

OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0033

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [] New [X] Renewal

Manufacturer Information

Manufacturer: Loren Cook Company

Manufacturer's Technical Representative: Bradley Skidmore

Mailing Address: 2015 E Dale St., Springfield, MO 65803

Telephone: (417) 869-6474

Email: bskidmore@lorencook.com

Product Information

Product Name: Exhaust/Smoke Control Fans

Product Type: NA

Product Model Number: ACRU, VCR, ACSC

General Description: Centrifugal Exhaust Fans for roof mount up to and including size 490. Applications include general Ventilation (ACRU), kitchen ventilation (VCR) and smoke control systems (ACSC). Seismic enhancements made to the test units and modifications required to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid, Floor Mounted

Applicant Information

Applicant Company Name: Structural Integrity Associates, Inc. dba TRU Compliance

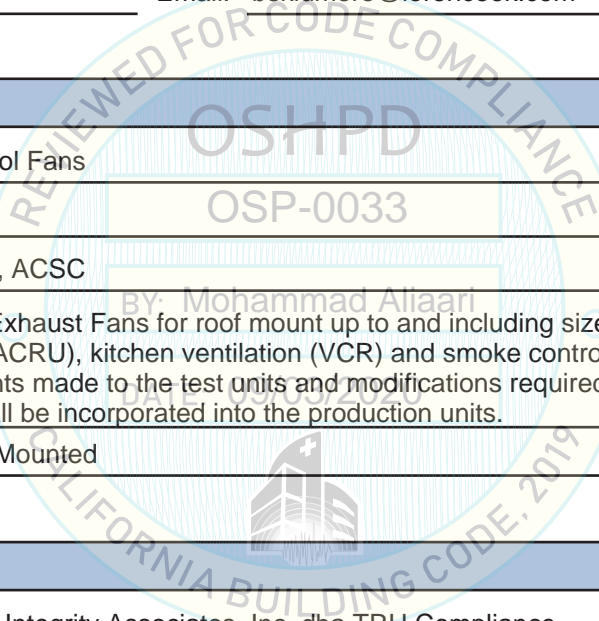
Contact Person: Galen Reid

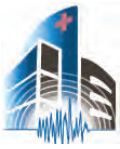
Mailing Address: 5215 Hellyer Ave. Suite 210, San Jose, CA 95138

Telephone: (541) 604-7225

Email: greid@structint.com

Title:





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California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.
Name: Andrew Coughlin California License Number: S6082
Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025
Telephone: (844) 878-0200 Email: acoughlin@structint.com

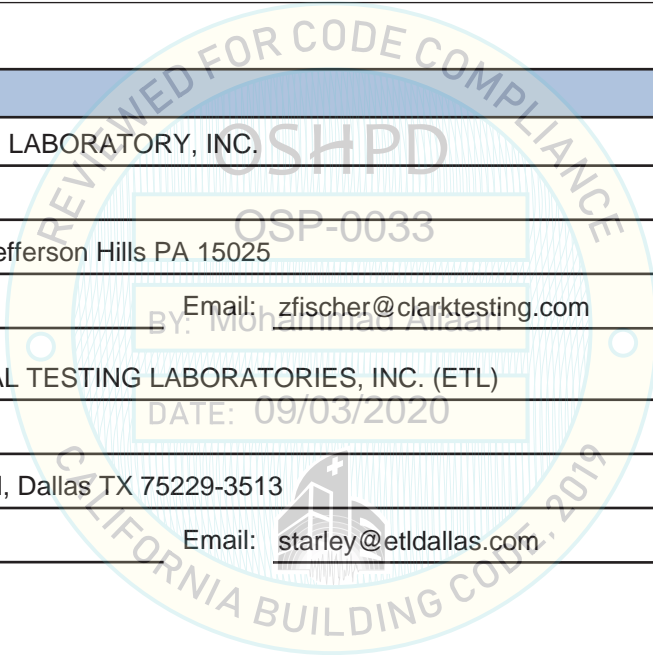
Certification Method

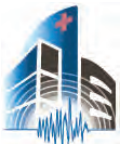
GR-63-Core ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
 Other (Please Specify): _____

Testing Laboratory

Company Name: CLARK TESTING LABORATORY, INC.
Contact Person: Zach Fischer
Mailing Address: 1801 Route 51, Jefferson Hills PA 15025
Telephone: (412) 387-1676 Email: zfischer@clarktesting.com

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)
Contact Person: Jeremy Lange
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513
Telephone: (972) 247-9657 Email: starley@etldallas.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.45

SDS (Design spectral response acceleration at short period, g) = 1.93

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0

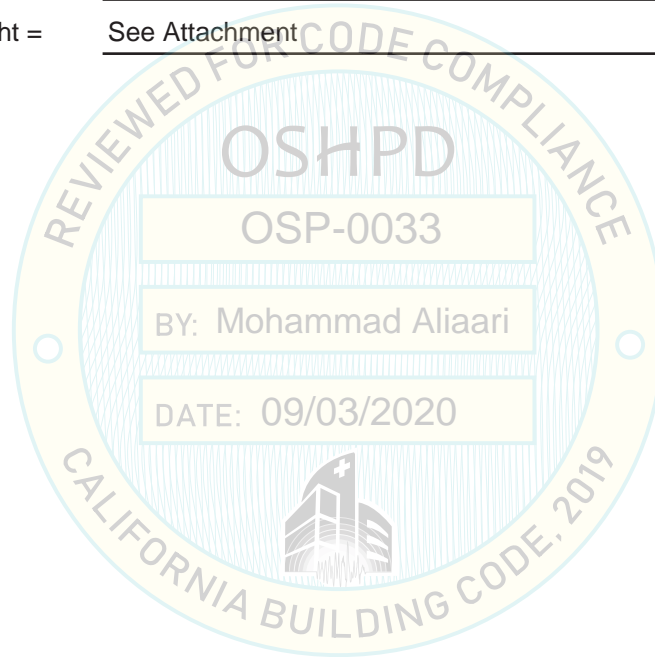
Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment



OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025

Date: 9/3/2020

Name: Mohammad Aliaari Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = 1.93 z/h = 1

Condition of Approval (if applicable): _____



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900240-CR-001 R0



Manufacturer: Loren Cook Company						TABLE 1	
Model Line: ACRU, VCR, ACSC							
Certified Product Construction Summary: Aluminum base with aluminum construction and aluminum wheel. Direct Drive Motor							
Certified Options Summary: With or without fiberglass insulation; Birdscreen							
Mounting Configuration: Rigid base mounted on up to 24" carbon steel curb							
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$			$I_p = 1.5$		
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
ACRUD ACRUD-HP ACRUD-XP VCRD VCRD-HP VCRD-XP (Direct Drive)	70	17.1	17.1	40.4	59	UUT: ACRUD tested - 24" curb	6
	90	21.1	21.1	40.4	67		Interp.
	100	21.1	21.1	40.4 ¹	70 ²	UUT: ACRUD tested - 8" curb	4
	101	25.3	25.3	46.4	71		Interp.
	120	30.2	30.2	50.2	110		Interp.
	135	30.2	30.2	50.6	116		Interp.
	150	34.7	34.7	54.3	132	UUT: ACRUD tested - 24" curb	8
	165	34.7	34.7	54.3	136		Interp.
	180	39.5	39.5	56.9	150		Interp.
	195	39.5	39.5	57.5	129 174.5	UUT 3: VCRD-HP tested - 24" curb UUT 7: VCRD-XP tested - 24" curb	3, 7
	210	45.3	45.3	59.4	262		Interp.
	225	45.3	45.3	59.1	286		Interp.
	245	49.3	49.3	62.1	310		Interp.
	270	49.3	49.3	62.1	333		Interp.
300	54.3	54.3	65.4	383	UUT: ACRUD-XP tested - 24" curb	9	
¹ Listed height is with 24" curb. Height of tested UUT with 8" curb is 24.4". ² Listed weight is with 24" curb. Weight of tested UUT with 8" curb is 42 lbs.							

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1900240-CR-001 R0

Manufacturer: Loren Cook Company						TABLE 2	
Model Line: ACRU, VCR, ACSC							
Certified Product Construction Summary: ASCS: Carbon steel base with aluminum construction, carbon steel wheels. VCR/ACRUB: Aluminum base with aluminum construction and aluminum wheel. Belt Drive							
Certified Options Summary: With or without fiberglass insulation; Birdscreen							
Mounting Configuration: Rigid base mounted on up to 24" carbon steel curb							
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$			$I_p = 1.5$		
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
ACSC ACSC-HP ACSC-XP (Belt Drive)	100	25.3	25.3	42.2	76		Extrap.
	120	30.2	30.2	50.3	114		Extrap.
	135	30.2	30.2	50.6	121		Extrap.
	150	34.7	34.7	52.3	143		Extrap.
	165	34.7	34.7	52.8	156		Extrap.
	180	39.4	39.4	56.9	189		Extrap.
	195	39.4	39.4	57.4	206		Extrap.
	210	45.3	45.3	59.4	334		Extrap.
	225	45.3	45.3	59.1	367		Extrap.
	245	49.3	49.3	65.1	430	UUT: ACSC tested - 24" curb	1
	270	49.3	49.3	65.1	458		Interp.
	300	54.3	54.3	70.9	466		Interp.
	330	54.3	54.3	74.4	479	UUT: ACSC tested - 24" curb	5
	ACRUB ACRUB-HP ACRUB-XP VCR VCR-HP VCR-XP (Belt Drive)	100	25.3	25.3	42.2	70		Interp.
120		30.2	30.2	50.3	106		Interp.
135		30.2	30.2	50.6	112		Interp.
150		34.7	34.7	52.3	132		Interp.
165		34.7	34.7	52.8	143		Interp.
180		39.4	39.4	56.9	175		Interp.
195		39.4	39.4	57.4	192		Interp.
210		45.3	45.3	59.4	315		Interp.
225		45.3	45.3	59.1	342		Interp.
245		49.3	49.3	62.1	390		Interp.
270	49.3	49.3	62.1	418		Interp.	

TRU Compliance, by Structural Integrity Associates, Inc.

844-TRU-0200 | info@trucompliance.com

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1900240-CR-001 R0



Manufacturer: Loren Cook Company Model Line: ACRU, VCR, ACSC						TABLE 2	
Certified Product Construction Summary: ASCS: Carbon steel base with aluminum construction, carbon steel wheels. VCR/ACRUB: Aluminum base with aluminum construction and aluminum wheel. Belt Drive							
Certified Options Summary: With or without fiberglass insulation; Birdscreen							
Mounting Configuration: Rigid base mounted on up to 24" carbon steel curb Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$				$I_p = 1.5$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
ACRUB	300	54.3	54.3	70.9	476		Interp.
ACRUB-HP	330	54.3	54.3	71.4	542		Interp.
ACRUB-XP	365	64.3	64.3	73.4	592		Interp.
VCR	402	64.3	64.3	75.7	612		Interp.
VCR-HP	445	76.3	76.3	78.2	624		Interp.
VCR-XP (Belt Drive)	490	76.3	76.3	82.1	637	UUT: ACRUB tested - 24" curb	10

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1900240-CR-001 R0



Manufacturer: Loren Cook Company		Table Description: Motors & Drives			TABLE 3	
Model Line: ACRU, VCR, ACSC						
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$			$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT	
Motor	Baldor/Reliance	1/3 HP	Weight: 29 lbs.		Extrap.	
		...	...		Extrap.
		3/4 HP	Weight: 32 lbs.	UUT: 230V - 1 phase	3	
		...	...		Interp.
	WEG	2 HP	Weight: 48 lbs.	UUT: 460V - 3 phase	1	
		1/6 HP	Weight: 23 lbs.		Extrap.	
		...	...		Extrap.
		5 HP	Weight: 62 lbs.	UUT: 460V - 3 phase	5	
	Quaece	...	...		Interp.
		7.5 HP	Weight: 77 lbs.	UUT: 460V - 3 phase	10	
		1/4 HP	Weight: 22 lbs.	UUT: 115V - 1 phase	4	
	McMillan	1/6 HP	Weight: 9 lbs.	UUT: 120V - 1 phase	6	
		...	...		Interp.
	Marathon	1/4 HP	Weight: 12 lbs.	UUT: 120V - 1 phase	7	
		1 HP	Weight: 18 lbs.	UUT: 460V - 3 phase	8	
...		...		Interp.		
Motor Drives	Yaskawa	5 HP	Weight: 108 lbs.	UUT: 460V - 3 phase	9	
		CIMR-VU4A0001__A	Weight: 2.6 lbs.	Motor Speed Controller	Extrap.	
		CIMR-VU4A0002__A	Weight: 3.1 lbs.	Motor Speed Controller	8	
		CIMR-VU4A0004__A	Weight: 3.5 lbs.	Motor Speed Controller	Interp.	
		CIMR-VU4A0005__A	Weight: 4.2 lbs.	Motor Speed Controller	Interp.	
		CIMR-VU4A0007__A	Weight: 4.2 lbs.	Motor Speed Controller	Interp.	
CIMR-VU4A0009__A	Weight: 4.2 lbs.	Motor Speed Controller	9			

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company						
Model Line: ACRU, VCR, ACSC						
UUT	Unit Description	Report Number	Testing Laboratory	S _{DS}	z/h	I _p
1	245 ACSC (Belt Drive)	Test Report EL8964	Clark Dynamic Test Laboratory	2.28 2.28	1.0 0.0	1.5
3	195 VCRD-HP (Direct Drive)	12695 Rev. 1	Environment Testing Laboratory (ETL)	1.93 1.93	1.0 0.0	1.5
4	100 ACRUD (Direct Drive)	12695 Rev. 1	Environment Testing Laboratory (ETL)	2.50 2.50	1.0 0.0	1.5
5	330 ACSC (Belt Drive)	12695 Rev. 1	Environment Testing Laboratory (ETL)	2.50 2.50	1.0 0.0	1.5
6	70 ACRUD (Direct Drive)	15331 Rev. 2	Environment Testing Laboratory (ETL)	1.93 1.93	1.0 0.0	1.5
7	195 VCRD-XP (Direct Drive)	15331 Rev. 2	Environment Testing Laboratory (ETL)	1.93 1.93	1.0 0.0	1.5
8	150 ACRUD (Direct Drive)	15331 Rev. 2	Environment Testing Laboratory (ETL)	1.93 1.93	1.0 0.0	1.5
9	300 ACRUD-XP (Direct Drive)	15331 Rev. 2	Environment Testing Laboratory (ETL)	1.93 1.93	1.0 0.0	1.5
10	490 ACRUB (Belt Drive)	1900240-TR-001	Environment Testing Laboratory (ETL)	2.0	1.0	1.5
Notes:						

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company	UUT 1
Model Line: ACRU, VCR, ACSC	
Model Number: 245 ACSC (Belt Drive) Serial Number: N/A	

Product Construction Summary:
Belt drive upblast spun aluminum ventilator. Carbon steel base and carbon steel wheel. Fiberglass insulation pad laying on top of the support base.
Certification excludes dampers and controllers - not tested

Options/Subcomponent Summary:
2HP Baldor motor 460V three phase; carbon steel roof curb with a height of 24"

<i>UUT Properties¹</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
430	49.3	49.3	65.1	6.3	7.0	15.6

^[1]Note: Unit weight and height includes weight and height of curb.

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 (2015)	2.28	1.0	1.5	3.65	2.74	1.52	0.61
		2.28	0.0					

Test Mounting Details:



UUT was mounted directly to the seismic table using (24) 3/8"-16 socket cap bolts with flat washers and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

UUT 3

Manufacturer: Loren Cook Company
Model Line: ACRU, VCR, ACSC
Model Number: 195 VCRD - HP (Direct Drive) **Serial Number:** N/A

Product Construction Summary:

Direct drive upblast spun aluminum ventilator. Aluminum base and aluminum wheel. Fiberglass insulation pad laying on top of the support base.
 Certification excludes dampers and controllers - not tested

Options/Subcomponent Summary:

3/4HP WEG motor 230V single phase; carbon steel roof curb with a height of 24"

UUT Properties¹

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
175	39.5	39.5	57.5	7.13	6.67	6.70

^[1]Note: Unit weight and height includes weight and height of curb.

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 (2015)	1.93	1.0	1.5	3.09	2.32	1.29	0.51
		1.93	0.0					

Test Mounting Details:



UUT was mounted directly to the seismic table using (24) 3/8"-16 Grade 8 socket cap bolts with flat washers and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company	UUT 4
Model Line: ACRU, VCR, ACSC	
Model Number: 100 ACRUD (Direct Drive) Serial Number: N/A	

Product Construction Summary:
Direct drive upblast spun aluminum ventilator. Aluminum base and aluminum wheel.
Certification excludes dampers and controllers - not tested

Options/Subcomponent Summary:
1/4HP Quaece motor 115V single phase; carbon steel roof curb with a height of 8"

<i>UUT Properties¹</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
42	21.2	21.2	24.4	16.32	15.76	22.55

^[1]Note: Unit weight and height include weight and height of curb.

<i>UUT Highest Passed Seismic Run Information</i>									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2019	ICC-ES AC156 (2015)	2.5	1.0	1.5	4	3	1.67	0.67	
		2.5	0.0						

Test Mounting Details:



UUT was mounted directly to the seismic table using (12) 3/8"-16 Grade 8 socket cap bolts with flat washers and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company	UUT 5
Model Line: ACRU, VCR, ACSC	
Model Number: 330 ACSC (Belt Drive) Serial Number: N/A	

Product Construction Summary:
Belt drive upblast spun aluminum ventilator. Galvanized steel base and carbon steel wheel. Fiberglass insulation pad laying on top of the support base.
Certification excludes dampers and controllers - not tested

Options/Subcomponent Summary:
5HP WEG motor 460V three phase; carbon steel roof curb with a height of 24"

<i>UUT Properties¹</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
479	54.3	54.3	74.4	9.20	9.13	8.78

^[1]Note: Unit weight and height includes weight and height of curb.

<i>UUT Highest Passed Seismic Run Information</i>									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2019	ICC-ES AC156 (2015)	2.5	1.0	1.5	4	3	1.67	0.67	
		2.5	0.0						

Test Mounting Details:



UUT was mounted directly to the seismic table using (40) 3/8"-16 Grade 8 socket cap bolts with flat washers and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company	UUT 6
Model Line: ACRU, VCR, ACSC	
Model Number: 70 ACRUD (Direct Drive) Serial Number: N/A	

Product Construction Summary:
All aluminum housing; Direct drive upblast spun aluminum; Backward inclined aluminum fan wheel; Two piece top cap with 3" height extension
Certification excludes dampers - not tested.

Options/Subcomponent Summary:
1/6HP Mcmillan motor; galv. carbon steel roof curb with a height of 24"; fan mounted speed control; NEMA 3 Disconnect; Electronically commutated Vari-flow motor; Birdscreen

<i>UUT Properties¹</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
59	17.1	17.1	40.4	12.17	11.41	19.43

^[1]Note: Unit weight and height includes weight and height of curb.

<i>UUT Highest Passed Seismic Run Information</i>									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2019	ICC-ES AC156 (2015)	1.93	1.0	1.5	3.09	2.32	1.29	0.51	
		1.93	0.0						

Test Mounting Details:



Fan to curb (hinged base): (15) #12 sheet metal screws (5 per side).
Curb to table: (12) 3/8" grade 8 socket cap bolts with flat washers (3 bolts/washers per side).
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

UUT 7

Manufacturer: Loren Cook Company
Model Line: ACRU, VCR, ACSC
Model Number: 195 VCRD-XP (Direct Drive) **Serial Number:** N/A

Product Construction Summary:

All aluminum housing; Direct drive upblast spun aluminum; Backward inclined aluminum fan wheel; Two piece top cap with stainless steel quick release latches
 Certification excludes dampers - not tested.

Options/Subcomponent Summary:

1/4HP Mcmillan motor; galv. carbon steel roof curb with a height of 24"; fan mounted speed control; NEMA 3 Disconnect; Electronically commutated Vari-flow motor; UL762

UUT Properties¹

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
129	39.5	39.5	57.5	10.39	9.46	9.38

^[1]Note: Unit weight and height includes weight and height of curb.

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 (2015)	1.93	1.0	1.5	3.09	2.32	1.29	0.51
		1.93	0.0					

Test Mounting Details:



Fan to curb (hinged base): (24) #12 sheet metal screws (8 per side).
 Curb to table: (24) 3/8" grade 8 socket cap bolts with flat washers (6 bolts/washers per side).
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company	UUT 8
Model Line: ACRU, VCR, ACSC	
Model Number: 150 ACRUD (Direct Drive) Serial Number: N/A	

Product Construction Summary:
All aluminum housing; Direct drive upblast spun aluminum; Backward inclined aluminum fan wheel; Two piece top cap with stainless steel quick release latches (sizes 120-300).
Certification excludes dampers - not tested.

Options/Subcomponent Summary:
1HP Marathon motor with external Yaskawa V1000 drive (CIMR-VU4A0002AA); galv. carbon steel roof curb with a height of 24"; fan mounted speed control; NEMA 3 Disconnect; Electronically commutated Vari-flow motor; Plastic drain tube; Birdscreen

<i>UUT Properties¹</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
132	34.6	34.6	54.3	8.25	8.02	16.65

^[1]Note: Unit weight and height includes weight and height of curb.

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 (2015)	1.93	1.0	1.5	3.09	2.32	1.29	0.51
		1.93	0.0					

Test Mounting Details:



Fan to curb: (24) #12 sheet metal screws (6 per side).
Curb to table: (20) 3/8" grade 8 socket cap bolts with flat washers (5 bolts/washers per side).
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

Manufacturer: Loren Cook Company	UUT 9
Model Line: ACRU, VCR, ACSC	
Model Number: 300 ACRUD-XP (Direct Drive) Serial Number: N/A	

Product Construction Summary:
All aluminum housing; Direct drive upblast spun aluminum; Backward inclined aluminum fan wheel; Two piece top cap with stainless steel quick release latches (sizes 120-300).
Certification excludes dampers - not tested.

Options/Subcomponent Summary:
5HP Marathon motor with external Yaskawa V1000 drive (CIMR-VU4A0009FAA); galv. carbon steel roof curb with a height of 24"; fan mounted speed control; NEMA 3 Disconnect; Plastic drain tube; Birdscreen

<i>UUT Properties¹</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
383	54.3	54.3	65.4	9.00	10.05	16.45

^[1]Note: Unit weight and height includes weight and height of curb.

<i>UUT Highest Passed Seismic Run Information</i>								
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 (2015)	1.93	1.0	1.5	3.09	2.32	1.29	0.51
		1.93	0.0					

Test Mounting Details:



Fan to curb: (36) #12 sheet metal screws (9 per side).
Curb to table: (32) 3/8" grade 8 socket cap bolts with flat washers (8 bolts/washers per side).
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900240-CR-001 R0

UUT 10

Manufacturer: Loren Cook Company
Model Line: ACRU, VCR, ACSC
Model Number: 490 ACRUB (Belt Drive) **Serial Number:** N/A

Product Construction Summary:
 Belt drive upblast spun aluminum ventilator. Aluminum base and aluminum wheel.
 Certification excludes dampers and controllers - not tested

Options/Subcomponent Summary:
 7.5HP WEG motor 460V three phase; carbon steel roof curb with a height of 24"

UUT Properties¹

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
637	76.3	76.3	82.1	4.4	4.4	3.0

^[1]Note: Unit weight and height includes weight and height of curb.

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019	ICC-ES AC156 (2015)	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Test Mounting Details:



UUT was mounted directly to the seismic table using (28) 3/8" Grade 5 bolts with flat washers and lock washers. Fan was mounted to curb using (52) 3/8" Grade 5 bolts. An additional 1.75" OD aluminum fender washer with galvanized SAE washer was added to each brace bolt at outside of housing.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.