

ANSI Z359.18 Type A and OSHA Test Report

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Test Report Number: 2018092700600
 Job Number: 137075
 Product Type: Type A Anchorage Connector
 Product Model: 00600 CB-1-B Bolt-on Anchor
 Dates of Manufacture: 1/1/18, 3/1/18, 4/1/18
 Date(s) of Testing: 3/26/18, 6/12-14/18, 6/8/18, 6/21/18, 7/23/18, 9/19/18

| <u>Tests Completed</u> | <u>Test Date</u> | <u>ANSI/ASSE Z359.18-2017</u> | <u>Pass/Fail</u> |
|---------------------------|-----------------------|-------------------------------|------------------|
| Design Requirements | 9/27 | | Pass |
| Static Strength | 3/26, 6/8, 6/21, 9/19 | | Pass |
| Dynamic Strength | 3/26, 6/8, 6/21, 9/19 | | Pass |
| Residual Strength | 3/26, 6/8, 6/21, 9/19 | | Pass |
| Corrosion | 6/12-14 | | Pass |
| Markings and Instructions | 9/27 | | Pass |

Please see attached test data for details

This test report covers these additional products:

00600-SS, 00601, 10685

John Halas
Engineer



Date: 9/28/18

Daniel Ortiola
Test Technician



Date: 10-01-18

Andre Pelland
Compliance and
Quality Manager



Date: 10/01/18

TEST EQUIPMENT

| Equipment | Model | Serial | |
|--------------------|-------|---------|--|
| Static load cell | | 347989A | |
| 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 |

| 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 | Yes | Yes | Yes |

| | |
|-----------------------------------|---|
| Substrate: 3" Beam Fixture | Fastener: Backer plate and (4) threaded rod assemblies |
|-----------------------------------|---|

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.) | 5030 | 5030 | 5041 |
| | 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 |

| | |
|----------------------------|------------------------------|
| Substrate: Concrete | Fastener: Hilti Hit-Z |
|----------------------------|------------------------------|

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.) | 5050 | 5049 | 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 |

| | |
|--|---|
| Substrate: 5.75" Thick Concrete Substrate | Fastener: (4) 1/2" x 3" Large Diameter Tapcon, Zinc Plated |
|--|---|

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.) | 5034 | 5027 | 5035 |
| | 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 |

| | |
|-------------------------|--------------------------------|
| Substrate: Steel | Fastener: Grade 8 Bolts |
|-------------------------|--------------------------------|

| 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.) | 5046 | 5049 | 5048 |
| | 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 | |

| | |
|-----------------------------------|--|
| Substrate: 6 x 6 Wood beam | Fastener: (4) 1/2" x 5" Lag Bolts |
|-----------------------------------|--|

4.2.1 Static Strength Testing of Anchorage Connectors
Requirements per 3.2.1.1, 3.2.1.2, 3.2.1.3 Figure 1

| 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.) | 5025 | 5022 | 5024 |
| | 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 Figure 2

| 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 |

Figure 1



Figure 1



| | | |
|---------|--|-----|
| 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 |

| 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 | N/A |
| | 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 |

| | | |
|----------------|--|-----|
| 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 | N/A |
| | 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 | N/A |
| | 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 |