



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0442

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Loren Cook Company

Manufacturer's Technical Representative: Bradley F. Skidmore, P.E.

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

Telephone: 417-869-6474

Email: bskidmore@lorencook.com

Product Information

Product Name: QMX-VP/QMXHP-VP

Product Type: Belt Drive Laboratory Exhaust Fans

Product Model Number: See Attachment

(List all unique product identification numbers and/or part numbers)

General Description: Belt drive laboratory exhaust fans with mixing box and fiberglass discharge nozzle.

Mounting Description: Rigid base mounted on 18" high curb, maximum.

Applicant Information

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


Contact Person: Galen Reid

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

Telephone: 541-604-7225

Email: greid@structint.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

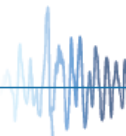
Signature of Applicant: 

Date: 8/7/2019

Title: Program Manager

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"





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

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Name: Andrew Coughlin, SE California License Number: S6082

Mailing Address: 5215 Hellyer Ave, Suite 210, San Jose, CA 94608

Telephone: (844) 878-0200 Email: acoughlin@structint.com

Supports and Attachments Preapproval

Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)

Supports and attachments are not preapproved

Certification Method

Testing in accordance with: ICC-ES AC156

Other (Please Specify): _____

BY: Mohammad Aliaari

DATE: 10/23/2020

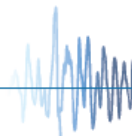
Testing Laboratory

Company Name: Environmental Testing Laboratory, Inc.

Contact Name: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas, TX 75229-3513

Telephone: (972) 247-9657 Email: jeremy@etldallas.com





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Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: [X] Yes [] No

Design Basis of Equipment or Components (Fp/Wp) = 1.50 (SDS = 2.0g); 1.44 (SDS = 3.2g)

SDS (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1.0); 3.20 (z/h = 0.0)

ap (In-structure equipment or component amplification factor) = 2.5

Rp (Equipment or component response modification factor) = 6

Omega_0 (System overstrength factor) = 2.0

Ip (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0 (SDS = 2.00g); 0.0 (SDS = 3.20g)

Equipment or Component Natural Frequencies (Hz) = See Attachment

Overall dimensions and weight (or range thereof) = See Attachment

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: [] Yes [X] No

Design Basis of Equipment or Components (V/W) =

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

SD1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) =

Omega_0 (System overstrength factor) =

Cd (Deflection amplification factor) =

Ip (Importance factor) = 1.5

Height to Center of Gravity above base =

Equipment or Component Natural Frequencies (Hz) =

Overall dimensions and weight (or range thereof) =

Tank(s) designed in accordance with ASME BPVC, 2015: [] Yes [] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [] Drawings [] Calculations [X] Manufacturer's Catalog

[X] Other(s) (Please Specify): Product Matrices

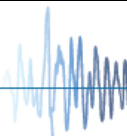
OSHPD Approval (For Office Use Only) - Approval Expires on December 31, 2025

Signature: M. Aliaari Date: October 23, 2020

Print Name: Mohammad Aliaari Title: Senior Structural Engineer

Special Seismic Certification Valid Up to : SDS (g) = See Above z/h = See Above

Condition of Approval (if applicable):



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1900241-CR-001 R0

Manufacturer: Loren Cook Company						TABLE 1	
Model Line: QMX-VP/QMXHP-VP							
Certified Product Construction Summary: Painted carbon steel welded housing. Carbon steel welded wheel. Stainless steel shaft. Stainless steel hardware. NEMA 3R disconnect.							
Certified Options Summary: Belt drive. With or without fiberglass reinforced plastic induction nozzle. With or without mixing box. Standard pressure (QMX-VP) or high pressure (QMXHP-VP). <i>*Dimensions and weight shown are with curb, nozzle, and mixing box.</i>							
Mounting Configuration: Rigid base mounted on 18" high curb, maximum Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 2.0 g \quad z/h=1.0$ $S_{DS} = 3.2 g \quad z/h=0.0$		$I_p = 1.5$
Model Line	Model	*Dimensions (in)			*Weight (lb)	Notes	UUT
		Depth	Width	Height			
QMX-VP	90QMXVP09H	28.0	38.0	110.0	1,023		1
	90QMXVP09L	28.0	38.0	92.0	1,023		Interp.
	120QMXVP09H	28.0	40.4	100.0	1,277		Interp.
	120QMXVP09L	28.0	40.4	100.0	1,277		Interp.
	120QMXVP12H	28.0	40.4	100.0	1,277		Interp.
	120QMXVP12L	28.0	40.4	100.0	1,277		Interp.
	135QMXVP09H	28.0	41.6	108.0	1,403		Interp.
	135QMXVP09L	28.0	41.6	108.0	1,403		Interp.
	135QMXVP12H	28.0	41.6	108.0	1,403		Interp.
	135QMXVP12L	28.0	41.6	108.0	1,403		Interp.
	150QMXVP09H	30.0	44.1	120.0	1,542		Interp.
	150QMXVP09L	30.0	44.1	120.0	1,542		Interp.
	150QMXVP12H	30.0	44.1	120.0	1,542		Interp.
	150QMXVP12L	30.0	44.1	120.0	1,542		Interp.
	150QMXVP15H	30.0	44.1	120.0	1,542		Interp.
	150QMXVP15L	30.0	44.1	120.0	1,542		Interp.
	165QMXVP09H	32.0	45.5	125.0	1,750		Interp.
	165QMXVP09L	32.0	45.5	125.0	1,750		Interp.
	165QMXVP12H	32.0	45.5	125.0	1,750		Interp.
	165QMXVP12L	32.0	45.5	125.0	1,750		Interp.
	165QMXVP15H	32.0	45.5	125.0	1,750		Interp.
	165QMXVP15L	32.0	45.5	125.0	1,750		Interp.
	180QMXVP12H	34.0	48.0	133.0	2,120		Interp.
	180QMXVP12L	34.0	48.0	133.0	2,120		Interp.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1900241-CR-001 R0

Manufacturer: Loren Cook Company						TABLE 1	
Model Line: QMX-VP/QMXHP-VP							
Certified Product Construction Summary: Painted carbon steel welded housing. Carbon steel welded wheel. Stainless steel shaft. Stainless steel hardware. NEMA 3R disconnect.							
Certified Options Summary: Belt drive. With or without fiberglass reinforced plastic induction nozzle. With or without mixing box. Standard pressure (QMX-VP) or high pressure (QMXHP-VP). *Dimensions and weight shown are with curb, nozzle, and mixing box.							
Mounting Configuration: Rigid base mounted on 18" high curb, maximum Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 2.0 g \quad z/h=1.0$ $S_{DS} = 3.2 g \quad z/h=0.0$		$I_p = 1.5$
Model Line	Model	*Dimensions (in)			*Weight (lb)	Notes	UUT
		Depth	Width	Height			
QMX-VP	180QMXVP15H	34.0	48.0	133.0	2,120		Interp.
	180QMXVP15L	34.0	48.0	133.0	2,120		Interp.
	180QMXVP18H	34.0	48.0	133.0	2,120		Interp.
	180QMXVP18L	34.0	48.0	133.0	2,120		Interp.
	202QMXVP12H	38.0	51.9	143.0	2,405		Interp.
	202QMXVP12L	38.0	51.9	143.0	2,405		Interp.
	202QMXVP15H	38.0	51.9	143.0	2,405		Interp.
	202QMXVP15L	38.0	51.9	143.0	2,405		Interp.
	202QMXVP18H	38.0	51.9	143.0	2,405		Interp.
	202QMXVP18L	38.0	51.9	143.0	2,405		Interp.
	202QMXVP21H	38.0	51.9	143.0	2,405		Interp.
	202QMXVP21L	38.0	51.9	143.0	2,405		Interp.
	225QMXVP12H	42.0	58.0	154.0	2,765		Interp.
	225QMXVP15H	42.0	58.0	154.0	2,765		Interp.
	225QMXVP15L	42.0	58.0	154.0	2,765		Interp.
	225QMXVP18H	42.0	58.0	154.0	2,765		Interp.
	225QMXVP18L	42.0	58.0	154.0	2,765		Interp.
	225QMXVP21H	42.0	58.0	154.0	2,765		Interp.
	225QMXVP21L	42.0	58.0	154.0	2,765		Interp.
	245QMXVP15H	44.0	60.6	165.0	3,019		Interp.
	245QMXVP15L	44.0	60.6	165.0	3,019		Interp.
245QMXVP18H	44.0	60.6	165.0	3,019		Interp.	
245QMXVP18L	44.0	60.6	165.0	3,019		Interp.	
245QMXVP21H	44.0	60.6	165.0	3,019		Interp.	

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1900241-CR-001 R0

Manufacturer: Loren Cook Company						TABLE 1	
Model Line: QMX-VP/QMXHP-VP							
Certified Product Construction Summary: Painted carbon steel welded housing. Carbon steel welded wheel. Stainless steel shaft. Stainless steel hardware. NEMA 3R disconnect.							
Certified Options Summary: Belt drive. With or without fiberglass reinforced plastic induction nozzle. With or without mixing box. Standard pressure (QMX-VP) or high pressure (QMXHP-VP). *Dimensions and weight shown are with curb, nozzle, and mixing box.							
Mounting Configuration: Rigid base mounted on 18" high curb, maximum Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 2.0 g \quad z/h=1.0$ $S_{DS} = 3.2 g \quad z/h=0.0$		$I_p = 1.5$
Model Line	Model	*Dimensions (in)			*Weight (lb)	Notes	UUT
		Depth	Width	Height			
QMX-VP	245QMXVP21L	44.0	60.6	165.0	3,019		Interp.
	245QMXVP24H	44.0	60.6	165.0	3,019		Interp.
	245QMXVP24L	44.0	60.6	165.0	3,019		Interp.
	270QMXVP15L	48.0	64.6	175.0	3,335		Interp.
	270QMXVP18H	48.0	64.6	175.0	3,335		Interp.
	270QMXVP18L	48.0	64.6	175.0	3,335		Interp.
QMXHP-VP	90QMXHPVP09H	28.0	38.0	92.0	1,020		Interp.
	90QMXHPVP09L	28.0	38.0	92.0	1,020		Interp.
	120QMXHPVP09H	28.0	40.4	100.0	1,277		Interp.
	120QMXHPVP09L	28.0	40.4	100.0	1,277		Interp.
	120QMXHPVP12H	28.0	40.4	100.0	1,277		Interp.
	120QMXHPVP12L	28.0	40.4	100.0	1,277		Interp.
	135QMXHPVP09H	28.0	41.6	108.0	1,402		Interp.
	135QMXHPVP09L	28.0	41.6	108.0	1,402		Interp.
	135QMXHPVP12H	28.0	41.6	108.0	1,402		Interp.
	135QMXHPVP12L	28.0	41.6	108.0	1,402		Interp.
	150QMXHPVP09H	30.0	44.1	120.0	1,543		Interp.
	150QMXHPVP09L	30.0	44.1	120.0	1,543		Interp.
	150QMXHPVP12H	30.0	44.1	120.0	1,543		Interp.
	150QMXHPVP12L	30.0	44.1	120.0	1,543		Interp.
	150QMXHPVP15H	30.0	44.1	120.0	1,543		Interp.
	150QMXHPVP15L	30.0	44.1	120.0	1,543		Interp.
	165QMXHPVP09H	32.0	45.5	125.0	1,750		Interp.
	165QMXHPVP09L	32.0	45.5	125.0	1,750		Interp.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1900241-CR-001 R0

Manufacturer: Loren Cook Company						TABLE 1	
Model Line: QMX-VP/QMXHP-VP							
Certified Product Construction Summary: Painted carbon steel welded housing. Carbon steel welded wheel. Stainless steel shaft. Stainless steel hardware. NEMA 3R disconnect.							
Certified Options Summary: Belt drive. With or without fiberglass reinforced plastic induction nozzle. With or without mixing box. Standard pressure (QMX-VP) or high pressure (QMXHP-VP). *Dimensions and weight shown are with curb, nozzle, and mixing box.							
Mounting Configuration: Rigid base mounted on 18" high curb, maximum Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2019		Seismic Certification Limits:			$S_{DS} = 2.0 g \quad z/h=1.0$ $S_{DS} = 3.2 g \quad z/h=0.0$		$I_p = 1.5$
Model Line	Model	*Dimensions (in)			*Weight (lb)	Notes	UUT
		Depth	Width	Height			
QMXHP-VP	165QMXHPVP12H	32.0	45.5	125.0	1,750		Interp.
	165QMXHPVP12L	32.0	45.5	125.0	1,750		Interp.
	165QMXHPVP15H	32.0	45.5	125.0	1,750		Interp.
	165QMXHPVP15L	32.0	45.5	125.0	1,750		Interp.
	180QMXHPVP12L	34.0	48.0	133.0	2,122		Interp.
	180QMXHPVP15H	34.0	48.0	133.0	2,122		Interp.
	180QMXHPVP15L	34.0	48.0	133.0	2,122		Interp.
	180QMXHPVP18H	34.0	48.0	133.0	2,122		Interp.
	180QMXHPVP18L	34.0	48.0	133.0	2,122		Interp.
	202QMXHPVP12H	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP12L	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP15H	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP15L	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP18H	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP18L	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP21H	38.0	51.9	143.0	2,370		Interp.
	202QMXHPVP21L	38.0	51.9	143.0	2,370		Interp.
	225QMXHPVP12H	42.0	58.0	154.0	2,764		Interp.
	225QMXHPVP12L	42.0	58.0	154.0	2,764		Interp.
	225QMXHPVP15H	42.0	58.0	154.0	2,764		Interp.
	225QMXHPVP15L	42.0	58.0	154.0	2,764		Interp.
	225QMXHPVP18H	42.0	58.0	154.0	2,764		Interp.
225QMXHPVP18L	42.0	58.0	154.0	2,764		Interp.	
225QMXHPVP21H	42.0	58.0	154.0	2,764		Interp.	

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1900241-CR-001 R0



Manufacturer: Loren Cook Company Model Line: QMX-VP/QMXHP-VP		Table Description: Dampers					TABLE 4			
Building Code: CBC 2019		Seismic Certification Limits:					$S_{DS} = 2.0g \quad z/h = 1.0$ $S_{DS} = 3.2g \quad z/h = 0.0$		$I_p = 1.5$	
Model Line (Manufacturer)	Model	Dimension (in)			Weight (lb)	Material	Notes	UUT		
		Depth	Width	Height						
Dampers (Ruskin)	CD50	5	8 1/4	5	4	Aluminum		Extrap.		
		5	13 1/4	5	5	Aluminum		1		
		5	16 1/2	5	5	Aluminum		Interp.		
		5	16 1/2	6 1/2	6.5	Aluminum		Interp.		
		5	16 1/2	7 1/4	7.25	Aluminum		Interp.		
		5	16 1/2	9 1/4	9.25	Aluminum		Interp.		
		5	18 1/2	8	8	Aluminum		Interp.		
		5	18 1/2	11	11	Aluminum		Interp.		
		5	20 1/2	8 3/4	8.75	Aluminum		Interp.		
		5	20 1/2	12 3/4	12.75	Aluminum		Interp.		
		5	22 1/2	9 3/4	9.75	Aluminum		Interp.		
		5	22 1/2	13 1/2	13.5	Aluminum		Interp.		
		5	24 1/2	18	18	Aluminum		1		
		5	25 1/2	11 1/2	11.5	Aluminum		Interp.		
		5	25 1/2	16	16	Aluminum		Interp.		
		5	26 1/2	20	20	Aluminum		Interp.		
		5	28 1/2	13	13	Aluminum		Interp.		
		5	28 1/2	18	18	Aluminum		Interp.		
		5	28 1/2	22	22	Aluminum		Interp.		
		5	30 1/2	14 1/2	14.5	Aluminum		Interp.		
5	30 1/2	20 1/4	20.25	Aluminum		Interp.				
5	30 1/2	24	24	Aluminum		Interp.				
5	34 1/2	15	15	Aluminum		2				

UNIT UNDER TEST (UUT) SUMMARY SHEET



1900241-CR-001 R0

Manufacturer: Loren Cook Company	UUT 1
Model Line: QMX-VP/QMXHP-VP	
Model Number: 90QMXVP09H	
Serial Number: N/A	

Product Construction Summary:
Painted carbon steel welded housing. Carbon steel welded wheel. Stainless steel shaft. Stainless steel hardware. NEMA 3R disconnect.

Options/Subcomponent Summary:
Belt drive with fiberglass reinforced plastic induction nozzle with mixing box. **Motor:** Weg - 002236ET3E145T-S; **Isolation Damper:** Ruskin - CD50 (24 1/2"x18"); **Damper Actuator:** Belimo-LF-120-s; **Bypass Damper:** Ruskin - CD50 (13 1/4"x5"); **Safety Switch:** Square D - HU361RB.

<i>UUT Properties</i>						
*Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	*Height	Front-Back	Side-Side	Vertical
1,023	28.0	38.0	110.0	19.8	18.9	17.6

<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)	2.0	1.0	1.5	3.20	2.40	2.13	0.85	
		3.2	0.0	1.5					

Test Mounting Details: *Weight and height include curb, nozzle, and mixing box



Rigid base mounted on 18" Loren Cook LECQ curb with (20) 3/8" F593 stainless bolts. Curb is welded to test fixture with 2" long welds at 6" O.C. all around.
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



1900241-CR-001 R0

Manufacturer: Loren Cook Company	UUT 2
Model Line: QMX-VP/QMXHP-VP	
Model Number: 270QMXHPVP18L Serial Number: N/A	

Product Construction Summary:
Painted carbon steel welded housing. Carbon steel welded wheel. Stainless steel shaft. Stainless steel hardware. NEMA 3R disconnect.

Options/Subcomponent Summary:
Belt drive with fiberglass reinforced plastic induction nozzle with mixing box. **Motor:** Weg - 03018ETE286T-W22; **Isolation Damper:** Ruskin - CD50 (44 1/2"x36"); **Damper Actuator:** Belimo-NF-120-s; **Bypass Damper:** Ruskin - CD50 (34 1/2"x15"); **Safety Switch:** Square D - HU362RB.

UUT Properties

*Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	*Height	Front-Back	Side-Side	Vertical
3,337	48.0	64.6	193.0	6.6	5.0	6.3

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	3.20	2.40	2.13	0.85
		3.2	0.0	1.5				

Test Mounting Details: *Weight and height include curb, nozzle, and mixing box



Rigid base mounted on 18" Loren Cook LECQ curb with (28) 3/8" F593 stainless bolts. Curb is welded to test fixture with 2" long welds at 6" O.C. all around.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.