



LOAD TESTING
OF
ACRO BUILDING SYSTEMS
GUARDRAIL POSTS

ATS JOB # D198123

PURCHASE ORDER # NONE SPECIFIED

Prepared for

CHARLES HENIKA
ACRO METAL STAMPING
2200 W. CORNELL ST.
MILWAUKEE, WI 53209

Prepared by

Eric Shiner, Materials Testing

Approved by

Shawn Murray, Group Manager

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Purchase Order # None Specified

Charles Henika
ACRO Metal Stamping
2200 W. Cornell St.
Milwaukee, WI 53209

Subject

Load testing of the ACRO Building Systems Guardrail Posts

Material

Carbon Steel

Background and Objective

The purpose of this testing was to load test the guard rail posts to verify the height of the guardrail post does not drop below 39" from the floor surface when a horizontal load of 200 lbs. is applied to the guardrail post, per the customer's instruction.

Test Procedure and Results

The guardrail posts were installed on a 2" x 6" wood block, a 2" x 4" stud and header assembly, and a cinderblock. The guardrail posts were fastened with #12 x 2" wood screws to the wood substrates and with 1/4" x 2 1/4" Tapcon anchors to the cinderblock substrate.

For Configuration 1, the 2" x 6" wood block substrate was fixed horizontally and the mounting face of the guardrail post was fastened to the 6" face of the substrate with wood screws in each of the six holes in the mounting plate, Figure 1.

For Configuration 2, two 2" x 4" wood studs were assembled to create a header/stud assembly. The mounting face of guardrail was installed at the joint of the header and stud with two wood screws in the header in the horizontal direction and two wood screws in the stud in vertical direction, Figure 2.

For Configuration 3, the cinderblock substrate was fixed and the mounting face of the guardrail post was fastened to the substrate with Tapcon in each of the six holes of the mounting plate, Figure 3.

A horizontal test load was applied to guardrail posts. The test load was 200 lbs. The load was held for one minute. During the test, the top rail height was measured to verify that it did not deflect to a height less than the allowable 39 inches. After one minute, each bracket was checked for fastener retraction.



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Table 1: Test Results

	Configuration 1	Configuration 2	Configuration 3
Test Substrate	2"x6" stud	2"x4" stud/header	Cinderblock
Anchor Type	#12 x 2" wood screw	#12 x 2" wood screw	1/4" x 2 1/4" Tapcon
Results	Acceptable	Rejected	Acceptable

Discussion and Conclusions

Configuration 1 and 3 tests were acceptable and did not permit the guard rail post to drop below the prescribed limit of 39".

The test performed on the Configuration 2 was rejectable. The fasteners were pulled from the substrate which permitted the guard rail post to deflect below 39" with a load of 128 lbs. applied.



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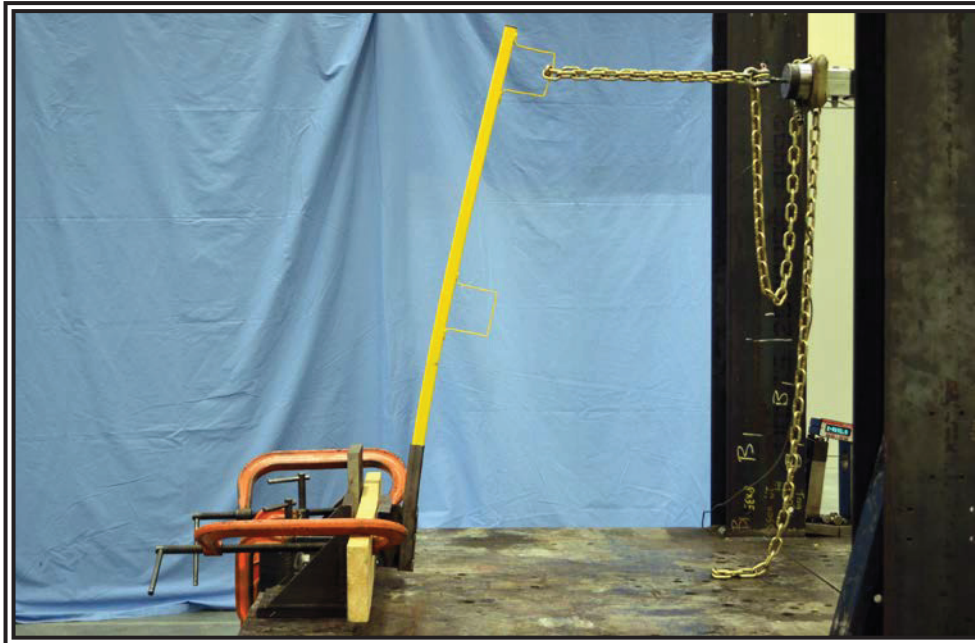


Figure 1: Configuration 1 with 200 lbs. applied.

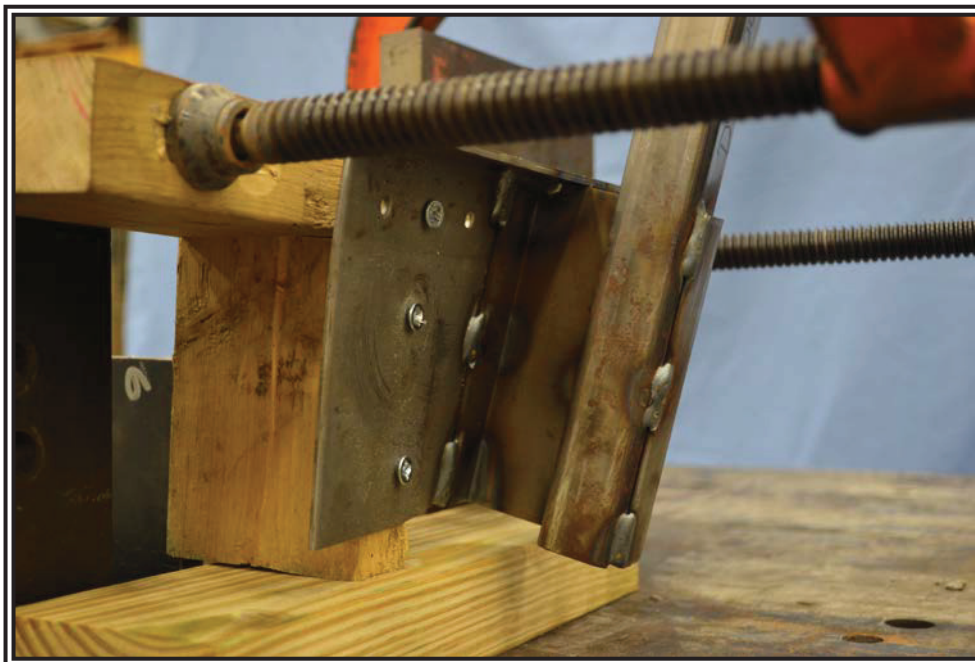


Figure 2: Configuration 2 with 200 lbs. applied.



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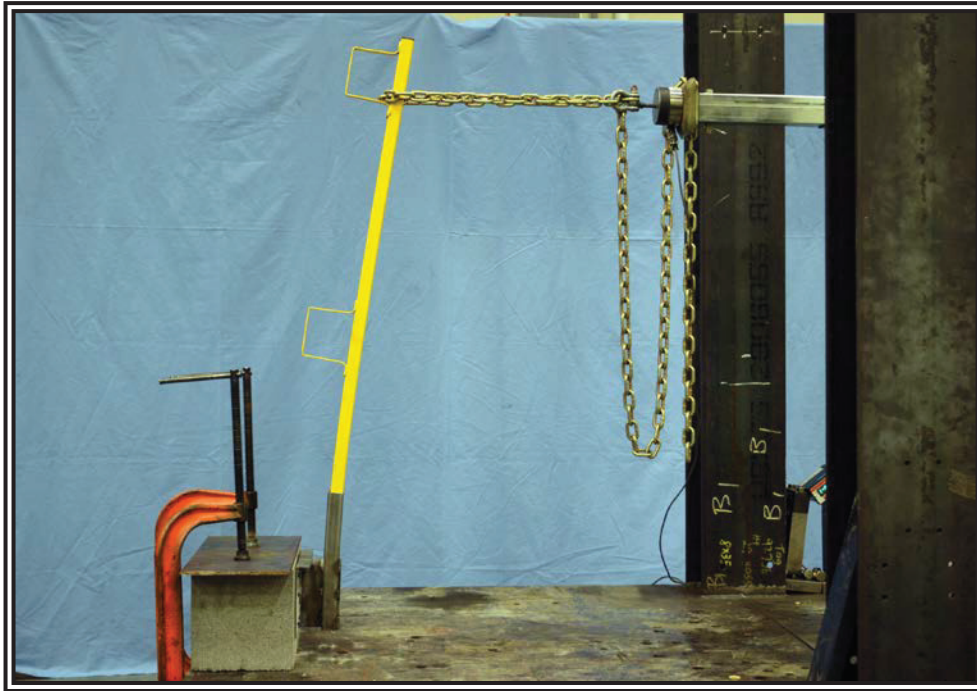


Figure 3: Configuration 3 with 200 lbs. applied.