

## TEST REPORT

Rendered to:

Cool Roofs  
407 North Main Street  
Roanoke, IL 61561

Report No.: 2022-6051(R0)  
Test Date: 02/08/2022 - 03/23/2022  
Report Date: 04/05/2022

### 1.0 General Information

#### 1.1 Product

*Ridgeline Safety Systems Anchors*

#### 1.2 Project Summary

ICC NTA, LLC was contracted by Cool Roofs to witness and test *Ridgeline Safety Systems Anchors* in accordance with OSH1926.502(d)(16)(v) and OSHA 1926.502(d)(15). Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at Cool Roofs' facility in Roanoke, IL and ICC PEI, LLC's facility in Goshen, IN, as detailed herein.

#### 1.3 Product Description

The products tested were described by the client as fall arrest devices, attached to the ridges of trusses. Four different types were tested herein.

#### 1.4 Qualifications

ICC PEI in Goshen, IN has demonstrated compliance with ISO/IEC 17025 and is consequently accredited as a Testing Laboratory and performed the anchorage load (in-line) test.

ICC PEI witnessed Cool Roofs perform all drop testing at their facility. Cool Roofs used their non-calibrated equipment (calipers, tape measure, scale) to verify part dimensions, drop height, and drop mass.

#### 1.5 Product Sampling

No evidence was provided that a third-party agency sampled materials for the testing reported herein. All test specimens were supplied by Cool Roofs.

## 1.6 Witnessing

ICC PEI remotely witnessed drop tests, which were all performed by Cool Roofs inside their building located at 1407 West Front Street, Roanoke, IL on February 8, 2022 and March 8, 2022.

No representatives of Cool Roofs were present for in-plane load anchorage testing reported herein.

## 1.7 Conditions of Testing

Unless otherwise indicated, all testing reported herein was conducted in ambient conditions.

## 2.0 Referenced Standards

**OSHA 1926.502**, Fall Protection Systems Criteria and Practices

### 3.0 Summary of Results

The table below provides a summary of the conclusions from the data for the testing performed and detailed within this test report.

Standard Section	Test	Variables		Ridge Anchor	Anchor Bottom Leg Style	Criteria Met <sup>a</sup>
		Truss Pitch (in.)	Throat Depth (in.)			
OSHA 1926.502(d)(16)(v)	Drop Test (ICC PEI remotely witnessed client testing at their facility)	12/12	1	HDQ002 Original Design	HDQ01A	Yes
			1-1/2	HDQ003 Original Design	HDQ01A	Yes
		4/12	2-1/2	HDQ004 Original Design	HDQ004	N/A (Chain broke)
				HDQ004 Original Design	HDQ01A	Yes
			4-1/2	HDQ007 Original Design	HDQ007	No
				HDQ007 New Design	HDQ007 (New Design)	Yes
OSHA 1926.502(d)(15)	Anchorage In-Line Load Test (Performed at ICC PEI)	4/12	1	HDQ002 Anchor New Design (Retrofit)	HDQ002 (New Design)	Yes
			1-1/2	HDQ003 Anchor New Design (Sheeted)	HDQ003 (New Design)	Yes
			2-1/2	HDQ004 Anchor New Design (1.5" Purlin)	HDQ004/ HDQ010 (New Design)	Yes
			4-1/2	HDQ007 Anchor New Design (3.5" Purlin)	HDQ007/ HDQ010 (New Design)	Yes

<sup>a</sup> For Anchorage (In-Line) Load Test: Must have withstood a minimum 5,000 lbf load.  
 For Drop Test: Must have withstood minimum 620 lbf drop from 6-ft (i.e. weight still held post-drop).

**4.0 OSHA 1926.502(d)(16)(v): Drop Test**

**4.1 General**

The purpose of this test was to test the capability of a fall arrest system’s anchorage to withstand twice the potential energy of a 310 lbm falling 6-ft (i.e. a 620 lbm falling 6-ft).

**4.2 Test Specimens**

Each specimen consisted of the client’s anchor system fastened to a truss member, which in turn was connected to a building the client provided to facilitate testing. The table below contains a list of the anchors tested as well as other test details.

Test Combinations	Each of the following ridge anchor fall protection devices were attached to a truss on a building of ample height to facility testing. HDQ001 (Original Design) 1. HDQ002 (Original Design) 2. HDQ003 (Original Design) 3. HDQ004 (Original Design) 4. HDQ007 (Original Design) 5. HDQ007 (New Design)
Load Application	One test per specimen Anchors were loaded by a chain connected to the weight, which was dropped in-plane with the length of the truss and anchor
Truss	12/12 pitch (tests 1 and 2) 4/12 (tests 3 through 6) Note: New truss was used for each test
Anchors-to-Truss	<u>All:</u> (5) #10 x 3-1/8-in. GRK R4 Multi-Purpose Screws per leg from peak  <u>Only New Design HDQ007:</u> Additional (4) per side flange, 2 side flanges (diagonal): #10 x 1-1/2-in. Pole Barn Screws w/Rubber Washers
Drop Weight Mass	650 lbm (tests 1 through 5) 655 lbm (test 6)

**4.3 Test Setup and Procedure**

Testing was performed by exposing each specimen to a drop of a minimum 620 lbm free falling 6-ft, at which point the drop force was transferred back the tie-off point on the anchor specimen. After each test visual observations were made of any damage along with documenting whether or not the specimen withstood the drop force (i.e. the weight was still suspended post-drop). In order to meet the criteria within OSHA 1926.502(d)(16)(v) the specimen had to withstand the drop.

Deviations from the standard include: None

#### 4.4 Test Results

Results from the drop testing are provided in the table below.

Truss Pitch	#	Measured Metal Thickness (in.)	Throat Depth (in.)	Ridge Anchor	Anchor Bottom Leg Style	Observations	Drop Height (in.)	Withstood Drop <sup>a</sup>
12/12	1	0.140	1	HDQ002	HDQ01A	Top and far side of bracket deformed and bent toward load side. Hole where load hook was attached also deformed.	72-1/4	Yes
	2	0.138	1-1/2	HDQ003	HDQ01A	Top and far side of bracket deformed and bent toward load side. Hole where load hook was attached also deformed.	72-1/4	Yes
4/12	3	0.134	2-1/2	HDQ004	HDQ004	Chain link attaching weight to anchor broke during drop, anchor remained in place. Incomplete test, therefore, a replacement test was performed with a new anchor.	72-1/4	N/A
	4	0.141		HDQ004	HDQ01A	Top and far side of bracket deformed and bent toward load side. Hole where load hook was attached also deformed.	72-1/4	Yes
	5	0.138	4-1/2	HDQ007 (Original Design)	HDQ007 (Original Design)	Top and far side of bracket deformed and bent toward load side. Hole where load hook was attached also deformed. Withdrawal of all screws from truss and full disengagement of anchor from truss.	72-3/8	No
	6	0.143		HDQ007 (New Design)	HDQ007 (New Design)	Top and far side of bracket deformed and bent toward load side.	72-1/4	Yes

<sup>a</sup> Must have withstood minimum 620 lbm drop from 6-ft (i.e. weight still held post-drop).

**5.0 OSHA 1926.502(d)(15): Anchorage Load Test**

**5.1 General**

The purpose of this test was to test the capability of a fall arrest system’s anchorage to support load.

**5.2 Test Specimens**

Each specimen consisted of the client’s anchor fastened to a truss member. The table below contains a list of the anchors tested as well as other test details.

Test Combinations	Each of the following ridge anchor fall protection devices were attached to a truss to facilitate testing. New Designs: 1. HDQ002 2. HDQ003 3. HDQ004 4. HDQ007
Load Application	One test per specimen Anchors were loaded in-plane with the pitch of the anchor and truss
Truss Pitch	4/12 Note: A new truss was used for each test
Anchors-to-Truss	<u>All except HDQ002:</u> (5) #10 x 3-1/8-in. GRK R4 Multi-Purpose Screws per leg from peak <u>Only HDQ002:</u> (6) #10 x 3-1/8-in. GRK R4 Multi-Purpose Screws per leg from peak <u>Only HDQ003, HDQ004, HDQ007:</u> Additional (4) per side flange, 2 side flanges (diagonal): #10 x 1-1/2-in. Pole Barn Screws w/Rubber Washers
Load Rate	1,000 lbf/minute

**5.3 Test Setup and Procedure**

Each specimen was loaded at a constant rate until 5,000 lbf was reached or until ultimate load, whichever occurred first. Load was applied, in-line with the pitch of the truss (and anchor leg) through a dual-acting cylinder connected by chains and/or shackles to the anchor hole nearest the cylinder in all cases. Load was measured by an in-line S-Load cell throughout the test. The maximum load which occurred during the test or ultimate load (if failure occurred), as applicable, were recorded along with any post-test observations. The failure mode, if applicable, was also recorded.

Deviations from the standard include: None

### 5.4 Test Results

Results from the in-line load testing are provided in the table below.

Test #	Ridge Anchor	Measured Metal Thickness (in.)	Bottom Bracket Width (in.)	Throat Depth (in.)	Diagonal Side Plates w/Screws	Maximum Load (lbf)	Ultimate Load (lbf)	Failure Mode and/or Observations
1	HDQ002	0.1371	4	1	No	5,312	N/A	None
2	HDQ003	0.1425	1 -7/8	1 -1/2	Yes	5,662	N/A	None
3	HDQ004	0.1357	4	2 -1/2	Yes	5,335	N/A	None
4	HDQ007	0.1377	4	4 -1/2	Yes	5,311	N/A	None

Test #	Ridge Anchor	Observations
1	HDQ002	Anchor bent and folded over at 3,800 lbf. It continued to hold the load increases throughout the test.
2	HDQ003	Anchor bent and folded over at 2,700 lbf. It continued to hold the load increases throughout the test.
3	HDQ004	Anchor bent and folded over at 3,500 lbf. It continued to hold the load increases throughout the test.
4	HDQ007	Anchor bent and folded over at 1,300 lbf. It continued to hold the load increases throughout the test.

## 6.0 Closing Statement

This report contains only findings and results arrived at after employing the specific test procedures listed herein. It does not constitute a recommendation for, endorsement of, or certification of the product or material tested. Unless differently required, ICC NTA, LLC reports apply the "Simple Acceptance" rule, also called "Shared Risk approach", of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity. ICC NTA makes no warranty, expressed or implied, except that the test has been performed, and a report prepared, based upon the specimen specified by the client. Extrapolation of data, from the test data provided herein, to the batch or lot from which the specimens were obtained may not correlate and should be interpreted with extreme caution. ICC NTA assumes no responsibility for variations in quality, composition, appearance, performance, or other features of similar materials produced by the client, other persons, or under conditions over which ICC NTA has no control. ICC NTA has issued this report for the exclusive use of the client to whom it is addressed. Any use or duplication of this report shall not be made without their consent. This report shall only be reproduced in its entirety.

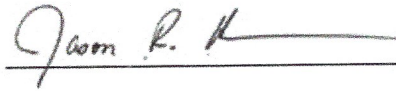
For ICC NTA, LLC:



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04/05/2022



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04/05/2022