APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0452 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Siemens Industry, Inc.

Manufacturer's Technical Representative: Heath Klein, National Business Development Manager - Automation

Mailing Address: 1000 Deerfield Parkway, Buffalo Grove, IL 60089

Telephone: (847) 970-1165 Email: Heath.klein@siemens.com

Product Information

Product Name: Zone Control Unit (ZCU)

Product Type: Mechanical Equipment

Product Model Number: See attachments
(List all unique product identification numbers and/or part numbers)

General Description: Zone Control Units are plug and play pre-fabricated terminal units, each containing an all-inclusive thermal transfer unit, piping, valves, sound attenuators, controls and sensors. Enclosures are galvanized carbon steel.

Mounting Description: Units are ceiling suspended (without spring isolators).

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Joseph L. La Brie, S.E.

Mailing Address: 1315 Greg Street, Suite 109

Telephone: (775) 358-5085 Email: labrie@shaketest.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: 11/9/15

Title: Partner Company Name: Dynamic Certification Laboratories

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

Company Name: Dynamic Certification Laboratories

Name: Dr. Ahmad Itani, S.E. California License Number: SE-5220

Mailing Address: 1315 Greg Street, Suite 109, Sparks, NV 89431

Telephone: (775) 358-5085 Itani@shaketest.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: Dynamic Certification Laboratories

Contact Name: Kelly Laplace, Project Manager

Mailing Address: 1315 Greg Street, Suite 109, Sparks, NV 89431

Telephone: (775) 358-5085 Email: kelly@shaketest.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.88

S_{DS} (Design spectral response acceleration at short period, g) = 2.50

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

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachments

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

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, 2022

Signature: Date: December 8, 2015

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.50 z/h = 1

Condition of Approval (if applicable):

Special Seismic Certification
Certified Components

DCL Dynamic Certification Laboratories

Manufacturer: SIEMENS Industry, Inc.

Product Line: ZCU (Zone Control Unit)

Product Construction: 22 gage galvanized carbon steel cabinet with 1.0" closed cell insulation

Options: Factory-installed piping, sound attenuator, coils, controls, airflow sensor, temperature sensor

Mounting Description: Ceiling suspended

Model Number	Dimensions (in)			Max. Operating Weight (lb)	Coil Rows	Sound Attenuator	Mount	Sds (g), z/h=1	Unit
	Max. Length	Width	Height						
ZH30450x	49.0	18.0	8.0	67	1 to 4	Yes	Ceiling suspended	2.5	Interpolated
ZH30550x	49.0	18.0	8.0	67	1 to 4	Yes			Interpolated
ZH30650x	44.0	18.0	8.0	67	1 to 4	Yes			Interpolated
ZH306504	44.0	18.0	8.0	67	1 to 4	Yes			UUT1
ZH30850x	44.0	18.0	10.0	67 to 160	1 to 4	Yes			Interpolated
ZH31050x	44.0	20.0	12.5		1 to 4	Yes			Interpolated
ZH31250x	44.0	22.0	15.0		1 to 4	Yes			Interpolated
ZH31450x	44.0	26.0	17.5		1 to 4	Yes			Interpolated
ZH31650x	44.0	30.0	18.0		1 to 4	Yes			Interpolated
ZH32050x	42.5	36.0	20.0		1 to 4	Yes			Interpolated
ZH32450x	43.0	44.0	20.0	160	1 to 4	Yes			Interpolated
ZH324504	43.0	44.0	20.0	160	1 to 4	Yes			UUT2

x=Number of coils (1 to 4)

Special Seismic Certification
Certified Subcomponents

DCL Dynamic Certification Laboratories

Manufacturer: SIEMENS Industry, Inc.

Product Line: ZCU (Zone Control Unit)

Mounting Description: Ceiling suspended

COILS

Component No.	Component Mfg.	Material	Unit
1-4-row, Size 04 to 05	Siemens	Aluminum fin with copper tubes	Extrapolated
1-4-row, Size 06			UUT1
1-4-row, Size 08 to 16			Interpolated
1-4-row, Size 20x16			Interpolated
1-4-row, Size 24x16			UUT2

Note: Coils may be 1 to 4 rows. The worst case (4 rows) was tested.

CONTROLS

Component No.	Component Mfg.	Description	Material	Unit
550-405	Siemens	ATEC VAV controller	Plastic with carbon steel	UUT1, UUT2
4011MWDH	Intec Controls	120V Transformer		UUT1, UUT2
SSD81U	Siemens	24VAC Actuator		UUT1, UUT2

AIRFLOW SENSOR

Component No.	Component Mfg.	Description	Material	Unit
Size 04 to 05	Siemens	Airflow sensor	Stainless steel	Extrapolated
Size 06				UUT1
Size 08 to 16				Interpolated
Size 20 x 16				Interpolated
Size 24 x 16				UUT2

TEMPERATURE SENSOR

Model Number	Component Mfg.	Description	Material	Unit
QAM1035	Siemens	Commissioning Sensor	Zinc-plated carbon steel and plastic	UUT1, UUT2

Special Seismic Certification
Tested Components

DCL Dynamic Certification Laboratories

Manufacturer: SIEMENS Industry, Inc.

Product Line: ZCU (Zone Control Unit)

Product Construction: 22 gage galvanized carbon steel cabinet with 1.0" closed cell insulation

Options: Factory-installed piping, sound attenuator, coils, controls, airflow sensor, temperature sensor

Mounting Description: Ceiling suspended

Model	Dimensions (in)			Operating Weight (lb)	Coils (4-Row)	Sound Attenuator	Mounting: Ceiling Suspended		Sds (g), z/h=1	Unit
	Length	Width	Height				Threaded Rod Diameter (in)	Maximum Threaded Rod Spacing (in)		
ZH306504	44.0	18.0	8.0	67	Yes	Yes	1/2	26	2.5	UUT1
ZH324504	43.0	44.0	20.0	160	Yes	Yes	1/2	31	2.5	UUT2

UUT1

UNIT UNDER TEST (UUT) Summary Sheet

DCL Dynamic Certification Laboratories

Manufacturer: SIEMENS Industry, Inc.

Product Line: ZCU (Zone Control Unit)

Model Number: ZH306504

Product Construction Summary: 22 gage galvanized carbon steel cabinet with 1.0" closed cell insulation

Options / Component Summary: Factory-installed piping, sound attenuator, coils, controls, airflow sensor, temperature sensor

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
67	UUT1	44.0	18.0	8.0	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2013	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:

Overall view of unit

View of bottom strut support

The unit was ceiling-suspended from the DCL shake table interface frame using 1/2-inch diameter all-thread rod spaced at 26" in the long direction of the unit, four manufacturer-provided 12-gage 90-degree brackets (each attached to the unit with four #14 SMS), and a strut frame (attached to the bottom of the unit with #12 SMS at 4" on-center). The all-thread rod length was 18" from the top of the unit to the attachment point at the shake table interface frame. Shear brackets were placed on top of each 12-gage, 90-degree bracket; each shear bracket was attached to the unit with four #14 SMS each. Lateral bracing consisted of 3/16-inch diameter steel cable and four sets of Mason SCBH-2/SSB-2 brackets installed at a 45 degree angle. The Mason brackets were attached to the interface frame with 1/2-inch diameter Grade 5 bolts.

UUT2

UNIT UNDER TEST (UUT) Summary Sheet

DCL Dynamic Certification Laboratories

Manufacturer: SIEMENS Industry, Inc.

Product Line: ZCU (Zone Control Unit)

Model Number: ZH324504

Product Construction Summary: 22 gage galvanized carbon steel cabinet with 1.0" closed cell insulation

Options / Component Summary: Factory-installed piping, sound attenuator, coils, controls, airflow sensor, temperature sensor

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component attachment system and force-resisting systems was maintained.

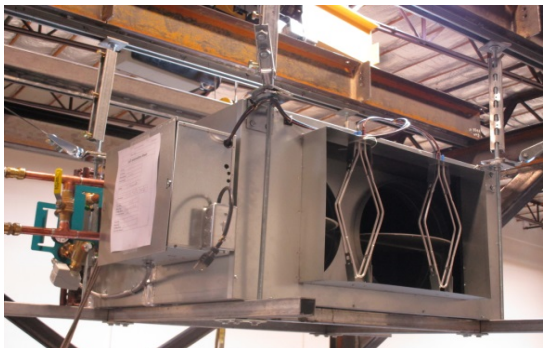
UUT Properties

Operating Weight (lb)	Dimensions (inches)				Lowest Natural Frequency (Hz)		
		Length	Width	Height	Front-Back	Side-Side	Vertical
160	UUT2	43.0	44.0	20.0	N/A	N/A	N/A

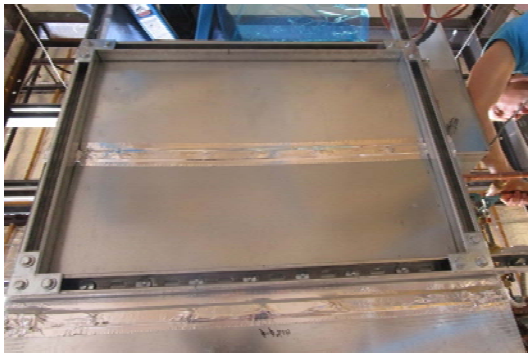
Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2013	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.67	0.67

Unit Mounting Description:



Overall view of unit



View of bottom strut support

The unit was ceiling-suspended from the DCL shake table interface frame using 1/2-inch diameter all-thread rod spaced at 31" in the long direction of the unit, four manufacturer-provided 12-gage 90-degree brackets (each attached to the unit with four #14 SMS), and a strut frame (attached to the bottom of the unit with #12 SMS at 4" on-center). The all-thread rod length was 17" from the top of the unit to the attachment point at the shake table interface frame. Shear brackets were placed on top of each 12-gage, 90-degree bracket; each shear bracket was attached to the unit with four #14 SMS each. Lateral bracing consisted of 3/16-inch diameter steel cable and four sets of Mason SCBH-2/SSB-2 brackets installed at a 45 degree angle. The Mason brackets were attached to the interface frame with 1/2-inch diameter Grade 5 bolts.