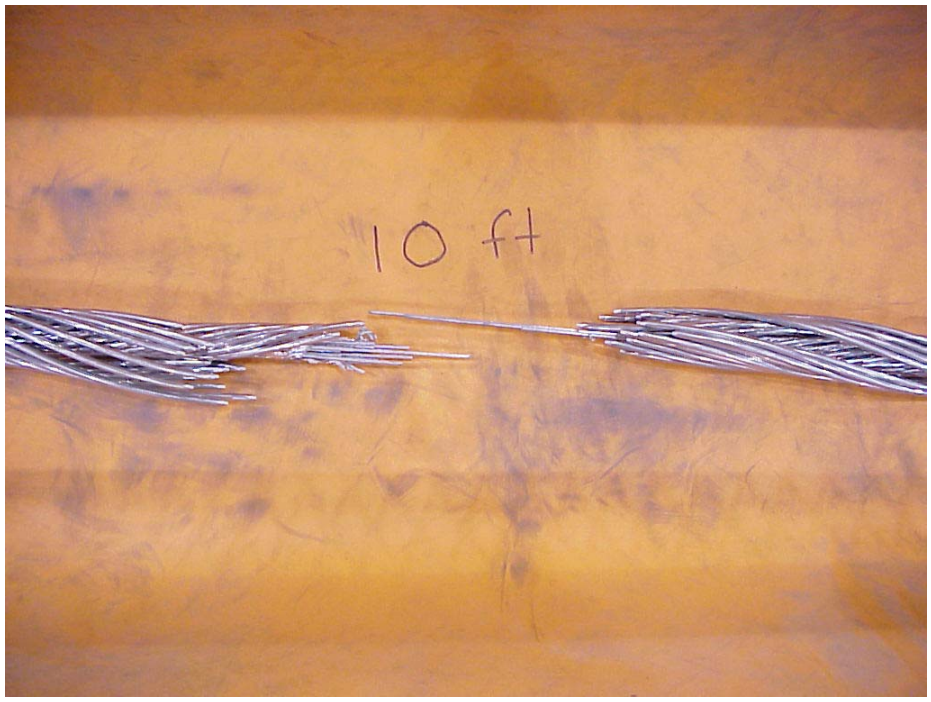

Figure 2b – “10 ft” sample after breaking

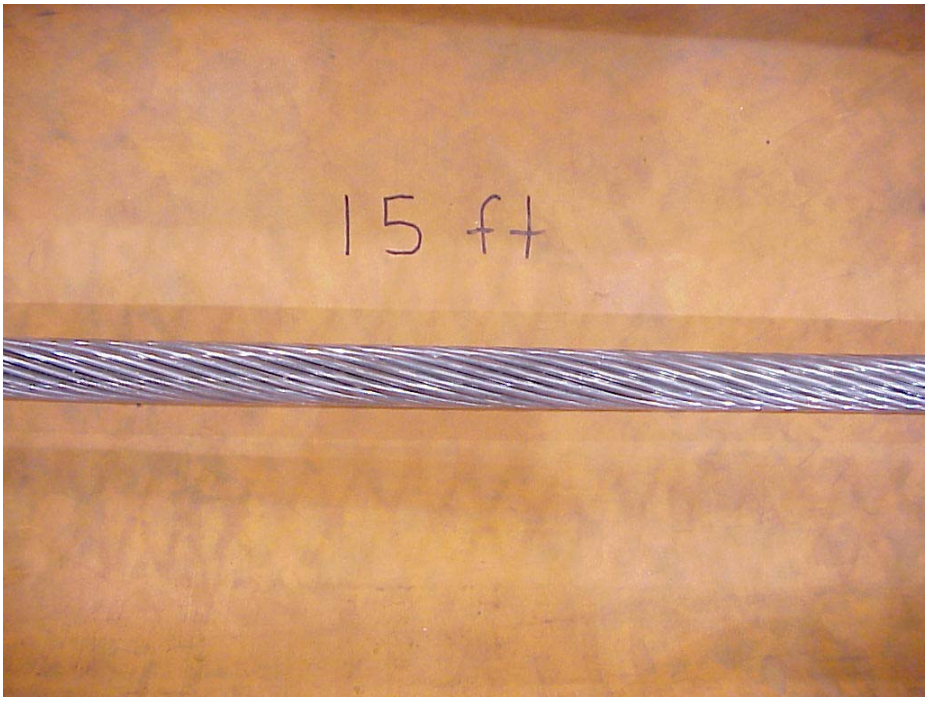

Figure 3a – “15 ft” sample before breaking

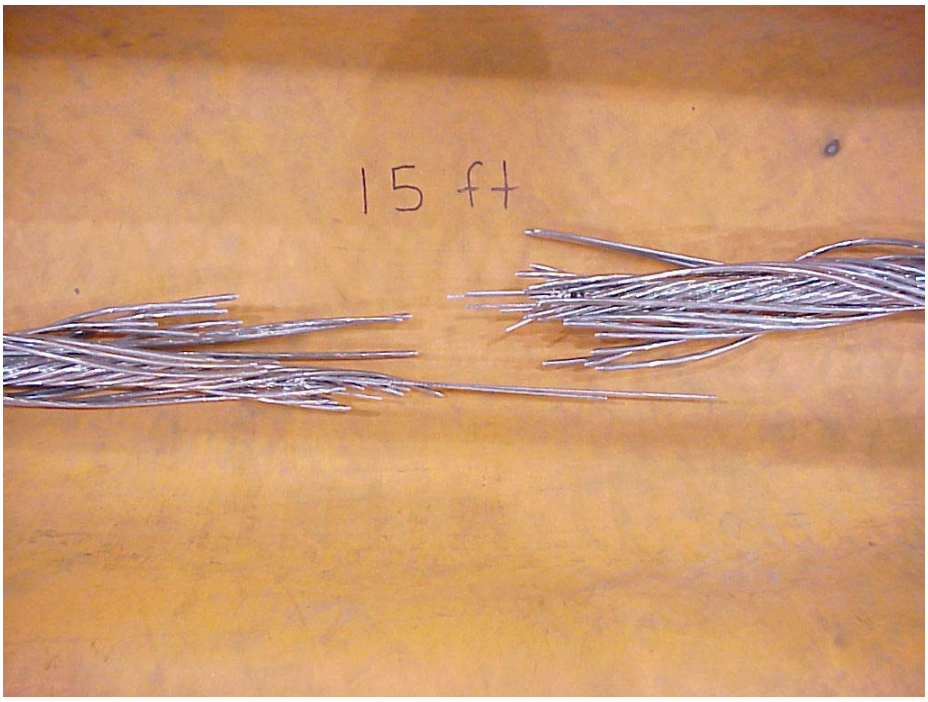

Figure 3b – “15 ft” sample after breaking

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DISCLAIMER

Kinectrics North America Inc. has prepared this report in accordance with, and subject to, the terms and conditions of the contract between Kinectrics North America Inc. and 3M Company, dated August 15, 2002.

ISO-9001
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APPENDIX C
INSTRUMENT SHEET
3M Company (Reference: 795 kcmil ACCR Conductor)

Test Description: Breaking Load Tests
Project Number: 9513-004-2003
Test Start Date: January 23, 2003
Test Finish Date: January 23, 2003

TEST DESCRIPTION	EQUIPMENT DESCRIPTION	MAKE	MODEL	ASSET # or SERIAL #	ACCURACY CLAIMED	CALIBRATION DATE	CALIBRATION DUE DATE	TEST USE
Breaking Load And Elevated Temperature Test	A/D Board	National Instruments	PCI-6034E	CA1C1A	±0.1% of reading	September 14, 2002	September 14, 2003	Data Acquisition
	Load Cell (MTS)	Lebow	3156	17356-0				
	Load Cell Conditioner	MTS	493.01DC	10000686-0	±1% of reading	February 13, 2002	February 13, 2003	Breaking Load
	Data Logger	Campbell Scientific	21X	11119-0	±0.1% of F.S.	January 28, 2003	January 28, 2004	Data Acquisition

DISTRIBUTION

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