# APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

| OFFICE USE ONLY | |
|---|---|
| APPLICATION #: | OSP – 0431 – 10 |

## OSHPD Special Seismic Certification Preapproval (OSP)

**Type:** ☒ New ☐ Renewal

## Manufacturer Information

Manufacturer: Eaton

Manufacturer's Technical Representative: Mark Allen

Mailing Address: 845 Corporate Circle, Sumter, SC 29154

Telephone: 803-481-6873 Email: MarkLAllen@eaton.com

## Product Information

Product Name: Pow-R-Line C (PRLC) and IFS Switchboards

Product Type: Low Voltage Distribution Switchboards & Roll-up Generator Termination Boxes

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

General Description: Low Voltage Distribution Switchboards, NEMA 1 and 3R, 600V.

Mounting Description: Rigid Floor Mounted.

## Applicant Information

Applicant Company Name: Eaton

Contact Person: Eddie Wilkie

Mailing Address: 175 Vista Blvd, Arden, NC 28704

Telephone: 828-651-0707 Email: eddiewilkie@eaton.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: Eddie Wilkie Date: 4/10/15

Title: Director - Engineering Company Name: Eaton

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

Company Name: ISAT

Name: William V. Joerger California License Number: SE4545

Mailing Address: 1020 Crews Road, Suite Q, Matthews, NC 28105

Telephone: 510-714-0216 Email: wvjoerger@isatsb.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: NTS Laboratories

Contact Name: Tom Boonarkat

Mailing Address: 7800 Hwy. 20 West, Huntsville, AL 35806

Telephone: 256-837-4111 Email: Tom.Boonarkat@nts.com

## Seismic Parameters

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

Design Basis of Equipment or Components ($F_p/W_p$) = 1.45

$S_{DS}$ (Design spectral response acceleration at short period, g) = 1.93

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

$R_p$ (Equipment or component response modification factor) 6.0

$\Omega_0$ (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 Resonance Summary

Overall dimensions and weight (or range thereof) = See Product Range Summary

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 ) =

$\Omega_0$ (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 3, 2015

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : $S_{DS}$ (g) = 1.93 z/h = 1

Condition of Approval (if applicable):

## Certified Product Range Summary
## PRLC/IFS Switchboards[1] & Roll-up Generator Termination Boxes

| Equipment Type | Model[2] | UUT Identifier | Section Continuous Current Rating (Amps) | Bus Material | Width (in.) | Depth (in.) | Height (in.) | Weight (lbs.) | $S_{DS}$[3] | Fp/Wp | NEMA Enclosure Type | UUT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Distribution Switchboards | PRLC & IFS | MEDP092014-006 | 100 | Cu | 51.25 | 49.25 | 90.25 | 1662 | 1.93 | 1.45 | 1 | 24 |
| | | | 400 | Cu | 20,30,36 | 24-66 | 78-90 | 998 | | | 1 | Interpolated |
| | | | 800 | Cu | 20,30,36,45,51,54 | 18-66 | 78-90 | 3560 | | | 1 | Interpolated |
| | | | 1000 | Cu | 20,30,36,45,51,54 | 18-66 | 78-90 | 3560 | | | 1 | Interpolated |
| | | | 1200 | Cu | 20,30,36,45,51,54 | 18-66 | 78-90 | 3560 | | | 1 | Interpolated |
| | | | 1600 | Cu | 20,30,36,45,51,54 | 18-66 | 78-90 | 3560 | | | 1 | Interpolated |
| | | | 2000 | Cu | 30,36,45,51, 54 | 18-66 | 78-90 | 3560 | | | 1 | Interpolated |
| | | MEDP092014-007 | 2000 | Cu | 54.25 | 73.25 | 90.25 | 3560 | | | 1 | 25 |
| Roll-up Generator Termination Boxes | GTB | MEDP092014-001 | 800 | Cu | 37.62 | 30.5 | 78.75 | 494 | 1.93 | 1.45 | 3R | 20 |
| | | | 800 | Cu | 36, 45 | 24 | 78 | 494 | | | 3R | Interpolated |
| | | | 1200 | Cu | 36, 45 | 24 | 78 | 539 | | | 3R | Interpolated |
| | | | 1600 | Cu | 36, 45 | 24 | 78 | 584 | | | 3R | Interpolated |
| | | | 2000 | Cu | 36, 45 | 24 | 78 | 674 | | | 3R | Interpolated |
| | | MEDP092014-002 | 2000 | Cu | 46.88 | 30.5 | 78.75 | 674 | | | 3R | 21 |

1. Manufactured by Eaton
2. Engineered to order product. Unique identifiers provided for each vertical section.

# PRLC & IFS Switchboards & Roll-up Generator Termination Boxes

## Certified Subcomponents: Enclosures[1,2]

| Model | NEMA Enclosure Type | Enclosure Mounting | Dimensions (inches) | | | Weight (lbs.) | $S_{DS}$ | $F_p/W_p$ | Test Status |
|---|---|---|---|---|---|---|---|---|---|
| | | | Width | Depth | Height | | | | |
| PRLC/IFS | 1 | Floor | 20.00 | 18-66 | 78-90 | 998 | 1.93 | 1.45 | Extrapolated |
| | 1 | Floor | 30.00 | 18-66 | 78-90 | 998 | | | Extrapolated |
| | 1 | Floor | 36.00 | 18-66 | 78-90 | 998 | | | Extrapolated |
| | 1 | Floor | 45.00 | 18-66 | 78-90 | 1510 | | | Extrapolated |
| | 1 | Floor | 51.00 | 18-66 | 78-90 | 1662 | | | Extrapolated |
| | 1 | Floor | 51.25 | 49.25 | 90.25 | 1662 | | | UUT 24 |
| | 1 | Floor | 54.25 | 73.25 | 90.25 | 3560 | | | UUT 25 |
| | | | | | | | | | |
| GTB | 3R | Floor | 36.00 | 24.00 | 78.00 | 494 | 1.93 | 1.45 | Extrapolated |
| | 3R | Floor | 37.62 | 30.50 | 78.75 | 494 | | | UUT 20 |
| | 3R | Floor | 45.00 | 24.00 | 78.00 | 674 | | | Interpolated |
| | 3R | Floor | 46.88 | 30.50 | 78.75 | 674 | | | UUT 21 |

1. All enclosures manufactured by Eaton
2. All enclosures made from powder coated, carbon steel.

## Certified Subcomponents: Bypass/Isolation Transfer Switch

| Frame Size | CAT Model # | Zenith Model #[2] | Continuous Current Rating | Poles | Weight (lbs.) | Manufacturer[1] | Test Status | $S_{DS}$ (g) | $F_p/W_p$ |
|---|---|---|---|---|---|---|---|---|---|
| 64B | CBTECT | ZBTSCT-Z2C | 100 | 4 | 1662 | Zenith | UUT 24 | 1.93 | 1.45 |
| 64B | CBTE, CBTEDT, CBTECT | ZBTS00, ZBTSDT, ZBTSCT-Z2C, -Z20, -Z2D | 100-1200 | 3 & 4 | 1662 | Zenith | Interpolated | 1.93 | 1.45 |
| 65B | | | 1600-2000 | 3 & 4 | 3360 | Zenith | Interpolated | 1.93 | 1.45 |
| 65B | CBTECT | ZBTSCT-Z2C | 2000 | 4 | 3360 | Zenith | UUT 25 | 1.93 | 1.45 |

1. Branded for Caterpillar (CAT)

2. Suffix Definition

| | | |
|---|---|---|
| - Z20 | Open transition | MX350 |
| - Z2D | Delay transition | MX350 |
| - Z2C | Closed transition | MX350 |

## PRLC & IFS Switchboards & Roll-up Generator Termination Boxes

## Resonant Frequency Summary

| Report | UUT | Front to Back (Hz) | Side to Side (Hz) | Vertical (Hz) |
|---|---|---|---|---|
| 32162R14 | 20 | 8.5 | 8.5 | 18 |
| 32162R14 | 21 | 8.7 | 8.8 | 16.5 |
| 32162R14 | 24 | 8.5 | 7.5 | 14 |
| 32162R14 | 25 | 8.5 | 10.5 | 8.5 |

## UUT 20 (Unit Under Test) Summary Sheet

Manufacturer: Eaton

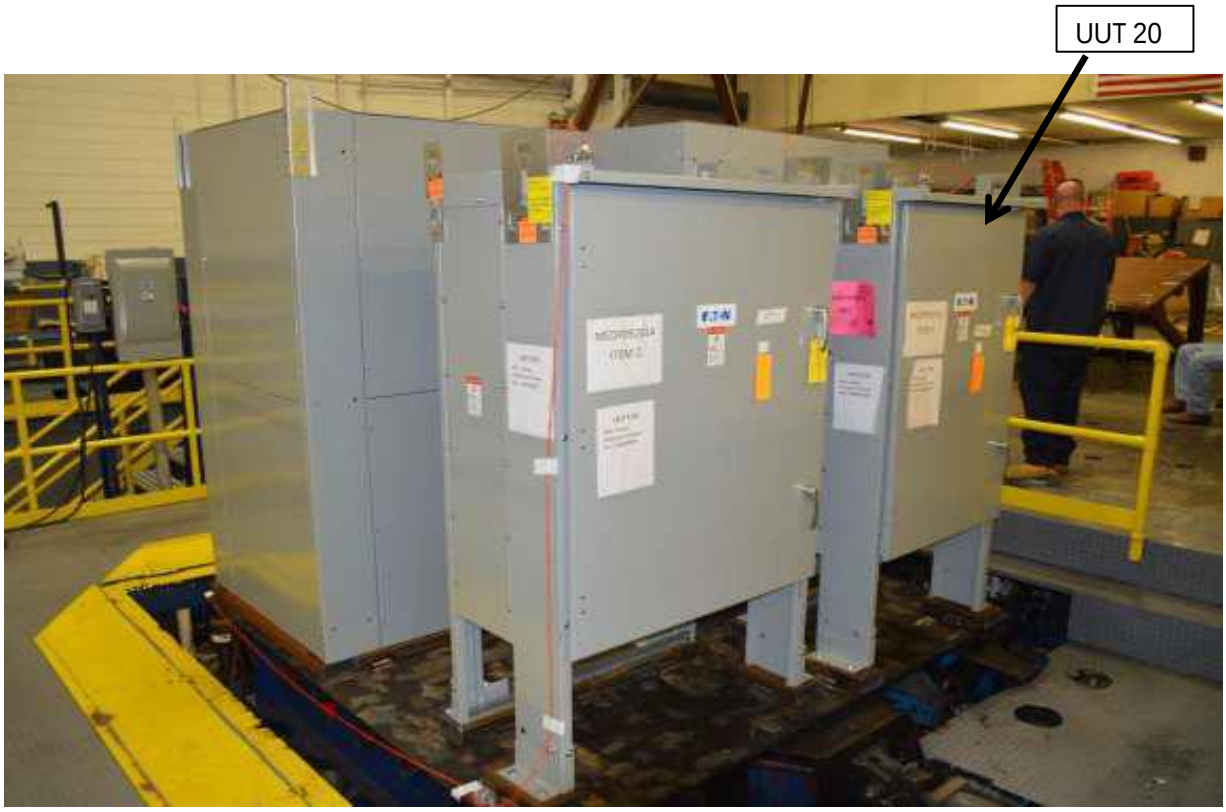
Model Number: MEDP092014-001 (PRLC/IFS)

Product Construction Summary:
Cabinet is constructed of powder coated coated carbon steel, NEMA 3R rating.

Options/Component Summary: N/A

| UUT Properties (As Tested) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Weight (lbs.) | | Dimensions (inches) | | | Lowest Natural Frequency (Hz) | | | | |
| | | Width | Depth | Height | Front-Back | | Side-Side | | Vertical |
| 494 | | 37.62 | 30.50 | 78.75 | 8.5 | | 8.5 | | 18 |
| Seismic Test Parameters | | | | | | | | | |
| Building Code | Test Criteria | C.G.-Height (in.) | Sds (g) | z/h | Ip | Aflx-H | Arig-H | Aflx-V | Arig-V |
| CBC 2013 | 2012 ICC-ES AC156 | 50.25 | 1.93 | 1 | 1.5 | 3.09 | 2.316 | 1.29 | 0.52 |

UUT maintained structural integrity and functionality as observed in post test inspection and operation checks.




UUT 20 was mounted to a rigid base with (8) 1/2" bolts (Grade 5). The steel frame (carbon steel) was welded to the shake table.

## UUT 21 (Unit Under Test) Summary Sheet

Manufacturer: Eaton

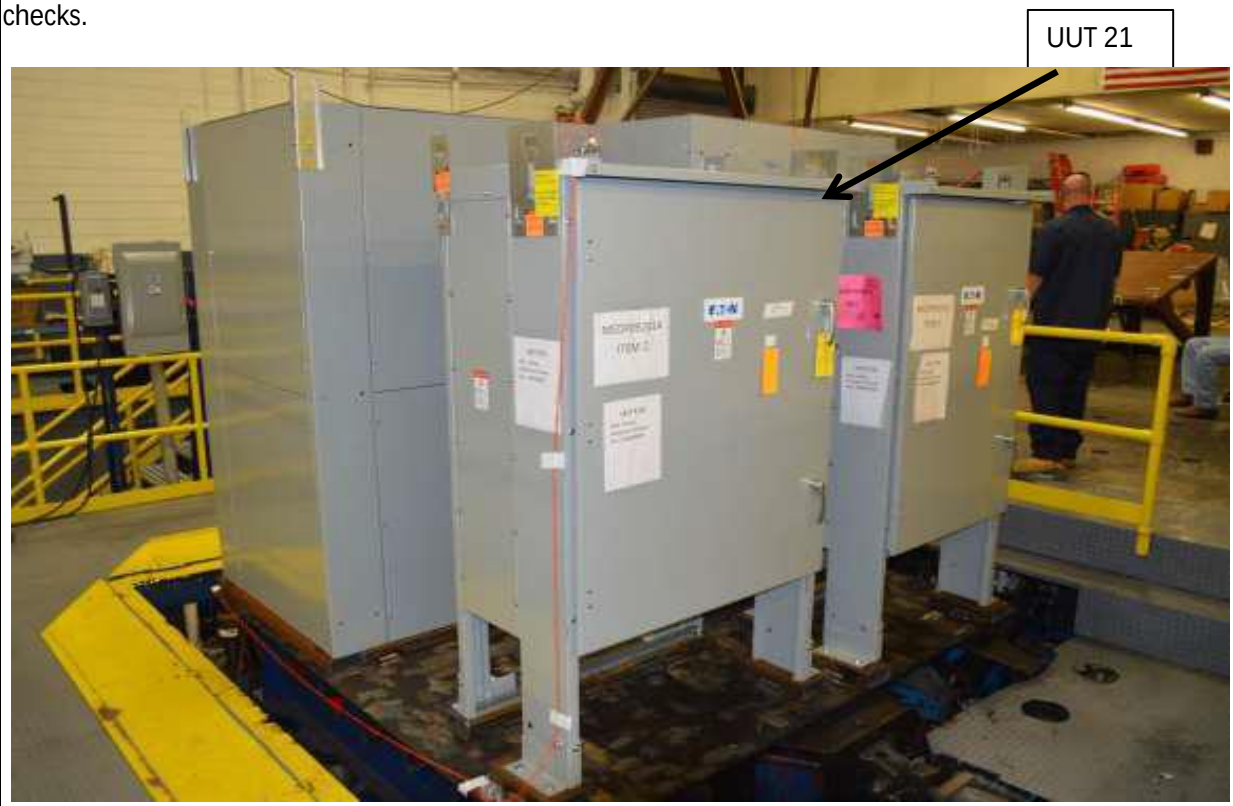
Model Number: MEDP092014-002 (PRLC/IFS)

Product Construction Summary:
Cabinet is constructed of electro-coated carbon steel, NEMA 3R rating.

Options/Component Summary: N/A

| UUT Properties (As Tested) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Weight (lbs.) | | Dimensions (inches) | | | Lowest Natural Frequency (Hz) | | | | |
| | | Width | Depth | Height | Front-Back | | Side-Side | | Vertical |
| 674 | | 46.88 | 30.5 | 78.75 | 8.7 | | 8.8 | | 16.5 |
| Seismic Test Parameters | | | | | | | | | |
| Building Code | Test Criteria | C.G.-Height (in.) | Sds (g) | z/h | Ip | Aflx-H | Arig-H | Aflx-V | Arig-V |
| CBC 2013 | 2012 ICC-ES AC156 | 51.5 | 1.93 | 1 | 1.5 | 3.09 | 2.32 | 1.29 | 0.52 |

UUT maintained structural integrity and functionality as observed in post test inspection and operation checks.




UUT 21 was mounted to a rigid base with (8) 1/2" bolts (Grade 5). The steel frame (carbon steel) was welded to the shake table.

## UUT 24 (Unit Under Test) Summary Sheet

Manufacturer: Eaton

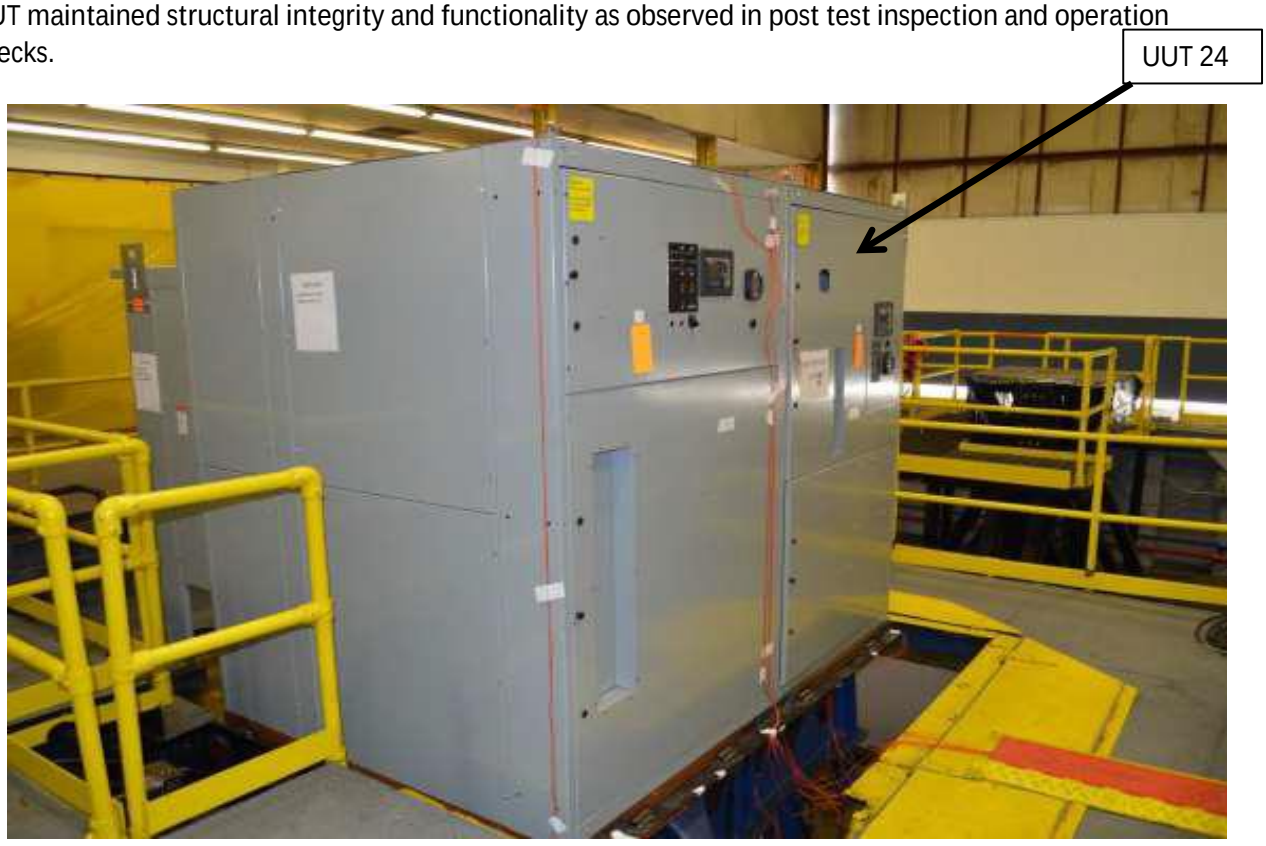
Model Number: MEDP092014-006 (PRLC/IFS)

Product Construction Summary:
Cabinet is constructed of electro-coated carbon steel, NEMA 1 rating.

Options/Component Summary: Bypass/Isolation Transfer Switch, 100A, Model CBTECT

| UUT Properties (As Tested) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Weight (lbs.) | | Dimensions (inches) | | | Lowest Natural Frequency (Hz) | | | | |
| | | Width | Depth | Height | Front-Back | | Side-Side | | Vertical |
| 1662 | | 51.25 | 49.25 | 90.25 | 8.5 | | 7.5 | | 14 |
| Seismic Test Parameters | | | | | | | | | |
| Building Code | Test Criteria | C.G.-Height (in.) | Sds (g) | z/h | Ip | Aflx-H | Arig-H | Aflx-V | Arig-V |
| CBC 2013 | 2012 ICC-ES AC156 | 42.3 | 1.93 | 1 | 1.5 | 3.09 | 2.32 | 1.29 | 0.52 |

UUT maintained structural integrity and functionality as observed in post test inspection and operation checks.




UUT 24 was mounted to a rigid base with (4) 1/2" bolts (Grade 5). The steel frame (carbon steel) was welded to the shake table.

## UUT 25 (Unit Under Test) Summary Sheet

Manufacturer: Eaton

Model Number: MEDP092014-007 (PRLC/IFS)

Product Construction Summary:
Cabinet is constructed of electro-coated carbon steel, NEMA 1 rating.

Options/Component Summary: Bypass/Isolation Transfer Switch, 2000A, Model CBTECT

| UUT Properties (As Tested) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Weight (lbs.) | | Dimensions (inches) | | | Lowest Natural Frequency (Hz) | | | | |
| | | Width | Depth | Height | Front-Back | | Side-Side | | Vertical |
| 3560 | | 54.25 | 73.25 | 90.25 | 8.5 | | 10.5 | | 8.5 |
| Seismic Test Parameters | | | | | | | | | |
| Building Code | Test Criteria | C.G.-Height (in.) | Sds (g) | z/h | Ip | Aflx-H | Arig-H | Aflx-V | Arig-V |
| CBC 2013 | 2012 ICC-ES AC156 | 47 | 1.93 | 1 | 1.5 | 3.09 | 2.32 | 1.29 | 0.52 |

UUT maintained structural integrity and functionality as observed in post test inspection and operation checks.


UUT 25 was mounted to a rigid base with (8) 1/2" bolts (Grade 5). The steel frame (carbon steel) was welded to the shake table.