



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY
APPLICATION #: OSP - 0356

OSHPD Special Seismic Certification Preapproval (OSP)

Type: [] New [X] Renewal

Manufacturer Information

Manufacturer: Greenheck, Inc.

Manufacturer's Technical Representative: Nathan Fetting

Mailing Address: 1100 Greenheck Dr., Schofield, WI 54476

Telephone: (715) 841-8549 Email: nathan.fetting@greenheck.com

Product Information

Product Name: Greenheck Sidewall Propeller Fans

Product Type: Sidewall Propeller Fans

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

General Description: Sidewall propeller fans with internal and external components as shown in the attachment.
UUT12 through 16 and related interpolated or extrapolated units shall be attached directly to wall/structure through unit
housing, and shall not be attached to any other component.

Mounting Description: Wall Mounted

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Contact Person: Galen Reid

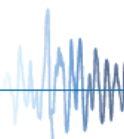
Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: greid@structint.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: [Handwritten Signature] Date: 4/18/2019

Title: Program Manager Company Name: TRU Compliance, by Structural Integrity Associates, Inc.





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

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Name: Andrew M. Coughlin California License Number: S6082

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: acoughlin@structint.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): _____

BY: Mohammad Aliaari

DATE: 08/17/2020

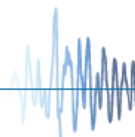
Testing Laboratory

Company Name: Environmental Testing Laboratory

Contact Name: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas, TX 75229

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





Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: [X] Yes [] No

Design Basis of Equipment or Components (Fp/Wp) = 1.88

Sds (Design spectral response acceleration at short period, g) = 2.50

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

Rp (Equipment or component response modification factor) = 6.0

Omega_0 (System overstrength factor) = 2.5

Ip (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 [X] No

Design Basis of Equipment or Components (V/W) =

Sds (Design spectral response acceleration at short period, g) =

Sd1 (Design spectral response acceleration at 1 second period, g) =

R (Response modification coefficient) = Mohammad Aliaari

Omega_0 (System overstrength factor) =

Cd (Deflection amplification factor) = DATE: 08/17/2020

Ip (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 [X] No

List of Attachments Supporting Special Seismic Certification

[X] Test Report(s) [] Drawings [] Calculations [] Manufacturer's Catalog

[X] Other(s) (Please Specify): Product Matrices

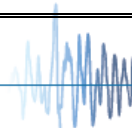
OSHPD Approval (For Office Use Only) - Approval Expires on December 31, 2025

Signature: M. Aliaari Date: August 17, 2020

Print Name: Mohammad Aliaari Title: SSE

Special Seismic Certification Valid Up to : Sds (g) = 2.50 z/h = 1.0

Condition of Approval (if applicable):



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1800859-CR-001 R0

| Manufacturer: Greenheck Fan Corporation | | | | | | TABLE 1 | | |
|--|-------|--------------------------------------|-------|--------|------------------|----------------|--|---------|
| Model Line: Sidewall Propeller Fans | | | | | | | | |
| Certified Product Construction Summary: Panel/Drive Frame made of 12ga - 18ga carbon steel. | | | | | | | | |
| Certified Options Summary: | | | | | | | | |
| Mounting Configuration: Wall mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested. | | | | | | | | |
| Building Code: CBC 2019 | | Seismic Certification Limits: | | | $S_{DS} =$ 2.5 g | $z/h = 1.0$ | $I_p = 1.5$ | |
| Model Line | Model | Dimensions (in) | | | Fan Wt. (lb) | Max Wt. (lb) | Notes | UUT |
| | | Depth | Width | Height | | | | |
| Direct Drive Level 1 SE: Exhaust SS: Supply | 8 | 8.0 | 13.0 | 13.0 | 15 | 70 | Stamped aluminum blades with carbon steel hub. | Extrap. |
| | 10 | 8.0 | 15.0 | 15.0 | 16 | 84 | | Extrap. |
| | 12 | 13.1 | 18.0 | 18.0 | 20 | 104 | | Extrap. |
| | 14 | 14.3 | 20.0 | 20.0 | 27 | 127 | | Extrap. |
| | 16 | 14.0 | 22.0 | 22.0 | 30 | 144 | | Extrap. |
| | 18 | 14.3 | 24.0 | 24.0 | 35 | 150 | | Extrap. |
| | 20 | 18.0 | 26.0 | 26.0 | 39 | 156 | | Extrap. |
| | 24 | 21.0 | 32.0 | 32.0 | 45 | 166 | | 2 |
| Direct Drive Level 2 SE: Exhaust SS: Supply | 16 | 14.0 | 22.0 | 22.0 | 78 | 78 | Carbon steel blades & hub - welded | 3 |
| | 18 | 14.3 | 24.0 | 24.0 | 80 | 176 | | Interp. |
| | 20 | 18.0 | 26.0 | 26.0 | 82 | 224 | | Interp. |
| | 24 | 21.0 | 32.0 | 32.0 | 85 | 373 | | Interp. |
| | 30 | 21.8 | 28.0 | 28.0 | 130 | 483 | | Interp. |
| | 36 | 28.0 | 44.0 | 44.0 | 230 | 656 | | Interp. |
| | 42 | 28.0 | 50.0 | 50.0 | 290 | 822 | | Interp. |
| | 48 | 28.5 | 56.0 | 56.0 | 375 | 1007 | | Interp. |
| Direct Drive Level 3 SCE: Exhaust SCS: Supply SCR: Reversible | 20 | 18.0 | 26.0 | 26.0 | 55 | 219 | Cast aluminum blades and hub. | Interp. |
| | 24 | 20.5 | 32.0 | 32.0 | 80 | 368 | | Interp. |
| | 30 | 20.0 | 38.0 | 38.0 | 125 | 478 | | Interp. |
| | 36 | 27.0 | 44.0 | 44.0 | 220 | 646 | | Interp. |
| | 42 | 29.2 | 50.0 | 50.0 | 290 | 822 | | Interp. |
| | 48 | 30.5 | 56.0 | 56.0 | 386 | 1007 | | Interp. |
| | 54 | 142.3 | 68.4 | 68.4 | 561 | 1018 | | 4 |

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1800859-CR-001 R0

| Manufacturer: Greenheck Fan Corporation | | | | | | | TABLE 2 | |
|--|-------|--|-------|--------|--------------|--------------|--|---------|
| Model Line: Sidewall Propeller Fans | | | | | | | | |
| Certified Product Construction Summary: Panel/Drive Frame made of 12ga - 18ga carbon steel. | | | | | | | | |
| Certified Options Summary: | | | | | | | | |
| Mounting Configuration: Wall mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested. | | | | | | | | |
| Building Code: CBC 2019 | | Seismic Certification Limits: $S_{DS}=$ 2.5 g $z/h=1.0$ | | | $I_p= 1.5$ | | | |
| Model Line | Model | Dimensions (in) | | | Fan Wt. (lb) | Max Wt. (lb) | Notes | UUT |
| | | Depth | Width | Height | | | | |
| Belt Drive Level 1 SBE: Exhaust SBS: Supply | 20 | 42.9 | 32.3 | 32.3 | 60 | 158 | Carbon steel blades and hub - Riveted | 8 |
| Belt Drive Level 2 SBE: Exhaust SBS: Supply | 20 | 19.5 | 26.0 | 26.0 | 65 | 229 | Dual thickness carbon steel blades and hub - Riveted | Extrap. |
| | 24 | 99.8 | 38.3 | 38.3 | 75 | 329 | | 5 |
| | 30 | 21.5 | 38.0 | 38.0 | 100 | 453 | | Interp. |
| | 36 | 25.0 | 50.0 | 50.0 | 160 | 586 | | Interp. |
| | 42 | 25.0 | 50.0 | 50.0 | 160 | 692 | | Interp. |
| | 48 | 25.0 | 56.0 | 56.0 | 260 | 740 | | Interp. |
| | 54 | 26.0 | 62.0 | 62.0 | 315 | 789 | | Interp. |
| | 60 | 105.3 | 74.4 | 74.4 | 370 | 805 | | 6 |
| Belt Drive Level 3 SBE: Exhaust SBS: Supply | 24 | 19.0 | 32.0 | 32.0 | 90 | 378 | Cold rolled carbon steel blades and hub - Welded | Extrap. |
| | 30 | 21.5 | 38.0 | 38.0 | 140 | 493 | | Extrap. |
| | 36 | 28.0 | 44.0 | 44.0 | 260 | 686 | | Extrap. |
| | 42 | 31.5 | 56.0 | 56.0 | 420 | 952 | | Extrap. |
| | 48 | 31.5 | 56.0 | 56.0 | 420 | 1052 | | Extrap. |
| | 54 | 35.8 | 62.0 | 62.0 | 590 | 1520 | | Extrap. |
| | 60 | 35.0 | 68.0 | 68.0 | 755 | 1673 | | Extrap. |
| | 72 | 73.0 | 91.1 | 91.1 | 1050 | 1942 | | 7 |
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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX



1800859-CR-001 R0

| Manufacturer: Greenheck Fan Corporation | | | | | | TABLE 2 | | |
|--|-------|--------------------------------------|-------|--------|-----------------|----------------|------------------------------|---------|
| Model Line: Sidewall Propeller Fans | | | | | | | | |
| Certified Product Construction Summary: Panel/Drive Frame made of 12ga - 18ga carbon steel. | | | | | | | | |
| Certified Options Summary: | | | | | | | | |
| Mounting Configuration: Wall mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested. | | | | | | | | |
| Building Code: CBC 2019 | | Seismic Certification Limits: | | | $S_{DS} = 2.5g$ | $z/h = 1.0$ | $I_p = 1.5$ | |
| Model Line | Model | Dimensions (in) | | | Fan Wt. (lb) | Max Wt. (lb) | Notes | UUT |
| | | Depth | Width | Height | | | | |
| Belt Drive Level 3 SBCE: Exhaust SBCS: Supply SBCR: Reversible | 24 | 19.0 | 32.0 | 32.0 | 90 | 378 | Cast aluminum blades and hub | Extrap. |
| | 30 | 21.5 | 38.0 | 38.0 | 140 | 493 | | Extrap. |
| | 36 | 28.0 | 44.0 | 44.0 | 260 | 686 | | Extrap. |
| | 42 | 28.0 | 50.0 | 50.0 | 320 | 852 | | Extrap. |
| | 48 | 31.5 | 56.0 | 56.0 | 420 | 1052 | | Extrap. |
| | 54 | 35.8 | 62.0 | 62.0 | 590 | 1520 | | Extrap. |
| | 60 | 35.0 | 68.0 | 68.0 | 755 | 1643 | | Extrap. |
| | 72 | 35.0 | 82.0 | 82.0 | 860 | 1942 | | 9 |
| AER Exhaust/Supply (Direct Drive) | 20 | 20.0 | 26.0 | 26.0 | 82 | 334 | Cast aluminum blades and hub | 10 |
| | 24 | 20.8 | 32.0 | 32.0 | 284 | 572 | | Interp. |
| | 30 | 21.6 | 38.0 | 38.0 | 307 | 660 | | Interp. |
| | 36 | 25.8 | 44.0 | 44.0 | 426 | 852 | | Interp. |
| | 42 | 27.5 | 50.0 | 50.0 | 615 | 1147 | | Interp. |
| | 48 | 28.5 | 56.0 | 56.0 | 626 | 1258 | | Interp. |
| | 54 | 33.8 | 62.0 | 62.0 | 815 | 1781 | | Interp. |
| | 60 | 35.0 | 68.0 | 68.0 | 838 | 1726 | | 11 |
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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

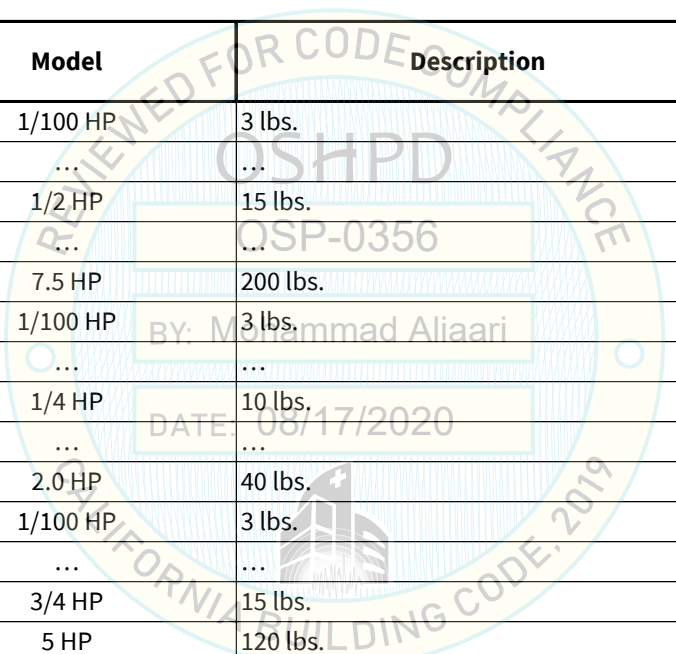
1800859-CR-001 R0



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|----------------------|---------------------------|--------------------------------------|----------------|
| Manufacturer: | Greenheck Fan Corporation | Table Description: Fan Motors | TABLE 3 |
| Model Line: | Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Component Type | Manufacturer | Model | Description | Notes | UUT |
|----------------|--------------|----------|-------------|-------------------------|---------|
| Fan Motor | WEG | 1/100 HP | 3 lbs. | | Extrap. |
| | | ... | ... | | Extrap. |
| | | 1/2 HP | 15 lbs. | UUT: 115V - 1 Phase | 8 |
| | | ... | ... | | Interp. |
| | Vari-Green | 7.5 HP | 200 lbs. | UUT: 230V - 3 Phase | 1 |
| | | 1/100 HP | 3 lbs. | | Extrap. |
| | | ... | ... | | Extrap. |
| | | 1/4 HP | 10 lbs. | UUT: 115V - 1 Phase | 3 |
| | Marathon | ... | ... | | Interp. |
| | | 2.0 HP | 40 lbs. | UUT: 230V - 1 Phase | 4 |
| | | 1/100 HP | 3 lbs. | | Extrap. |
| | | ... | ... | | Extrap. |
| | | 3/4 HP | 15 lbs. | UUT: 115V - 1 Phase | 2 |
| | | 5 HP | 120 lbs. | UUT: 460V - 3 Phase | 6 |
| | Baldor | ... | ... | | Interp. |
| | | 20 HP | 283 lbs. | UUT: 460V - 3 Phase | 9 |
| | | 1/100 HP | 3 lbs. | | Extrap. |
| | | ... | ... | | Extrap. |
| | | 1 HP | 38 lbs. | UUT: 115V - 1 Phase | 5 |
| | | ... | ... | | Interp. |
| | | 2 HP | 45 lbs. | UTT: 230/460V - 3 Phase | 10 |
| | | ... | ... | | Interp. |
| | | 20 HP | 534 lbs. | UUT: 460V - 3 Phase | 7,11 |



SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

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|--|-----------------------------------|----------------|
| Manufacturer: Greenheck Fan Corporation | Table Description: Dampers | TABLE 4 |
| Model Line: Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT |
|--------------------------------------|------------------------------------|----------------|-------|--------|----------------|--|-------|---------|
| | | Depth | Width | Height | | | | |
| Greenheck, Inc. Backdraft Dampers | VCD-20 | 5.13 | 6 | 6 | 10 | Carbon steel frame and blades | | Extrap. |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 5.25 | 26 | 26 | 25 | | | 2 |
| | | ... | ... | ... | ... | | | Interp. |
| | | 5.25 | 74 | 74 | 120 | | | 7 |
| | VCD-23 | 5.13 | 6 | 6 | 10 | Carbon steel frame and blades | | Extrap. |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 5.25 | 62 | 62 | 95 | | | 6 |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 5.25 | 74 | 74 | 165 | | | Extrap. |
| | VCD-34(Motorized) | 5.13 | 10 | 6 | 15 | Carbon steel frame and blades | | Extrap. |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 5.25 | 74 | 74 | 165 | | | 9 |
| | VCD-42 (Motorized) ¹ | 5.13 | 6 | 6 | 10 | Carbon steel frame and aluminum blades | | Extrap. |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 5.25 | 22 | 22 | 24 | | | 8 |
| | | 5.25 | 56 | 56 | 75 | | 4 | |
| | | ... | ... | ... | ... | Carbon steel frame and aluminum blades | | Interp. |
| | | 5.25 | 74 | 74 | 164 | | 12 | |

Notes:
1. Dampers interpolated by UUT12, UUT13, or UUT14 shall be attached directly to wall/structure through unit housing, and shall not be attached to any other component.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

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|--|-----------------------------------|----------------|
| Manufacturer: Greenheck Fan Corporation | Table Description: Dampers | TABLE 4 |
| Model Line: Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT |
|--------------------------------------|--------------------------------------|----------------|-------|--------|----------------|---|-------|---------|
| | | Depth | Width | Height | | | | |
| Greenheck, Inc. Backdraft Dampers | VCD-43 (Motorized) ¹ | 5 | 8 | 5 | 10 | Aluminum frame and blades | | Extrap. |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 5 | 26 | 26 | 25 | | | 5 |
| | | ... | ... | ... | ... | | | Interp. |
| | | 5 | 74 | 74 | 149.5 | | | 13 |
| | WD-300/400 (Gravity) ¹ | 3.5 | 6 | 6 | 10 | Carbon steel frame and aluminum blades | | Extrap. |
| | | ... | ... | ... | ... | | | Extrap. |
| | | 3.5 | 18 | 18 | 20 | | | Extrap. |
| | | 3.5 | 56 | 56 | 70 | | | 1 |
| | | ... | ... | ... | ... | | | Interp. |
| | | 3.5 | 74 | 74 | 61 | | | 14 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Notes:
1. Dampers interpolated by UUT12, UUT13, or UUT14 shall be attached directly to wall/structure through unit housing, and shall not be attached to any other component.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

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|----------------------|---------------------------|---|----------------|
| Manufacturer: | Greenheck Fan Corporation | Table Description: Housing Options | TABLE 5 |
| Model Line: | Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT | |
|-----------------------------------|-------|----------------|-------|--------|----------------|------------------------|------------------------|------------------------|---------|
| | | Depth | Width | Height | | | | | |
| Wall Collar (Greenheck) | 8 | 16 | 16 | 16 | 18 | 20ga Carbon Steel | | Extrap. | |
| | 10 | 16 | 18 | 18 | 20 | | | Extrap. | |
| | 12 | 16 | 21 | 21 | 24 | | | Extrap. | |
| | 14 | 18 | 23 | 23 | 27 | | | Extrap. | |
| | 16 | 18 | 25 | 25 | 38 | | | Extrap. | |
| | 18 | 18 | 27 | 27 | 41 | | | Extrap. | |
| | 20 | 18 | 29 | 29 | 47 | | | UUT: 18ga Carbon Steel | 8 |
| | 24 | 18 | 38 | 38 | 60 | 18 -12ga Carbon Steel | UUT: 18ga Carbon Steel | 2 | |
| | 30 | 18 | 44 | 44 | 71 | | | Interp. | |
| | 36 | 19 | 50 | 50 | 83 | | | Interp. | |
| | 42 | 19 | 56 | 56 | 94 | | | Interp. | |
| | 48 | 19 | 62 | 62 | 105 | | | Interp. | |
| | 54 | 20 | 68 | 68 | 141 | | | Interp. | |
| | 60 | 21 | 74 | 74 | 160 | | | UUT: 16ga Carbon Steel | 6 |
| | 72 | 22 | 89 | 89 | 320 | | 14 -12ga Carbon Steel | | Extrap. |
| Short Wall Housing (Greenheck) | 8 | 19 | 16 | 16 | 26 | 20 - 12ga Carbon Steel | | Interp. | |
| | 10 | 19 | 18 | 18 | 32 | | | Interp. | |
| | 12 | 24 | 21 | 21 | 41 | | | Interp. | |
| | 14 | 26 | 23 | 23 | 50 | | | Interp. | |
| | 16 | 27 | 25 | 25 | 56 | | UUT: 20ga Carbon Steel | 3 | |
| | 18 | 28 | 27 | 27 | 64 | 18 - 12ga Carbon Steel | | Interp. | |
| | 20 | 32 | 29 | 29 | 85 | | | Interp. | |
| | 24 | 37 | 38 | 38 | 125 | | | Interp. | |

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

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| Manufacturer: Greenheck Fan Corporation | | Table Description: Housing Options | | | | TABLE 5 | | |
|--|--------------|--|--------------|---------------|------------------------|------------------------|-------------------|------------------------|
| Model Line: Sidewall Propeller Fans | | | | | | | | |
| Building Code: CBC 2019 | | Seismic Certification Limits: $S_{DS} = 2.5g$ $z/h = 1.0$ | | | | $I_p = 1.5$ | | |
| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT |
| | | Depth | Width | Height | | | | |
| Short Wall Housing (Greenheck) | 30 | 38 | 44 | 44 | 148 | 18 - 12ga Carbon Steel | | Interp. |
| | 36 | 39 | 50 | 50 | 177 | | | Interp. |
| | 42 | 44 | 56 | 56 | 207 | | | Interp. |
| | 48 | 44 | 62 | 62 | 250 | 14 - 12ga Carbon Steel | | Interp. |
| | 54 | 51 | 68 | 68 | 365 | | | Interp. |
| | 60 | 54 | 74 | 74 | 450 | | | Interp. |
| | 72 | 54 | 89 | 89 | 1100 | | 12ga Carbon Steel | |
| Long Wall Housing (Greenheck) | 8 | 25 | 16 | 16 | 26 | 20ga Carbon Steel | | Interp. |
| | 10 | 25 | 18 | 18 | 32 | | | Interp. |
| | 12 | 29 | 21 | 21 | 41 | | | Interp. |
| | 14 | 32 | 23 | 23 | 50 | | | Interp. |
| | 16 | 33 | 25 | 25 | 56 | | | Interp. |
| | 18 | 34 | 27 | 27 | 64 | | | Interp. |
| | 20 | 38 | 29 | 29 | 85 | 18 - 12ga Carbon Steel | | Interp. |
| | 24 | 43 | 38 | 38 | 125 | | | Interp. |
| | 30 | 44 | 44 | 44 | 148 | | | Interp. |
| | 36 | 45 | 50 | 50 | 177 | 20 - 14ga Carbon Steel | | Interp. |
| | 42 | 48 | 56 | 56 | 207 | | | Interp. |
| | 48 | 50 | 62 | 62 | 250 | | | Interp. |
| | 54 | 56 | 68 | 68 | 365 | | | Interp. |
| | 60 | 60 | 74 | 74 | 450 | | | Interp. |
| | 72 | 60 | 89 | 89 | 1100 | | 12ga Carbon Steel | UUT: 12ga Carbon Steel |

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1800859-CR-001 R0



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|--|---|----------------|
| Manufacturer: Greenheck Fan Corporation | Table Description: Options and Accessories | TABLE 6 |
| Model Line: Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT |
|--|-------|----------------|-------|--------|----------------|--|-------------------------|-----|
| | | Depth | Width | Height | | | | |
| Motor Side Guard ¹ (Greenheck) | 20 | 17 | 28 | 28 | 15 | 18ga Welded carbon steel wire | UUT8: 18ga Carbon Steel | 8 |
| | 24 | 20 | 34 | 34 | 20 | | UUT2: 18ga Carbon Steel | 2 |
| | 30 | 23 | 40 | 40 | 26 | | Interp. | |
| | 36 | 24 | 46 | 46 | 30 | | Interp. | |
| | 42 | 26 | 53 | 53 | 37 | | Interp. | |
| | 48 | 29 | 59 | 59 | 42 | | Interp. | |
| Damper Guard ¹ (Greenheck) | 8 | 6 | 10 | 10 | 6 | 18ga Carbon Steel Frame with expanded steel screen | Interp. | |
| | 10 | 7 | 12 | 12 | 8 | | Interp. | |
| | 12 | 5 | 14 | 14 | 9 | | Interp. | |
| | 14 | 6 | 16 | 16 | 11 | | Interp. | |
| | 16 | 7 | 18 | 18 | 13 | | Interp. | |
| | 18 | 6 | 20 | 20 | 14 | | Interp. | |
| | 20 | 7 | 22 | 22 | 17 | | UUT8: 18ga Carbon Steel | 8 |
| | 24 | 6 | 26 | 26 | 21 | | Interp. | |
| | 30 | 7 | 32 | 32 | 22 | | Interp. | |
| | 36 | 4 | 38 | 38 | 24 | | Interp. | |
| | 42 | 10 | 44 | 44 | 38 | | Interp. | |
| | 48 | 9 | 50 | 50 | 39 | | Interp. | |
| | 54 | 8 | 56 | 56 | 44 | | Interp. | |
| | 60 | 7 | 62 | 62 | 48 | | Interp. | |
| 72 | 8 | 74 | 74 | 58 | Interp. | | | |

¹ Damper Guard, Motor Side Guard, OSHA Side Guard are structurally the same.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1800859-CR-001 R0



| | | |
|--|---|----------------|
| Manufacturer: Greenheck Fan Corporation | Table Description: Options and Accessories | TABLE 6 |
| Model Line: Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT | |
|---|-------|----------------|-------|--------|----------------|---|-------|------------------------|---------|
| | | Depth | Width | Height | | | | | |
| OSHA Side Guard ¹ (Greenheck) | 8 | 10 | 13 | 13 | 8 | 20ga Carbon Steel Frame with steel screen | | Interp. | |
| | 10 | 10 | 15 | 15 | 12 | | | Interp. | |
| | 12 | 12 | 18 | 18 | 17 | | | Interp. | |
| | 14 | 12 | 20 | 20 | 19 | | | Interp. | |
| | 16 | 12 | 22 | 22 | 21 | | | UUT: 20ga Carbon Steel | 3 |
| | 18 | 12 | 24 | 24 | 24 | | | | Interp. |
| | 20 | 18 | 26 | 26 | 26 | 18 - 12ga Carbon Steel Frame with steel screen | | Interp. | |
| | 24 | 20 | 32 | 32 | 27 | | | UUT: 18ga Carbon Steel | 5 |
| | 30 | 22 | 38 | 38 | 36 | | | | Interp. |
| | 36 | 24 | 44 | 44 | 63 | 16 - 12ga Carbon Steel Frame with steel screen | | Interp. | |
| | 42 | 29 | 50 | 50 | 67 | | | Interp. | |
| | 48 | 28 | 56 | 56 | 72 | | | Interp. | |
| | 54 | 34 | 62 | 62 | 98 | | | UUT: 16ga Carbon Steel | 4 |
| | 60 | 34 | 68 | 68 | 105 | | | UUT: 16ga Carbon Steel | 6 |
| | 72 | 34 | 82 | 82 | 132 | | | UUT: 12ga Carbon Steel | 7 |
| Steel Weatherhood 45° Turn Down (Greenheck) | 8 | 13 | 11 | 12 | 9 | 18 - 16ga Carbon steel | | Extrap. | |
| | 10 | 15 | 13 | 14 | 12 | | | Extrap. | |
| | 12 | 46 | 15 | 17 | 15 | | | Extrap. | |
| | 14 | 18 | 17 | 19 | 18 | | | Extrap. | |
| | 16 | 19 | 19 | 21 | 21 | | | Extrap. | |
| | 18 | 22 | 21 | 23 | 26 | | | Extrap. | |

¹ Damper Guard, Motor Side Guard, OSHA Side Guard are structurally the same.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1800859-CR-001 R0



| | | |
|--|---|----------------|
| Manufacturer: Greenheck Fan Corporation | Table Description: Options and Accessories | TABLE 6 |
| Model Line: Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT | |
|--|-------|----------------|-------|--------|----------------|------------------------|------------------------|--------------------------------------|---------|
| | | Depth | Width | Height | | | | | |
| Steel Weatherhood 45° Turn Down (Greenheck) ¹ | 20 | 25 | 23 | 25 | 31 | 18 - 16ga Carbon steel | | Extrap. | |
| | 24 | 27 | 29 | 22 | 43 | | | Extrap. | |
| | 30 | 29 | 35 | 38 | 53 | | | Extrap. | |
| | 36 | 33 | 41 | 44 | 68 | 16ga Carbon steel | | Extrap. | |
| | 42 | 36 | 47 | 50 | 81 | | | Extrap. | |
| | 48 | 40 | 53 | 56 | 105 | | | Extrap. | |
| | 54 | 45 | 60 | 62 | 150 | | | UUT: 16ga Carbon Steel w/bird screen | 1 |
| | 60 | 48 | 66 | 68 | 184 | | | | Interp. |
| | 72 | 53 | 78 | 81 | 213.5 | | | UUT: 16ga Carbon Steel w/bird screen | 15 |
| Steel Weatherhood 90° Turn Down (Greenheck) | 8 | 16 | 11 | 13 | 12 | 18 - 16ga Carbon steel | | Interp. | |
| | 10 | 19 | 13 | 15 | 16 | | | Interp. | |
| | 12 | 20 | 15 | 18 | 20 | | | Interp. | |
| | 14 | 23 | 17 | 20 | 24 | | | Interp. | |
| | 16 | 25 | 19 | 22 | 29 | | | Interp. | |
| | 18 | 28 | 21 | 24 | 35 | | | Interp. | |
| | 20 | 30 | 23 | 26 | 42 | | | Interp. | |
| | 24 | 36 | 29 | 33 | 61 | | | UUT: 18ga Carbon steel w/bird screen | 5 |
| | 30 | 40 | 35 | 39 | 79 | | 16 - 12ga Carbon steel | | Interp. |
| | 36 | 46 | 41 | 45 | 104 | | | Interp. | |
| | 42 | 49 | 47 | 51 | 127 | | | Interp. | |
| | 48 | 56 | 53 | 57 | 163 | | | Interp. | |

¹ UUT12 thru 16 and related interpolated units shall be attached directly to wall/structure through unit housing, and shall not be attached to any other component.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1800859-CR-001 R0



| | | | |
|----------------------|---------------------------|---|----------------|
| Manufacturer: | Greenheck Fan Corporation | Table Description: Options and Accessories | TABLE 6 |
| Model Line: | Sidewall Propeller Fans | | |

| | | |
|--------------------------------|--|-------------|
| Building Code: CBC 2019 | Seismic Certification Limits: $S_{DS} = 2.5g$ $z/h = 1.0$ | $I_p = 1.5$ |
|--------------------------------|--|-------------|

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT |
|---|-------|----------------|-------|--------|----------------|----------------|----------------------------------|---------|
| | | Depth | Width | Height | | | | |
| Aluminum Weatherhood 45° Turn Down (Greenheck) | 8 | 13 | 11 | 12 | 5 | 0.063 Aluminum | | Extrap. |
| | 10 | 15 | 13 | 14 | 7 | | Extrap. | |
| | 12 | 46 | 15 | 17 | 8 | | Extrap. | |
| | 14 | 18 | 17 | 19 | 10 | | Extrap. | |
| | 16 | 19 | 19 | 21 | 12 | | Extrap. | |
| | 18 | 22 | 21 | 23 | 14 | | Extrap. | |
| | 20 | 25 | 23 | 25 | 17 | | Extrap. | |
| | 24 | 27 | 29 | 22 | 24 | | Extrap. | |
| | 30 | 29 | 35 | 38 | 29 | | Extrap. | |
| | 36 | 33 | 41 | 44 | 37 | | Extrap. | |
| | 42 | 36 | 47 | 50 | 44 | | Extrap. | |
| | 48 | 40 | 53 | 56 | 56 | | Extrap. | |
| | 54 | 45 | 60 | 62 | 71 | | Extrap. | |
| | 60 | 48 | 66 | 68 | 90 | | UUT: 16ga Aluminum w/bird screen | 6 |
| 72 | 53 | 78 | 81 | 115.5 | | Interp. | | |
| Aluminum Weatherhood 90° Turn Down (Greenheck) | 8 | 16 | 11 | 13 | 7 | 0.063 Aluminum | | Interp. |
| | 10 | 19 | 13 | 15 | 8 | | Interp. | |
| | 12 | 20 | 15 | 18 | 11 | | Interp. | |
| | 14 | 23 | 17 | 20 | 13 | | Interp. | |
| | 16 | 25 | 19 | 22 | 16 | | Interp. | |
| | 18 | 28 | 21 | 24 | 19 | | Interp. | |
| | 20 | 30 | 23 | 26 | 22 | | Interp. | |
| 24 | 36 | 29 | 33 | 32 | Interp. | | | |

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1800859-CR-001 R0



| | | | |
|----------------------|---------------------------|---|----------------|
| Manufacturer: | Greenheck Fan Corporation | Table Description: Options and Accessories | TABLE 6 |
| Model Line: | Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Model Line (Manufacturer) | Model | Dimension (in) | | | Weight (lb) | Material | Notes | UUT | |
|--|-------|----------------|-------|--------|----------------|----------------|-------|---|---------|
| | | Depth | Width | Height | | | | | |
| Aluminum Weatherhood 90° Turn Down (Greenheck) ¹ | 30 | 40 | 35 | 39 | 42 | 0.063 Aluminum | | Interp. | |
| | 36 | 46 | 41 | 45 | 54 | | | Interp. | |
| | 42 | 49 | 47 | 51 | 67 | | | Interp. | |
| | 48 | 56 | 53 | 57 | 83 | | | Interp. | |
| | 54 | 61 | 60 | 64 | 102 | | | UUT: 16ga Aluminum w/bird screen | 4 |
| | 60 | 67 | 66 | 70 | 133 | | | | Interp. |
| | 72 | 72 | 78 | 82 | 148 | | | UUT: 16ga Aluminum w/bird screen and rain guard | 16 |
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¹ UUT12 thru 16 and related interpolated units shall be attached directly to wall/structure through unit housing, and shall not be attached to any other component.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1800859-CR-001 R0



| | | |
|--|--|----------------|
| Manufacturer: Greenheck Fan Corporation | Table Description: Electrical Accessories | TABLE 7 |
| Model Line: Sidewall Propeller Fans | | |

Building Code: CBC 2019 **Seismic Certification Limits:** $S_{DS} = 2.5g$ $z/h = 1.0$ $I_p = 1.5$

| Component Type | Manufacturer | Model | Description | Notes | UUT |
|------------------------------|--------------------------|--------------------|--------------|-------|-----------|
| Disconnects | Square-D | NEMA-1 | Toggle - 30A | | 1 |
| | | NEMA-3R | Toggle - 30A | | 2,6 |
| | | NEMA 3R Heavy Duty | 30A | | 4,8 |
| | | NEMA-4 Heavy Duty | 30A | | 5 |
| | ABB | NEMA-4 | 30A | | 3 |
| | | NEMA -4X | Toggle - 40A | | 7 |
| Damper Actuator Honeywell | ML/MS | NEMA-4 | Toggle - 40A | | 9 |
| | | ML4202F1000 | 20 in-lb | | 2 |
| | | ML8202F1006 | 175 in-lb | | 5 |
| | | MS4120F1006 | 175 in-lb | | 4,6,12,13 |
| Damper Actuator Belimo | TFB-TFBX/AFBUP- AFXUP | MS8120F1002 | 175 in-lb | | 7 |
| | | TF120 | 22 in-lb | | 8 |
| | | AFBUP-S | 180 in-lb | | 9 |
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UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

Manufacturer: Greenheck Fan Corporation
Model Line: Sidewall Propeller Fans

| UUT | Unit Description | Report Number | Testing Laboratory | S _{DS} | z/h | I _p |
|-----|-----------------------------------|---------------|--|-----------------|-----|----------------|
| 1 | SE2-54-416-C75 Direct Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 2 | SE1-24-432-B7 Direct Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 3 | SE2-16-423-A3 Direct Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 4 | SCS3-54-315-C75 Direct Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 5 | SBS-2H24-10 Belt Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 6 | SBE-2H60-50 Belt Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 7 | SBS-3L72-200 Belt Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 8 | SBE-1L20-5 Belt Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 9 | SBCR-72-200 Belt Drive | 12774, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 10 | AER - 20 | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 11 | AER - 60 | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 12* | VCD-42 Damper (On Fan) | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 13* | VCD-43 Damper (On Fan) | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 14* | WD - 300/400 Damper (On Fan) | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 15* | 45° Turndown Weatherhood (On Fan) | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |
| 16* | 90° Turndown Weatherhood (On Fan) | 15133, Rev.1 | Environmental Testing Laboratory (ETL) | 2.5 | 1.0 | 1.5 |

Notes:

* UUT12 thru 16 are only dampers attached directly to wall/structure through unit housing.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 1 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SE2-54-416-C75 – Direct Drive | |
| Serial Number: N/A | |

Product Construction Summary:
14ga carbon steel fan panel. Propeller made of steel blades and hub – welded.

Options/Subcomponent Summary:
Motor: WEG motor 7.5HP/230V-3phase. Damper: Greenheck gravity operated damper WD300 56Wx56H. Disconnect: Square-D NEMA-1 toggle – 30A. Options & Accessories: 16ga carbon steel weatherhood 45° turn down with bird screen.

| <i>UUT Properties</i> | | | | | | |
|-----------------------|----------------|-------|--------|-------------------------------|-----------|----------|
| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 561* | 30.1 | 62.0 | 62.0 | N/A | N/A | N/A |

| <i>UUT Highest Passed Seismic Run Information</i> | | | | | | | | | |
|---|---------------------|---------------------|-----|----------------|------------------------|------------------------|------------------------|------------------------|--|
| Building 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 2019 | ICC-ES AC156 (2010) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 | |

Test Mounting Details:



*Weight of fan only

Unit attached to the test fixture using 16-3/8" x 3" lag screws. Greenheck damper and weatherhood attached using 18 and 20-3/8" x 3" lag screws, respectively.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 2 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SE1-24-432-B7 – Direct Drive Serial Number: N/A | |

Product Construction Summary:
18ga carbon steel fan panel. Propeller made of stamped aluminum blades with carbon steel hub.

Options/Subcomponent Summary:
Motor: Marathon motor 0.75HP / 115V-1phase. Damper: Greenheck motorized VCD-20. Damper Actuator: Honeywell ML4202F1000 (20in-lbs). Disconnect: Square-D NEMA-3R toggle – 30A. Housing Options: Wall collar made 18ga carbon steel. Options & Accessories: 18ga steel motor side guard.

| <i>UUT Properties</i> | | | | | | |
|-----------------------|----------------|-------|--------|-------------------------------|-----------|----------|
| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 166 | 21.0 | 32.0 | 32.0 | N/A | N/A | N/A |

| <i>UUT Highest Passed Seismic Run Information</i> | | | | | | | | |
|---|---------------------|---------------------|-----|----------------|------------------------|------------------------|------------------------|------------------------|
| Building 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 2019 | ICC-ES AC156 (2010) | 1.75 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



Unit attached to the test fixture using 12-3/8" x 3" lag screws.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 3 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SE2-16-423-A3 – Direct Drive Serial Number: N/A | |

Product Construction Summary:
18ga carbon steel fan panel. Propeller made of steel blades and hub - welded.

Options/Subcomponent Summary:
Motor: Vari-Green 0.25HP / 115V-1phase. Disconnect: Square-D NEMA-4-30A. Housing Options: Short wall housing made of 20ga carbon steel. Options & Accessories: 20ga carbon steel OSHA side guard.

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 78 | 14.0 | 22.0 | 22.0 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2010) | 1.7/2.5/2.0 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



Unit attached to the test fixture using 12-3/8" x 3" lag screws.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 4 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SCS3-54-315-C75 – Direct Drive Serial Number: N/A | |

Product Construction Summary:
14ga carbon steel fan panel. Propeller made of cast aluminum blades and hub.

Options/Subcomponent Summary:
Motor: Vari-Green motor 2HP / 230V-1phase. Damper: Greenheck motorized VCD-42 56Wx56H. Damper Actuator: Honeywell MS4120F1006 (175in-lbs). Disconnect: Square-D NEMA-3R heavy duty – 30A. Housing Options: Filtered wall housing made of 16ga carbon steel. Filters: (12) Research Products filters 23.25Wx20.75H. Options & Accessories: 16ga carbon steel OSHA side guard and 16ga aluminum weatherhood 90° turn down with bird screen. Discharge Diffuser: 2-way 56Wx56H carbon steel.

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 1018 | 142.3 | 68.4 | 68.4 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2010) | 1.7/2.5/2.0 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



Unit attached to the test fixture using 16-3/8" x 3" lag screws, 2- 1/2" all threaded rods and 20-1/4" tek screws (weatherhood). Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 5 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SBS-2H24-10 – Belt Drive | |
| Serial Number: N/A | |

Product Construction Summary:
18ga carbon steel fan panel. H type Propeller made of dual thickness carbon steel blades and hub – riveted.

Options/Subcomponent Summary:
Motor: Baldor motor 1HP / 115V-1phase. Damper: Greenheck motorized VCD-43 26Wx26H. Damper Actuator: Honeywell ML8202F1006 (175in-lbs). Disconnect: Square-D NEMA-4 heavy duty – 30A. Housing Options: Filtered wall housing made of 18ga carbon steel. Filters: (4) Research Products filters 23.25Wx16.25H. Options & Accessories: 18ga carbon steel OSHA side guard and 18ga carbon steel weatherhood 90° turn down with bird screen. Discharge Diffuser: 4-way 26Wx26H carbon steel.

| <i>UUT Properties</i> | | | | | | |
|-----------------------|----------------|-------|--------|-------------------------------|-----------|----------|
| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 329 | 99.8 | 38.3 | 38.3 | N/A | N/A | N/A |

| <i>UUT Highest Passed Seismic Run Information</i> | | | | | | | | | |
|---|---------------------|---------------------|-----|----------------|------------------------|------------------------|------------------------|------------------------|--|
| Building 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 2019 | ICC-ES AC156 (2010) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 | |

Test Mounting Details:



Unit attached to the test fixture using 12-3/8" x 3" lag screws and (2) 1/2" all threaded rods.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 6 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SBE-2H60-50 – Belt Drive | |
| Serial Number: N/A | |

Product Construction Summary:
14ga carbon steel fan panel. H type Propeller made of dual thickness carbon steel blades and hub – riveted.

Options/Subcomponent Summary:
Motor: Marathon motor 5HP / 460V-3phase. Damper: Greenheck motorized VCD-23 62Wx62H. Damper Actuator: Honeywell MS4120F1006 (175in-lbs). Disconnect: Square-D NEMA-3R Toggle – 30A. Housing Options: Wall collar made of 16ga carbon steel. Options & Accessories: 16ga carbon steel OSHA side guard and 16ga aluminum weatherhood 45° turn down with bird screen.

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 805 | 105.3 | 74.4 | 74.4 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2010) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



← UUT 6 → UUT 6 →

Unit attached to the test fixture using 16-3/8" x 3" lag screws.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 7 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SBS-3L72-200 – Belt Drive Serial Number: N/A | |

Product Construction Summary:
12ga carbon steel fan panel. L type propeller made of steel blades and hub – welded.

Options/Subcomponent Summary:
Motor: Baldor motor 20HP / 460V-3phase. Damper: Greenheck motorized VCD-20 74Wx74H. Damper Actuator: Honeywell MS8120F1002 (175in-lbs). Disconnect: ABB NEMA-4X Toggle – 40A. Housing Options: Long wall housing made of 12ga carbon steel. Options & Accessories: 12ga carbon steel OSHA side guard.

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 1942 | 73.0 | 91.1 | 91.1 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2010) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



Unit attached to the test fixture using 20-3/8" x 3" lag screws.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 8 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SBE-1L20-5 – Belt Drive | |
| Serial Number: N/A | |

Product Construction Summary:
18ga carbon steel fan panel. L type propeller made of carbon steel blades and hub - riveted.

Options/Subcomponent Summary:
Motor: WEG motor 0.5 HP / 115V-1phase. Damper: Greenheck motorized VCD-42 22Wx22H. Damper Actuator: Belimo TF120 (22in-lbs). Disconnect: Square-D NEMA-3R heavy duty – 30A. Housing Options: Wall collar made of 18ga carbon steel. Options & Accessories: 18ga steel motor side guard and 18ga carbon steel damper guard.

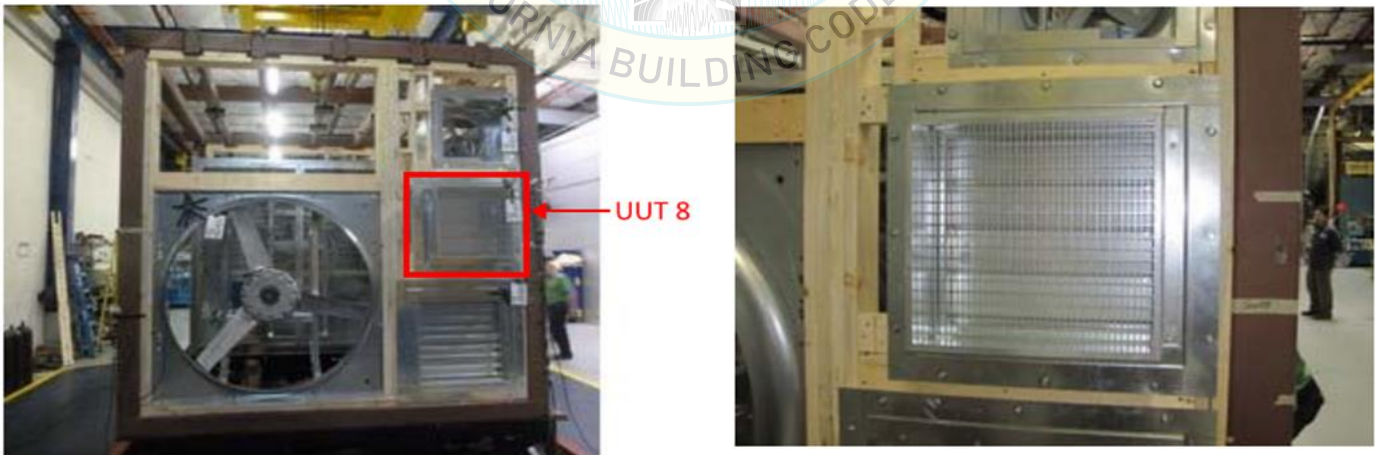
UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 157.5 | 42.9 | 32.3 | 32.3 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2010) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



Unit attached to the test fixture using 12-3/8" x 3" lag screws.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|--------------|
| Manufacturer: Greenheck Fan Corporation | UUT 9 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: SBCR-72-200 – Belt Drive | |
| Serial Number: N/A | |

Product Construction Summary:
12ga galvanized steel fan panel. Cast aluminum blades and hub.

Options/Subcomponent Summary:
Motor: Marathon motor 20HP / 460V-3phase. Damper: Greenheck motorized VCD-34 74Wx74H. Damper Actuator: Belimo AFBUP-S (180 in-lbs). Disconnect: ABB NEMA-4 Toggle – 40A.

| <i>UUT Properties</i> | | | | | | |
|-----------------------|----------------|-------|--------|-------------------------------|-----------|----------|
| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 860* | 35.0 | 82.0 | 82.0 | N/A | N/A | N/A |

| <i>UUT Highest Passed Seismic Run Information</i> | | | | | | | | | |
|---|---------------------|---------------------|-----|----------------|------------------------|------------------------|------------------------|------------------------|--|
| Building 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 2019 | ICC-ES AC156 (2010) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 | |

Test Mounting Details:



*Weight of fan only

Unit attached to the shake table fixture using 40-3/8" x 3" lag screws. Greenheck Damper attached using 22-3/8" x 3" lag screws. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 10 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: AER - 20 | |
| Serial Number: 15743375 | |

Product Construction Summary:
16 ga carbon steel fan panel. Cast aluminum blades and hub.

Options/Subcomponent Summary:
Baldor 2 HP 230/460 V Motor

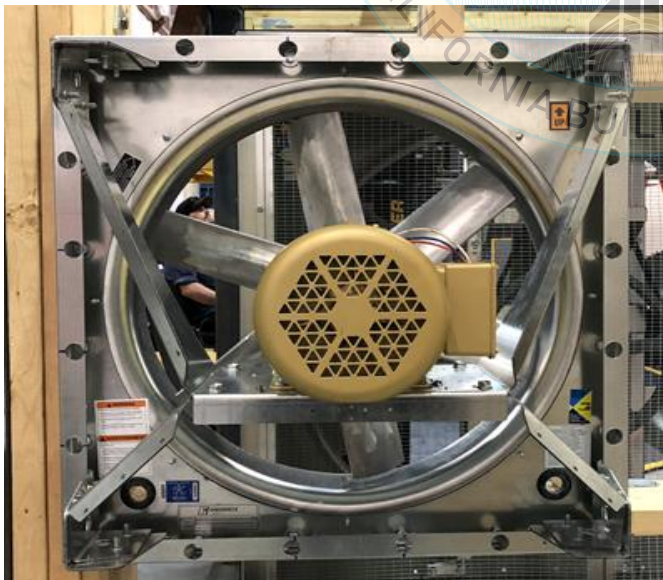
UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 82* | 20.0 | 26.0 | 26.0 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



*Weight of fan only

UUT was wall mounted to the test fixture with eight (8) 3/8" x 2" lag bolts with washers.
Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|--|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 11 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: AER - 60 | |
| Serial Number: 15698227 | |

Product Construction Summary:
14 ga carbon steel fan panel. Cast aluminum blades and hub.

Options/Subcomponent Summary:
Baldor 20Hp motor-3 phase 460V

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 838* | 35.0 | 68.0 | 68.0 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



*Weight of fan only
 UUT was wall mounted to the test fixture with twenty (20) 3/8" x 2" lag bolts with washers.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 12 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: VCD - 42 Damper Serial Number: N/A | |

Product Construction Summary:
Carbon steel frame (16 ga), with aluminum blades (0.063" Thick)

Options/Subcomponent Summary:
Damper Actuator: Honeywell (PN: MS4120F), Baldor 10 HP Motor 230/460V

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 164 | 5.3 | 74.0 | 74.0 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details: wall mounted rigid



UUT 12 was mounted to the unit housing with twenty two (22) #12 x 5/8" self tapping screws and rubber washer. The unit housing was wall mounted-rigid to the test fixture with nineteen (19) 3/8" x 2" lag bolts with washer. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 13 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: VCD - 43 Damper Serial Number: N/A | |

Product Construction Summary:
Aluminum frame (0.125" thick) with aluminum blades (0.063 thick)

Options/Subcomponent Summary:
Damper Actuator: Honeywell (PN: MS4120F), Baldor 10 HP Motor 230/460V

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 149.5 | 5.0 | 74.0 | 74.0 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



UUT 13 was mounted to the unit housing with twenty two (22) #12 x 5/8" self tapping screws and rubber washers. The unit housing was wall mounted-rigid to the test fixture with nineteen (19) 3/8" x 3" lag bolts with washer. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 14 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: WD-300/400 Serial Number: N/A | |

Product Construction Summary:
Carbon steel frame (18 ga) with aluminum blades (0.025" thick)

Options/Subcomponent Summary:
Manual damper control

UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 61 | 3.5 | 74.0 | 74.0 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



UUT 14 was mounted to the unit housing with twenty two (22) #12 x 5/8" self tapping screws and rubber washers. The unit housing was wall mounted-rigid to test fixture with nineteen (19) 3/8" x 3" lag bolts with washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 15 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: 45 Degree Weatherhood Serial Number: N/A | |

Product Construction Summary:
16 ga Carbon Steel

Options/Subcomponent Summary:
Birdscreen

| <i>UUT Properties</i> | | | | | | |
|-----------------------|----------------|-------|--------|-------------------------------|-----------|----------|
| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 155.5 | 53 | 78 | 81 | N/A | N/A | N/A |

| <i>UUT Highest Passed Seismic Run Information</i> | | | | | | | | | |
|---|---------------------|---------------------|-----|----------------|------------------------|------------------------|------------------------|------------------------|--|
| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 | |

Test Mounting Details:



UUT 15 was mounted to the unit housing with eighteen (18) #12 x 5/8" self tapping screws and rubber washers. The housing was wall mounted-rigid to the test fixture with twenty (20) 3/8" x 3" lag bolts with washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET



1800859-CR-001 R0

| | |
|---|---------------|
| Manufacturer: Greenheck Fan Corporation | UUT 16 |
| Model Line: Sidewall Propeller Fans | |
| Model Number: 90 Degree Weatherhood Serial Number: N/A | |

Product Construction Summary:
16 ga. Aluminum

Options/Subcomponent Summary:
Rainguard, birdscreen

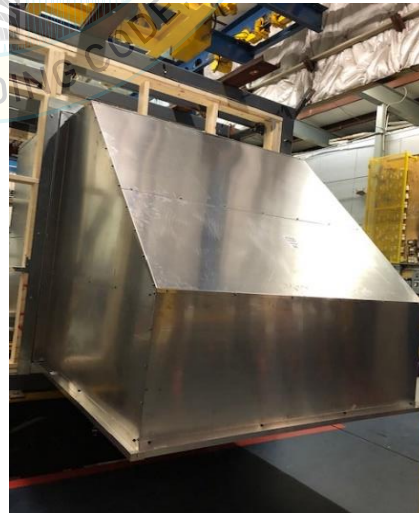
UUT Properties

| Weight (lb) | Dimension (in) | | | Lowest Natural Frequency (Hz) | | |
|-------------|----------------|-------|--------|-------------------------------|-----------|----------|
| | Depth | Width | Height | Front-Back | Side-Side | Vertical |
| 148 | 72 | 78 | 82 | N/A | N/A | N/A |

UUT Highest Passed Seismic Run Information

| Building 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 2019 | ICC-ES AC156 (2015) | 2.5 | 1.0 | 1.5 | 4.00 | 3.00 | 1.67 | 0.67 |

Test Mounting Details:



UUT 16 was mounted to the unit housing with twenty-one (21) #12 x 5/8" self tapping screws and rubber washers. The unit housing was wall mounted-rigid to the test fixture with nineteen (19) 3/8" x 2" lag bolts with washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.