APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0081 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: **Toshiba Medical Systems Corporation**

Manufacturer's Technical Representative: Greg Patterson

Mailing Address: 2441 Michelle Drive, Tustin CA 92780

Telephone: On File Email: On File

Product Information

Product Name: **RADREX-i SYSTEM**

Product Type: Radiography medical imaging system

Product Model Number: See Attachment 1
(List all unique product identification numbers and/or part numbers)

General Description: Multiple component systems for the provision of radiography medical imaging. Seismic certification is limited to the components identified in Attachment 1. Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: See Attachment 1

Applicant Information

Applicant Company Name: **EASE Co.**

Contact Person: JONATHAN ROBERSON, S.E

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: (909) 606-7622 Email: j.roberson@easeco.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: 1/31/2017

Title: Principal Engineer Company Name: **EASE LLC**

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

Company Name: **EASE LLC**

Name: JONATHAN ROBERSON, S.E. California License Number: S4197

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: (909) 606-7622 Email: j.roberson@easeco.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: Environmental Testing Laboratory, Inc.

Contact Name: Brady Richard

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

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

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = **SEE ATTACHMENT 1**

S_{DS} (Design spectral response acceleration at short period, g) = **SEE ATTACHMENT 1**

a_p (In-structure equipment or component amplification factor) = **SEE ATTACHMENT 1**

R_p (Equipment or component response modification factor) = **SEE ATTACHMENT 1**

Ω_0 (System overstrength factor) = **SEE ATTACHMENT 1**

I_p (Importance factor) = **1.5**

z/h (Height factor ratio) = **SEE ATTACHMENT 1**

Equipment or Component Natural Frequencies (Hz) = **SEE ATTACHMENT 2**

Overall dimensions and weight (or range thereof) = **SEE ATTACHMENT 1**

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): **ATTACHMENTS 1 & 2**

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

Signature: _____ Date: April 6, 2017

Print Name: Timothy J. Piland Title: SSE

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

Condition of Approval (if applicable): Approval is limited to units identical to tested units.

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

TABLE 1:

Manufacturer	**TOSHIBA MEDICAL SYSTEMS CORPORATION** [2] [4]
System	**RADREX-I Radiography System** **DRAD-3000E/U8** **DRAD-3000E/U9** **DRAD-3000E/US**

COMPONENT	PART NO.	APPROX. DIMENSIONS (IN.) W	D	H	MAX. WT. (LB.)	MOUNT	BASIS [1]	F_P/W_P	S_{DS}	z/h	a_P	R_P	Ω_0
Ceiling Suspended Tube Support • Ceiling Travel Rails	DST-3000A1/W3 DSR-242B/W1	25 ---	37 205.5	24.2 / 51.4 3	1105 215	Ceiling Suspended	UUT-1	3.60 1.50	2.0 2.5	1 0	2 ½	2½	2
Elevator-Type Bucky Table with FPD (Flat Panel Detector)	EBT-3000A1/V6	39.5	94	19.7 / 37.4	894 [3]	Floor	UUT-2	2.40 1.13	2.0 2.5	1 0	1	1½	1½
Elevator-Type Bucky Table for Wireless FPD	EBT-3000A1/V5	39.5	94	19.7 / 37.4	882 [3]	Floor	UUT-3	2.40	2.0	1	1	1½	1½
REXPanel Portable Wireless Digital Detector (Varian)	TFP-4336W	15.1	18.1	0.6	7.7			1.13	2.5	0			
Vertical Bucky Stand with FPD	VBS-3100A1/V6	34.1	33.3	85.8	321	Wall/Floor	UUT-4	2.40 1.13	2.0 2.5	1 0	1	1½	1½
Vertical Bucky Stand for Wireless FPD	VBS-1000A1/V7	31.5	23.1	79.6	426	Wall/Floor	UUT-5	2.40	2.0	1	1	1½	1½
REXPanel Portable Wireless Digital Detector (Varian)	TFP-4336W	15.1	18.1	0.6	7.7			1.13	2.5	0			
System Interface	SYS-3000A1/S3	22.5	15.8	35.4	147	Wall/Floor	UUT-6	1.44 1.13	2.0 2.5	1 0	1	2½	2
Diagnostic X-Ray High Voltage Generator	KXO-80SS/D9	26.75	14.9	35.4	318	Wall/Floor	UUT-7	1.44 1.13	2.0 2.5	1 0	1	2½	2
Digital Radiographic System	TFD-3000B/W2	21.7	16.5	40.1	221	Floor	UUT-8	1.44 1.13	2.0 2.5	1 0	1	2½	2
19" LCD monitor w/ touch panel (iiyama)	PLT1900	17	2.5	14	11	CT-A	UUT-11	1.44	2.0	1	1	2½	2
19" LCD monitor (EIZO)	0FTD1930 NNO	17	2.5	14	8.5	CT-A	UUT-12	1.13	2.5	0			
3-Bay Charger for REXPanel Portable Wireless Digital Detector (Varian)	35205 REV B	10.2	13.5	2.2	2.5	CT-A	UUT-13	1.44 1.13	2.0 2.5	1 0	1	2½	2
Eaton 9PX5K UPS	9104-5211-00P	5.1	28.4	17.3	104.5	Floor	UUT-A1	1.80	2.5	1.0	1	2½	2
Eaton 9PX6K UPS	9104-12585-00P	5.1	28.4	17.3	104.5	Floor	UUT-B1	1.44 1.13	2.0 2.5	1 0	1	2½	2

Mount	FLOOR (RIGID BASE): a free-standing, base mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base. WALL/FLOOR MOUNTED refers to a condition where the unit bears on, and is anchored directly to the supporting floor. In addition, lateral restraint anchoring the unit to an adjacent wall or other supporting structure is provided along the height of the equipment. CEILING SUSPENDED: refers to a condition where the unit is anchored to and suspended from a framing system at or slightly above the ceiling line of the room. CTA (COUNTERTOP ANCHORED) refers to a condition where the unit is anchored to a counter, desk, or other piece of fixed furniture..
Notes	1. BASIS: • UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. • SAME: Model is physically, mechanically & electrically the same as test specimen. Difference is limited to model number, color, software and/or GE manufacturing location. • INT (Interpolate/Extrapolate): indicates a model that was not specifically tested, and by which seismic certification is established through evaluation of testing of other, similar models in the product line 2. All components in table above are manufactured by Toshiba Medical Systems Corporation (TMSC) except as noted. 3. Patient Couch weights do not include the 500 lb simulated patient loads present during testing. 4. Toshiba seismic kits used in the testing programs shall be installed as a necessary condition of Special Seismic Certification.

UUT-1 Ceiling Suspended Tube Support & Ceiling Travel Rails

MANUFACTURER: Toshiba Medical Systems Corp.

IDENTIFICATION:

Tube Support	Ceiling Travel Rails
DST-3000A1/W3	DSR-242B/W1

DESCRIPTION: Component of RADREX-i System

MOUNTING: Ceiling Suspended using:
(2) – M10-Class 12.9 bolts & Unistrut P1008-M10 channel nuts w/ springs.
Typical each of (5) Unistrut P1000 support points along each of (2) longitudinal rail. (20 bolts total).

PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vert-Axis
25	37	24.2 – 51.4	1105	4.2	4.3	4.5
----	205.5	3	215	-------	-------	-------

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 2 Elevator-Type Bucky Table with FPD

MANUFACTURER: Toshiba Medical Systems Corp.

IDENTIFICATION: EBT-3000A1/V6

DESCRIPTION: Component of RADREX-i System.

MOUNTING: Floor mounted using:
(4) – ½" dia. SAE J429 Grade 8 bolts to interface plate.

PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vert-Axis
39.5	94	19.7 – 37.4	894+ 500 lb patient load	10.3	17.9	5.1

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 3 Elevator-Type Bucky Table for Wireless FPD

MANUFACTURER:	Toshiba Medical Systems Corp.	
IDENTIFICATION:	EBT-3000A1/V5	Patient Table
	TFP-4336W	REXPanel
DESCRIPTION:	Component of RADREX-i System. REXPanel wireless portable detector (by Varian Medical Systems) installed in bucky during test.	
MOUNTING:	Floor mounted using: (4) – ½" diameter SAE J429 Grade 8 bolts to interface plate.	

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
39.5	94	19.7 – 37.4	882 + 500 lb patient load	11.2	26.9	5.5

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 4 Vertical Bucky Stand with FPD

MANUFACTURER:	Toshiba Medical Systems Corp.	
IDENTIFICATION:	VBS-3100A1/V6	
DESCRIPTION:	Component of RADREX-i System. Tilting motorized bucky wall stand with internal fixed FPD	
MOUNTING:	Wall/Floor mounted using: (4) – 3/8" dia. ASTM A574 Socket Head Cap Screws to wall (4) – ½" diameter SAE J429 Grade 8 bolts to interface plate at base.	

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
34.1	33.3	85.8	321	7.4	11.6	11.0

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 5 Vertical Bucky Stand for Wireless FPD

MANUFACTURER:	Toshiba Medical Systems Corp.
IDENTIFICATION:	VBS-1000A1/V7 Bucky Stand TFP-4336W REXPanel
DESCRIPTION:	Component of RADREX-i System. Non-tilting bucky. REXPanel wireless portable detector (by Varian Medical Systems) installed in bucky during test.
MOUNTING:	Wall/Floor mounted using (2) – 3/8" dia. ASTM A574 Socket Head Cap Screws to wall (4) – 3/8" dia. ASTM A574 Socket Head Cap Screws to interface plate at base.

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
31.5	23.1	79.6	426	7.6	12.5	11.9

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 6 System Interface

MANUFACTURER:	Toshiba Medical Systems Corp.
IDENTIFICATION:	SYS-3000A1/S3
DESCRIPTION:	Component of RADREXi System.
MOUNTING:	Wall/Floor mounted using: (4) – ¼" diameter hex washer head sheet metal screws to wall (4) – 3/8" dia. ASTM A574 Socket Head Cap Screws to interface plate at base.

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
22.5	15.8	35.4	147	21.4	17.7	36.4

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 7 Diagnostic X-Ray High Voltage Generator

MANUFACTURER:	Toshiba Medical Systems Corp.
IDENTIFICATION:	KXO-80SS/D9
DESCRIPTION:	Component of RADREX-i System.
MOUNTING:	Wall/Floor mounted using: (4) – ¼" diameter hex washer head sheet metal screws to wall (4) – ½" diameter SAE J429 Grade 8 bolts to interface plate at base.

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
26.75	14.9	35.4	318	20.0	19.6	19.0

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 8 Digital Radiographic System

MANUFACTURER:	Toshiba Medical Systems Corp.
IDENTIFICATION:	TFD-3000B/W2
DESCRIPTION:	Component of RADREX-i System.
MOUNTING:	Floor mounted using: (4) – 3/8" dia. ASTM A574 Socket Head Cap Screws to interface plate.

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
21.7	16.5	40.1	221	9.4	6.4	27.4

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT-11 19" LCD monitor w/ touch panel

MANUFACTURER:	iiyama
IDENTIFICATION:	Model No.: TFDK-TPLCD Iiyama ProLite T1931SR Model PLT1900
DESCRIPTION:	Component of RADREX-i System.
MOUNTING:	Countertop Anchored mounted using; (4) Toshiba provided machine screws to integral bracket on UUT-8

PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vert-Axis
16.9	2.25	15	11	10.9	6.5	27.9

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 12 19" LCD monitor without touch panel

MANUFACTURER:	EIZO
IDENTIFICATION:	TFDK-LCD
DESCRIPTION:	Component of RADREX-i System.
MOUNTING:	Countertop Anchored mounted using: (4) Toshiba provided machine screws to integral bracket on UUT-8

PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vert-Axis
17	2.5	14	8.5	9.2	6.7	13.5

SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- 13 — 3-Bay Battery Charger for Portable Wireless FPD (TFP-4336W)

MANUFACTURER:	Varian Medical Systems (VMS)
IDENTIFICATION:	Model No. 35205 REV B S/N: 000544
DESCRIPTION:	3-Bay battery charger for Varian Medical Systems 14.8V / 2.1 AH litium-Ion batteries (REF 30771 REV B) , which are used with RADRex Portable Wireless FPD (TFP-4336W).
MOUNTING:	Countertop Anchored using: 1"W x 8"L Velcro hook & loop tape applied to the lower face of the charger at the two side edges .

PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		Front-Axis	Side-Axis	Vert-Axis
10.2	13.5	2.2	2.5	33.0	41	26.5

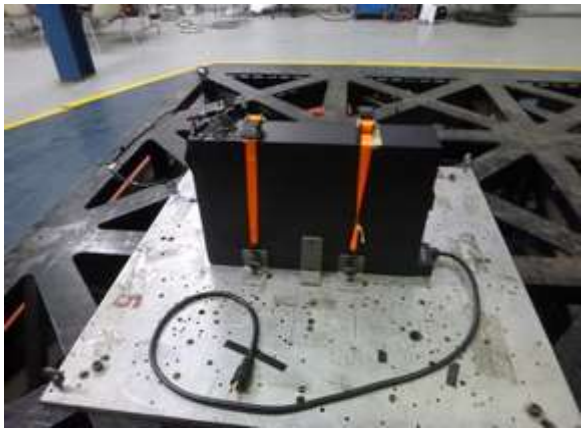
SHAKE TABLE TEST PARAMETERS

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 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

UUT- A1 — Eaton 9PX5K UPS

MANUFACTURER:	Eaton
IDENTIFICATION:	Part No.: 9104-5211-00P Serial No.:G204D41024
DESCRIPTION:	Uninterruptible Power Supply with internal batteries.
MOUNTING:	Floor Mounted using: Toshiba Seismic Mount kit (Model No. ANC-CA-9PX5K-UPS) (4)-3/8" ASTM A574 Socket Head Cap Screws to aluminum interface plate.



PROPERTIES:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		X-Axis	Y-Axis	Z-Axis
5.1	28.4	17.3	104.5	11.0	28.2	22.6

SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	ICC-ES AC156	2.5	1.0	1.5	4.00	3.00	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.

ATTACHMENT 2: TEST SPECIMEN SUMMARY

UUT- B1	**Eaton 9PX6K UPS**
MANUFACTURER:	Eaton
IDENTIFICATION:	Part No.: 9104-12585-00P Serial No.: G205G02132
DESCRIPTION:	Uninterruptible Power Supply with internal batteries.
MOUNTING:	Floor Mounted using: Toshiba Seismic Mount kit (Model No. ANC-CA-9PX5K-UPS) (4)-3/8" ASTM A574 Socket Head Cap Screws to aluminum interface plate..

PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front/Back	Side/Side	Vertical
5.1	28.4	17.3	104.5	43.1	18.3	>50

SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2016	ICC-ES AC156	2.0 2.5	1 0	1.5	3.20	2.40	1.68	0.68

Unit maintained structural integrity and remained functional per manufacturer requirements.