APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP-0345-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: i-Gard Corporation

Manufacturer's Technical Representative: Sergio Panetta

Mailing Address: 7615 Kimbel St Unit 1 Mississauga ON Canada L5S 1A8

Telephone: 905-673-1553 Email: spanetta@i-gard.com

Product Information

Product Name: Neutral Grounding Resistors (NGR)

Product Type: Electrical equipment

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

General Description: NGR is used in an electrical system similar to a fuse and protect personnel and equipment from damage. NGR limits the duration of the electrical fault in a system.

Mounting Description: Rigid base mounted and Seismic Neoprene isolator base mounted.

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Giuliano, PE

Mailing Address: 113 Main Street Bloomingdale NJ 07403

Telephone: 973-838-1780 Email:

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: 8/27/13

Title: Company Name: The VMC Group

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

Company Name: The VMC Group

Name: Mr. Ken Tarlow California License Number: SE2851

Mailing Address: 113 Main Street 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: PEER, University of California at Berkeley

Contact Name: Wesley Neighbour

Mailing Address: 1301 S. 46th street Richmond CA 94804

Telephone: 510-642-3437 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) = 1.76 (rigid) and 4.28 (Isolated)

S_{DS} (Design spectral response acceleration at short period, g) = 2.44 (Rigid) and 2.38 (Isolated)

a_p (In-structure equipment or component amplification factor) = 1.0 (Rigid) 2.5(Isolated)

R_p (Equipment or component response modification factor) = 2.5

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 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, 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: 10/10/2013

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = See Above z/h = 1.0

Condition of Approval (if applicable): _____

OSHPD OSP PRODUCT MATRIX WITH CERTIFIED SUBCOMPONENTS

Manufacturer: i-Gard Corporation
Product Type: Neutral Grounding Resistors (NGR)
Seismic Level: Sds = 2.44 g, z/h = 1.0 rigid mounted
Sds = 2.38 g, z/h = 1.0 isolator mounted

Product Configuration

Type A: Resistors supported on side walls of the enclosure and the enclosure is supported at the base
Type B: Resistors supported on a rack, rack is base mounted on the enclosure floor and the enclosure is supported at the base
Type C: Resistors supported on two racks, one on top of the other, separated by terminals in between, bottom rack is base mounted on the enclosure floor and the enclosure is supported at the base
Type D: Resistors supported on the back wall of the enclosure and the enclosure is supported at the base

All product was tested on and certified as hard mounted and isolated

Table 1: Certified Product Matrix

Sr. No.	Dimensional Data				Product Configuration	Product Specifications					UUT
	Max Length (in)	Max Width (in)	Max Height (in)	Max Weight (lbs)		Enclosure Type	NGR Type	Voltage L / N (Volts)	Resistance (Ohms)	Current (Ampere)	
4	23	16	7	30	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-3	277-1-C	277	277	1	1
3	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-2	347-5-60148	347	69.4	5	interpolated
5	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-4	277-2-C	277	277	2	interpolated
6	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-5	277-5-C	277	277	5	interpolated
7	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-6	347-1-C	347	347	1	interpolated
8	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-7	347-2-C	347	347	2	interpolated
9	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-8	347-5-10S	347	347	5	interpolated
10	23	16	7	35	Type A	Indoor / Outdoor Type 3R (CSA) 1LV-9	347-15-10S	347	347	15	interpolated
11	23	16	14.5	50	Type A	NEMA 3R 2LV-2	347-10-60158	347	34.7	10	interpolated
13	23	16	14.5	50	Type A	NEMA 3R 2LV-2	277-10-C	277	27.7	10	interpolated

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Table 1: Certified Product Matrix

12	23	16	14.5	55	Type A	NEMA 3R 2LV-2	277-5-C/CT	277	55.4	5	interpolated
14	23	16	14	60	Type A	NEMA 3R 2LV-2	347-5-C/CT	347	69.4	5	2
15	40	28	26.5	170	Type B	NEMA 3R KD (Knock Down)	277-25-C	277	11.08	25	3
16	40	28	26.5	170	Type B	NEMA 3R KD (Knock Down)	347-15-C	347	23.13	15	interpolated
17	40	28	26.5	170	Type B	NEMA 3R KD (Knock Down)	347-25-C	347	13.88	25	interpolated
18	40	28	26.5	170	Type B	NEMA 3R KD (Knock Down)	2400-5-10S	2400	480	5	interpolated
19	40	28	26.5	170	Type B	NEMA 3R KD (Knock Down)	2400-10-10S	2400	240	10	interpolated
45	40	36	38.5	250	Type B	NEMA 3R KD (Knock Down)	4160-15-10S	4160	277.3	15	4
20	40	36	38.5	350	Type B	NEMA 3R	2400-300-62566	2400	8	300	interpolated
21	40	36	38.5	350	Type B	NEMA 3R	2400-200-62562	2400	12	200	interpolated
22	40	36	38.5	350	Type B	NEMA 3R	2400-100-62556	2400	24	100	interpolated
23	40	36	38.5	350	Type B	NEMA 3R	2400-400-62570	2400	6	400	interpolated
24	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	1390-5-C	1390	278	5	interpolated
25	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-2-C	2400	1200	2	interpolated
26	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-3-C	2400	800	3	interpolated
27	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-4-C	2400	600	4	interpolated
28	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-1-C	2400	2400	1	interpolated
29	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-200-10S	2400	12	200	interpolated
30	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-250-10S	2400	9.6	250	interpolated
31	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-300-10S	2400	8	300	interpolated
32	40	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-400-10S	2400	6	400	interpolated
42	52	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-5-C	2400	480	5	interpolated

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Table 1: Certified Product Matrix

43	52	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-10-C	2400	230	10	interpolated
44	52	36	38.5	350	Type B	NEMA 3R KD (Knock Down)	2400-25-10S	2400	96	25	interpolated
57	52	36	50.5	400	Type B	NEMA 3R KD (Knock Down)	2400-100-62558	2400	24	100	5
47	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	1390-400-10S	1390	3.48	400	interpolated
48	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-5-C/CT	2400	480	5	interpolated
49	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-10-C/CT	2400	240	10	interpolated
50	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-100-60S	2400	24	100	interpolated
51	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-100-10S/CT	2400	24	100	interpolated
52	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-200-10S/CT	2400	12	200	interpolated
53	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-300-10S/CT	2400	8	300	interpolated
54	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-400-10S/CT	2400	6	400	interpolated
55	52	36	48.5	430	Type B	NEMA 3R KD (Knock Down)	2400-800-10S	2400	3	800	interpolated

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Table 1: Certified Product Matrix

46	52	36	38.5	350	Type C	NEMA 3R KD (Knock Down)	2400-50-60S	2400	48	50	interpolated
56	50	50	48.5	350	Type C	NEMA 3R KD (Knock Down)	2400-50-60S/CT	2400	48	50	6
58	52	36	66.5	585	Type C	NEMA 3R HV (Welded Frame)	4160-100-60S	4160	41.6	100	interpolated
33	50	50	66.5	800	Type C	NEMA 3R	8000-100-62715	8000	80	100	7
34	50	50	66.5	820	Type C	NEMA 3R	8000-200-62717	8000	40	200	interpolated
35	50	50	66.5	820	Type C	NEMA 3R	8000-400-62721	8000	20	400	interpolated
36	50	50	66.5	820	Type C	NEMA 3R HV (Welded Frame)	8000-400-62721-New	8000	20	400	interpolated
37	50	50	66.5	820	Type C	NEMA 3R HV (Welded Frame)	2400-25-C	2400	96	25	interpolated
38	50	50	66.5	820	Type C	NEMA 3R HV (Welded Frame)	2400-400-60S	2400	6	400	interpolated
39	50	50	66.5	820	Type C	NEMA 3R HV (Welded Frame)	4160-200-60S	4160	20.8	200	interpolated
40	50	50	66.5	820	Type C	NEMA 3R HV (Welded Frame)	8000-100-10S	8000	80	100	interpolated
41	50	50	66.5	820	Type C	NEMA 3R HV (Welded Frame)	8000-200-10S	8000	40	200	interpolated
64	62	50	66.5	1050	Type C	NEMA 3R HV (Welded Frame)	8000-200-10S/CT	8000	40	200	8
59	62	50	66.5	1120	Type C	NEMA 3R HV (Welded Frame)	2400-25-C/CT	2400	96	25	interpolated
60	62	50	66.5	1120	Type C	NEMA 3R HV (Welded Frame)	2400-400-60S/CT	2400	6	400	interpolated
61	62	50	66.5	1120	Type C	NEMA 3R HV (Welded Frame)	4160-100-60S/CT	4160	41.6	100	interpolated
62	62	50	66.5	1120	Type C	NEMA 3R HV (Welded Frame)	4160-200-60S/CT	4160	20.8	200	interpolated
63	62	50	66.5	1120	Type C	NEMA 3R HV (Welded Frame)	8000-100-10S/CT	8000	80	100	interpolated
1	21	16	34.5	110	Type D	NEMA 3R OHMNI	OHMNI-4PM-10RM	277 L/N	27.7	10	9
2	21	16	34.5	110	Type D	NEMA 3R OHMNI	OHMNI-6PM-10RM	347 L/N	34.7	10	10

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I-Gard Neutral Ground Resistors
Table 2: Certified Sub-Components

Enclosure		
Mfr	**Material**	**UUT**
iGard	Carbon Steel	All

Mtg Frame		
Mfr	**Material**	**UUT**
iGard	Aluminum	All

Resistors		
Mfr	**Material**	**UUT**
iGard	Nickel-Chromium	1, 2
iGard	1JR Alloy type 2	3 thru 8
iGard	1GR Alloy type 2	9, 10

Junction Box		
Mfr	**Material**	**UUT**
iGard	Carbon Steel	1

5KV Standoff			
Manufacturer	**Part No.**	**Material**	**UUT**
Porcelain Products	5002	Glazed Porcelain	4 thru 8

15KV Standoff			
Manufacturer	**Part No.**	**Material**	**UUT**
Porcelain Products	5003	Glazed Porcelain	4, 6, 8

Current Transformer			
Manufacturer	**Part No./Size**	**Material**	**UUT**
GE	114-500 / 600V	Molded Epoxy	2
GE	JKM-3C / 5KV	Molded Epoxy	7
GE	JKM-5C / 15KV	Molded Epoxy	8
iGard	RM-T2A-NGRS-6 / 600V	Molded Epoxy	9
iGard	RM-T3A-NGRS-6 / 600V	Molded Epoxy	10

Terminal Pads/ Bushing			
Manufacturer	**Part No./Size**	**Material**	**UUT**
Grt Genesis	1100-A1 / 600V	Epoxy	1, 2, 3
Porcelain Products	5001	Glazed Porcelain	4 thru 8

Terminal Block			
Manufacturer	**Part No.**	**Material**	**UUT**
Cooper Bussmann	EB27B04SC	Molded Thermoplastic	1, 9, 10

Models and sizes shown are the only ones offered and approved

Table 3: UUT Matrix
Shake Group 1 - Rigid Mount To Table

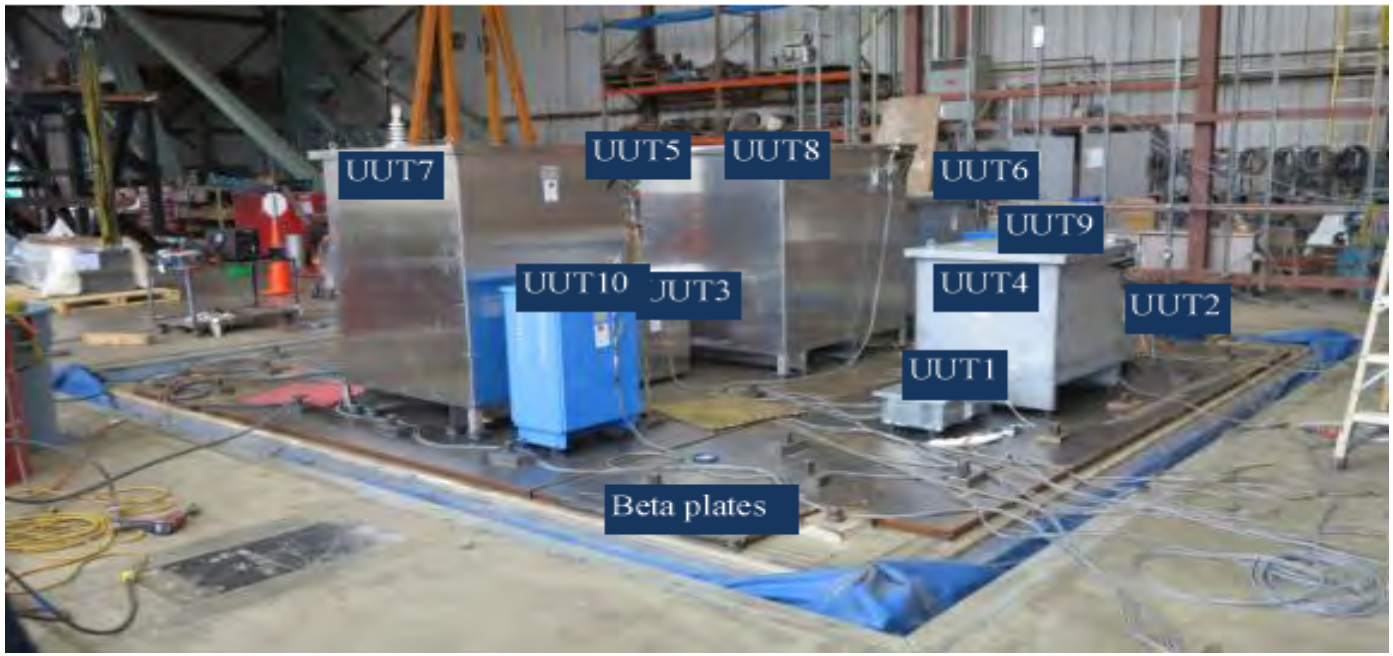
UUT	Make	Model	UUT Configuration Description	Weight (lbs)	Height (in)	Width (in)	Length (in)	Description of Mounting Method	Connection Details	S_{DS}	Isolator	Qty	z/h	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}	Nat. Freq.		
																		X	Y	Z
1	I-Gard	277-1-C	Type A, Galvanized Steel	30	7	16	23	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection	2.44	None	0	1	3.9	2.93	1.63	0.65	NA	NA	NA
2	I-Gard	347-5-C/CT	Type A, Carbon Steel	60	14	16	23	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						NA	NA	NA
3	I-Gard	277-25-C	Type B, Hot Dip Galvanized Steel	170	26.5	28	40	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						NA	NA	21.3
4	I-Gard	4160-15-10S	Type B, Carbon Steel	250	38.5	36	40	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						18.2	17.8	18.8
5	I-Gard	2400-100-62558	Type B, Galvanized Steel	400	50.5	36	52	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 5/8 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						13.1	10.2	21.3
6	I-Gard	2400-50-60S/CT	Type B, Hot Dip Galvanized Steel	350	48.5	50	50	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						NA	18.9	NA
7	I-Gard	8000-100-62715	Type C, Stainless Steel	800	66.5	50	50	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(8) 5/8 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						NA	19.7	21.1
8	I-Gard	8000-200-10S/CT	Type C, Aluminum	1050	66.5	50	62	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(8) 5/8 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						NA	19.9	23.1
9	I-Gard	OHMNI-4PM-10RM	Type D, Carbon Steel	110	34.5	16	21	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						15.0	18.8	18.6
10	I-Gard	OHMNI-6PM-10RM	Type D, Carbon Steel	110	34.5	16	21	UUT Bolted to Beta Plates Beta Plates Bolted to Shake Table	(4) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		None	0						15.0	14.7	24.0

Weight Includes Fixtures (Estimate)
NA: Not Available

Table 3: UUT Matrix
Shake Group 2 - Mounted To Table Using Seismic Neoprene Isolators

UUT	Make	Model	UUT Configuration Description	Weight (lbs)	Height (in)	Width (in)	Length (in)	Description of Mounting Method	Connection Details	S_{DS}	VMC Isolator	Qty	z/h	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}	Nat. Freq.		
																		X	Y	Z
1	I-Gard	277-1-C	Type A, Galvanized Steel	30	7	16	23	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection	2.38	RDC2-175	4	1	3.81	2.86	1.59	0.63	NA	NA	NA
2	I-Gard	347-5-C/CT	Type A, Carbon Steel	60	14	16	23	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection		RDC2-175	4						27.2	22.5	27.2
3	I-Gard	277-25-C	Type B, Hot Dip Galvanized Steel	170	26.5	28	40	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection		RDC2-175	4						13.1	12.7	21.5
4	I-Gard	4160-15-10S	Type B, Carbon Steel	250	38.5	36	40	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection		RDC2-175	4						7.6	9.8	18.0
5	I-Gard	2400-100-62558	Type B, Galvanized Steel	400	50.5	36	52	UUT Bolted to (4) TTB-10-500 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 5/8-11UNC-2B Grade 8 x 1-1/2" LG (8) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		TTB-10-500	4						5.7	5.9	12.7
6	I-Gard	2400-50-60S/CT	Type B, Hot Dip Galvanized Steel	350	48.5	50	50	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection		RDC2-175	4						9.8	9.4	16.8
7	I-Gard	8000-100-62715	Type C, Stainless Steel	800	66.5	50	50	UUT Bolted to (4) TTB-10-500 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(8) 5/8-11UNC-2B Grade 8 x 1-1/2" LG (16) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		TTB-10-500	8						8.4	6.6	15.4
8	I-Gard	8000-200-10S/CT	Type C, Aluminum	1050	66.5	50	62	UUT Bolted to (4) TTB-10-500 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(8) 5/8-11UNC-2B Grade 8 x 1-1/2" LG (16) 1/2 UNC Grade 8 x 1-1/2" LG Standard Connection		TTB-10-500	8						8.2	10.6	15.6
9	I-Gard	OHMNI-4PM-10RM	Type D, Carbon Steel	110	34.5	16	21	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection		RDC2-175	4						9.8	7.8	27.2
10	I-Gard	OHMNI-6PM-10RM	Type D, Carbon Steel	110	34.5	16	21	UUT Bolted to (4) RDC2-175 Seismic Neoprene Isolator Bolted to Beta Plates Bolted to Shake Table	(4) 1/2-13UNC Grade 8 x 1-1/2" LG (8) 3/8 UNC Grade 8 x 1-1/2" LG Standard Connection		RDC2-175	4						10.0	7.2	24.2

Weight Includes Fixtures (Estimate)
NA: Not Available



All units were full of contents, maintained structural integrity and passed post-shake functional compliance.