AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
• ENVIRONMENTAL
• GEOTECHNICAL
• MATERIALS
• FORENSICS

REPORT OF BOND STRENGTH TESTING OF REINFORCING STEEL BARS

PROJECT:

VpCI CorrVerter®

REPORTED TO:

CORTEC
4119 WHITE BEAR PARKWAY
ST. PAUL MN 55110

ATTN: ANDREA HANSEN

AET PROJECT NO: 05-03736

DATE: JUNE 26, 2008

INTRODUCTION

This report presents the results of reinforcing steel bond strength testing for Cortec, Inc. Our work was limited to performing reinforcing steel bar strength bond testing in accordance with ASTM:A944 and submitting the results of the tests within a factual report. Our work was requested and authorized by Andrea Hansen of the Cortec Corporation.

SAMPLE DESCRIPTION

Corroded rebars were prepared at Cortec Laboratory for testing at American Engineering Testing. First they were wiped with a damp cloth and allowed to dry for a few minutes. Then approximately 3 mil (wet) of VpCI CorrVerter® was applied by brush to all surfaces. Two sets of #6 reinforcing steel bars were then submitted for testing. One set of uncoated bars which had been cleaned and the second set identified as VpCI CorrVerter® which had a black colored coating. The reinforcing steel was submitted to the laboratory on May 13, 2008. The sets of reinforcing bar were labeled JG 6 5 40 China. Rib size and spacing was similar on both bar sets.

PROCEDURES

Bond strength testing was performed in accordance with ASTM:A944-05, "Standard Test Method for Comparing Bond Strength of Steel Reinforcing Bars to Concrete Using Beam End Specimens." The test specimens were constructed per ASTM:A944, "Standard Specifications for Epoxy Coated Prefabricated Steel Reinforcing Bars" Section 5, "Test Specimen." The test specimens were stored in the laboratory during the curing where the temperature typically ranges from 60 to 80°F.

TEST RESULTS

The following is a summary of our test results:

1. The concrete test cylinders stored in proximity of the test specimen had compressive strengths of 5380 and 5430 psi at the time of testing.

2. The failure mode of all six specimens, three with and three without coated bar was cracking of the concrete test specimens. Failure of all specimens was at a load of 24,000 lbs. Following is a summary of our elongation readings at the loaded specimen end.

   A. Uncoated reinforcing steel

Applied Load, lbs.	**Free End Displacement**			
	Control A	Control B	Control C	Control Average
0	.009	.014	.002	.008
2,000	.013	.024	.014	.017
4,000	.021	.029	.023	.024
6,000	.029	.037	.039	.035
8,000	.036	.049	.045	.043
10,000	.049	.062	.057	.056
12,000	.062	.085	.073	0.73
14,000	.079	.103	.091	0.91
16,000	.092	.131	.106	.110
18,000	.104	.146	.114	.121
20,000	.123	.162	.129	.138
22,000	.148	.185	.144	.159
24,000	Concrete Failed	Concrete Failed	Concrete Failed	Concrete Failed

B. VpCI CorrVerter®

Applied Load, lbs.	Free End Displacement			
	Test A	Test B	Test C	Test Average
0	.013	.003	.008	.009
2,000	.013	.015	.019	.016
4,000	.021	.023	.031	.025
6,000	.032	.037	.044	.038
8,000	.041	.051	.053	.048
10,000	.049	.059	.062	.057
12,000	.055	.066	.077	.066
14,000	.061	.078	.084	.074
16,000	.076	.089	.089	.085
18,000	.079	.103	.095	.092
20,000	.086	.114	.104	.101
22,000	.105	.129	.117	.117
24,000	Concrete Failed	Concrete Failed	Concrete Failed	Concrete Failed

DISCUSSION OF RESULTS

The displacement results indicate that the VpCI CorrVerter® coating bond strength of the reinforcing steel bars to the concrete was equal or better than the control. At an applied load of 22,000 lbs. the bars coated with VpCI CorrVerter® slipped .117 inches on average, while the average slippage of the control bars was .159 inches.

REMARKS

The samples were destroyed during testing and discarded. If you have any questions regarding this report or need additional information, feel free to contact us.

Report Prepared By:
American Engineering Testing, Inc.

Joseph T. Johnson
Engineering Technician II
Phone: 651-659-1354
Fax: 651-647-2744
jjohnson@amengtest.com

Report Reviewed By:
American Engineering Testing, Inc.

Daniel M. Vruno, P.E.
Sr. Concrete Engineer
MN Lic. No. 42037
Phone: 651-659-1334
Fax: 651-647-2744
dvruno@amengtest.com

PHOTOGRAPHS
AET PROJECT NO. 05-03736

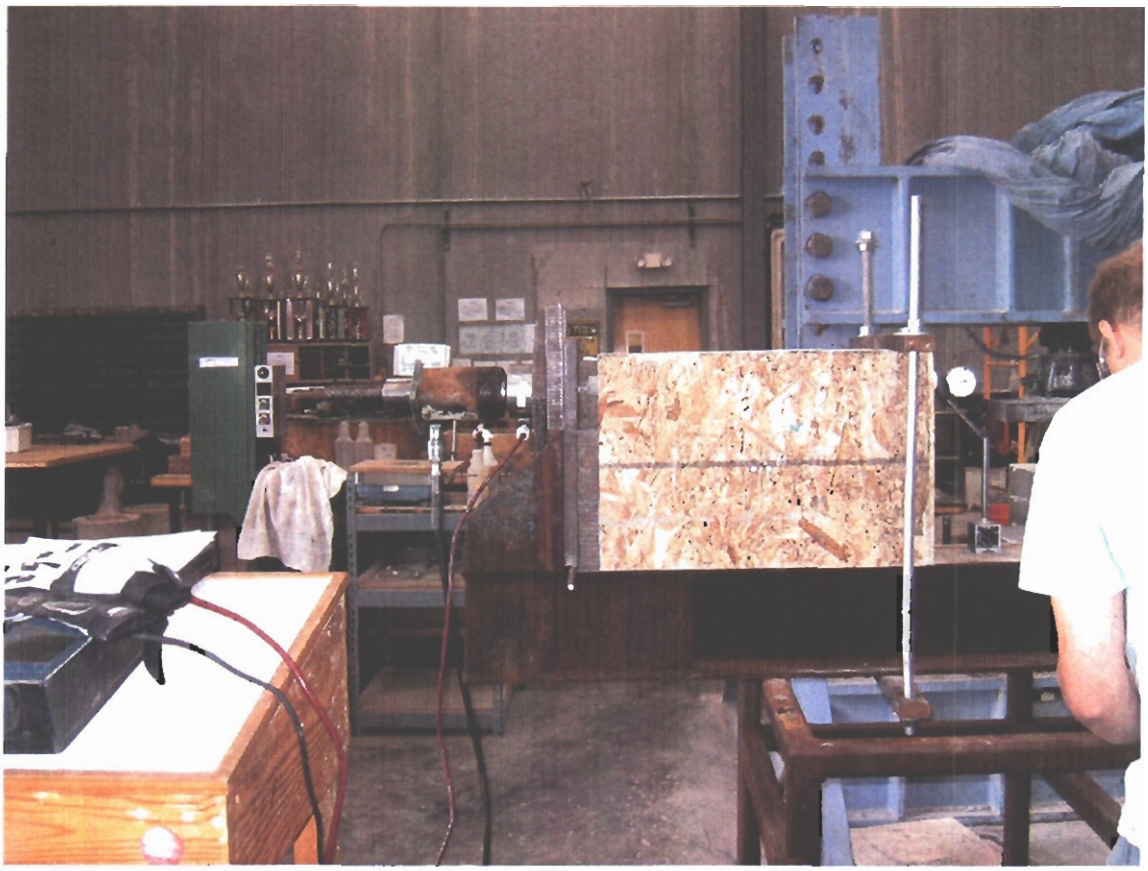
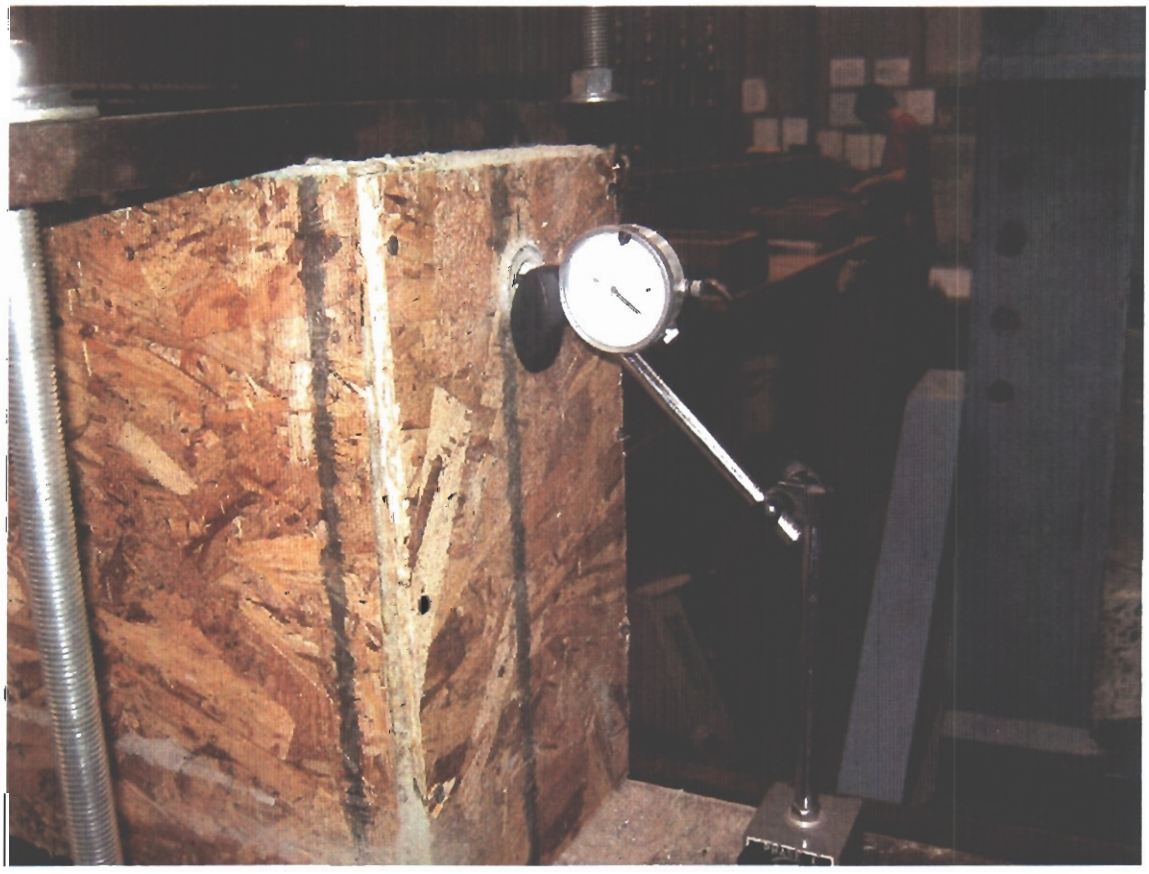


Photo 1: Test apparatus and specimen during testing

Photo 2: Dial indicator for elongation measurements



PHOTOGRAPHS
AET PROJECT NO. 05-03736

Photo 3: Typical failure of specimens

Photo 4: Test sample B after failure

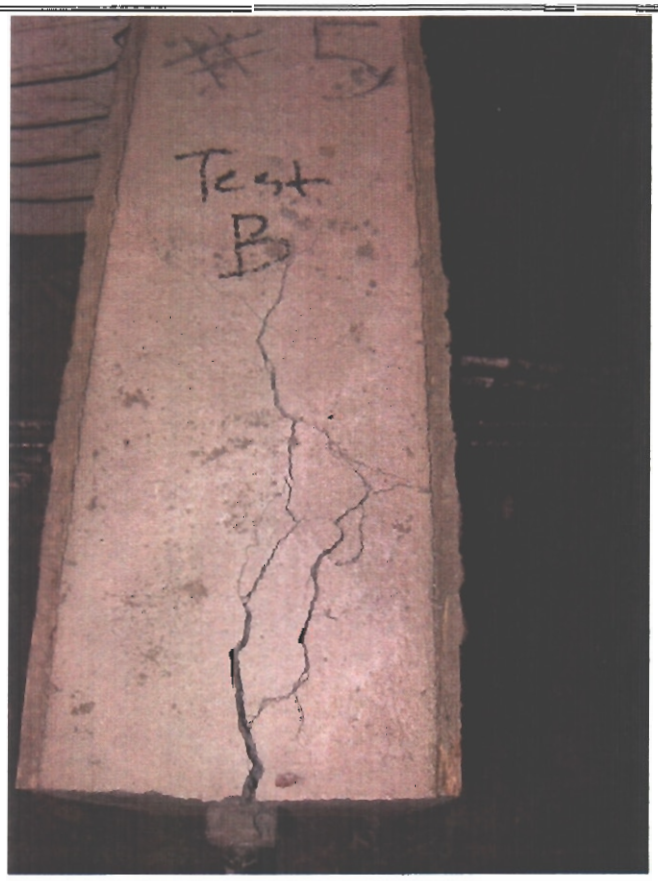


Photo 5: Control sample C after failure