November 17, 2021

Titan Constructed / HFPS, Inc.
Ken Walker / Gary Hardy

Reference: Tie-Back Roof Anchor Testing
353 Main Street Apartments
353 Main Street, Redwood City, Ca
Specialized Testing Project No. STAT92199

To whom it may concern,

Attached is our report for the referenced test program. We appreciate the opportunity to be of service. If you have any questions or comments, please do not hesitate to call.

Respectfully submitted,

Scott Stevens

Scott Stevens
Specialized Testing, Inc.

Materials Testing Since 1989

SPECIALIZED TESTING

Committed to a Safer World

IAS ACCREDITED Testing Laboratory

TECHNICIAN'S FIELD REPORT

Specialized Testing Project No. STAT92199

DATE:	11/17/2021 - 11/19/2021	**TYPE OF TEST:**	Proof Load Tests of Roof Tie-Back Anchors
JOB ADDRESS:	353 Main Street, Redwood City, Ca	**EQUIPMENT USED:**	Dynafor model LLZ2 Electronic Load Cell / Serial Number 190708 74 2001-0007
JOB NAME:	353 Main Street Apartments	**TECHNICIAN NAME:**	Daniel Moreno
CLIENT NAME:	Titan Constructed / HFPS, Inc.	**AREA(S) TESTED:**	Roof

DESCRIPTION OF FIELD SERVICES

The objective of the test program was to verify, by performing horizontal and/or vertical proof load tests, that the seventy (70) newly installed tie-back anchors installed at the 353 Main Street Apartments Project located in Redwood City, CA are suitable for use and in safe working conditions as required by CAL/OSHA Title 8, Article 6, Section 3296 guidelines.

Pursuant to the client specifications, Specialized Testing, Inc. performed horizontal proof load tests of the newly installed roof tie-back anchors. **Attachment 1** presents photographs of the test setup, and test procedure for the horizontal proof load tests of the HFPS tie-back anchors. **Attachment 2** presents photographs of the one (1) Non-HFPS anchor (#63). **Attachment 3** presents a drawing of the anchor placement and testing plan. **Attachment 4** presents Calibration Certificate for the load cell. **Table 1** presents the test results for all tests.

All tie-back anchors tested in the horizontal orientation held the applied proof load with no evidence of failure. Additionally, all tie-back anchors held the 5-minute proof load hold without exceeding the specified maximum load drop of 10-percent.

TABLE 1 - TEST RESULTS SUMMARY

TEST NO. (ANCHOR ID) (1)	ANCHOR TYPE (LOAD DIRECTION)	2,500-LBS TARGET LOAD AT 0-MIN (2)	2,500-LBS TARGET LOAD AT 5-MIN (2)	LOAD DROP %	TEST DATE	COMMENTS
1 (A1 - A2)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,530	2,440	4	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
2 (A3 - A4)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,440	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
3 (A5 - A6)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,450	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
4 (A7 - A8)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,420	4	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
5 (A9 - A10)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,440	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
6 (A11 - A12)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,530	2,460	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
7 (A13 - A14)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,500	2,430	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
8 (A15 - A16)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,505	2,430	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
9 (A17 - A18)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,440	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
10 (A19 - A20)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,450	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
11 (A21 - A22)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,505	2,420	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
12 (A23 - A24)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,440	3	11/17/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.

2520						
TEST NO. (ANCHOR ID) (1)	ANCHOR TYPE (LOAD DIRECTION)	2505	2,500-LBS TARGET LOAD AT 5-MIN (2)	LOAD DROP %	TEST DATE	COMMENTS
13 (A25 - A26)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,500	2,430	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
14 (A27 - A28)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,505	2,410	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
15 (A29 - A30)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,430	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
16 (A31 - A32)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,420	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
17 (A33 - A34)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,450	2	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
18 (A35 - A36)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,430	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
19 (A37 - A38)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,420	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
20 (A39 - A40)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,430	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
21 (A41 - A42)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,530	2,450	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
22 (A43 - A44)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,505	2,460	2	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
23 (A45 - A46)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,500	2,430	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
24 (A47 - A48)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,505	2,420	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
25 (A49 - A50)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,450	2	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
26 (A50 - A51)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,500	2,440	2	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
27 (A52 - A53)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,430	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
28 (A54 - A55)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,440	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
29 (A56 - A57)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,515	2,420	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
30 (A58 - A59)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,500	2,420	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
31 (A60 - A61)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,430	4	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
32 (A62 - A63)	Hardy Fall Protection Systems, Inc. Tie-Back Anchor (A62)- **Anchor A63 was a Non-HFPS Anchor** (Horizontal)	2,505	2,440	3	11/18/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.

TABLE 1 - TEST RESULTS SUMMARY - CONTINUED						
TEST NO. (ANCHOR ID) (1)	ANCHOR TYPE (LOAD DIRECTION)	2,500-LBS TARGET LOAD AT 0-MIN (2)	2,500-LBS TARGET LOAD AT 5-MIN (2)	LOAD DROP %	TEST DATE	COMMENTS
33 (A64 - A65)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,510	2,450	2	11/19/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
34 (A66 - A67)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,530	2,440	4	11/19/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
35 (A68 - A69)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,505	2,430	3	11/19/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.
36 (A69 - A70)	Hardy Fall Protection Systems, Inc. Tie-Back Anchors (Horizontal)	2,520	2,450	3	11/19/2021	The load drop was less than 10%. No visual evidence of failure and or permanent deformation.

(1) Anchor ID = Specialized Testing, Inc. ID Number

(2) The force or proof load and load hold duration were provided by the client.

(3) The test results relate to the tested specimens only.

TECHNICIAN SIGNATURE: *Danny Moreno*

APPROVED BY: Scott Stevens

SIGNED FOR THE COMPANY: *Scott Stevens*

Scott Stevens



Digitally signed by Thomas A. Kolden
Date: 2021.11.22 12:06:45 -06'00'

ATTACHMENT 1 - HORIZONTAL LOAD TEST SETUP AND PROCEDURE

353 Main Street, Redwood City, Ca
Specialized Testing Project No. STAT92199



Figure 1 - Hardy Fall Protection Systems, Inc. Tie-Back Anchor Horizontal Load Test Setup
1 = Turnbuckle (Used to Apply Load), 2 = Load Cell, and 3 = Levels to Measure Displacement

Horizontal Load Test Procedure

- The test apparatus was positioned on a group of two tie-back anchors as shown in Figure 1
- The horizontal load was steadily imparted to the tie-back anchors until a minimum proof load of 2,500-lbs. was achieved
- The 2,500-lbs. minimum proof load was held for five minutes
- The system was monitored during the 5 minute load hold to determine if the specified maximum load drop of 10-percent of the specified proof load (250-lbs.) was observed
- After the 5 minute load hold, the load was released and a visual inspection of the tie-back anchors was performed.

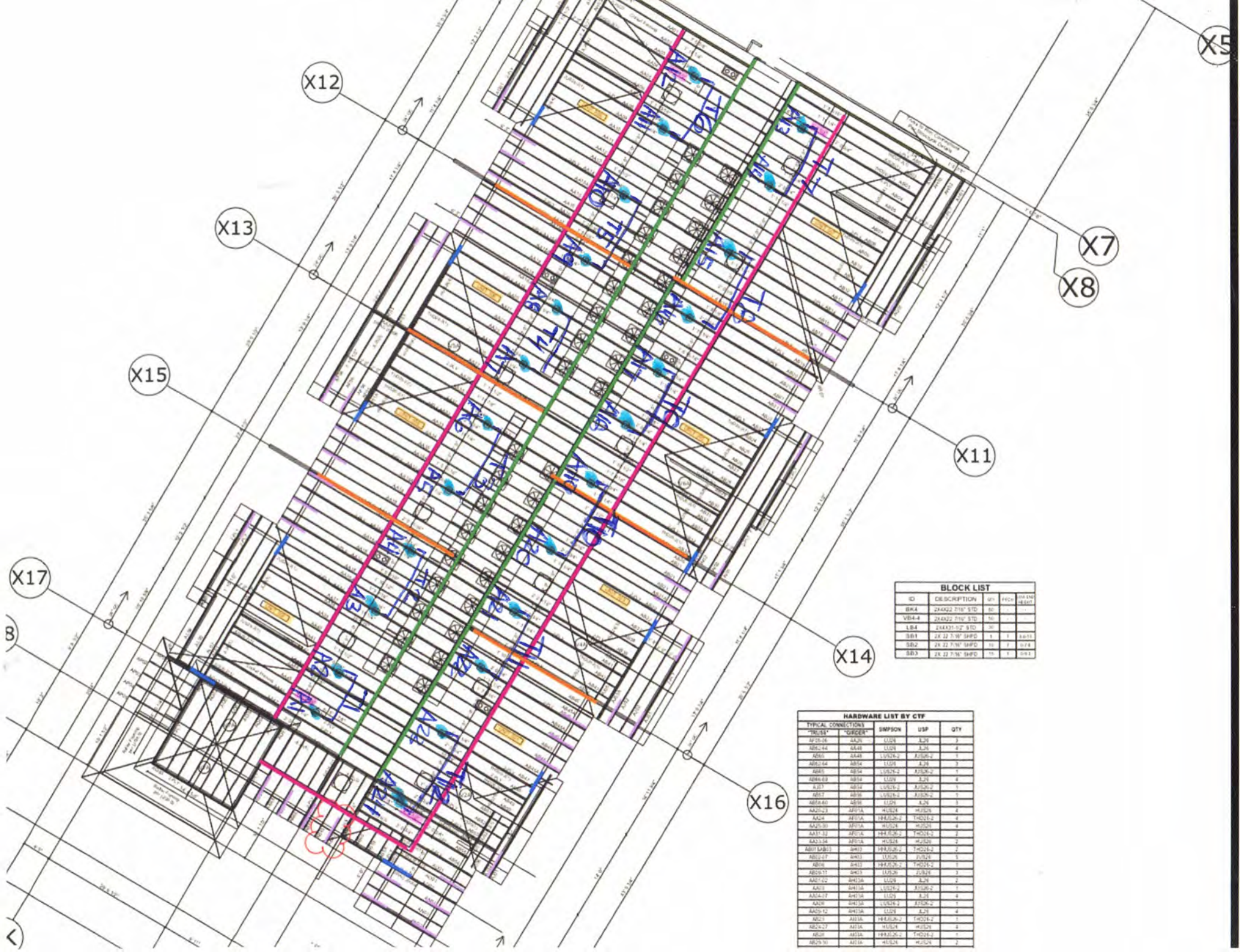
ATTACHMENT 2 - NON-HFPS ANCHOR

353 Main Street, Redwood City, Ca
Specialized Testing Project No. STAT92199



Figure 1 - Non-HFPS Tie-Back Anchor

ATTACHMENT 3 - ROOF PLAN OF ANCHOR PLACEMENT AND TEST PLAN



BLOCK LIST				
ID	DESCRIPTION	QTY	PITCH	THK ENC HEIGHT
BK4	24.4X22 7/16" STD	60	-	-
VB4-4	24.4X22 7/16" STD	50	-	-
LB4	24.4X31-1/2" STD	30	-	-
SB1	24' 22 7/16" SHPD	1	1	6.4-11
SB2	24' 22 7/16" SHPD	15	1	0-7.4
SB3	24' 22 7/16" SHPD	15	1	0-6.1

HARDWARE LIST BY CTF				
TYPICAL CONNECTIONS		SIMPSON	USP	QTY
"TRUSS"	"GIRDER"			
AF05-06	AA26	LUS28	RJC26	3
AB62-64	AA48	LUS28	RJC26	4
AB60	AA48	LUS26-2	RJC26-2	1
AB62-64	AB54	LUS28	RJC26	3
AB65	AB54	LUS26-2	RJC26-2	1
AB66-69	AB54	LUS28	RJC26	4
AJ07	AB54	LUS26-2	RJC26-2	1
AB67	AB56	LUS26-2	RJC26-2	1
AB68-60	AB56	LUS28	RJC26	3
AA20-23	AF01A	HUS26	HUS26	4
AA24	AF01A	HHUS26-2	THD26-2	4
AA25-30	AF01A	HUS26	HUS26	4
AA31-33	AF01A	HHUS26-2	THD26-2	2
AA33-34	AF01A	HUS26	HUS26	2
AB01 AB03	BH03	HHUS26-2	THD26-2	2
AB02-07	BH03	LUS26	JUS26	5
AB08	BH03	HHUS26-2	THD26-2	1
AB09-11	BH03	LUS26	JUS26	3
AA27-32	BH03A	LUS28	RJC26	2
AA01	BH03A	LUS26-2	RJC26-2	1
AA04-07	BH03A	LUS28	RJC26	4
AA08	BH03A	LUS26-2	RJC26-2	1
AA09-12	BH03A	LUS28	RJC26	4
AB21	AB13A	HHUS26-2	THD26-2	1
AB24-27	AB13A	HUS26	HUS26	4
AB28	AB13A	HHUS26-2	THD26-2	1
AB29-30	AB13A	HUS26	HUS26	2

SECTION B

EBM



ATTACHMENT 4 - CALIBRATION CERTIFICATE

Report and Certificate of Calibration

CAL-CERT CALIBRATION CERTIFICATION
"Measure the Difference"

www.Cal-Cert.com

Toll Free
888-700-4100

Address
120 S. Chaparral Ct Suite 110
Anaheim Hills, CA 92808

Local
714-696-5300

A2LA ACCREDITED
CERT #4986.02

Report #:	18414-145458-1564	**Customer PO#:**	
Customer Name:	Specialized Testing		
Customer Address:	10600 Pioneer Boulevard, Suite G		
City:	Santa Fe Springs	**State:** CA	**Zip:** 90670
Contact:	Kevin Kwan		
Service Address:	120 S. Chaparral Court, Suite 110	Anaheim Hills, CA 92808	

Calibration Standards

ACS132T / 00222 | Load Cell | Strainsense | SN: 901018B | Cal: 03/27/2020 | Due: 03/31/2021 | Vendor: Cal-Cert | Range: 981.00 - 30,000 lbf | Report #: 13343-75998-318
ACS386T / 00222 | Load Cell | Strainsense | SN: 090129 | Cal: 03/19/2020 | Due: 03/31/2021 | Vendor: Cal-Cert | Range: 166.00 - 3,000 lbf | Report #: 13343-75997-318
ACS436 | Thermo-Hygrometer | Comark | SN: 06205950003 | Cal: 05/13/2020 | Due: 05/31/2021 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 14154-78091-65

Instrument Data

Calibration Date:	March 10, 2021	**Reference:**		ASTM E-4
Recommended Due Date:	March 10, 2022	**Cal-Cert Procedure:**		CP-001
Calibration Frequency:	12 Months	**Indicating System:**		Digital
Manufacturer:	Dynafor	**Temperature:**	68	°F
Type:	Load Cell Dynamometer	**Humidity:**	37%	RH
Model Number:	LLZ2	**Cal Factor:**		None
Serial #:	190708 74 2001-0007	**Asset #:**		None
Capacity:	3200 kilograms	**Service Location:**		Cal-Cert Lab
Tolerance:	See Remarks Full Scale	**As Found:**		Pass
Allowable Error:	9.6 kilograms	**As Left:**		Pass

Instrument Range: 3,200 **kilograms** **Resolution:** 1 **kilograms** **Mode Verified:** Tension

Unit Under Test Reading	As Found	Tolerance	Verification Reading #1	Error	Tolerance	Verification Reading #2	Error	Tolerance	Average Error
0	0	0	0	0	0	0	0	0	0
320	320.5	0.96	320.5	0.5	0.96	320	0	0.96	0.25
640	640	1.92	640	0	1.92	641	1	1.92	0.5
1280	1282	3.84	1282	2	3.84	1283	3	3.84	2.5
1920	1923	5.76	1923	3	5.76	1924	4	5.76	3.5
2560	2565	7.68	2565	5	7.68	2567	7	7.68	6.0
3040	3048	9.12	3048	8	9.12	3047	7	9.12	7.5
0	0	0	0	0	0	0	0	0	0

Expanded Uncertainty ± 2.3268 kilograms

Copyright 2013 Cal-Cert. All rights reserved.

Manufacturer: Dynafor **Type:** Load Cell Dynamometer **Serial #:** 190708 74 2001-0007

Remarks:

Tolerance is +/-0.3% I,V.

We sincerely thank you for your business. Please call us at 714-696-5300 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.02.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.
Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.
All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Mike Blanco **Date:** March 10, 2021

Technical Manager: Marshall Doyle **Signature:** 

Report #: 18414-145458-1564

Copyright 2013 Cal-Cert. All rights reserved.