



Test Report ANSI/ASSE Z359.18

420 N. Five Mile Rd.
Boise, ID 83713
208-244-0242

Test Report Number: 2024021100152
Job Name: Permanent Roof Anchor
Product SKU#: 206917
Product Type: Roof Anchor
Product Description: Permanent Roof Anchor
Testing Standard: ANSI/ASSE Z359.18 Safety Requirements for Anchorage Connectors for Active Fall Protection Systems
Dates of Manufacture: 1/01/2024
Date(s) of Testing: 2/11/2024

REQUIREMENT VERIFICATION

<u>Requirement Description</u>	<u>Clause/Section</u>	<u>Result</u>
Design Requirements	3.1 Design Requirements	Meets or Exceeds
Low-Temperature Performance	3.1.3.2.1 Low-Temperature Performance	Meets or Exceeds
Performance Requirements	3.2 Performance Requirements	Meets or Exceeds
Markings and Instructions	5. Markings and Instructions	Meets or Exceeds

QUALIFICATION TESTING

<u>Test Description</u>	<u>Test Date</u>	<u>Clause/Section</u>	<u>Result</u>
Static Strength (A) (1/2" Plywood & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (4/12 Roof Pitch - 18.4 Degrees)	2/11/2024	4.2.1.1 Static Strength Testing of Type A Anchorage Connectors	Pass
Dynamic Strength (A) (1/2" Plywood & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (4/12 Roof Pitch - 18.4 Degrees)	2/11/2024	4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors	Pass
Residual Strength (A) (1/2" Plywood & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (4/12 Roof Pitch - 18.4 Degrees)	2/11/2024	4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors	Pass
Static Strength (A) (20 Gauge Metal & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (4/12 Roof Pitch - 18.4 Degrees)	2/11/2024	4.2.1.1 Static Strength Testing of Type A Anchorage Connectors	Pass
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Residual Strength (A) (20 Gauge Metal & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (4/12 Roof Pitch - 18.4 Degrees)	2/11/2024	4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors	Pass

QUALIFICATION TESTING

<u>Test Description</u>	<u>Test Date</u>	<u>Clause/Section</u>	<u>Result</u>
Static Strength (A) (1/2" Plywood & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (12/12 Roof Pitch - 45 Degrees)	2/11/2024	4.2.1.1 Static Strength Testing of Type A Anchorage Connectors	Pass
Dynamic Strength (A) (1/2" Plywood & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (12/12 Roof Pitch - 45 Degrees)	2/11/2024	4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors	Pass
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Static Strength (A) (20 Gauge Metal & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (12/12 Roof Pitch - 45 Degrees)	2/11/2024	4.2.1.1 Static Strength Testing of Type A Anchorage Connectors	Pass
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Residual Strength (A) (20 Gauge Metal & 2x6 Structural Member) (5/16" x 3.5" Stainless Steel Lag Bolt) (12/12 Roof Pitch - 45 Degrees)	2/11/2024	4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors	Pass

This test report covers no additional products or SKU's:

Notes

Test Equipment		
Equipment	Model	Serial
Mechanical AP Dynamometer	30006-0100	E 23218
12,000 Winch	APEX 1200	373122320

3.1	Design Requirements	
3.1.1	a) Connection points shall support only one user or system at a time	Meets or Exceeds
	b) A connection point eye on a type T anchorage connector shall be a closed eye with a minimum 1 inch inside radius	NA
	c) Anchorage connectors shall not have closed loops that could be mistaken for a connection point	NA
	d) Any operable gates, rings, buckles, or other hardware covered by ANSI Z359.12-2012 shall comply with ANSI Z359-12-2012	Meets or Exceeds
	e) Multiple connections shall only be permitted on tripod or davit style anchorages	NA
3.1.2	Surfaces shall be free from burrs, pits, sharp corners and roughness	Meets or Exceeds
3.1.3.1	Hot-dipped galvanized steel shall conform with ASTM A123/123M	NA
3.1.3.2.1	Type A anchorage connectors shall maintain toughness at temps between -30 degrees F and +130 de-grees F. Each dynamic strength test sample shall be conditioned at -35 +/-2 C for a minimum of 3 hours and removed no more than five minutes before testing.	Meets or Exceeds
3.1.4.1	Textiles shall not contain natural fibers	NA
3.1.4.2	If a subsystem uses stitching for connection of load-bearing components, the equipment manufacturer shall pro-duce the stitching and cutting and meet the following requirements:	Meets or Exceeds
	a) Use lock stitching	NA
	b) Secure the ends of threads by backstitching, overlapping stitching, or other methods	NA
	c) Threads used for sewing shall be physically compatible with the webbing and of a quality comparable to that of the webbing	NA
	d) Hot-cut or fuse thermoplastic materials, cord, tape, and webbing to prevent fraying	NA
	e) The thread color or shade shall contrast with that of the webbing to facilitate visual inspection	NA

Notes

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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	Meets or Exceeds
	b) The year of manufacture	Meets or Exceeds
	c) Model number	Meets or Exceeds
	d) "ANSI Z359.18" and the type	Meets or Exceeds
	e) Markings to indicate restrictions on directions of loading, if applicable	Meets or Exceeds
	f) Where specified by the manufacturer, the working load	Meets or Exceeds
	g) An individual serial number or a lot or batch number that provides traceability	Meets or Exceeds
	h) Minimum Breaking Strength, followed by "MBS."	Meets or Exceeds
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	Meets or Exceeds
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	Meets or Exceeds
5.1.2.3	The minimum service temperature for the anchorage connector according to 3.1.3.2	Meets or Exceeds
5.1.2.4	For tripods and davit systems, the maximum number of users permitted on the system	NA

3.1.3.2.1 Low-Temperature Static Performance Type A Anchorage Connectors requirements per 3.2.2.1
a) Condition sample at -30°C for 3 hours b) A new anchorage connector may be used for each test c) The test force shall be 5,000 pounds (22.2kN) +50/-0 pounds (+0.22/-0kN). Apply these forces in accordance with the requirements of 4.1.2. d) Install the anchorage connector on the test anchorage in accordance with the requirements of 4.1.2 e) Apply the load to the anchorage connector in the direction(s) of loading specified in 4.1.2.5 f) Apply the load at a rate not greater than 2 inches (51mm) per minute. Maintain the load above 5,000 pounds (22.2kN) for at least 3 minutes g) Release the load h) Evaluate the test results per 3.2.1.1

3.1.3.2.1 Low-Temperature Static Performance Type A Anchorage Connectors requirements per 3.2.2.1																				
<table border="1"> <thead> <tr> <th>Samples</th> <th>Sample # 07</th> <th>Sample # 08</th> <th>Sample # 09</th> </tr> </thead> <tbody> <tr> <td>Anchorage Connector Withstands Applied Load</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>Actual load applied (lb)</td> <td>5000</td> <td>5000</td> <td>5000</td> </tr> <tr> <td>If gates are present, no separation more than 1/8"</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>Result/Assessment</td> <td>Pass</td> <td>Pass</td> <td>Pass</td> </tr> </tbody> </table>	Samples	Sample # 07	Sample # 08	Sample # 09	Anchorage Connector Withstands Applied Load	Yes	Yes	Yes	Actual load applied (lb)	5000	5000	5000	If gates are present, no separation more than 1/8"	NA	NA	NA	Result/Assessment	Pass	Pass	Pass
Samples	Sample # 07	Sample # 08	Sample # 09																	
Anchorage Connector Withstands Applied Load	Yes	Yes	Yes																	
Actual load applied (lb)	5000	5000	5000																	
If gates are present, no separation more than 1/8"	NA	NA	NA																	
Result/Assessment	Pass	Pass	Pass																	

**3.1.3.2.1 Low-Temperature Dynamic Performance
Type A Anchorage Connectors
requirements per 3.2.2.1**

- a) Condition sample at -30°C for 3 hours
- b) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- c) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded
- d) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- e) Provide enough cable to achieve a free-fall distance of 3, +0.1/-0, ft (0.9, +0.03/-0m)
- f) Retract cable at full speed until desired arrest force is achieved
- g) Evaluate the test results per 3.2.2.1

**3.1.3.2.1 Low-Temperature Dynamic Performance
Type A Anchorage Connectors
requirements per 3.2.2.1**

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage Connector arrests test weight	Yes	Yes	Yes
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

**3.1.3.2.1 Low-Temperature Residual Performance
Type A Anchorage Connector
requirements per 3.2.2.1**

- a) Condition sample at -30°C for 3 hours
- b) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- c) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded
- d) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- e) Provide enough cable to achieve a free-fall distance of 3, 0.1/-0, ft (0.9, +0.03/-0m)
- f) Retract cable at full speed until desired arrest force is achieved
- g) Evaluate the test results per 3.2.2.1

**3.1.3.2.1 Low-Temperature Residual Performance
Type A Anchorage Connector
requirements per 3.2.2.1**

Samples	Sample # 04	Sample # 05	Sample # 06
Anchorage connector arrests test weight	Yes	Yes	Yes
Anchorage connector supports test weight for minimum one minute	Yes	Yes	Yes
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

The testing procedure entailed the utilization of a simulated roof inclined at an angle of 45 degrees, thereby replicating a roof with a pitch of 12/12. The composition of the simulated roof comprised 2x6 #2 kiln-dried fir, emulating engineered trusses spaced at 24" OC, supplemented with 1/2" OSB to represent roof sheeting. Additionally, the roof incorporated 15-year, 3-tab asphalt shingles and roofing felt.

The anchor was securely affixed to the roof structure by means of manufacturer-supplied 5/16" x 3 1/2" long stainless steel lag screws, fastened directly into the structural member.

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 Z359.18, 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	Meets or Exceeds
	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:	Meets or Exceeds
	i) Can withstand 5,000 lb (22.2kN) without failure, except that lower strengths are acceptable when permitted by applicable legislation; or	Meets or Exceeds
	ii) Are certified by a professional engineer as having the required strength for fall arrest or travel restraint, as applicable, or;	Meets or Exceeds
	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.	Meets or Exceeds
	c) The manufacturer shall clearly label the minimum service temperature for the an anchorage connector according to 3.1.3.2	Meets or Exceeds
	d) The manufacturer shall supply complete specifications for fasteners	Meets or Exceeds
	e) The anchorage type	Meets or Exceeds
	f) The permitted uses of the anchorage connector	Meets or Exceeds
	g) The connection point(s), working load limit	Meets or Exceeds
	h) The material used in the anchorage connector's construction	Meets or Exceeds
	i) The length of the anchorage connector and any other dimensions that may affect its compatibility with anchorage to which it may be connected	Meets or Exceeds
	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	Meets or Exceeds
	k) A statement that only one fall protection system or positioning system may be attached to an individual connection point	Meets or Exceeds
	l) Specification providing the intended directions(s) of loading of the anchorage connector	Meets or Exceeds
	m) A complete list of the anchorage connector components provided by the manufacturer at the time of sale	Meets or Exceeds
	n) A warning against unauthorized alterations, relocations or additions to the anchorage connector	Meets or Exceeds

5.2.1.2	Use:	
	a) Instructions on proper installation and use, including, but not limits to, compatibility with other fall protection components	Meets or exceeds
	b) The length of the anchorage connector and any other dimensions that may affect its compatibility with anchorages to which it may be connected	Meets or exceeds
	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	Meets or exceeds
	d) Permitted and forbidden uses, including clear description of and the recommended ways of dealing with applicable compatibility concerns	Meets or exceeds
	e) A warning to remove any surface contamination such as concrete, stucco, roofing material, etc., that could accelerate cutting or abrading of attached components	Meets or exceeds
	f) Warnings concerning environments and conditions that may degrade the anchorage connector	Meets or exceeds
	g) Training requirements	Meets or exceeds
5.2.1.3	Inspection and Field Testing:	
	a) Instructions on testing, if needed	NA
	b) Where applicable, directions for the installer to performs and document proof testing upon installation. Directions shall include proof load forces and acceptable methods	Meets or exceeds
	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	Meets or exceeds
	d) The recommended frequencies and procedures for inspection, maintenance, and when applicable, testing	Meets or exceeds
	e) Instructions for inspecting and servicing an anchorage connector after it is subjected to a fall or an inspection reveals an unsafe condition	Meets or exceeds
	f) If applicable, guidelines for retirement of the anchorage connector	Meets or exceeds
	g) The action to be taken if an inspection of an anchorage connector reveals an unsafe condition	Meets or exceeds
	h) The action to be taken after the anchorage connector is subjected to a fall	Meets or exceeds
	i) Criteria for removal of an anchorage connector from service if deformed from its original installed configuration	Meets or exceeds
5.2.1.4	Cinching and Non-Cinching Style Anchorage Connectors	
	a) Where the anchorage connector includes an abrasion pad, provide directions that the abrasion pad shall be installed between the anchorage and the load bearing strap	NA
	b) The proper method of installing the anchorage connector including, as applicable for non-cinching anchorage connectors, the maximum angle permitted between connection legs	Meets or exceeds

**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.1.1**

- a) A new anchorage connector may be used for each test
- b) The test force shall be 5,000 pounds (22.2kN) +50/-0 pounds (+0.22/-0kN). Apply these forces in accordance with the requirements of 4.1.2.
- c) Install the anchorage connector on the test anchorage in accordance with the requirements of 4.1.2
- d) Apply the load to the anchorage connector in the direction(s) of loading specified in 4.1.2.5
- e) Apply the load at a rate not greater than 2 inches (51mm) per minute. Maintain the load above 5,000 pounds (22.2kN) for at least 3 minutes
- f) Release the load
- g) Evaluate the test results per 3.2.1.1

**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.1.1**

Samples	Sample # 07	Sample # 08	Sample # 09
Anchorage Connector Withstands Applied Load	Yes	Yes	Yes
Actual load applied (lb)	5000	5000	5000
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.1.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable
- c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- d) Provide enough cable to achieve a free-fall distance of 3, +0.1/-0, ft (0.9, +0.03/-0m)
- e) Retract cable at full speed until desired arrest force is achieved
- f) Evaluate the test results per 3.2.2.1

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.1.1**

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage Connector arrests test weight	Yes	Yes	Yes
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

The testing procedure entailed the utilization of a simulated roof inclined at an angle of 18.4 degrees, thereby replicating a roof with a pitch of 4/12. The composition of the simulated roof comprised 2x6 #2 kiln-dried fir, emulating engineered trusses spaced at 24" OC, supplemented with 1/2" OSB to represent roof sheeting. Additionally, the roof incorporated 15-year, 3-tab asphalt shingles and roofing felt.

The anchor was securely affixed to the roof structure by means of manufacturer-supplied 5/16" x 3 1/2" long stainless steel lag screws, fastened directly into the structural member.

**4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.2.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
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requirements per 3.2.2.1**

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage connector arrests test weight	Yes	Yes	Yes
Anchorage connector supports test weight for minimum one minute	Pass	Pass	Pass
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

**Direction of forces applied during 4.2.1.1.
Anchor pulled downward by static forces**



**Direction of forces applied during 4.2.2.1. + 4.2.3.1
Anchor pulled downward by dynamic forces**



**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.1.1**

- a) A new anchorage connector may be used for each test
- b) The test force shall be 5,000 pounds (22.2kN) +50/-0 pounds (+0.22/-0kN). Apply these forces in accordance with the requirements of 4.1.2.
- c) Install the anchorage connector on the test anchorage in accordance with the requirements of 4.1.2
- d) Apply the load to the anchorage connector in the direction(s) of loading specified in 4.1.2.5
- e) Apply the load at a rate not greater than 2 inches (51mm) per minute. Maintain the load above 5,000 pounds (22.2kN) for at least 3 minutes
- f) Release the load
- g) Evaluate the test results per 3.2.1.1

**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.1.1**

Samples	Sample # 07	Sample # 08	Sample # 09
Anchorage Connector Withstands Applied Load	Yes	Yes	Yes
Actual load applied (lb)	5000	5000	5000
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
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(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.1.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable
- c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- d) Provide enough cable to achieve a free-fall distance of 3, +0.1/-0, ft (0.9, +0.03/-0m)
- e) Retract cable at full speed until desired arrest force is achieved
- f) Evaluate the test results per 3.2.2.1

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.1.1**

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage Connector arrests test weight	Yes	Yes	Yes
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

The testing procedure entailed the utilization of a simulated roof inclined at an angle of 45 degrees, thereby replicating a roof with a pitch of 12/12. The composition of the simulated roof comprised 2x6 #2 kiln-dried fir, emulating engineered trusses spaced at 24" OC, supplemented with 1/2" OSB to represent roof sheeting. Additionally, the roof incorporated 15-year, 3-tab asphalt shingles and roofing felt.

The anchor was securely affixed to the roof structure by means of manufacturer-supplied 5/16" x 3 1/2" long stainless steel lag screws, fastened directly into the structural member.

4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.2.1

a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.

b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable

c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)

d) Provide enough cable to achieve a free-fall distance of 3, 0.1/-0, ft (0.9, +0.03/-0m)

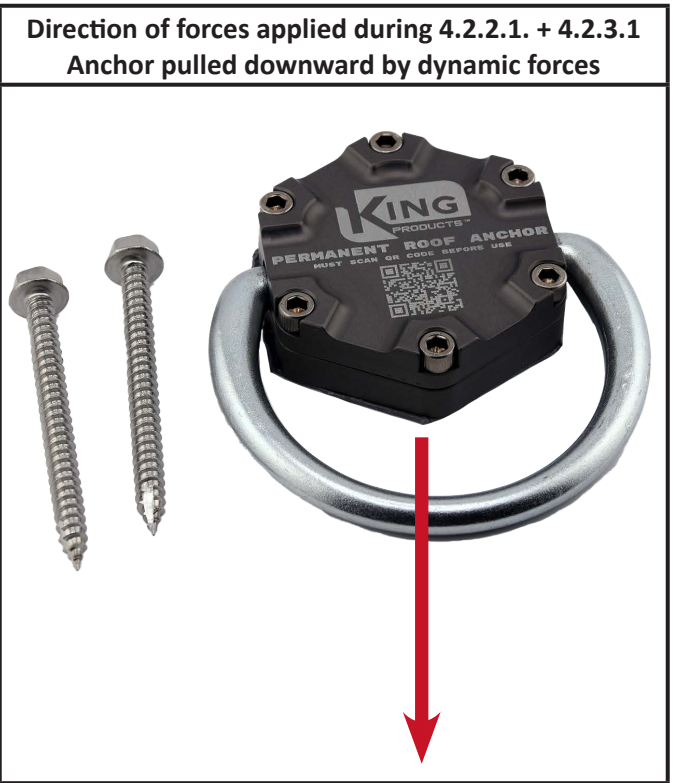
e) Retract cable at full speed until desired arrest force is achieved

f) Evaluate the test results per 3.2.2.1

4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(1/2" Plywood & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.2.1

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage connector arrests test weight	Yes	Yes	Yes
Anchorage connector supports test weight for minimum one minute	Pass	Pass	Pass
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes



**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.1.1**

- a) A new anchorage connector may be used for each test
- b) The test force shall be 5,000 pounds (22.2kN) +50/-0 pounds (+0.22/-0kN). Apply these forces in accordance with the requirements of 4.1.2.
- c) Install the anchorage connector on the test anchorage in accordance with the requirements of 4.1.2
- d) Apply the load to the anchorage connector in the direction(s) of loading specified in 4.1.2.5
- e) Apply the load at a rate not greater than 2 inches (51mm) per minute. Maintain the load above 5,000 pounds (22.2kN) for at least 3 minutes
- f) Release the load
- g) Evaluate the test results per 3.2.1.1

**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.1.1**

Samples	Sample # 16	Sample # 17	Sample # 18
Anchorage Connector Withstands Applied Load	Yes	Yes	Yes
Actual load applied (lb)	5000	5000	5000
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.2.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable
- c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- d) Provide enough cable to achieve a free-fall distance of 3, +0.1/-0, ft (0.9, +0.03/-0m)
- e) Retract cable at full speed until desired arrest force is achieved
- f) Evaluate the test results per 3.2.2.1

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 roof pitch - 18.4 Degrees)
requirements per 3.2.2.1**

Samples	Sample # 13	Sample # 14	Sample # 15
Anchorage Connector arrests test weight	Yes	Yes	Yes
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

The testing procedure entailed the utilization of a simulated roof inclined at an angle of 18.4 degrees, thereby replicating a roof with a pitch of 4/12. The composition of the simulated roof comprised 2x6 #2 kiln-dried fir, emulating engineered trusses spaced at 24" OC, supplemented with 1/2" OSB to represent roof sheeting. Additionally, the roof incorporated 20 gauge metal roof sheeting.

The anchor was securely affixed to the roof structure by means of manufacturer-supplied 5/16" x 3 1/2" long stainless steel lag screws, fastened directly into the structural member.

**4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.2.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable
- c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- d) Provide enough cable to achieve a free-fall distance of 3,0.1/-0, ft (0.9, +0.03/-0m)
- e) Retract cable at full speed until desired arrest force is achieved
- f) Evaluate the test results per 3.2.2.1

**4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(4/12 Roof Pitch - 18.4 Degrees)
requirements per 3.2.2.1**

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage connector arrests test weight	Yes	Yes	Yes
Anchorage connector supports test weight for minimum one minute	Pass	Pass	Pass
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

**Direction of forces applied during 4.2.1.1.
Anchor pulled downward by static forces**



**Direction of forces applied during 4.2.2.1. + 4.2.3.1
Anchor pulled downward by dynamic forces**



**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.1.1**

- a) A new anchorage connector may be used for each test
- b) The test force shall be 5,000 pounds (22.2kN) +50/-0 pounds (+0.22/-0kN). Apply these forces in accordance with the requirements of 4.1.2.
- c) Install the anchorage connector on the test anchorage in accordance with the requirements of 4.1.2
- d) Apply the load to the anchorage connector in the direction(s) of loading specified in 4.1.2.5
- e) Apply the load at a rate not greater than 2 inches (51mm) per minute. Maintain the load above 5,000 pounds (22.2kN) for at least 3 minutes
- f) Release the load
- g) Evaluate the test results per 3.2.1.1

**4.2.1.1 Static Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.1.1**

Samples	Sample # 16	Sample # 17	Sample # 18
Anchorage Connector Withstands Applied Load	Yes	Yes	Yes
Actual load applied (lb)	5000	5000	5000
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.2.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable
- c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- d) Provide enough cable to achieve a free-fall distance of 3, +0.1/-0, ft (0.9, +0.03/-0m)
- e) Retract cable at full speed until desired arrest force is achieved
- f) Evaluate the test results per 3.2.2.1

**4.2.2.1 Dynamic Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.2.1**

Samples	Sample # 13	Sample # 14	Sample # 15
Anchorage Connector arrests test weight	Yes	Yes	Yes
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

The testing procedure entailed the utilization of a simulated roof inclined at an angle of 45 degrees, thereby replicating a roof with a pitch of 12/12. The composition of the simulated roof comprised 2x6 #2 kiln-dried fir, emulating engineered trusses spaced at 24" OC, supplemented with 1/2" OSB to represent roof sheathing. Additionally, the roof incorporated 20 gauge metal roof sheathing.

The anchor was securely affixed to the roof structure by means of manufacturer-supplied 5/16" x 3 1/2" long stainless steel lag screws, fastened directly into the structural member.

**4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.2.1**

- a) Install the anchorage connector, conditioned according to the applicable requirements of this section, on the test anchorage in accordance with the requirements of 4.1.2.
- b) Connect one end of the test lanyard to the connection point of the anchorage connector to be loaded or to the arrest force measuring instrumentation, as applicable
- c) Connect the other end of the test lanyard to the Mechanical AP Dynamometer, attached to the arrest force implementation instrumentation (12,000 lbs winch)
- d) Provide enough cable to achieve a free-fall distance of 3, 0.1/-0, ft (0.9, +0.03/-0m)
- e) Retract cable at full speed until desired arrest force is achieved
- f) Evaluate the test results per 3.2.2.1

**4.2.3.1 Residual Strength Testing of Type A Anchorage Connectors
(20 Gauge Metal & 2x6 Structural Member)
(5/16" x 3.5" Stainless Steel Lag Bolt)
(12/12 Roof Pitch - 45 Degrees)
requirements per 3.2.2.1**

Samples	Sample # 01	Sample # 02	Sample # 03
Anchorage connector arrests test weight	Yes	Yes	Yes
Anchorage connector supports test weight for minimum one minute	Pass	Pass	Pass
If gates are present, no separation more than 1/8"	NA	NA	NA
Result/Assessment	Pass	Pass	Pass

Notes

**Direction of forces applied during 4.2.1.1.
Anchor pulled downward by static forces**



**Direction of forces applied during 4.2.2.1. + 4.2.3.1
Anchor pulled downward by dynamic forces**

