APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0376 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Trane

Manufacturer's Technical Representative: Mike Lewis

Mailing Address: 1515 Mercer Road, Lexington, KY 40511

Telephone: 859-259-2500 Email: mlewis@trane.com

Product Information

Product Name: Performance Climate Changer

Product Type: Packaged Air Handling Units

Product Model Number: PCC Size 3 thru Size 100
(List all unique product identification numbers and/or part numbers)

General Description: Rigid floor mounted catalogued Air Handling Units that can be made in multiple sizes as measured by the area of the coils. Seismic enhancements made to UUTs and modifications required to address anomalies observed during shake testing shall be incorporated into the production units.

Mounting Description: Rigid floor mounted.

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Wilson, Jr.

Mailing Address: 113 Main St, Bloomingdale, NJ 07403

Telephone: 973-838-1780 Email: jwilson@thevmcgroup.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: Date: 2/18/15

Title: CEO Company Name: The VMC Group

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

Company Name: The VMC Group

Name: Kenneth Tarlow California License Number: SE2851

Mailing Address: 113 Main St, Bloomingdale, NJ 07403

Telephone: 973-838-1780 Email: ken.tarlow@thevmcgroup.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: UC Berkeley

Contact Name: Wesley Neighbour

Mailing Address: 1301 South 46th Street, Building 420, Richmond, CA 94804

Telephone: 510-665-3409 Email: wdn@berkeley.edu

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 4.16

S_{DS} (Design spectral response acceleration at short period, g) = 1.85

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

R_p (Equipment or component response modification factor) = 2.0

Ω_0 (System overstrength factor) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See Attached

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

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, 2010: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☐ Calculations ☒ Manufacturer's Catalog

☐ Other(s) (Please Specify): _____

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019

Signature: _____ Date: April 8, 2015

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : S_{DS} (g) = 1.85 z/h = 1

Condition of Approval (if applicable): _____

Trane Performance Climate Changer (PCC) Packaged AHUs

OSHPD OSP Certified Product Matrix - Base Mounted Indoor & Outdoor AHUs

Table 1 - PCC - Cabinet Sizes

Unit Size	Max Unit Height	Max Unit Width	Max Unit Length	Max Module Length	Max Module Weight	Module Types	UUT	MFR
003	29.00	32.00	unlimited	52.25	395	Air Mixing Section Air Blender Section Filter Section Access Section Silencer Section	extrapolated	Trane
004	29.00	44.00	unlimited	52.25	539		extrapolated	
006	35.25	44.00	unlimited	52.25	627		extrapolated	
008	37.75	51.00	unlimited	52.25	684		extrapolated	
010	37.75	62.00	unlimited	54.50	883		13	
012	41.50	67.00	unlimited	57.50	927		interpolated	
014	41.50	72.00	unlimited	57.50	1080		interpolated	
017	49.00	72.00	unlimited	57.50	1244		interpolated	
021	52.75	80.00	unlimited	55.50	1460		interpolated	
025	61.50	80.00	unlimited	56.50	1735		interpolated	
030	61.50	94.00	unlimited	57.50	1989		interpolated	
035	67.25	100.00	unlimited	63.75	2455		interpolated	
040	67.25	113.00	unlimited	64.75	2701		interpolated	
050	75.75	126.00	unlimited	68.50	3670		interpolated	
057	85.50	126.00	unlimited	68.50	3537		interpolated	
066	92.50	141.00	unlimited	84.00	4056		interpolated	
080	107.50	141.00	unlimited	92.00	4822		interpolated	
100	119.75	155.00	unlimited	96.00	5885		14	

Overall unit length is variable depending on the installed modules
Units are certified for "inline" applications only. No L-shaped, T-shaped or U-shaped units are permitted.
Stacked units are not a part of this pre-approval.

Table 2 - PCC - Base Frame Construction

Use	Base Construction	Baserail Height	Material	Section	UUT	MFR
Indoor	Bolted Baserails	2.5	16 ga Galv Carbon Steel	Cold Formed	extrapolated	Trane
		4			extrapolated	
		6			13	
		2.5	14 ga Galv Carbon Steel		extrapolated	
		4			extrapolated	
		6			13	
Outdoor	Welded Baserails	4	10 ga Galv Carbon Steel	Cold Formed	extrapolated	
		6			14	

Table 3a - PCC - Enclosure Construction - Wall/Roof Exterior Panels

Skin	Insulation	Panel Nominal Thickness	Wall/Roof Panel Material	Wall/Roof Panel Thickness*	Wall/Roof Panel Type	UUT	MFR
Outer	Interstitial Foam	2"	Galv Carbon Steel	22 ga (0.026")	Solid	13,14	Trane

***Note that Trane uses a lower bound tolerance of 0.026" on the material.**

Table 3b - PCC - Enclosure Construction - Wall/Roof Interior Panels (Liners)

Skin	Insulation	Panel Nominal Thickness	Wall/Roof Panel Material	Wall/Roof Panel Thickness*	Wall/Roof Panel Type	UUT	MFR
Inner	Interstitial Foam	2"	Galv Carbon Steel	22 ga (0.026")	Solid	13,14	Trane
Inner	Interstitial Foam	2"	Galv Carbon Steel	22 ga (0.026")	Perforated	14	

Trane Performance Climate Changer (PCC) Packaged AHUs

OSHPD OSP Certified Product Subcomponent Matrix

Table 1 - TR150 VFD

Model	Dimensions (in)	Weight (lbs)	Power Rating [hp]	Voltage Rating	UUT	Manufacturer
X1317****	19Wx12Dx30H	86	0.50	200-575	extrapolated	Trane (Danfoss)
X1317****	19Wx12Dx30H	86	0.75	200-575	extrapolated	
X1317****	19Wx12Dx30H	86	1.00	200-575	extrapolated	
X1317****	19Wx12Dx30H	92	1.50	200-575	extrapolated	
X1317****	19Wx12Dx30H	92	2.00	200-575	extrapolated	
X1317****	19Wx12Dx30H	92	3.00	200-575	extrapolated	
X1317****	19Wx12Dx30H	96	5.00	200-575	extrapolated	
X1317****	19Wx12Dx30H	99	7.50	200-575	extrapolated	
X13170952010	19Wx12Dx30H	96	10.00	200	13 - External	
X1317****	24Wx14Dx44H	178	15.00	200-575	interpolated	
X1317****	24Wx14Dx44H	176	20.00	200-575	interpolated	
X1317****	24Wx14Dx44H	178	25.00	200-575	interpolated	
X1317****	24Wx14Dx44H	143	30.00	200-575	interpolated	
X1317****	24Wx14Dx44H	176	40.00	200-575	interpolated	
X1317****	24Wx14Dx44H	171	50.00	200-575	interpolated	
X1317****	24Wx14Dx44H	138	60.00	200-575	interpolated	
X1317****	24Wx14Dx44H	138	75.00	200-575	interpolated	
X13170942050	24Wx14Dx44H	171	100.00	460	14 - Internal	

******signifies HP & Voltage combinations.**

All Vended starters and VFD's are specified by Trane as being fabricated from Galvanized Carbon Steel.

Table 2 - Starter

Model	Dimensions (in)	Weight (lbs)	Power Rating (HP)	Voltage Rating	UUT	Manufacturer
X1318****	16Wx10Dx23H	72	0.5 to 5	200-575	extrapolated	Trane (Whitepath)
X13180877070	16Wx10Dx23H	73	7.5	200	13 -External	
X13180876100	24Wx5Dx30H	57	100	460	14 -Internal	

******signifies HP & Voltage combinations.**

Table 3 - Controller

	Model	Dimensions (in)	Weight (lbs)	UUT	Manufacturer
Low Voltage Controller (DDC)	UC600	19Wx11Dx30H	65	13	Trane

Table 4 - Miscellaneous Components

Description	Model Number	Dimensions (in)	Weight (lbs)	Materials	UUT	Mfr
External Junction Box	na	na	na	na	14	CED
GFCI / Switch	X19091415010	4.5Wx2.25Dx4.5H	1.25	Aluminum	14	CED
UV Switch	4951-3157-0001	2Wx2.75Dx5.25H	0.16	Steel/Plastic	14	CED
Light Engine Light (For Interior Illumination)	X13161074010	3 Dia x 4 L	1.6	Aluminum	13	Light Engine

Trane Performance Climate Changer (PCC) Packaged AHUs

OSHPD OSP Certified Product Subcomponent Matrix

Table 5a: Filter Rack

Filter Rack Type			Frame Material Options	Dimensions Max Width x Max Height	Size						UUT	MFG
Load Access	Type	Holds Filter Type			03	· · ·	10	· · ·	100	120		
Side Loading	Flat	2"	22 gage galvanized carbon steel filter holding tracks with 18 gage galvanized carbon steel vertical supports and blockoffs	Rack assembly and blockoffs fill inside unit dimensions for all unit sizes	X	X	X	X	X	X	extrapolated	Trane
		4"			X	X	X	X	X	X	13	
		CMDS 2"/ 4" Combo			X	X	X	X	X	X	interpolated	
		Bag/ Cartridge (BC)			X	X	X	X	X	X	14	
Front Loading	Flat	2"	14 gage galvanized carbon steel filter holding rack with 18 gage galvanized carbon steel blockoffs	Rack assembly and blockoffs fill inside unit dimensions for all unit sizes	X	X	X	X	X	X	13,14	
		4"										
		Bag (B)										
		Catridge (C)										

All filters racks are made from Galvanized CS

Table 5b: Filter Media

Filter Media Type				Filter Media Materials	Size						UUT	MFG
Filter Size	Filter Type		MERV Rating		03	· · ·	10	· · ·	100	120		
2"	Permanent		2	Aluminum	X	X	X	X	X	X	13, 14	Airguard Industries
	Throwaway		5	Fiberglass	X	X	X	X	X	X	13,14	
	Pleated	Coated	7	cotton/polyester	X	X	X	X	X	X	extrapolated	
		Regular	13		X	X	X	X	X	X	14	
4"	Pleated	Coated	7	cotton/polyester	X	X	X	X	X	X	13	
		Regular	8		X	X	X	X	X	X	extrapolated	
	High Efficiency	65%	11	cotton/polyester	X	X	X	X	X	X	13	
		85%	12		X	X	X	X	X	X	interpolated	
		95%	14		X	X	X	X	X	X	14	
	Standard		11	cotton/polyester	X	X	X	X	X	X	14	
			13		X	X	X	X	X	X	14	
12"	Cartridge	65%	11	Synthetic	X	X	X	X	X	X	14	
		85%	12		X	X	X	X	X	X	interpolated	
		95%	15		X	X	X	X	X	X	14	
18"	Short Bag	65%	12	Synthetic	X	X	X	X	X	X	13	
		85%	13		X	X	X	X	X	X	interpolated	
		95%	14		X	X	X	X	X	X	14	
30"	Long Bag	65%	12	Synthetic	X	X	X	X	X	X	13	
		85%	13		X	X	X	X	X	X	interpolated	
		95%	14		X	X	X	X	X	X	14	

Trane Performance Climate Changer (PCC) Packaged AHUs

OSHPD OSP Certified Product Subcomponent Matrix

Table 6 - Sound Attenuator

Model	Type	Unit Size	Dimensions			Weight	UUT	Mfr
			H (in)	W (in)	D (in)	Lb.		
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	3	20	26.5	36	64	extrapolated	Vibro-Acoustics
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	4	20	39	36	96	extrapolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	3	20	26.5	60	103	extrapolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	6	26.25	39	36	116	extrapolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	8	28.75	45.5	36	132	extrapolated	
X45091539050	Rectangular Dissipative	10	28.75	56.5	36	149	13	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	4	20	39	60	149	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	6	26.25	39	60	178	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	8	28.75	45.5	60	200	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	12	32.5	61.5	36	217	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	14	32.5	67	36	224	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	10	28.75	56.5	60	225	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	17	40	67	36	263	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	21	43.75	75	36	302	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	12	32.5	61.5	60	338	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	14	32.5	67	60	347	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	17	40	67	60	405	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	25	52.5	75	36	414	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	21	43.75	75	60	465	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	30	52.5	88.5	36	487	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	35	58.25	90.5	36	557	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	40	58.25	103	36	588	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	25	52.5	75	60	643	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	30	52.5	88.5	60	745	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	50	66.75	116	36	794	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	35	58.25	90.5	60	805	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	40	58.25	103	60	874	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	57	76.5	116	36	880	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	66	80	131	36	954	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	80	95	131	36	1092	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	50	66.75	116	60	1164	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	57	76.5	116	60	1285	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	66	80	131	60	1432	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	100	107.25	145	36	1485	interpolated	
X4509****	Rectangular Dissipative, Fiberglass Lined, or Film Lined	80	95	131	60	1631	interpolated	
X45091547180	Rectangular Film Lined	100	107.25	145	60	2220	14	

******signifies Type & Depth combination.**

Trane Performance Climate Changer (PCC) Packaged AHUs

OSHPD OSP UUT Matrix

Table 7 - UUT Summary

UUT	Report Reference	Height (in)	Width (in)	Total Length (in)	Total Weight Unit Loading	Modules	Enclosure Construction	Base Construction	Installation Method
UUT#13	UC Berkeley PEER-STI/2013-18	38	62	156	2050# 30.5 psf	Fan Section Filter Section Silencer Section Controls Section Filter Section	Outer Panel - Galv CS 22ga (0.026") Inner Panel - Galv CS 22ga (0.026") Insulation - Interstitial Foam Panel Thickness - 2" Nominal	Assembled (Bolted) 14 Gauge Galvanized CS Base Rail Height 6"	Base Mounted Rigidly
UUT#14	UC Berkeley PEER-STI/2013-18	120	155	277	13,450# 45.1 psf	Controls Section Filter Section Silencer Section Fan Section Filter Section Access Section	Outer Panel - Galv CS 22ga (0.026") Inner Panel - Galv CS 22ga (0.026") Insulation - Interstitial Foam Panel Thickness - 2" Nominal	Assembled (Welded) 10 Gauge Galvanized CS Base Rail Height 6"	Base Mounted Rigidly

Table 8 - UUT Summary Subcomponent Matrix

UUT	Variable Frequency Drive	Damper / Actuators	Plenum Fan	Housed Fan Belt Drive	Cooling Coils	Heating Coils	Starters	Controls	TCACS
UUT#13	Trane (Danfoss) 7.5hp 200V	None	None	Comefri 10" FC Single Fan 5 HP 208-230/460 VAC Regal Beloit Motor Galvanized CS Wheel	None	None	Trane (Whitepath) 7.5hp 200V	Trane UC600	None
UUT#14	Trane (Danfoss) 100hp 460V	None	None	Comefri 44" AF Single Fan 100 HP 208-230/460 VAC Regal Beloit Motor Galvanized CS Wheel	None	None	Trane (Whitepath) 100hp 460V	None	None

UUT #13

Manufacturer: Trane

Model: PCC Size 10

Cabinet Construction Summary:

Base:	Galvanized Carbon Steel Sheetmetal
Walls:	Galvanized Carbon Steel Sheetmetal
Roof:	Galvanized Carbon Steel Sheetmetal

Component Summary:

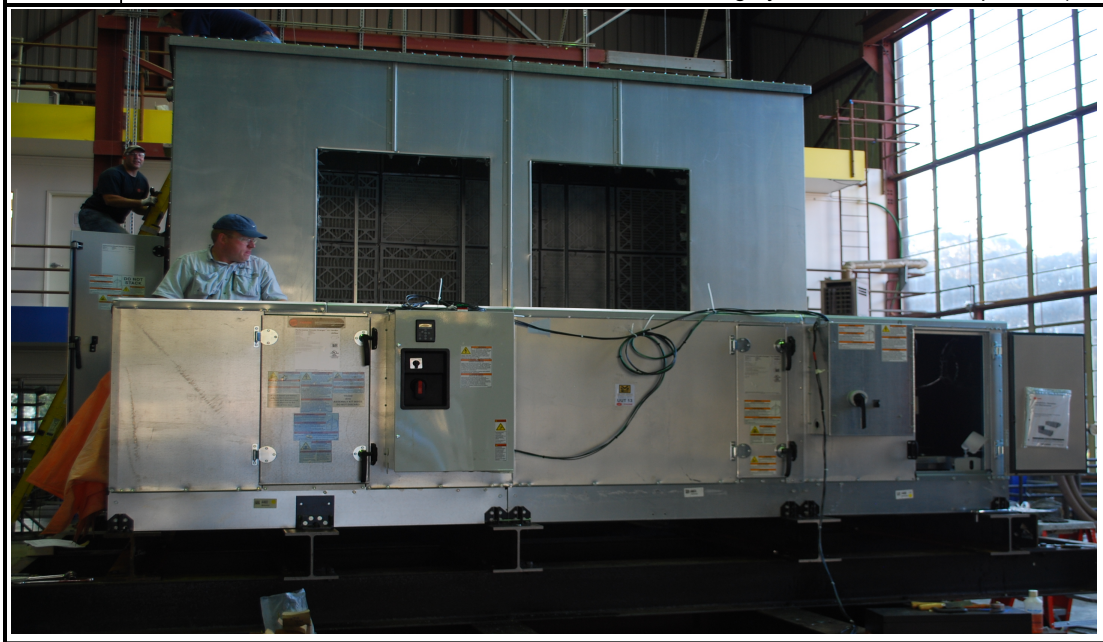
Item	Dimensions				Lowest Natural Frequency (Hz)		
	Length (in)	Width (in)	Height (in)	Weight	F-B	S-S	V
Enclosure with Base Rails	156	62	38	2050 lbs	22.9	11.3	33.3+
				30.5 psf			
Housed Fan (present for content, but excluded)							
Filter Rack (Side Loading)							
Sound Attenuator							
Controls Section (VFD, Starter & Controller)							
Filter Rack (Front Loading)							

Seismic Test Parameters:

Qualification Method	Sds (g)	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
ICC-ES AC156	1.85	1.0	1.5	2.96	2.22	1.23	0.49

Pre/Post Shake Functionality Test Results:

Pre:	PASSED
Post:	All units were full of contents and maintained structural integrity and functional compliance (PASSED)



UUT Mounting Description:

Base mounted unit with (28) 1/2" dia SAE Grade 8 bolts (50" max spacing), fixture rigidly on table.

UUT #14

Manufacturer: Trane

Model: PCC Size 100

Cabinet Construction Summary:

Base:	Galvanized Carbon Steel Sheetmetal
Walls:	Galvanized Carbon Steel Sheetmetal
Roof:	Galvanized Carbon Steel Sheetmetal

Component Summary:

Item	Dimensions				Lowest Natural Frequency (Hz)		
	Length (in)	Width (in)	Height (in)	Weight	F-B	S-S	V
Enclosure with Base Rails	277	155	120	13450 lbs	8.3	8.6	33.3+
				45.4 psf			
Controls Section (VFD & Starter)							
Filter Rack (Front Loading)							
Sound Attenuator							
Housed Fan (present for content, but excluded)							
Filter Rack (Side Loading)							
Access Section							

Seismic Test Parameters:

Qualification Method	Sds (g)	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
ICC-ES AC156	1.85	1.0	1.5	2.96	2.22	1.23	0.49

Pre/Post Shake Functionality Test Results:

Pre:	PASSED
Post:	All units were full of contents and maintained structural integrity and functional compliance (PASSED)

UUT Mounting Description:

Base mounted unit with (32) 1/2" dia SAE Grade 8 bolts (48" max spacing), fixture rigidly on table.