Architectural Testing

TEST REPORT

Report No.: C2155.02-109-44

Rendered to:

ROCKSTEADY, LLC
Lititz, Pennsylvania

PRODUCT TYPE: Drywall Clip

Reference must be made to Report No. C2155.02-109-44, dated 04/05/13 for complete test specimen description and detailed test results.

1.0 Report Issued To: RockSteady, LLC
112 North Cedar Street
Lititz, Pennsylvania 17543

2.0 Test Laboratory: Architectural Testing, Inc.
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Project Summary:

3.1 Product Type: Drywall Clip

3.2 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). Test specimen description and results are reported herein.

3.3 Test Dates: 03/13/2013 - 03/20/2013

3.4 Test Record Retention End Date: All test records for this report will be retained until April 5, 2017.

3.5 Test Location: Architectural Testing, Inc. test facility in York, Pennsylvania.

3.6 Test Sample Source: The test specimens were provided by the client. Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of four years from the report completion date.

3.7 List of Official Observers:

Name	Company
Jeremy R. Bender	Architectural Testing, Inc.
Eric M. Brennan	Architectural Testing, Inc.
Michael D. Stremmel, P.E.	Architectural Testing, Inc.
Aaron M. Shultz	Architectural Testing, Inc.

4.0 Test Procedure:

Testing was conducted to evaluate the performance of RockSteady, LLC's drywall clip system. Testing was performed using sheets of drywall held back to a wood stud wall with a drywall clip to determine the force required to pull the stack of drywall over. Testing was performed using three different sizes of drywall. Testing was performed with the clip into the face of the wood stud using an aluminum angle and with the clip installed into the side of the wood stud.

The stack of drywall was leaned up against a wood test wall with either a 4" or 6" kick-out at the base of the stack of drywall. The drywall clip was securely fastened to the test wall and the lead piece of drywall. A force gauge was used to pull the stack of drywall, from the last sheet of drywall against the test wall. The maximum force to break the clip was recorded. Each test was repeated four times and the average of the four tests was calculated.

Pull testing of the RockSteady clip into wood studs and 20 gauge steel studs were performed on a SATEC Universal testing machine to determine the relative performance difference between the two studs. The steel stud allowable loads presented in this report are based off of the comparison of the pull testing as a fraction of the total result obtained through pull testing the clips using stacks of drywall with the clips installed to wood studs.

5.0 Test Specimen Description:

5.1 Drywall Stack:

Drywall Stack #1: 34 sheets of 8' x 4' x 1/2" thick drywall
Drywall Stack #2: 34 sheets of 12' x 4' x 1/2" thick drywall
Drywall Stack #3: 34 sheets of 14' x 4' x 1/2" thick drywall
Drywall Stack #4: 26 sheets of 10' x 4' x 5/8" thick drywall

5.2 Test Wall Construction: The test wall was constructed of 2x4 wood studs, spaced 16" on center secured with #6 x 3" drywall screws to the top and bottom plates. The test wall was anchored to prevent movement of the test wall under load.

5.3 Clip Construction: The clip was constructed of galvanized steel. The clip utilized a 1/8" diameter braided cable with a #8 x 1" long pancake head screw with washer, (Reference Photo Nos. 2 and 3).

5.4 Side of Stud Clip Installation: The clip was slid over the outer-most sheet of drywall. The wire extending from the top of clip was extended back toward the wood test wall. The screw at the end of the wire was installed into the side of the wood stud, a minimum 1” from the exterior edge.

5.0 Test Specimen Description: (Continued)

5.5 Face of Stud Clip Installation: The clip was slid over the outer-most sheet of drywall. The wire extending from the top of clip was extended back toward the wood test wall. The screw at the end of the wire was installed into face of stud.

***General Note**: One clip was utilized at the center of the drywall stack for drywall up to 12' long. Two clips were utilized, spaced nominally 6' on center, for 14' long drywall.*

6.0 Test Results: The following test results were recorded.

8' x 4' x 1/2" Thick Drywall
34 sheets on Wood Studs (One Clip)

	4" Kick-out Side of Stud	4" Kick-out Face of Stud	6" Kick-out Side of Stud	6" Kick-out Face of Stud
Test 1	450 lb	400 lb	550 lb	500 lb
Test 2	500 lb	425 lb	525 lb	475 lb
Test 3	500 lb	425 lb	550 lb	450 lb
Test 4	500 lb	450 lb	550 lb	475 lb
Average	487.5 lb	425 lb	543.75 lb	475 lb

12' x 4' x 1/2" Thick Drywall
34 sheets on Wood Studs (One Clip)

	4" Kick-out Side of Stud	4" Kick-out Face of Stud	6" Kick-out Side of Stud	6" Kick-out Face of Stud
Test 1	400 lb	400 lb	600 lb	500 lb
Test 2	450 lb	400 lb	550 lb	550 lb
Test 3	500 lb	400 lb	550 lb	550 lb
Test 4	400 lb	400 lb	550 lb	450 lb
Average	437.5 lb	400 lb	562.5 lb	512.5 lb

12' x 4' x 1/2" Thick Drywall
34 sheets on 20 Gauge Steel Studs (One Clip)

	4" Kick-out Side of Stud	4" Kick-out Face of Stud
Test 1	450 lb	325 lb
Test 2	475 lb	325 lb
Test 3	400 lb	325 lb
Test 4	450 lb	325 lb
Average	443.75 lb	325 lb

6.0 Test Results: (Continued)

12' x 4' x 1/2" Thick Drywall
34 sheets on 20 Gauge Steel Studs (Two Clips)

	4" Kick-out Face of Stud
Test 1	575 lb
Test 2	525 lb
Test 3	500 lb
Test 4	525 lb
Average	531.25 lb

12' x 4' x 1/2" Thick Drywall
34 sheets on 25 Gauge Steel Studs (One Clip)

	4" Kick-out Face of Stud	4" Kick-out Side of Stud
Test 1	330 lb	380 lb
Test 2	320 lb	380 lb
Test 3	330 lb	360 lb
Test 4	340 lb	360 lb
Average	330 lb	370 lb

12' x 4' x 1/2" Thick Drywall
34 sheets on 25 Gauge Steel Studs (Two Clips)

	4" Kick-out Face of Stud
Test 1	400 lb
Test 2	400 lb
Test 3	450 lb
Test 4	450 lb
Average	425 lb

6.0 Test Results: (Continued)

12' x 4' x 1/2" Thick Drywall
34 sheets on 2x6 Wood Studs (One Clip)

	4" Kick-out Side of Stud
Test 1	360 lb
Test 2	360 lb
Test 3	350 lb
Test 4	340 lb
Average	352.5 lb

12' x 4' x 1/2" Thick Drywall
34 sheets on 2x6 Wood Studs (Two Clips)

	4" Kick-out Side of Stud
Test 1	410 lb
Test 2	410 lb
Test 3	420 lb
Test 4	410 lb
Average	412.5 lb

14' x 4' x 1/2" Thick Drywall
34 sheets on Wood Studs (Two Clips)

	4" Kick-out Side of Stud	4" Kick-out Face of Stud	6" Kick-out Side of Stud	6" Kick-out Face of Stud
Test 1	800 lb	625 lb	800 lb	625 lb
Test 2	800 lb	650 lb	650 lb	550 lb
Test 3	725 lb	625 lb	775 lb	675 lb
Test 4	750 lb	600 lb	775 lb	800 lb
Average	768.75 lb	625 lb	750 lb	662.5 lb

10' x 4' x 5/8" Thick Drywall
26 sheets on Wood Studs (One Clips)

	4" Kick-out Side of Stud	4" Kick-out Face of Stud	6" Kick-out Side of Stud	6" Kick-out Face of Stud
Test 1	400 lb	350 lb	450 lb	400 lb
Test 2	400 lb	350 lb	400 lb	450 lb
Test 3	450 lb	350 lb	425 lb	425 lb
Test 4	400 lb	350 lb	425 lb	450 lb
Average	412.5 lb	350 lb	425 lb	431.25 lb

7.0 Summary: The tables below summarize the ultimate loads obtained through mock-up testing.

8' x 4' x 1/2" Thick Drywall
34 sheets on Wood Studs

	Clip Installed into the Face of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	One Clip	425.0 lb	475.0 lb
	Clip Installed into the Side of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	One Clip	487.5 lb	543.75 lb

12' x 4' x 1/2" Thick Drywall
34 sheets on Wood Stud and Steel Studs

	Clip Installed into the Face of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud (2x4)	One Clip	400.0 lb	512.5 lb
SPF Wood Stud (2x6)	One Clip	352.5 lb	N/A
SPF Wood Stud (2x6)	Two Clips	412.5 lb	N/A
20 Gauge Steel Stud	One Clip	325.0 lb	N/A
20 Gauge Steel Stud	Two Clips	531.3 lb	N/A
25 Gauge Steel Stud	One Clip	330.0 lb	N/A
25 Gauge Steel Stud	Two Clips	425.0 lb	N/A
	Clip Installed into the Side of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	One Clip	437.5 lb	562.5 lb
20 Gauge Steel Stud	One Clip	443.8 lb	N/A
25 Gauge Steel Stud	One Clip	370.0 lb	N/A
25 Gauge Steel Stud	Two Clips	425.0 lb	N/A

7.0 Summary: (Continued)

14' x 4' x 1/2" Thick Drywall
34 sheets on Wood Studs

	Clip Installed into the Face of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	Two Clips	625.0 lb	662.5 lb
	Clip Installed into the Side of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	Two Clips	768.7 lb	750.0 lb

10' x 4' x 5/8" Thick Drywall
26 sheets on Wood Studs

	Clip Installed into the Face of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	One Clip	350.0 lb	431.25 lb
	Clip Installed into the Side of the Stud		
Stud Type	**Clips**	**4" kick-out**	**6" kick-out**
SPF Wood Stud	One Clip	412.5 lb	425 lb

***Note**: Allowable working loads should be determined by applying an appropriate factor of the safety to the maximum test loads referenced in this report.*

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, Inc.

Digitally Signed by: Jeremy R. Bender

Jeremy R. Bender
Technician

Digitally Signed by: Michael D. Stremmel

Michael D. Stremmel, P.E.
Senior Project Engineer

JRB/dem

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Photographs (2)

Appendix A

Photographs

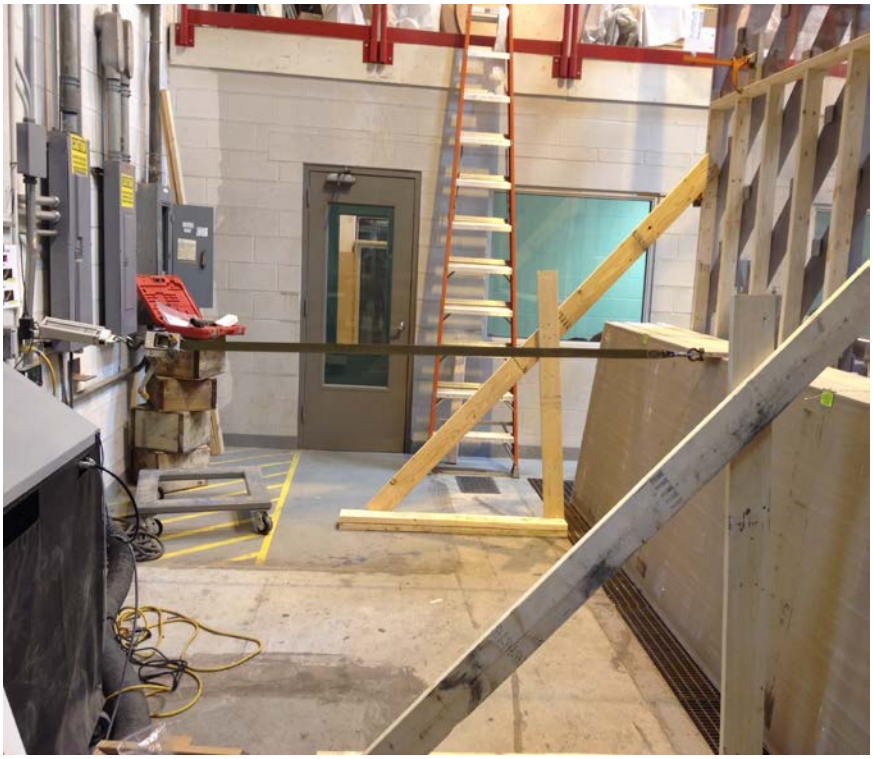

Photo No. 1
Test Set-Up

Photo No. 2
Drywall Clip

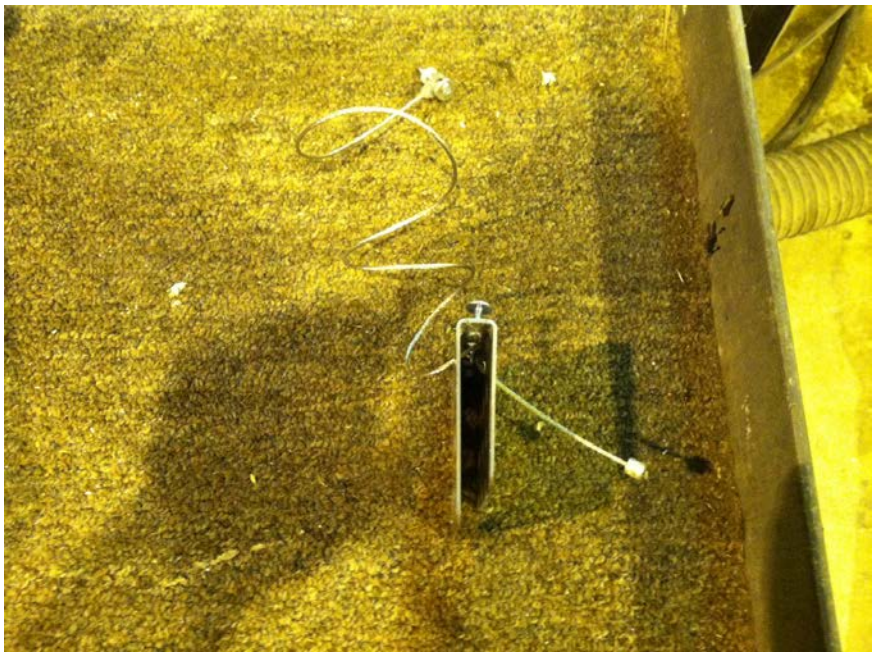

Photo No. 3
Drywall Clip (Side View)