



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

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

OFFICE USE ONLY

APPLICATION #: OSP – 0195 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Twin City Fan Companies, Ltd.

Manufacturer's Technical Representative: Jaime Yeh

Mailing Address: 5959 Trenton Lane North, Minneapolis, MN 55442-3237

Telephone: 763.551.7600 Email: jyeh@tcf.com

Product Information

Product Name: BCV/BCVR/BCVSH (and Aerovent BIUB/BIUBR/BIUBSH)

Product Type: Centrifugal fans

Product Model Number: See attachment

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

General Description: Utility centrifugal ventilating fans

Mounting Description: Base mounted – rigid or isolated

Applicant Information

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

Contact Person: Matt Tobolski, PhD, SE

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

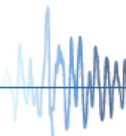
Telephone: 844.TRU.0200 Email: mtobolski@structint.com

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: 12/18/2017

Title: Executive Advisor Company Name: Structural Integrity Associates, Inc.

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





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

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

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

Name: Matt Tobolski, PhD, SE California License Number: S5648

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

Telephone: 844.TRU.0200 Email: mtobolski@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): _____

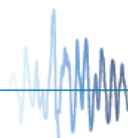
Testing Laboratory

Company Name: Twin City Fan Companies, Ltd.

Contact Name: Jaime Yeh

Mailing Address: 5959 Trenton Lane North, Minneapolis, MN 55442-3237

Telephone: 763.551.7600 Email: jyeh@tcf.com





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Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: Yes No [(z/h = 1); 1.50 rigid; 4.50 spring isolated];
Design Basis of Equipment or Components (F_p/W_p) = _____ [(z/h = 0); 1.13 rigid; 1.88 spring isolated]

S_{DS} (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1); 2.50 (z/h = 0);

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

R_p (Equipment or component response modification factor) = 6.0 (rigid); 2.0 (spring isolated)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1 (S_{DS} = 2.00); 0 (S_{DS} = 2.50)

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 No

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

S_{DS} (Design spectral response acceleration at short period, g) = _____

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

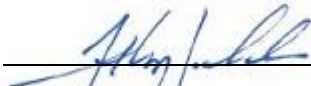
Tank(s) designed in accordance with ASME BPVC, 2015: Yes No

List of Attachments Supporting Special Seismic Certification

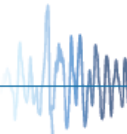
Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): Attachment

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: <u></u>	Date: <u>January 23, 2018</u>
Print Name: <u>Timothy J. Piland</u>	Title: <u>SSE</u>
Special Seismic Certification Valid Up to : S_{DS} (g) = <u>See Above</u>	z/h = <u>See Above</u>
Condition of Approval (if applicable): _____	

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



SPECIAL SEISMIC CERTIFICATION
 CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 16005



<i>Manufacturer:</i> Twin City Fan Companies, Ltd.	<i>Table Description:</i> Disconnect Switches	TABLE 6
<i>Model Line:</i> BCV, BCVR, BCVSH		

Building Code: CBC 2016 *Seismic Certification Limits:* $S_{DS} = 2.0g$ $z/h = 1.0$ $I_P = 1.5$
 $S_{DS} = 2.5g$ $z/h = 0.0$

Component Type	Manufacturer	Part Number	Description	Notes	UUT
Disconnect Switch	Salzer	H226-41300-700N4	1 ϕ & 3 ϕ ; 25A; 120-600V, NEMA 3R		1
		H233-41300-710N4	1 ϕ & 3 ϕ ; 25A; 120-600V, NEMA 3R		4
	Square D	HU361RB	3 ϕ ; 30A; 200/208-600V, NEMA 3R		2
	Sprecher & Schuh	LA7-100-1753-SR	3 ϕ ; 100A; 200/208-600V, NEMA 4X		3
	G.E.	THN3361R	3 ϕ ; 30A; 200/208-600V, NEMA 3R		3
		THN3361SS	1 ϕ & 3 ϕ ; 30A; 200/208-600V, NEMA 4X		Interp.
		THN3362R	3 ϕ ; 60A; 200/208-600V, NEMA 3R		Interp.
		THN3362SS	1 ϕ & 3 ϕ ; 60A; 200/208-600V, NEMA 4X		Interp.
		THN3363SS	1 ϕ & 3 ϕ ; 100A; 200/208-600V, NEMA 4X		Interp.
		THN3363R	3 ϕ ; 100A; 240-600V, NEMA 3R		Interp.
		THN3364R	3 ϕ ; 200A; 240-600V, NEMA 3R		Interp.
THN3364SS		1 ϕ & 3 ϕ ; 200A; 200/208-600V, NEMA 4X		4	

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 16005



Manufacturer: Twin City Fan Companies, Ltd.		Table Description: Non-Active Options			TABLE 7	
Model Line: BCV, BCVR, BCVSH						
Building Code: CBC 2016		Seismic Certification Limits: $S_{DS} = 2.0g$ $z/h = 1.0$ $S_{DS} = 2.5g$ $z/h = 0.0$			$I_P = 1.5$	
Component Type	Manufacturer	Material	Description	Notes	UUT	
Weather Cover	Twin City Fan	Carbon Steel	Motor, bearing and belt drive cover		2,3,4	
Bolted Access Door	Twin City Fan	Carbon Steel	Bolted panel		1,3	
Hinged Access Door	Twin City Fan	Carbon Steel	Hinged panel with quick access		2	
Drain Connection	Twin City Fan	Carbon Steel	Threaded connection to drain water		2,3,4	
Drain with Plug	Twin City Fan	Carbon Steel	Plug for drain connection		2,4	
Backplate Fins	Twin City Fan	Carbon Steel	Fins on backplate		4	
		Aluminum	Fins on backplate		3	
Inlet Flange	Twin City Fan	Carbon Steel	Flange connection on inlet		2	
Outlet Flange	Twin City Fan	Carbon Steel	Flange connection on outlet		3,4	
Inlet Screen	Twin City Fan	Carbon Steel	Safety screen at inlet		1	
Belt Guard	Twin City Fan	Carbon Steel	Belt drive cover		1	
Extended Lube Lines	Twin City Fan	Nylon	For greasing bearings		1	
Spark Resistance	Twin City Fan	N/A	Type B: AL wheel, AL rub plate	(configuration of options)	1	
		N/A	Type C: AL wheel or funnel. AL rub plate	(configuration of options)	2,3	
UL 705 Rating	Twin City Fan	N/A	Config. w/ weather cover	(configuration of options)	2	
High Temp Package	Twin City Fan	N/A	Config. w/ CS wheel, insul. stand, shaft seal, high temp grease, shaft cooler	(configuration of options)	4	
Discharge Orientation	Twin City Fan	Carbon Steel	THD: top horizontal discharge		4	
		Carbon Steel	BHD: bottom horizontal discharge		1	
		Carbon Steel	UBD: upblast discharge		3	
		Carbon Steel	DBD: downblast discharge		2	

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 16005



Manufacturer: Twin City Fan Companies, Ltd.	UUT 1
Model Line: BCV, BCVR, BCVSH	
Model Number: BCV 105 Serial Number: 17-21274-1-1	

Product Construction Summary:
Carbon steel housing. Belt driven. Backward inclined riveted aluminum wheel. 100% wheel width. 100% wheel diameter.

Options/Subcomponent Summary:
Active Options: Teco 145T motor (2HP, 575V); Shaft Grounding Ring; Ruskin GDS105 Shutter; Salzer H226-41300-700N4 Disconnect Switch.
Non-Active Options: Bolted Access Door; Inlet Screen; Type B Spark Resistance; Belt Guard; Extended Lube Lines; BHD discharge.

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
130	25.4	24.9	22.9	>33.0	24.2	>33.0

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 2016	ICC-ES AC156	2.0 g	1.0	1.5	3.2	2.4	1.68	0.68
		2.5 g	0.0					

Test Mounting Details:



Rigidly Mounted to table. Fan bolted to table with (6) 3/8" dia. A307 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 16005



Manufacturer: Twin City Fan Companies, Ltd.	UUT 3
Model Line: BCV, BCVR, BCVSH	
Model Number: BCVR Class 2, 365 Serial Number: 17-21274-3-1	

Product Construction Summary:
Carbon steel housing. Belt driven. Backward inclined welded aluminum wheel. 105% wheel width. 105% wheel diameter.

Options/Subcomponent Summary:
Active Options: Teco 326T motor (50 HP, 230/460V); Shaft grounding ring; Ruskin GDS365 Shutter; G.E. THN3361R Disconnect Switch; Sprecher & Schuh LA7-100-1753-SR Disconnect Switch.
Non-Active Options: Weather cover (std. on BCVR); Bolted access door (std. on BCVR); Drain connection (std. on BCVR); Backplate Fins (std. on BCVR); Outlet flange; Type C spark resistance; UBD discharge.

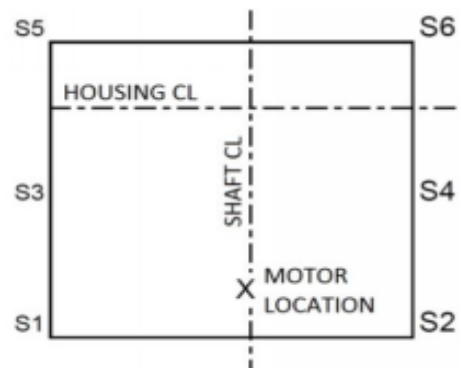
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1898	71.6	69.2	65.0	4.5	3.4	3.4

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 2016	ICC-ES AC156	2.0 g	1.0	1.5	3.2	2.4	1.68	0.68
		2.5 g	0.0					

Test Mounting Details:



Fan mounted to (6) VMC isolators using standard isolator mounting hardware. S1, S2: VMC MSS-1E-650; S3, S4: VMC MSS-1E-530; S5, S6: VMC MSS-1E-400. Isolators mounted to table with (4) 3/8" dia. A307 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 16005



Manufacturer: Twin City Fan Companies, Ltd.	UUT 4
Model Line: BCV, BCVR, BCVSH	
Model Number: BCVSH Class 2, 365 Serial Number: 17-21274-4-1	

Product Construction Summary:
Carbon steel housing. Belt driven. Backward inclined welded steel wheel. 105% wheel width. 105% wheel diameter.

Options/Subcomponent Summary:
Active Options: Baldor 326T motor (50 HP, 575V); Shaft grounding ring; Ruskin GDS365 Shutter; G.E. THN3364SS Disconnect Switch; Salzer H233-41300-710N4 Disconnect Switch.
Non-Active Options: Weather cover (std. on BCVSH); Backplate fins (std. on BCVSH); High temperature package (std. on BCVSH); Outlet flange; Drain connection with plug; THD discharge.

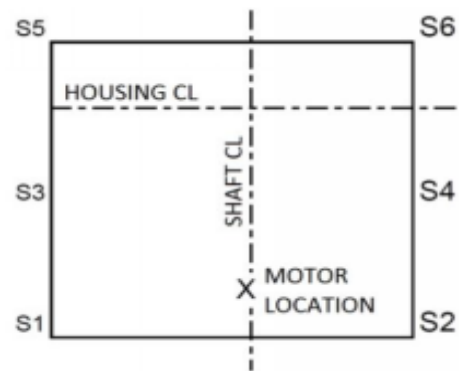
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1948	70.9	68.6	78.0	4.9	3.5	8.5

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 2016	ICC-ES AC156	2.0 g	1.0	1.5	3.2	2.4	1.68	0.68
		2.5 g	0.0					

Test Mounting Details:



Fan mounted to (6) VMC isolators using standard isolator mounting hardware. S1, S2: VMC MSS-1E-650; S3, S4: VMC MSS-1E-530; S5, S6: VMC MSS-1E-400. Isolators mounted to table with (4) 3/8" dia. A307 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.