ANSI Z359.18 Type A and OSHA Test Report

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Kent, WA 98032
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Test Report Number:	2018071800342
Job Number:	133278
Product Type:	Anchorage Connector
Product Model:	00342 Skyhook adjustable roof anchor
Dates of Manufacture:	03/01/2017, 08/01/2017
Date(s) of Testing:	03/27/18, 05/29/18, 06/17-19/18

Tests Completed	Test Date	ANSI/ASSE Z359.18-2017	Pass/Fail
Design Requirements	7/23		Pass
Static Strength	3/27		Pass
Dynamic Strength	3/27		Pass
Dynamic Strength - OSHA	5/29		Pass
Residual Strength	3/27		Pass
Corrosion	6/17-19		Pass
Markings and Instructions	7/23		Pass

Please see attached test data for details

Fastener/Substrate Tests Completed	
Substrate/Fastener	Performance Standard
5.75 in. thick concrete & (30) 1/4 x 2-3/4 in. screw	ANSI Z359.18-2017, OSHA 1910, OSHA 1926 Subpart M
Simulated wood roof in field & (60) #14-10 x 2 in. screws	OSHA 1910, OSHA 1926 Subpart M
Simulated wood roof into truss & (60) #14-10 x 2 in. screws	OSHA 1910, OSHA 1926 Subpart M
Simulated metal roof (20 gauge) & (60) #14-10 x 2 in. metal screws	OSHA 1910, OSHA 1926 Subpart M

John Halas
Engineer — Date: 8/22/18

Craig Allen
Test Technician — Date: 08/08/2018

Andre Pelland
Compliance and Quality Manager — Date: 08/08/2018

Job Number:	133278	Engineer:	John Halas
Product:	Anchorage Connector	Tested By:	Craig Allen
Model Number:	00342 Skyhook adjustable roof anchor	Reviewed By:	Andre Pelland

TEST EQUIPMENT

Equipment	Model	Serial	
Static load cell		367976A	
282 lb. test weight			

3.1	ANSI Design Requirements	
3.1.1 (a)	Connection points shall support only one user or system at a time	Pass
(c)	Anchorage connectors shall not have closed loops that could be mistaken for a connection point	Pass
(d)	Any operable gates, rings, buckles or other hardware covered by ANSI Z359.12-2012 shall comply with ANSI Z359.12-2012	Pass
(e)	Multiple connections shall only be permitted on tripod or davit style anchorages	N/A
3.1.2	Surfaces shall be free from burrs, pits, sharp corners and roughness	Pass
3.1.3.1	Hot-dipped galvanized steel shall conform with ASTM A123/123M	N/A
3.1.3.2.1	Type A and Type T anchorage connectors shall maintain toughness at temps between -30 degrees F and +130 degrees F	Pass

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Substrate: 5.75 in. thick concrete	**Fastener:** (30) 1/4 x 2-3/4 in. screw

4.2.1 Static Strength Testing of Anchorage Connectors

Requirements per 3.2.1.1, 3.2.1.2, 3.2.1.3

a) Attach anchorage on approved substrate per 4.1.2
b) (Type A and T) Apply 5,000 lbs. load in permitted direction(s) at a rate no greater than 2 inches per minute for at least 3 minutes
c) Release load
d) Evaluate results per 3.2.1.1, 3.2.1.2, 3.2.1.3 as required

Requirement	Sample #1	Sample #2	Sample #3
Anchorage connector withstands applied load	Pass	Pass	Pass
Actual load applied (lbs.)	5042	5036	5045
If gates are present, no separation more than 1/8"	N/A	N/A	N/A
COMPLIANT	Pass	Pass	Pass

4.2.2 Dynamic Strength Testing of Anchorage Connectors

Requirements per 3.2.2.1, 3.2.2.2, 3.2.2.3

a) Condition sample as necessary per 4.2.2.3.1
b) Attach anchorage on approved substrate per 4.1.2
c) Connect 282 lbs. test weight to anchorage connector via test lanyard
d) (Type A and T) Raise weight to achieve 3 ft. free fall
e) Release test weight and evaluate in accordance with 3.2.2.1, 3.2.2.2, 3.2.2.3 as required

Requirement	Sample #1	Sample #2	Sample #3
Anchorage connector arrests test weight	Pass	Pass	Pass
If gates are present, no separation more than 1/8"	N/A	N/A	N/A
COMPLIANT	Pass	Pass	Pass

4.2.3 Residual Dynamic Strength Testing of Anchorage Connectors

Requirements per 3.2.3.1, 3.2.3.2, 3.2.3.3

a) Repeat dynamic test as specified in 4.2.2
b) Evaluate results in accordance with 3.2.2.1, 3.2.2.2, 3.2.2.3 as required

Requirement	Sample #1	Sample #2	Sample #3
Anchorage connector arrests test weight	Pass	Pass	Pass
Anchorage connector supports test weight for min. one minute	Pass	Pass	Pass
If gates are present, no separation more than 1/8"	N/A	N/A	N/A
COMPLIANT	Pass	Pass	Pass

4.2.5 Corrosion Testing of Anchorage Connectors

Requirements per 3.2.5.1, 3.2.5.2, 3.2.5.3

a) (Type A and D) Expose anchorage connector to (2) 24-hour salt spray exposures separated by a one-hour drying period
b) Evaluate results in accordance with 3.2.5.1, 3.2.5.2 as required

Requirement	Sample #1	Sample #2	Sample #3
Type A and D anchorage connectors shall not show presence of red rust or other corrosion	Pass	Pass	Pass
COMPLIANT	Pass	Pass	Pass

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Substrate: Simulated wood roof in field	**Fastener:** (60) #14-10 x 2 in. screws

Dynamic Strength Testing of Anchorage Connectors
Requirements per Manufacturer Established OSHA Anchor Testing
(Figure 1)

1. Determine drop height required to create 3,600 or 5,000 pound force.
2. Install anchorage connector according to manufacturer's instructions.
3. Make sure that the anchorage connector is oriented so that the test load is applied in the intended direction of use.
4. Release load.

Requirement	Sample #1	Sample #2	Sample #3
Tested to load (lbs.)	5,000	5,000	5,000
Anchor withstands applied load?	Pass	Pass	Pass
COMPLIANT	Yes	Yes	Yes

Dynamic Strength Testing of Anchorage Connectors
Requirements per Manufacturer Established OSHA Anchor Testing
(Figure 2)

1. Determine drop height required to create 3,600 or 5,000 pound force.
2. Install anchorage connector according to manufacturer's instructions.
3. Make sure that the anchorage connector is oriented so that the test load is applied perpendicular to the intended direction of use.
4. Release load.

Requirement	Sample #1	Sample #2	Sample #3
Tested to load (lbs.)	5,000	5,000	5,000
Anchor withstands applied load?	Pass	Pass	Pass
COMPLIANT	Yes	Yes	Yes

Figure 1

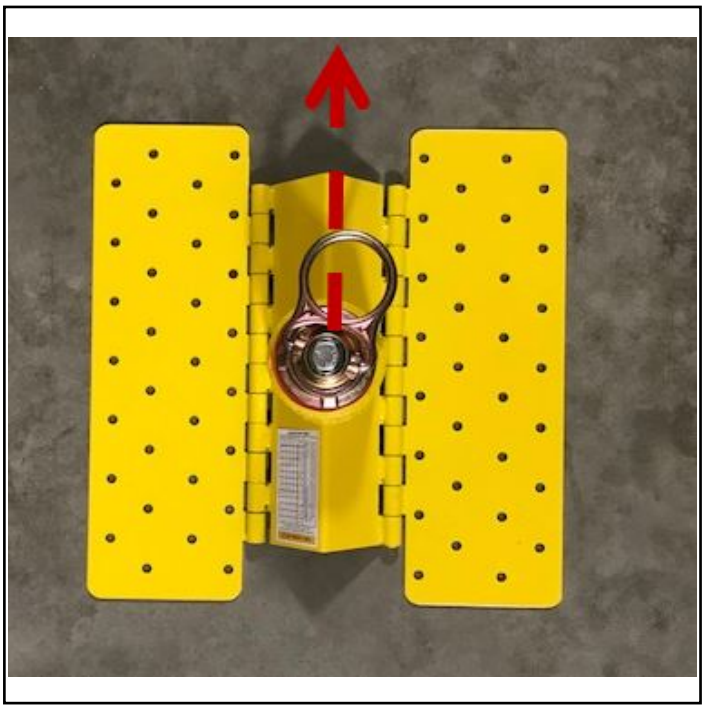
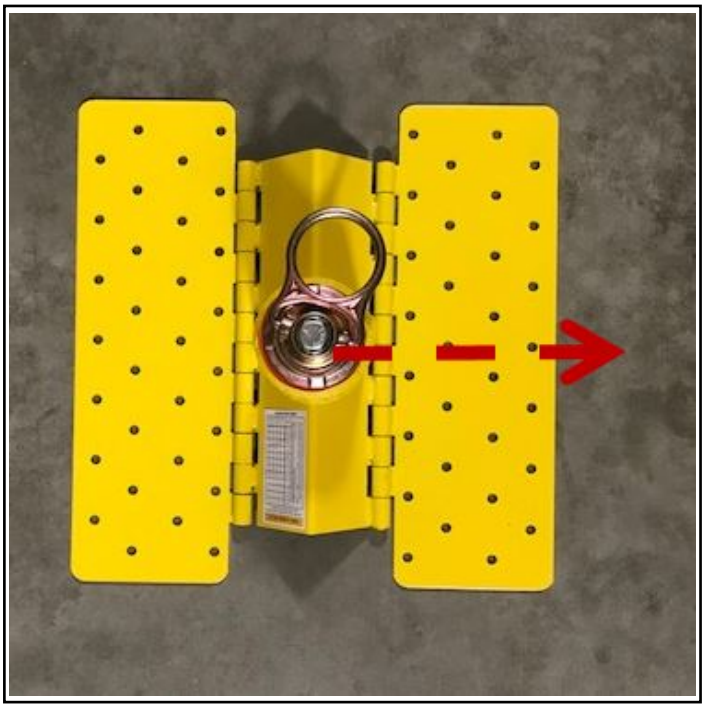


Figure 2



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Substrate: Simulated wood roof into truss	**Fastener:** (60) #14-10 x 2 in. screws

Dynamic Strength Testing of Anchorage Connectors
Requirements per Manufacturer Established OSHA Anchor Testing
(Figure 1)

1. Determine drop height required to create 3,600 or 5,000 pound force.
2. Install anchorage connector according to manufacturer's instructions.
3. Make sure that the anchorage connector is oriented so that the test load is applied in the intended direction of use.
4. Release load.

Requirement	Sample #1	Sample #2	Sample #3
Tested to load (lbs.)	5,000	5,000	5,000
Anchor withstands applied load?	Pass	Pass	Pass
COMPLIANT	Yes	Yes	Yes

Dynamic Strength Testing of Anchorage Connectors
Requirements per Manufacturer Established OSHA Anchor Testing
(Figure 2)

1. Determine drop height required to create 3,600 or 5,000 pound force.
2. Install anchorage connector according to manufacturer's instructions.
3. Make sure that the anchorage connector is oriented so that the test load is applied perpendicular to the intended direction of use.
4. Release load.

Requirement	Sample #1	Sample #2	Sample #3
Tested to load (lbs.)	5,000	5,000	5,000
Anchor withstands applied load?	Pass	Pass	Pass
COMPLIANT	Yes	Yes	Yes

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Substrate: Simulated metal roof (20 gauge)	**Fastener:** (60) #14-10 x 2 in. metal screws

Dynamic Strength Testing of Anchorage Connectors
Requirements per Manufacturer Established OSHA Anchor Testing
(Figure 1)

1. Determine drop height required to create 3,600 or 5,000 pound force.
2. Install anchorage connector according to manufacturer's instructions.
3. Make sure that the anchorage connector is oriented so that the test load is applied in the intended direction of use.
4. Release load.

Requirement	Sample #1	Sample #2	Sample #3
Tested to load (lbs.)	5,000	5,000	5,000
Anchor withstands applied load?	Pass	Pass	Pass
COMPLIANT	Yes	Yes	Yes

Dynamic Strength Testing of Anchorage Connectors
Requirements per Manufacturer Established OSHA Anchor Testing
(Figure 2)

1. Determine drop height required to create 3,600 or 5,000 pound force.
2. Install anchorage connector according to manufacturer's instructions.
3. Make sure that the anchorage connector is oriented so that the test load is applied perpendicular to the intended direction of use.
4. Release load.

Requirement	Sample #1	Sample #2	Sample #3
Tested to load (lbs.)	5,000	5,000	5,000
Anchor withstands applied load?	Pass	Pass	Pass
COMPLIANT	Yes	Yes	Yes

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5	**Markings and Instructions**	
5.1	**Marking Requirements**	
5.1.1	**General:** The following markings shall appear in English on a label, marking or tag that is designed to last for the lifetime of the anchorage connector and is permanently affixed to the anchorage connector.	
	a) The manufacturer's name and mark	Yes
	b) The year of manufacture	Yes
	c) Model number	Yes
	d) "ANSI Z359.18" and the type	Yes
	e) Markings to indicate restrictions on directions of loading, if applicable	N/A
	f) Where specified by the manufacturer, the working load	Yes
	g) An individual serial number or a lot or batch number that provides traceability	Yes
	h) Minimum Breaking Strength, followed by "MBS."	Yes
5.1.2	**Specific:** As required for the specific anchorage connector, the following markings shall appear in English on a label, marking or tag that is designed to last for the lifetime of the anchorage connector and is permanently affixed to the anchorage connector	Yes
5.1.2.1	An anchorage connector that incorporates a closed loop not intended for connection, but may be mistaken for a connection point shall be permanently labeled with a warning not to connect a fall protection system or suspended component to the closed loop when used in a cinching operation	N/A
5.1.2.3	The minimum service temperature for the anchorage connector according 3.1.3.2	Yes
5.1.2.4	For tripods and davit systems, the maximum number of users permitted on the system	N/A

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5.2	Instruction Requirements	
5.2.1	**General:** Provide the following instructions and information in English with each anchorage connector.	
5.2.1.1	**Overall:**	
	a) A statement that the anchorage connector has been tested in compliance with the requirements of ANSI/ASSE Z359.7, and caution that the ANSI compliance testing covers only the hardware and does not extend to the anchorage and substrate to which the anchorage connector is attached	Yes
	b) Specifications for appropriate anchorages(s) to which the anchorage connector can be attached, including instructions on how to proceed when the user is unable to determine whether the anchorage meets the manufacturer's specification and instructions that the anchorage connector shall only be connected to anchorages that:	Yes
	i) Can withstand 5,000 lbs. (22.2 kN) without failure, except that lower strengths are acceptable when permitted by applicable legislation; or	N/A
	ii) Are certified by a professional engineer as having the required strength for fall arrest or travel restraint, as applicable, or;	N/A
	iii) The manufacturer may provide specifications of allowable materials including the minimum shapes, sizes and geometry of structural elements to which the anchorage connector may be fastened. A qualified person shall approve these specifications.	Yes
	c) The manufacturer shall clearly label the minimum service temperature for the anchorage connector according to 3.1.3.2	Yes
	d) The manufacturer shall supply complete specifications for fasteners	Yes
	e) The anchorage type	Yes
	f) The permitted uses of the anchorage connector	Yes
	g) The connection point(s), working load limit	Yes
	h) The material used in the anchorage connector's construction	Yes
	i) The length of the anchorage connector and any other dimensions that may affect its compatibility with anchorage to which it may be connected	Yes
	j) The manufacturer shall make available upon request information for the design of systems, such as AAF and/or force vs. displacement curve(s) for the device	N/A
	k) A statement that only one fall protection system or positioning system may be attached to an individual connection point	Yes
	l) Specification providing the intended directions(s) of loading of the anchorage connector	Yes
	m) A complete list of the anchorage connector components provided by the manufacturer at the time of sale	Yes
	n) A warning against unauthorized alterations, relocations or additions to the anchorage connector	Yes

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5.2.1.2	**Use:**	
	a) Instructions on proper installation and use, including, but not limited to, compatibility with other fall protection components	Yes
	b) The length of the anchorage connector and any other dimensions that may affect its compatibility with anchorages to which it may be connected	Yes
	c) Where applicable, directions regarding the appropriate length of lanyard to use with the anchorage connector to compensate for the additional length that it may add to the lanyard	Yes
	d) Permitted and forbidden uses, including clear description of and the recommended ways of dealing with applicable compatibility concerns	Yes
	e) A warning to remove any surface contamination such as concrete, stucco, roofing material, etc., that could accelerate cutting or abrading of attached components	Yes
	f) Warnings concerning environments and conditions that may degrade the anchorage connector	Yes
	g) Training requirements	Yes
5.2.1.3	**Inspection and Field Testing:**	
	a) Instructions on testing, if needed	N/A
	b) Where applicable, directions for the installer to perform and document proof testing upon installation. Directions shall include proof load forces and acceptable methods	N/A
	c) Field serviceability testing: The manufacturer shall provide guidelines for how often field load testing must be undertaken to prove that the anchorage connector continues to be adequately secured to the structure. These guidelines shall include recommended methods for testing, including the direction and point of application of test loads	N/A
	d) The recommended frequencies and procedures for inspection, maintenance, and when applicable, testing.	Yes
	e) Instructions for inspecting and servicing an anchorage connector after it is subjected to a fall or an inspection reveals an unsafe condition	Yes
	f) If applicable, guidelines for retirement of the anchorage connector	Yes
	g) The action to be taken if an inspection of and anchorage connector reveals an unsafe condition	Yes
	h) The action to be taken after the anchorage connector is subjected to a fall	Yes
	i) Criteria for removal of an anchorage connector from service if deformed from its original installed configuration	Yes