



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0416

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Nortek Air Solutions, LLC

Representative: Preston Harris Mailing Address: 19855

SW 124th Ave, Tualatin, OR 97062

Telephone: (503) 639-0113

Email: pharris@huntair.com

Product Information

Product Name: Air Handling Units

Product Type: Fans

Product Model Number: Various (See Attachment)

General Description: FANWALL TECHNOLOGY uses multiple, small diameter, high-efficiency airfoil plenum fans. Coplanar

Mounting Description: See Certified Product Tables, rigid base mounted and wall mounted

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Structural Integrity Associates

Contact Person: Stephen Reimus

Mailing Address: 233 SW Wilson Ave. Suite 101, Bend, OR 97702

Telephone: (541) 292-5820

Email: sreimus@structint.com

Title: Senior Engineer



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

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

Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.

Name: Andrew Coughlin California License Number: S6082

Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025

Telephone: (415) 635-8461 Email: acoughlin@structint.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3
☐ Other (Please Specify): _____

Testing Laboratory

Company Name: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, CONSTRUCTION ENGINEERING
RESEARCH LABORATORY (CERL)

Contact Person: Jim Wilcoski

Mailing Address: 2902 Newmark Dr., Champaign IL 61822-1076

Telephone: (217) 373-6763 Email: james.wilcoski@usace.army.mil

Company Name: CLARK TESTING LABORATORY, INC.

Contact Person: Devon Lohr

Mailing Address: 1801 Route 51, Jefferson Hills PA 15025

Telephone: (412) 387-1026 Email: dlohr@clarktesting.com

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

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

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

Company Name: UNIVERSITY OF CALIFORNIA, BERKELEY (PEER)

Contact Person: Amarnath Kasalanati

Mailing Address: 1301 South 46th St., Bldg. 420, Richmond CA 94804-1729

Telephone: (510) 642-6475 Email: peer_center@berkeley.edu





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.5

S_{Ds} (Design spectral response acceleration at short period, g) = 2.0

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0

Ω₀ (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025

Date: 8/20/2021

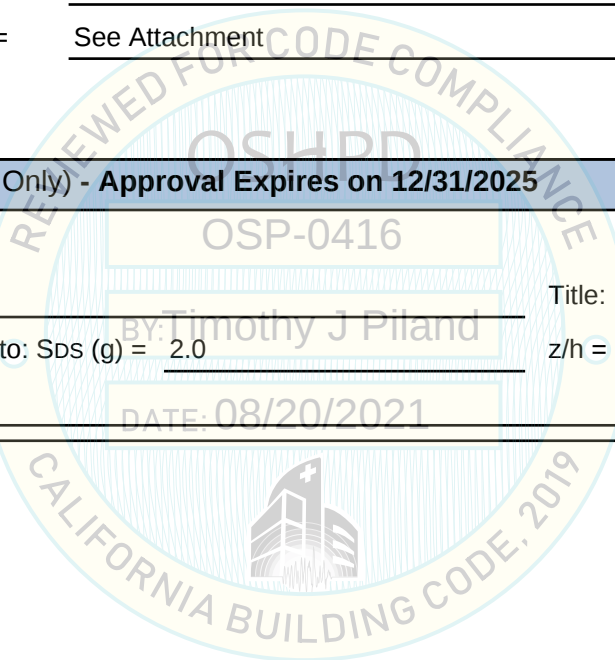
Name: Timothy Piland

Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: S_{Ds} (g) = 2.0

z/h = 1

Condition of Approval (if applicable):



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC						TABLE 1		
Model Line: Fanwall Technology™								
Certified Product Construction Summary: Fan cells are constructed of 2x2 aluminum extruded members. Wheels are constructed of aluminum. Fan cell external and internal panels: 0.40"aluminum and stainless steel sheet - solid and perforated. Cross bracing as indicated in certified drawings.								
Certified Options Summary: Backdraft dampers and discharge guards. Motors per Table 3.								
Mounting Configuration: Base 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:			$S_{DS}= 2.0 g$ $z/h=1.0$		$I_p= 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Max. Cells per Stack	Notes	UUT
		Depth	Width	Height				
Fanwall Technology™: Welded or Riveted	10" Fan Wheel	24	20	20	133	5		Extrap.
		...	...	...	...			Extrap.
		32	24	20	173	4	UUT 3: Welded, Vert. Flow UUT 4a: Riveted, Hor. Flow	3 ¹ , 4a
		...	...	...	...			Interp.
	12" Fan Wheel	44	36	44	356	3		Interp.
		24	20	20	140	5		Interp.
		...	...	...	...			Interp.
		44	36	44	364	3		Interp.
	14" Fan Wheel	24	24	20	140	6		Interp.
		...	...	...	...			Interp.
		44	36	44	365	3		Interp.
	16" Fan Wheel	32	28	20	204	5		Interp.
		...	...	...	...			Interp.
		48	44	44	367	3		Interp.
	18" Fan Wheel	32	28	20	207	5		Interp.
		...	...	...	...			Interp.
		48	44	44	367	3		Interp.
	20" Fan Wheel	32	28	20	210	5		Interp.
		...	...	...	...			Interp.
		48	44	44	367	3		Interp.
Additional Notes:								
¹ Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.								

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC						TABLE 1		
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Certified Options Summary: Backdraft dampers and discharge guards. Motors per Table 3.								
Mounting Configuration: Base 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:			$S_{DS}= 2.0 g$ $z/h=1.0$		$I_p= 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Max. Cells per Stack	Notes	UUT
		Depth	Width	Height				
Fanwall Technology™: Welded or Riveted	22" Fan Wheel	32	36	20	244	4		Interp.
		...	...	...	...			Interp.
		32	44	44	367	3	UUT 3: Welded, Vert. Flow UUT 4a: Riveted, Hor. Flow	3 ¹ , 4a
Fanwall Technology™: Gen II	10" Fan Wheel	16	22	24	54	6		Extrap.
		...	...	...	...			Extrap.
		24	22	27	82	5	UUT: 2W x 5H Config.	1
		...	...	...	...			Interp.
		42	30	30	157	4		Interp.
	12" Fan Wheel	16	25	24	57	6		Interp.
		...	...	...	...			Interp.
		23	32	32	125	4	UUT: 2W x 4H Config.	5
		...	...	...	...			Interp.
		42	32	32	166	4		Interp.
	14" Fan Wheel	17	25	24	57	6		Interp.
		...	...	...	...			Interp.
		42	34	34	173	4		Interp.
	16" Fan Wheel	18	28	28	66	5		Interp.
		...	...	...	...			Interp.
		48	38	38	195	2		Interp.
Additional Notes: ¹ Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.								

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC						TABLE 1		
Model Line: Fanwall Technology™								
Certified Product Construction Summary: Fan cells are constructed of 2x2 aluminum extruded members. Wheels are constructed of aluminum. Fan cell external and internal panels: 0.40"aluminum and stainless steel sheet - solid and perforated. Cross bracing as indicated in certified drawings.								
Certified Options Summary: Backdraft dampers and discharge guards. Motors per Table 3.								
Mounting Configuration: Base 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:			$S_{DS}= 2.0g \quad z/h=1.0$		$I_p= 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Max. Cells per Stack	Notes	UUT
		Depth	Width	Height				
Fanwall Technology™: Gen II	18" Fan Wheel	21	31	28	74	5		Interp.
		...	...	...	...			Interp.
		48	40	40	199	3		Interp.
	20" Fan Wheel	21	31	28	74	5		Interp.
		...	...	...	...			Interp.
		50	42	42	199	3		Interp.
	22" Fan Wheel	22	34	34	83	4		Interp.
		...	...	...	...			Interp.
		51	34	34	199	4	UUT: (2) 1W x 4H Config.	1
		...	...	...	...			Interp.
		38	40	44	165	3	UUT: 2W x 3H	5
		...	...	...	...			Interp.
		33	44	44	175	3	UUT: 2W x 3H	5

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC						TABLE 2		
Model Line: Fanwall Technology™								
Certified Product Construction Summary: Fan cells are constructed of 2x2 aluminum extruded members. Wheels are constructed of aluminum and polymer. Fan cell external and internal panels: 0.40"aluminum and stainless steel sheet - solid and perforated.								
Certified Options Summary: Backdraft dampers and discharge guards. Motors per Table 3.								
Mounting Configuration: Base 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:			$S_{DS}= 2.0 g$ $z/h=1.0$		$I_p= 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Max. Cells per Stack	Notes	UUT
		Depth	Width	Height				
Fanwall Technology™: Gen III (Retrofit Application)	10" Fan Wheel	16	22	24	54	6		Extrap.
		...	...	...	...			Extrap.
		28	25	27	209		UUT: 2W x 5H Config.	10 ¹
		...	...	...	...			Interp.
		42	30	30	157	5		Interp.
	12" Fan Wheel	16	25	24	86	5		Interp.
		...	...	...	...			Interp.
		28	25	27	217		UUT: 2W x 5H Config.	10 ¹
		...	...	...	...			Interp.
		42	32	32	166	5		Interp.
	14" Fan Wheel	17	25	24	88	5		Interp.
		...	...	...	...			Interp.
		42	34	34	173	5		Interp.
	16" Fan Wheel	18	28	28	66	6		Interp.
		...	...	...	...			Interp.
		34	38	38	430	3		Interp.
	18" Fan Wheel	21	31	28	74	6		Interp.
		...	...	...	...			Interp.
		35	40	40	447	3		Interp.
	20" Fan Wheel	21	31	28	74	6		Interp.
		...	...	...	...			Interp.
		36	42	42	520	3		Interp.
Additional Notes: ¹ Maximum weight of single tested fan cell								

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

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Manufacturer: Nortek Air Solutions, LLC		Table Description: Fan Motors			TABLE 3
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Fan Motor	Siemens	1 HP	230/460 Volts	UUT: 55 lbs	3 ¹ , 4a, 1
		...			Interp.
		10HP	460 Volts	UUT: 144 lbs	1
		...			Interp.
		15 HP	230/460 Volts	UUT: 218 lbs	3 ¹
		...			Interp.
	Baldor	20 HP	230/460 Volts	UUT: 291 lbs	4a
		1 HP	230/460 Volts	UUT: 45 lbs	1, 10
		...			Interp.
		12 HP	230/460 Volts	UUT: 169 lbs	1
	Toshiba	15 HP		UUT: 238 lbs	9
		1 HP	230/460 Volts	UUT: 63 lbs	5, 1, 10
		...			Interp.
		12 HP	230/460 Volts	UUT: 202 lbs	1
		...			Interp.
	Nortek Air Solutions	15 HP	230/460 Volts	UUT: 320 lbs	4a, 9
		2.5-3640-380-480V3Ph	460V, 3 Phase, 60 Hz	UUT: 2.5 kW	5, 10
		...			Interp.
			6.0-1860-380-480V3Ph	460V, 3 Phase, 60 Hz	UUT: 6 kW

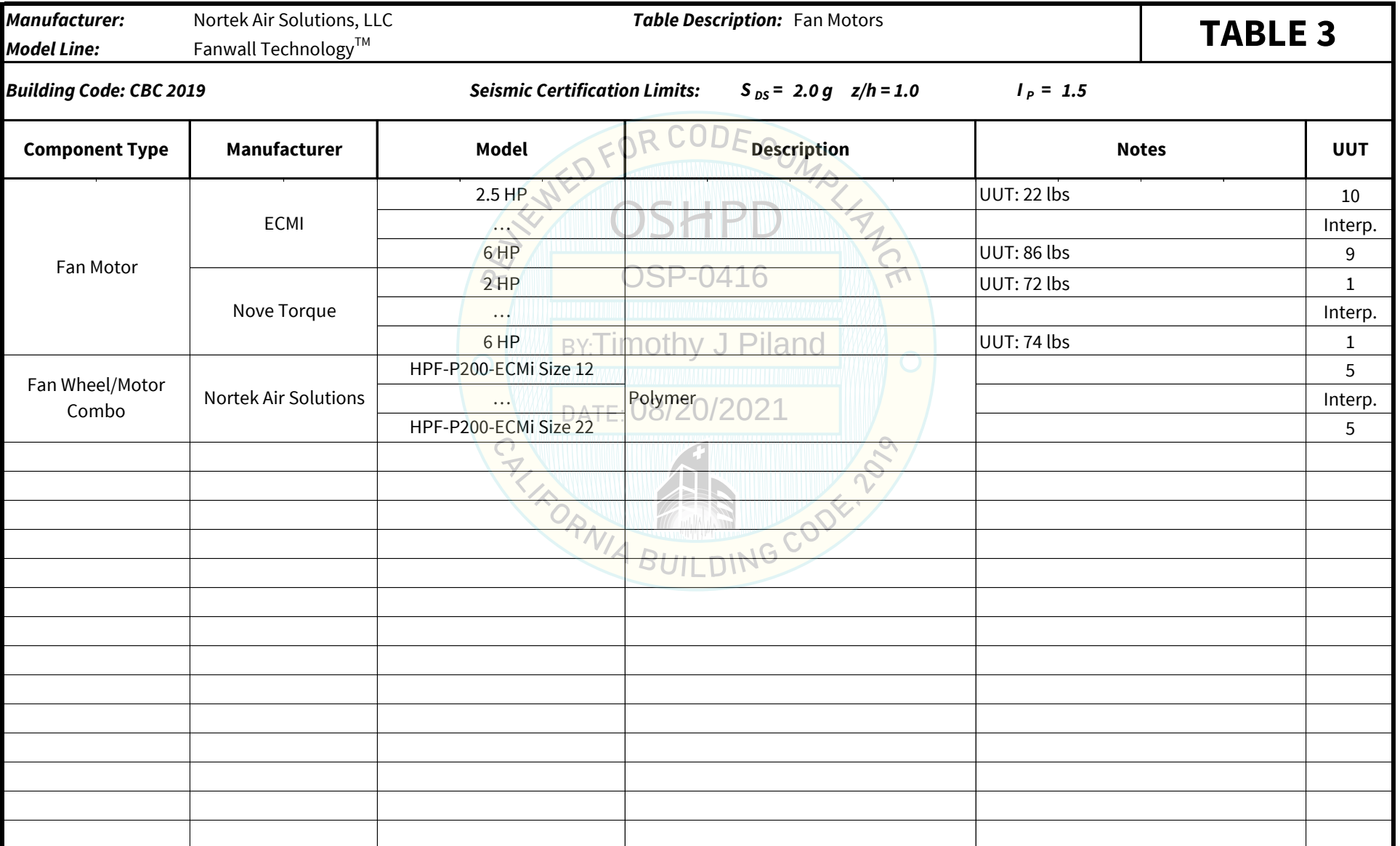
Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

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Manufacturer: Nortek Air Solutions, LLC		Table Description: Enclosure				TABLE 6		
Model Line: Fanwall Technology™								
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$				$I_p = 1.5$		
Model Line	Model (Manufacturer)	Dimension (in)			Weight (lb)	Material	Notes	UUT
		Depth	Width	Height				
Control & VFD Enclosures	Huntair	12	20	24	30	Carbon Steel	NEMA 1/12/3R/4X ¹	Extrap.
		...	...	...	...			Extrap.
		16	28	42	176		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 12)	3a
		...	...	...	...			Interp.
		10	28	40	143		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 1)	5
		...	...	...	...			Interp.
		12	36	48	216		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 3R)	2b
		...	...	...	...			Interp.
		20	56	72	470		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 1)	2a
		...	...	...	...			Interp.
		16	56	90	530		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 1)	5
		...	...	...	...			Interp.
		20	56	86	1032	Stainless Steel	NEMA 1/12/3R/4X ¹ , (UUT: NEMA 1)	12a, 12b
		12	20	24	30		NEMA 1/12/3R/4X ¹	Extrap.
		...	...	...	...			Extrap.
		14	38	54	404		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 4)	13a, 13b
		...	...	...	...			Interp.
		18	56	90	983		NEMA 1/12/3R/4X ¹ , (UUT: NEMA 4)	11a, 11b

Additional Notes:

¹No physical difference between NEMA 1, NEMA 12, and NEMA 3R. NEMA 4X is powder coated.

Additional Notes:

¹No physical difference between NEMA 1, NEMA 12, and NEMA 3R. NEMA 4X is powder coated.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical		TABLE 7	
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$		$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	ABB	ACH550	208V/230V/460V, 1 HP, 18 lbs	UUT: 1 HP, 18 lbs	2a
			208V/230V/460V, 3 HP, 18 lbs		10, 13 ¹
			208V/230V/460V, 5 HP, 18 lbs		Interp.
			208V/230V/460V, 7.5 HP, 18 lbs		Interp.
			208V/230V/460V, 10 HP, 25 lbs		Interp.
			208V/230V/460V, 15 HP, 25 lbs		Interp.
			208V/230V/460V, 20 HP, 41 lbs		Interp.
			208V/230V/460V, 25 HP, 41 lbs		Interp.
			208V/230V/460V, 30 HP, 41 lbs		Interp.
			208V/230V/460V, 35 HP, 58 lbs		Interp.
			208V/230V/460V, 40 HP, 58 lbs		Interp.
			208V/230V/460V, 50 HP, 58 lbs		Interp.
			208V/230V/460V, 60 HP, 58 lbs		Interp.
			208V/230V/460V, 75 HP, 58 lbs		Interp.
			208V/230V/460V, 100 HP, 190 lbs		Interp.
			208V/230V/460V, 125 HP, 190 lbs		Interp.
			208V/230V/460V, 150 HP, 190 lbs	UUT: 150 HP, 190 lbs	2a, 9, 13 ¹
		ACH580	208/230V, 1 HP, 10.6 lbs		Extrap.
			460V, 1 HP, 10.6 lbs		Extrap.
			208/230V, 1.5 HP, 10.6 lbs		Extrap.
			460V, 1.5 HP, 10.6 lbs		Extrap.

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	ABB	ACH580	208/230V, 2 HP, 10.6 lbs		Extrap.
			460V, 2 HP, 10.6 lbs		Extrap.
			208/230V, 3 HP, 10.6 lbs		Extrap.
			460V, 3 HP, 10.6 lbs		10
			208/230V, 5 HP, 10.6 lbs		Interp.
			460V, 5 HP, 10.6 lbs		Interp.
			460V, 7.5 HP, 10.6 lbs		Interp.
			575V, 2 HP, 15 lbs		Interp.
			575V, 3 HP, 15 lbs		Interp.
			575V, 5 HP, 15 lbs		Interp.
			208/230V, 7.5 HP, 15 lbs		Interp.
			575V, 7.5 HP, 15 lbs		Interp.
			208/230V, 10 HP, 15 lbs		Interp.
			460V, 10 HP, 15 lbs		Interp.
			575V, 10 HP, 15 lbs		Interp.
			460V, 15 HP, 15 lbs		Interp.
			575V, 15 HP, 15 lbs		Interp.
			208/230V, 15 HP, 28.7 lbs		Interp.
			208/230V, 20 HP, 28.7 lbs		Interp.
			460V, 20 HP, 28.7 lbs		Interp.
			575V, 20 HP, 28.7 lbs		Interp.
			460V, 25 HP, 28.7 lbs		Interp.
			575V, 25 HP, 28.7 lbs		Interp.

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Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	ABB	ACH580	460V, 30 HP, 28.7 lbs		Interp.
			575V, 30 HP, 28.7 lbs		Interp.
			208/230V, 25 HP, 44.1 lbs		Interp.
			460V, 40 HP, 44.1 lbs		Interp.
			460V, 50 HP, 44.1 lbs		Interp.
			460V, 60 HP, 44.1 lbs		Interp.
			208/230V, 30 HP, 64 lbs		Interp.
			208/230V, 40 HP, 64 lbs		Interp.
			575V, 40 HP, 64 lbs		Interp.
			575V, 50 HP, 64 lbs		Interp.
			575V, 60 HP, 64 lbs		Interp.
			460V, 75 HP, 64 lbs		Interp.
			575V, 75 HP, 64 lbs		Interp.
			208/230V, 50 HP, 95 lbs		Interp.
			460V, 100 HP, 95 lbs		Interp.
			208/230V, 60 HP, 123.5 lbs		Interp.
			208/230V, 75 HP, 123.5 lbs		Interp.
			575V, 100 HP, 123.5 lbs		Interp.
			460V, 125 HP, 123.5 lbs		Interp.
			575V, 125 HP, 123.5 lbs		Interp.
			460V, 150 HP, 123.5 lbs		9

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Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	ABB	ACS320	208V/230V/460V	UUT: 1 HP, 3.5 lbs	2b, 10, 13 ¹
			208V/230V/460V, 3 HP, 3.5 lbs		Interp.
			208V/230V/460V, 5 HP, 3.5 lbs		Interp.
			208V/230V/460V, 7.5 HP, 7 lbs		Interp.
			208V/230V/460V, 10 HP, 7 lbs		Interp.
			208V/230V/460V, 15 HP, 7 lbs		Interp.
			208V/230V/460V	UUT: 20 HP, 11 lbs	2b, 13 ¹
			208V/230V/460V, 25 HP, 11 lbs		Interp.
		208V/230V/460V, 30 HP, 11 lbs		Interp.	
		ACS355	480V, 0.5 HP, 2.6 lbs		Extrap.
			480V, 0.75 HP, 2.6 lbs		Extrap.
			480V, 1 HP, 3.0 lbs		Extrap.
			480V, 1.5 HP, 3.0 lbs		Extrap.
			480V	UUT: 2 HP, 3.0 lbs	1
			480V, 3 HP, 3.0 lbs		Interp.
			480V, 4 HP, 3.0 lbs		Interp.
			480V, 5 HP, 3.0 lbs		Interp.
			480V, 7.5 HP, 6.9 lbs		Interp.
			480V, 10 HP, 6.9 lbs		Interp.
			480V	UUT: 15 HP, 11.5 lbs	1

Additional Notes:

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Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	Danfoss	FC101	208V/230V/460V	UUT: 1 HP	5, 10, 11 ¹
			208V/230V/460V	UUT: 15 HP	5
			208V/230V/460V	UUT: 125 HP	9
		VLT	208V/230V/460V	UUT: 5 HP	5
			208V/230V/460V	UUT: 15HP	5
			208V/230V/460V	UUT: 150 HP, 212 lbs	3 ¹ , 11 ¹
	Yaskawa	E7	208V/230V/460V, 3 HP, 9 lbs		Interp.
			208V/230V/460V, 5 HP, 9 lbs		Interp.
			208V/230V/460V, 7.5 HP, 9 lbs		Interp.
			208V/230V/460V, 10 HP, 13 lbs		Interp.
			208V/230V/460V, 15 HP, 13 lbs		Interp.
			208V/230V/460V, 20 HP, 13 lbs		Interp.
			208V/230V/460V, 25 HP, 22 lbs		Interp.
			208V/230V/460V, 30 HP, 22 lbs		Interp.
			208V/230V/460V, 40 HP, 53 lbs		Interp.
			208V/230V/460V, 50 HP, 53 lbs		Interp.
			208V/230V/460V, 60 HP, 88 lbs		Interp.
			208V/230V/460V, 75 HP, 88 lbs		Interp.
			208V/230V/460V, 100 HP, 88 lbs		Interp.
			208V/230V/460V, 125 HP, 194 lbs		Interp.
			208V/230V/460V	UUT: 150 HP, 196 lbs	2a
Additional Notes:					
¹ Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.					

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7		
Model Line: Fanwall Technology™							
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$					
Component Type	Manufacturer	Model	Description	Notes	UUT		
VFD	Yaskawa	V1000	208V/230V/460V	UUT: 1 HP, 3 lbs	2b, 10, 13 ¹		
			208V/230V/460V, 3 HP, 4.2 lbs		Interp.		
			208V/230V/460V, 5 HP, 4.2 lbs		Interp.		
			208V/230V/460V, 7.5 HP, 5.7 lbs		Interp.		
			208V/230V/460V	UUT: 10 HP, 9 lbs	2b		
		Z1000	208V/230V/460V, 15 HP, 9 lbs		Interp.		
			208V/230V/460V	UUT: 20 HP, 12 lbs	2b, 13 ¹		
			208V/230V/460V, 25 HP, 12 lbs		Interp.		
			480V	UUT: 3 HP, 11.9 lbs	1, 10, 11 ¹		
			480V, 5 HP, 12.6 lbs		Interp.		
			480V, 7.5 HP, 13.4 lbs		Interp.		
			480V, 10 HP, 16.1 lbs		Interp.		
			480V, 15 HP, 16.8 lbs		Interp.		
			480V	UUT: 20 HP, 18.5 lbs	1		
			480V	UUT: 25 HP 28.7 lbs	1, 11 ¹		
			480V	UUT: 125 HP 161 lbs	9		
			Nortek Air Solutions	HD4005XX	480V, XX denotes 10" or 25" pressure setting (firmware only)	0.5 HP, 9.5 lbs	Extrap.
				HD4010XX		UUT: 1 HP, 9.5 lbs, 10" model	1, 10, 12 ¹
	HD4015XX	1.5 HP, 9.5 lbs		10			
	HD4020XX	2 HP, 9.5 lbs		Interp.			
	HD4025XX	2.5 HP, 9.5 lbs		Interp.			

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	Nortek Air Solutions	HD4030XX	480V, XX denotes 10" or 25" pressure setting (firmware only)	3 HP, 9.5 lbs	10, 12 ¹
		HD4035XX		3.5 HP, 9.5 lbs	10
		HD4040XX		4 HP, 9.5 lbs	Interp.
		HD4045XX		4.5 HP, 9.5 lbs	Interp.
		HD4050XX		5 HP, 9.5 lbs	Interp.
		HD4055XX		5.5 HP, 9.5 lbs	Interp.
		HD4060XX		6 HP, 9.5 lbs	Interp.
		HD4065XX		6.5 HP, 9.5 lbs	Interp.
		HD4070XX		7 HP, 9.5 lbs	Interp.
		HD4075XX		7.5 HP, 9.5 lbs	Interp.
		HD4080XX		8 HP, 9.5 lbs	Interp.
		HD4085XX		8.5 HP, 9.5 lbs	Interp.
		HD4090XX			Interp.
		HD4095XX		9.5 HP, 9.5 lbs	9
		HD4100XX		UUT: 10 HP, 9.5 lbs, 25" model	1, 9, 12 ¹
		Siemens		RT0002-11N	115V, 1-PH; 0.25HP, 1.43 lbs
	RT0002-23N		230V, 3-PH, 0.25HP, 1.43 lbs		Extrap.
	RT0002-21N		230V, 1-PH, 0.25HP, 1.43 lbs		Extrap.
	RT0005-23N		230V, 3-PH, 0.5HP, 1.5 lbs		Extrap.
	RT0005-11N		115V, 1-PH, 0.5HP, 1.63 lbs		Extrap.
	RT0005-21N		230V, 1-PH, 0.5HP, 1.68 lbs		Extrap.
Additional Notes:					
¹ Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.					

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0\text{ g}$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	Siemens	RT0005-43N	460V, 3-PH, 0.5HP, 1.68 lbs		Extrap.
		RT001X-23N	230V, 3-PH, 1HP, 1.79 lbs		Extrap.
		RT001X-43N	460V, 3-PH, 1HP, 1.79 lbs		Extrap.
		RT001X-53N	575V, 3-PH, 1HP, 1.87 lbs		Extrap.
		RT002X-53N	575V, 3-PH, 2HP, 1.92 lbs		Extrap.
		RT001X-21N	230V, 1-PH, 1HP, 2.09 lbs		Extrap.
		RT002X-43N	460V, 3-PH, 2HP, 2.21 lbs		Extrap.
		RT002X-23N	230V, 3-PH, 2HP, 2.32 lbs		Extrap.
		RT003X-53N	575V, 3-PH, 3HP, 2.6 lbs		Extrap.
		RT001X-11N	115V, 1-PH, 1HP, 2.73 lbs		Extrap.
		RT002X-21N	230V, 1-PH, 2HP, 2.73 lbs		Extrap.
		RT003X-23N	230V, 3-PH, 3HP, 2.73 lbs		Extrap.
		RT003X-21N	230V, 1-PH, 3HP, 2.73 lbs		Extrap.
		RT003X-43N	460V, 3-PH, 3HP, 2.73 lbs		9
		RT005X-23N	230V, 3-PH, 5HP, 2.73 lbs		Interp.
		RT005X-43N	460V, 3-PH, 5HP, 2.73 lbs		Interp.
		RT005X-53N	575V, 3-PH, 5HP, 2.84 lbs		Interp.
		RT0075-53N	575V, 3-PH, 7.5HP, 4.5 lbs		Interp.
		RT010X-53N	575V, 3-PH, 10HP, 4.5 lbs		Interp.
		RT0075-23N	230V, 3-PH, 7.5HP, 4.56 lbs		Interp.
		RT0075-43N	460V, 3-PH, 7.5HP, 4.56 lbs		Interp.
	RT010X-43N	460V, 3-PH, 10HP, 4.56 lbs		9	

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
VFD	Schneider	ATV 212	1 HP, 5 lbs		10
			2 HP, 5 lbs		Interp.
			3 HP, 5 lbs		Interp.
			5 HP, 8 lbs		Interp.
			7.5 HP, 8 lbs		Interp.
			10 HP, 15 lbs		9
			15 HP, 15 lbs	Same Chassis as 10 HP Model	Interp.
Disconnect Switch and Circuit Breaker	Siemens	CFS361J5	30A	Eaton R4H3030FJ	Extrap.
		CFS362J	60A Disconnect	Eaton R9J3060FJ	4a, 12 ¹
		CFS363J	60A Circuit Breaker	Eaton R9K3100FJ	12 ¹
		CFS364J	300A Circuit Breaker	Eaton R9L3200FJ	2b, 3a, 13 ¹
		CFS365J	400A Circuit Breaker	Eaton R9M3400FJ	2a, 11 ¹
	Eaton	R5A3016U	16A - Non-fused Disconnect		13 ¹
		R9E3400U	400A - Non-fused Disconnect		13 ¹
Compact Circuit Breaker	Eaton	FAZ-C20/1-NA-SP	1-Pole CB - 20A		11 ¹
		FAZ-C10/2-NA	2-Pole CB - 10A		13 ¹
		FAZ-C16/3-NA	3-Pole CB - 16A		11 ¹ , 12 ¹
Fuse Holder and Fuse	Bussman	LPJ-1SP	1A		13 ¹
		LPJ-5SP	5A	Bussmann Fuse Type LPJ, full range	12 ¹
		LPJ-10SP	10A	Bussmann Fuse Type DFJ, full range	12 ¹
		LP-CC-15	15A	Bussman Fuse Type LP-CC, full range	11 ¹
Additional Notes:					
¹ Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.					

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Fuse Holder and Fuse	Bussman	CCP-3-30CC, J60030-3CR	30A	Bussmann Fuse Type KTK, full range	2b, 11 ¹
		J60060-3CR, CCP-3-60CF	60A	Bussmann Fuse Type FNQ, full range	11 ¹
		LPJ-100SP	100A	Bussmann Fuse Type FNM, full range	12 ¹
		LPJ-200SP	200A	Bussmann Fuse Type GMA, full range	12 ¹
		J60400-3CR	400A		2a, 13 ¹
Distribution Block	Marathon	132580	175A	Bussmann PDBFS220, PDB321-3	2b, 12 ¹
		1403404	310A	Bussmann PDBFS303, PDB323-3	12 ¹ , 13 ¹
		1453579	380A	Bussmann PDBFS330	13 ¹
		1453587	665A	Bussmann PDBFS500	2a, 11 ¹
Contactor	Siemens	3RT10151AK61	7A	Eaton XTCE007B10A	2a, 13 ¹
		3RT10231AK60	9A	Eaton XTCE009B10A	Interp.
		3RT10241AK60	12A	Eaton XTCE012B10A	Interp.
		3RT10251AK60	17A	Eaton XTCE018C10A - 18A	Interp.
		3RT10361AK60	50A	Eaton XTCE050D00A	Interp.
		3RT10451AK60	80A	Eaton XTCE080F00A	2a
		3RT10461AK60	95A	Eaton XTCE095F00	Interp.
		3RT10546AF36	115A	Eaton XTCE115G00A	Interp.
		3RT10556AF36	150A	Eaton XTCE150G00A	2a, 11 ¹
		3RT10646AF36	225A	Eaton XTCE185H22A - 185A	Extrap.
		3RT10656AF36	265A	Eaton XTCS250L22A - 250A	Extrap.
Additional Notes:					
¹ Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.					

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0\text{ g}$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
MSP	Siemens	3RV10210JA10	0.7 to 1.0A	Eaton XTPR001BC1 - 0.63 to 1.0A	Extrap.
		3RV10211AA10	1.1 to 1.6A	Eaton XTPR1P6BC1 - 1.0 to 1.6A	2a
		3RV10211CA10	1.8 to 2.5A	Eaton XTPR2P5BC1 - 1.6 to 2.5A	13 ¹
		3RV10211FA10	3.5 to 5.0A	Eaton XTPR004BC1 - 2.5 to 4.0A	Interp.
		3RV10211HA10	5.5 to 8.0A	Eaton XTPR010BC1 - 6.3 to 10A	3a
		3RV10211KA10	9.0 to 12.5A	Eaton XTPR012BC1 - 8 to 12.5A	2a
		3RV10214AA10	11 to 16A	Eaton XTPR016BC1 - 10 to 16A	2a, 4a
		3RV10314BA10	14 to 20A	Eaton XTPR025DC1 - 16 to 25A	11 ¹ , 13 ¹
		3RV10314EA10	22 to 32A	Eaton XTPR032DC1 - 25 to 32A	Interp.
		3RV10414HA10	36 to 45A	Eaton XTPR050DC1 - 40 to 50A	Interp.
		3RV10414JA10	45 to 50A	Eaton XTPR063DC1 - 55 to 65A	2a
		Power Supply	Eaton	PSG120F24RM	480 VAC input - 5A output
PSF240F24RM	480 VAC input - 10A output				12 ¹
Siemens	6EP1332-1SH42		2.5A	Eaton PSG60E	Extrap.
	6EP1332-1SH51		4A	Eaton PSG120E	2b, 8, 11 ¹
	6EP1334-3BA00		10A	Eaton PSG240E	5, 13 ¹
IDEC	PS5R-VE24		0.5 lbs, 3.75A		8
Transformer	Micron	B075LP7JK	75VA Pri 120x240 vac Sec: 24 vac	Eaton C0075E1B	Extrap.
		B050LP7RB	50VA Pri 120x240 vac Sec: 24 vac	Eaton C0050E1BFB	Extrap.
		B150LP7JKF	150VA Pri 120x240 vac Sec: 24 vac	Eaton C0150E1B	3a
		B250BTZ13RBF	250VA Pri 480x240 vac Sec: 120 vac	Eaton C0250E2AFB	Interp.
Additional Notes:					
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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0\text{ g}$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
Transformer	Micron	B500BTZ13RBF	500VA Pri 480x240 vac Sec: 120 vac	Eaton C0500E2AFB	2b
		B750BTZ13RBF	750VA Pri 480x240 vac Sec: 120 vac	Eaton C0750E2AFB	2a, 13 ¹
		B1K0-0500-3F	1000VA Pri 480x240 vac Sec: 120 vac	Eaton C1000E2AFB	11 ¹
		B2K0-0502-3H	2000VA Pri 480x240 vac Sec: 120 vac	Eaton C2000K2AFB	Interp.
		B3K0-0503-3H	3000VA Pri 480x240 vac Sec: 120 vac	Eaton C3000K2A	2a, 12 ¹
Reactor	TCI	KDRA3H	7.6A		5
		KDRA4H	11A		Interp.
		KDRA5H	14A		12 ¹
		KDRB2H	21A		Interp.
		KDRC3H	27A		Interp.
		KDRF4H	52A		Interp.
		KDRF2H	77A		Interp.
		KDRI2H	125A		Interp.
		KDRG3H	156A		2b
		KDRG1H	185A		13 ¹
Terminal Block	Pheonix	Typ QTC 2.5	15A	Also Typ QTC 2.5-PE grounding term	11 ¹ , 12 ¹ , 13 ¹
		Typ ST 4	30A		3b, 12 ¹
		Typ ST 4-PE	30A - Grounding Terminals		5, 12 ¹
PLC Controls	Siemens	Circuit Breaker			2b
		Power Supply			2b, 12 ¹ , 13 ¹
		Controller			2b, 11 ¹ , 12 ¹

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC		Table Description: Electrical			TABLE 7
Model Line: Fanwall Technology™					
Building Code: CBC 2019		Seismic Certification Limits: $S_{DS} = 2.0 g$ $z/h = 1.0$ $I_p = 1.5$			
Component Type	Manufacturer	Model	Description	Notes	UUT
PLC Controls	Siemens	Touch Screen	4" min to 19" maximum		2b, 12 ¹
		Expansion Module	Typ QTC 2.5, Typ QTC 2.5-PE		5, 11 ¹
		Communication Module	Typ ST 4		5, 11 ¹ , 12 ¹
Thermostat	Pfennenberg	ETR201	Thermostat, 120-240V	SKT011419N0	3 ¹ , 4a, 5, 1, 11 ¹ , 12 ¹ , 13 ¹
Transducer	Dwyer	MS2-W103-LCD-BC	XDCR, DP, Adjustable 0-10", 15", w/ Display	No Eaton equivalent	2b, 13 ¹
		616KD-03-V			11 ¹
	Huntair/Setra	Hunt-010W-D			11 ¹
Cool Fan (4" to 6")	Rittal	120 to 240V			5
	U.S. Toyo	120 to 240V			2 ¹ , 3 ¹ , 4a
	Hoffman	120 to 240V	Hoffman - NEMA TYPE 12		11 ¹ , 13 ¹
	San Ace 172	24 VDC			12 ¹
HMI Screen	Niagara	Horyzon-C10	4.4 lbs		8, 13 ¹
Expander	Niagara	IO-R-16	0.625 lbs		8, 13 ¹
		IO-R-34	1.25 lbs		8, 13 ¹
Controller	Niagara	JACE-8000	1.25 lbs		8, 13 ¹
Contact Switch	Phoenix	SFN 5TX-24VAC	1 lb, 24VAC		8, 13 ¹

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

Additional Notes:

¹Subcomponent was tested in all UUT configurations as seen in the UUT Summaries.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

Model Line: Fanwall Technology™

UUT	Unit Description	Report Number (UUT No. in Report)	Testing Laboratory	S _{DS}	z/h	I _p
1	FWT (Gen II)	13379 Rev.1 (UUT 1)	Environmental Testing Laboratory, Inc.	2.00 3.20	1.0 0.0	1.5
2a ¹	Air Handling Cabinet: CSU-10K	HuntAir9293 (UUT 1 - Run #1)	Clark Testing	2.00	1.0	1.5
2b ¹	Air Handling Cabinet: CSU-10K	HuntAir9293 (UUT 1 - Run #2)	Clark Testing	2.00	1.0	1.5
3a ¹	Air Handling Cabinet: CSU-20K	HuntAir9293 (UUT 2 - Run #3)	Clark Testing	2.00	1.0	1.5
3b ¹	Air Handling Cabinet: CSU-20K (Inlet Wall Removed w/ Cable Bracing)	HuntAir9293 (UUT 2 - Run #4)	Clark Testing	2.00	1.0	1.5
4a ¹	Air Handling Cabinet: CSU-40K	HuntAir9293 (UUT 3 - Run #9)	Clark Testing	2.00	1.0	1.5
5 ¹	Air Handling Cabinet: CSU-20K	1700754-TR-001 R2 (UUT 4)	CERL	2.00 2.50	1.0 0.0	1.5
6	Not Used					
7	Not Used					
8 ¹	Air Handling Cabinet: CSU-20K	1801166-TR-001 R0 (UUT 8)	Pacific Earthquake Engineering Research Center (PEER)	2.00 2.50	1.0 0.0	1.5
9	3x2 FWT (Gen III)	1801194-TR-001-R0 (UUT 9)	Environmental Testing Laboratory, Inc.	2.20 3.52	1.0 0.0	1.5
10	5x2 FWT (Gen III)	1801194-TR-001-R0 (UUT 10)	Environmental Testing Laboratory, Inc.	2.20 3.52	1.0 0.0	1.5
11a	Control Panel (NEMA 4 SST - isolated)	1801194-TR-001-R0 (UUT 11a)	Environmental Testing Laboratory, Inc.	2.10 2.20	1.0 0.0	1.5
11b	Control Panel (NEMA 4 SST - rigid)	1801194-TR-001-R0 (UUT 11b)	Environmental Testing Laboratory, Inc.	2.23 2.73	1.0 0.0	1.5
12a	Control Panel (NEMA 1 CST - isolated)	1801194-TR-001-R0 (UUT 12a)	Environmental Testing Laboratory, Inc.	2.10 2.20	1.0 0.0	1.5
12b	Control Panel (NEMA 1 CST - rigid)	1801194-TR-001-R0 (UUT 12b)	Environmental Testing Laboratory, Inc.	2.23 2.73	1.0 0.0	1.5
13a	Control Panel (NEMA 4 SST - isolated)	1801194-TR-001-R0 (UUT 13a)	Environmental Testing Laboratory, Inc.	2.10 2.20	1.0 0.0	1.5

Additional Notes:

¹UUT included for inclusion of subcomponents.

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1801194-CR-001-R3



Model Line: Fanwall Technology™

[illegible]

Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 1
Model Line:	Fanwall	
Model Number:	FWT	
Serial Number:		2101-005

Product Construction Summary:

Fan Cells: 2x2 aluminum extruded members, coplanar and extended coplanar panels are 0.040" aluminum and 22 ga. stainless steel sheet - solid and perforated

Cable Bracing: 3/8" galvanized steel cables with 1/4" A36 brackets

(10) 28Dx22Wx27H fan cells with 10" wheel (2W x 5H configuration) without extended coplanar

(4) 34Dx34Wx34H fan cells with 22" wheel (1W x 4H configuration) without extended coplanar

(4) 51Dx34Wx34H fan cells with 22" wheel (1W x 4H configuration) with extended coplanar

Options/Subcomponent Summary:

Fan Wheel: 10" Aluminum Gen II Fan Wheel, 22" Aluminum Gen II Fan Wheel; **Motor (480V):** Siemens 1 HP & 10 HP, Baldor 1 HP & 12 HP, Toshiba 1 HP & 12 HP, Nove Torque 2 HP & 6 HP; **VFD (460V):** ABB ACS355 3 HP, 20 HP, & 25 HP, Yaskawa Z1000 3 HP, 20 HP, & 25 HP, Nortek Air Solutions HD4010XX, HD4100XX; **Thermostat:** Pfennenberg; **Back Draft Dampers**

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
7155	60	130	150	3.6	3.9	22.9

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	2.0 3.2	1.0 0.0	1.5	3.2	2.4	2.13	0.85

Test Mounting Details:

Single Cross Bracing, no inlet or outlet wall.



FANWALL sections mounted within air handling section constructed of 2" galvanized steel panels with 6" tube sections. FANWALL sections mounted at base using floor rigid CES Group standard mounting details with gage metal blank off panels to air handling walls. Air handling section mounted to shake table with (4) 5/8" diameter grade 8 bolts.

Unit maintained structural integrity and remained functional per manufacturer requirement.

Contents were included in testing per operating conditions.

TRU Compliance, by Structural Integrity Associates, Inc.

844-TRU-0200 | info@trucompliance.com

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

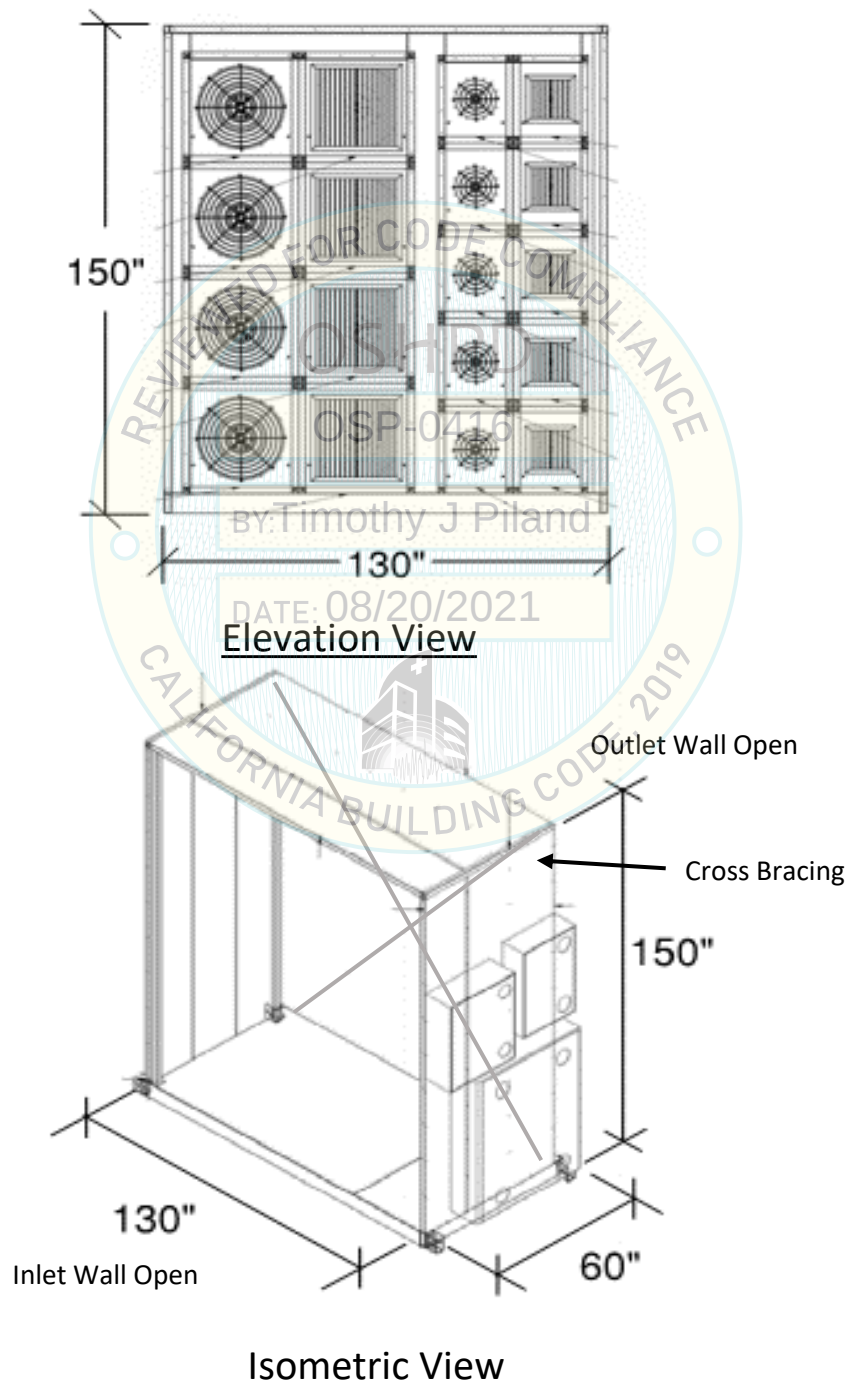
Model Line: Fanwall

Model Number: FWT

Serial Number: 2101-005

UUT 1

Unit Drawings



UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 2a
Model Line:	Fanwall Technology™	
Model Number:	CSU-10K	
		Serial Number: 2097-01

Product Construction Summary:

Wall/Roof: Standard 2" Panels, 16 ga. galv. carbon steel exterior with 20 ga. galv. carbon steel liner; **Base:** Carbon steel channel base, 16 ga. galv. carbon steel skin with 20 ga. galv. carbon steel liner and 20 ga. carbon steel subfloor; **Door:** (2) 2" thick, 18.5(W) x 61.5(H) with thermal break window, 12.5(W) x 61.5(H) no window.

Options/Subcomponent Summary:

Heat Transfer Coil: Heat Transfer Coil (HT1): Huntair, 7 FPI, 1 row, aluminum, staggered mounting - qty. 2 (40"x8"x85.5"); Heat Transfer Coil (HT2): Huntair, 6 FPI, 12 rows, copper, stacked mounting - qty. 2 (83"x17.5"x40.5"); **Humidifier:** Mfg. Vapac (8"x24"x24"); **Electrical Control Panel:** NEMA1 (20"x56"x78"), ABB ACH550 150 HP VFD, Yaskawa E7 150 HP VFD; **Damper:** Huntair HD6 (8"x48"x30"); **Louver:** Huntair HL (6"x26"x60"); **Actuator:** Belimo AS-120-S; **Cool Fan:** U.S. Toyo 120V-240V; Disconnect Switch & Circuit Breaker; Fuse Holder & Fuse; Distribution Block; Contactor; MSP; Transformer; VFD

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
7450	96.25	96	96	15.2	10.7	20.5

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	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Test Mounting Details:

(4) walls in place with 2-heat transfer coils



All test units contain an integrated structural base frame. This unit was mounted directly to the seismic table using twelve (12) 1/2"-13 Grade 5 hex head bolts (3 bolts per side) with flat washers and lock washers

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

Contents were included in testing per operating conditions.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

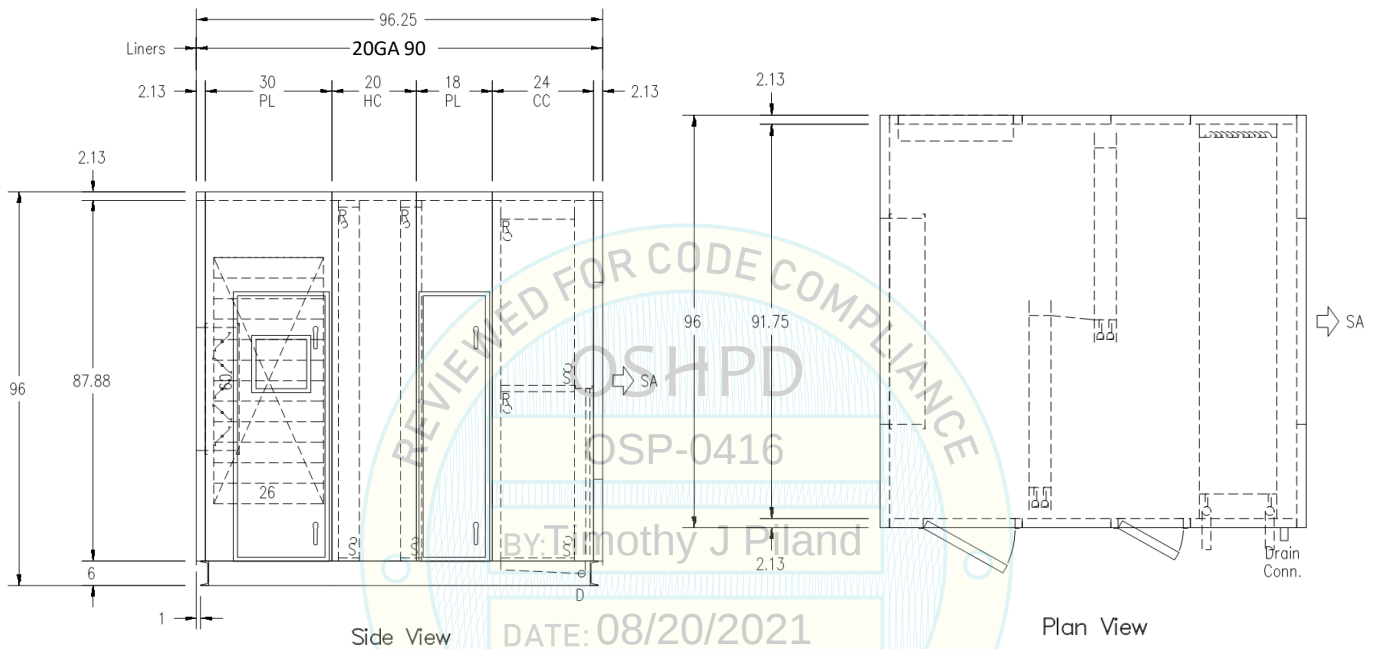
Model Line: Fanwall Technology™

Model Number: CSU-10K

Serial Number: 2097-01

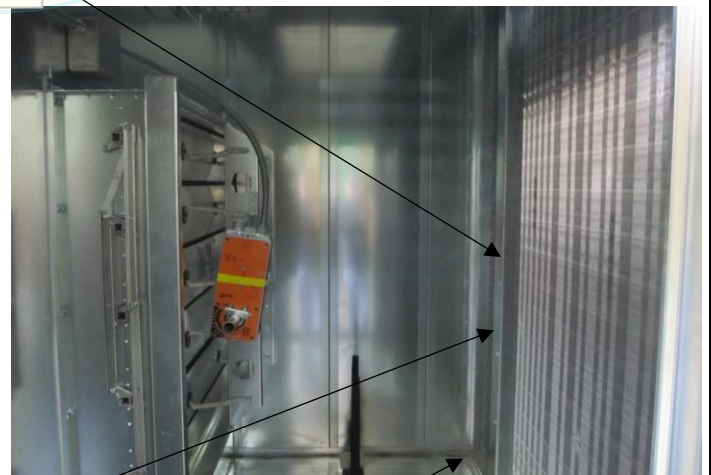
UUT 2a

Unit Drawings



Coil Support Details

(7) 0.188" Rivets at bottom of each coil, (6) 0.188 Rivets at top of each coil, (2) 2-16ga. C-channel stiffeners each side of coil (8-total), (3) #14x1" screws at 7-5/8" o.c. max spacing along each c-channel stiffener.



1

3

1

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 2b
Model Line:	Fanwall Technology™	
Model Number:	CSU-10K	
		Serial Number: 2097-01

Product Construction Summary:

Wall/Roof: Standard 2" Panels, 16 ga. galv. carbon steel exterior with 20 ga. galv. carbon steel liner; **Base:** Carbon steel channel base, 16 ga. galv. carbon steel skin with 20 ga. galv. carbon steel liner and 20 ga. carbon steel subfloor; **Door:** (2) 2" thick, 18.5(W) x 61.5(H) with thermal break window, 12.5(W) x 61.5(H) no window.

Options/Subcomponent Summary:

Filter Rack: Type 8, 4" pre-filter, 12" final filter (12"x92"x88"); **Humidifier:** Mfg. Vapac (8"x24"x24"); **Electrical Control Panel:** NEMA3R (12"x36"x48"), PLC, ABB ACH320 1,20 HP VFD's, Yaskawa V1000 1,10,20 HP VFD's; **Damper:** Huntair HD6 (8"x48"x30"); **Louver:** Huntair HL (6"x26"x60"); **Actuator:** Belimo AS-120-S; **Cool Fan:** U.S. Toyo 120V-240V; Disconnect Switch & Circuit Breaker; Fuse Holder & Fuse; Distribution Block; Power Supply; Transformer; Reactor; Transducer/Display; PLC Controls

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
7450	96.25	96	96	15.2	10.7	20.5

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	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Test Mounting Details:

(4) walls in place with 2-heat transfer coils



All test units contain an integrated structural base frame. This unit was mounted directly to the seismic table using twelve (12) 1/2"-13 Grade 5 hex head bolts (3 bolts per side) with flat washers and lock washers

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

Contents were included in testing per operating conditions.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

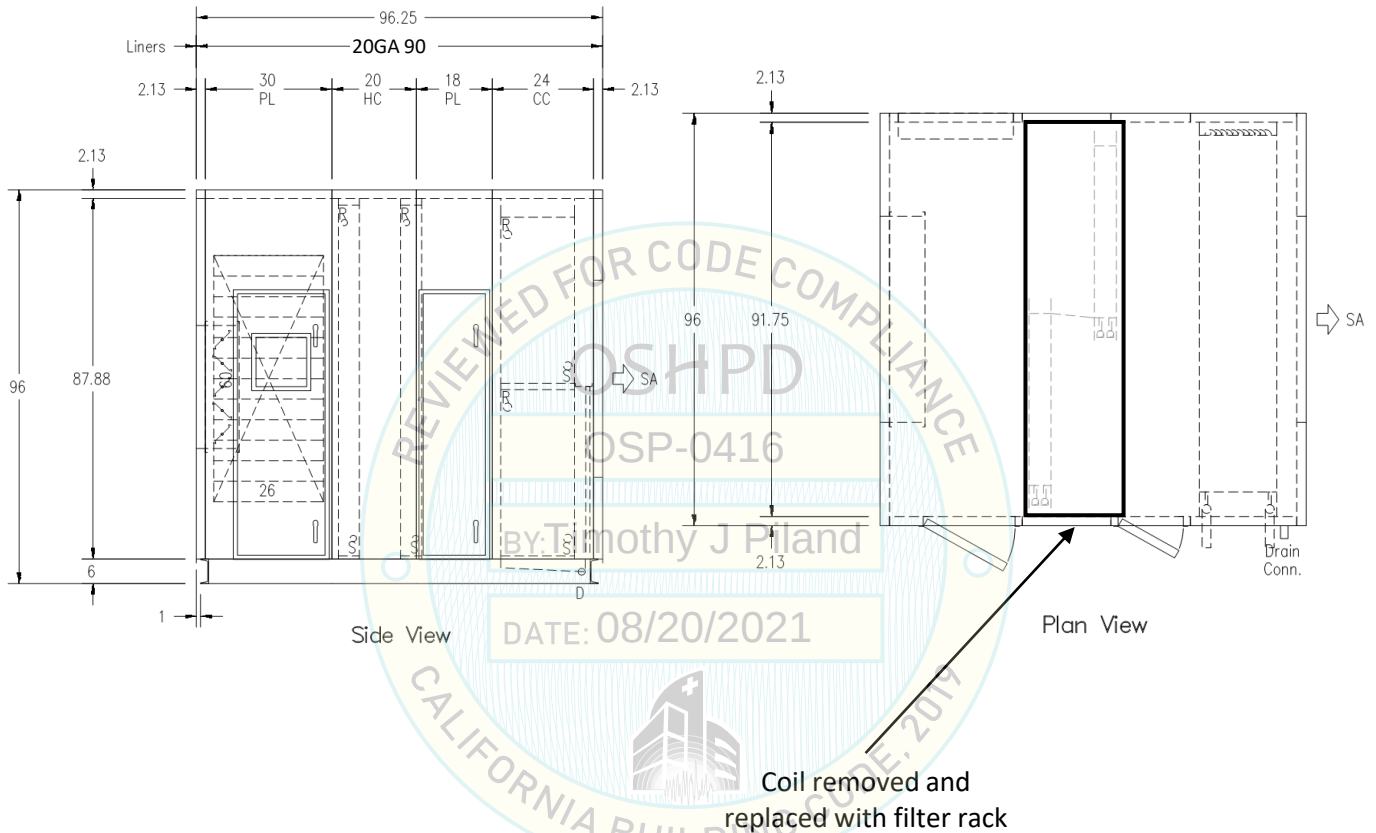
Model Line: Fanwall Technology™

Model Number: CSU-10K

Serial Number: 2097-01

UUT 2b

Unit Drawings



UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 3a
Model Line:	Fanwall Technology™	
Model Number:	CSU-20K	
		Serial Number: 2097-02

Product Construction Summary:

Wall/Roof: Standard 4" Panels, 16 ga. galv. carbon steel exterior with 20 ga. galv. carbon steel liner and 16 ga. galv. carbon steel blankoff with sloped roof; **Base:** Carbon steel channel base, 16 ga. galv. carbon steel skin with 20 ga. galv. carbon steel liner and 20 ga. carbon steel subfloor; **Door:** (2) 2" thick, 18.5(W) x 61.5(H) with thermal break window, 30.5(W) x 24.5(H) no window.

Options/Subcomponent Summary:

Fanwall: 3 fans, vertical upflow (2 up, 1 down), 10" and 22" wheels, welded cells, 1 HP and 15 HP Siemens motors (38.5"x131"x136"); **Heat Transfer Coil:** Heat Transfer Coil (HT3): Huntair, 14 FPI, 2 row, aluminum, stacked mounting - qty. 3 (127"x7"x40.5"); **Filter Rack:** HEPA filter and filter rack (12"x140"x140"); **Electrical Control Panel:** NEMA12 (16"x28"x42"); **VFD:** Danfoss VLT 100 HP, recessed panel construction; **Damper:** Ruskin CD50 (5"x60"x36"); **Louver:** Ruskin ELF (6"x40"x36"); **Actuator:** Belimo AS-120-S; **Cool Fan:** U.S. Toyo 120V-240V; HEPA Filter; Disconnect Switch & Circuit Breaker; MSP; Transformer

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
9050	108	144	144.25	4.0	6.6	20.6

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	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Test Mounting Details:

(4) walls in place



All test units contain an integrated structural base frame. This unit was mounted directly to the table using fourteen (14) 1/2" - 13 grade 5 hex head bolts (7 bolts on both exterior sides) with flat washer and lock washers.

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

Contents were included in testing per operating conditions.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

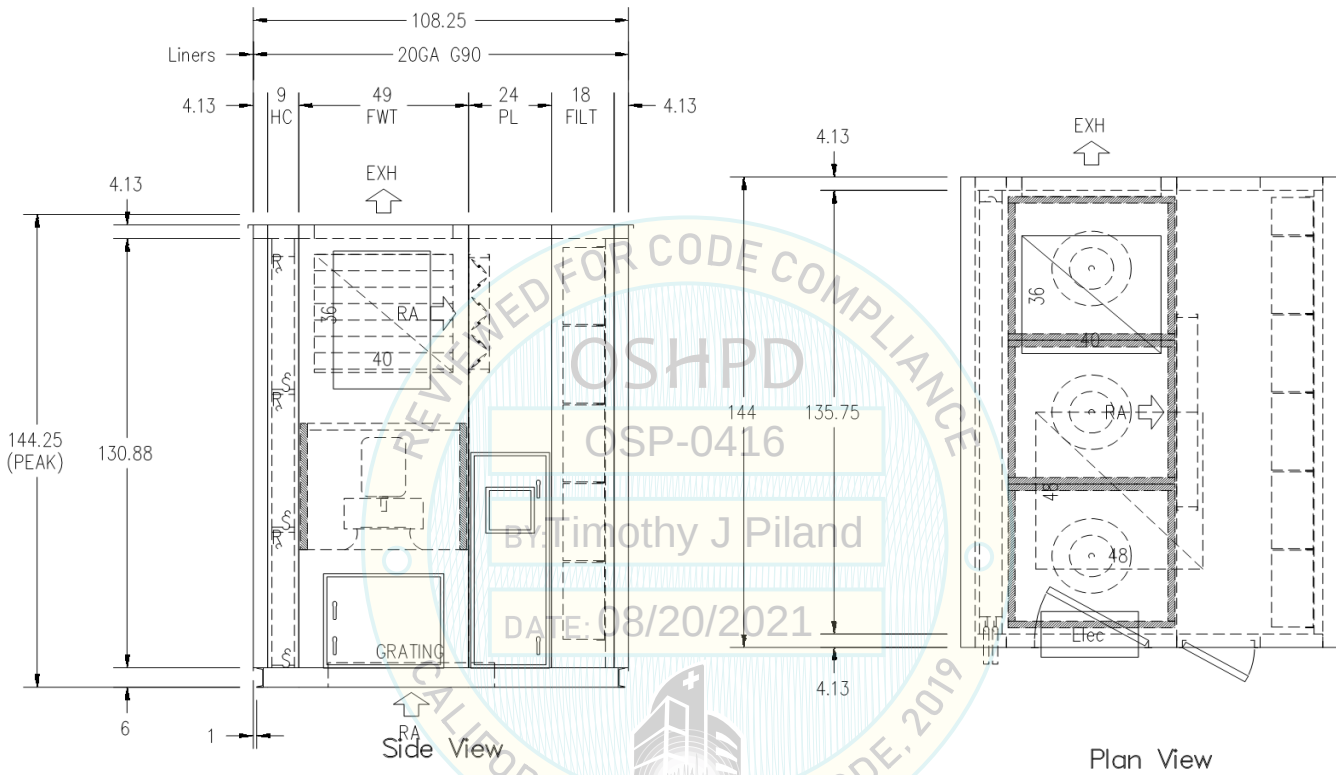
Model Line: Fanwall Technology™

Model Number: CSU-20K

Serial Number: 2097-02

UUT 3a

Unit Drawings



UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 3b
Model Line:	Fanwall Technology™	
Model Number:	CSU-20K	
		Serial Number: 2097-02

Product Construction Summary:

Wall/Roof: Standard 4" Panels, 16 ga. galv. carbon steel exterior with 20 ga. galv. carbon steel liner and 16 ga. galv. carbon steel blankoff with sloped roof; **Base:** Carbon steel channel base, 16 ga. galv. carbon steel skin with 20 ga. galv. carbon steel liner and 20 ga. carbon steel subfloor; **Door:** (2) 2" thick, 18.5(W) x 61.5(H) with thermal break window, 30.5(W) x 24.5(H) no window; **Cable Bracing:** 3/8" galvanized steel cables with 1/4" A36 brackets.

Options/Subcomponent Summary:

Fanwall: 3 fans, vertical upflow (2 up, 1 down), 10" and 22" wheels, welded cells, 1 HP and 15 HP Siemens motors (38.5"x131"x136"); **Heat Transfer Coil:** Heat Transfer Coil (HT3): Huntair, 14 FPI, 2 row, aluminum, stacked mounting - qty. 3 (127"x7"x40.5"); **Filter Rack:** HEPA filter and filter rack (12"x140"x140"); **MSP Enclosure:** NEMA4X (10"x16"x16"); **VFD:** Danfoss VLT 100 HP, recessed panel construction; **Damper:** Ruskin CD50 (5"x60"x36"); **Louver:** Ruskin ELF (6"x40"x36"); **Actuator:** Belimo AS-120-S; **Cool Fan:** U.S. Toyo 120V-240V; HEPA Filter; Terminal Block

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
9050	108	144	144.25	4.0	6.6	20.6

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	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Test Mounting Details:

Inlet wall removed; cable bracing at filter rack



All test units contain an integrated structural base frame. This unit was mounted directly to the table using fourteen (14) 1/2" - 13 grade 5 hex head bolts (7 bolts on both exterior sides) with flat washer and lock washers.

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

Contents were included in testing per operating conditions.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

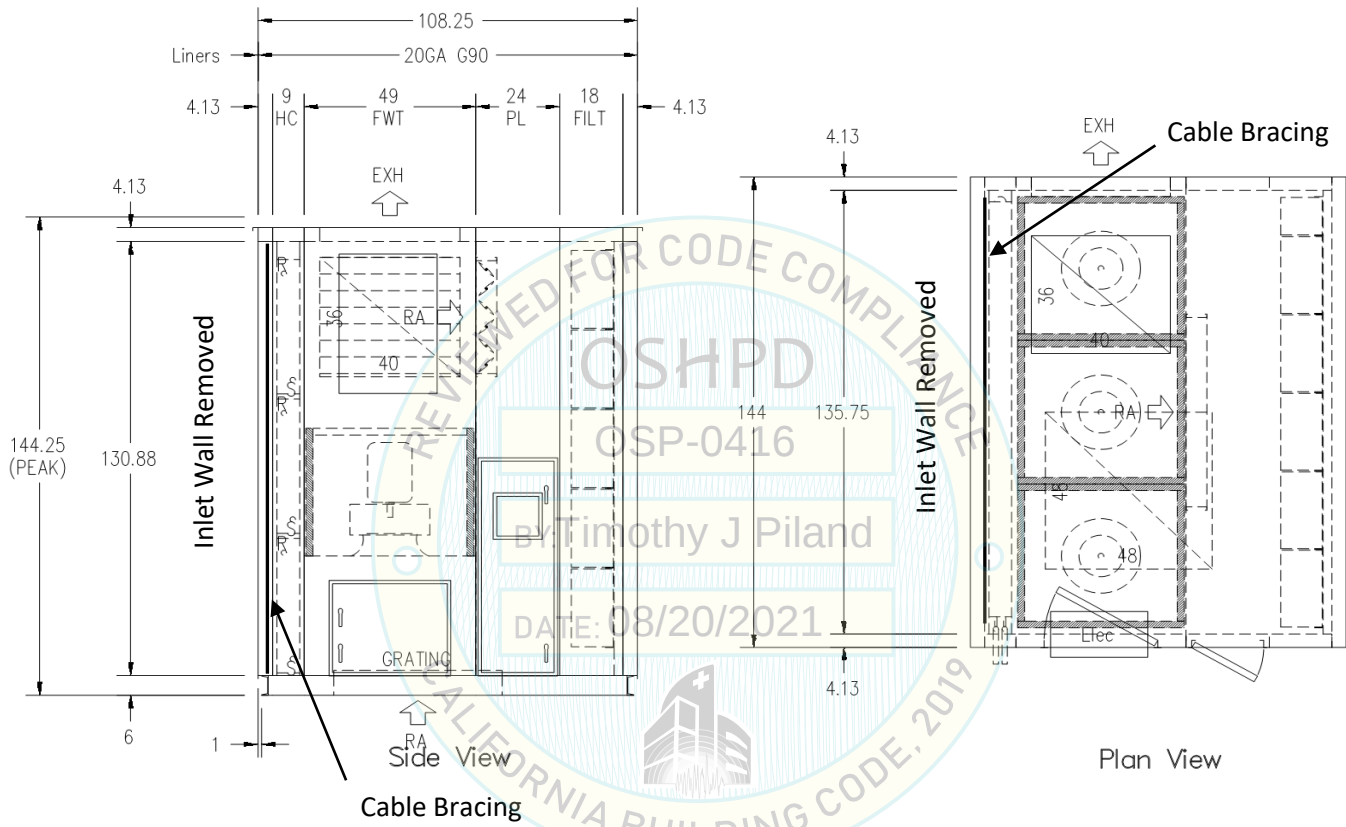
Model Line: Fanwall Technology™

Model Number: CSU-20K

Serial Number: 2097-02

UUT 3b

Unit Drawings



UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 4a
Model Line:	Fanwall Technology™	
Model Number:	CSU-40K	
		Serial Number: 2097-03

Product Construction Summary:

Wall/Roof: Standard 4" Panels, 0.080" aluminum exterior with 0.063" solid aluminum liner, 0.080" solid aluminum blankoff;
Base: 6" Aluminum structural tubing, 0.125" aluminum floor liner with 0.063" aluminum base liner; **Door:** 2" thick, 12.5(W) x 61.5(H) no window.

Options/Subcomponent Summary:

Fanwall: 29 fans, 10" and 22" carbon steel wheels, horizontal standard 5 cell(W) x 7 cell(H), welded/riveted cells, back draft dampers, 1 HP and 20 HP Siemens motors (34"x212"x131"); **Filter Rack:** 4" pre-filter, 12" final filter, type 8 (12"x236"x140");
Enclosure: NEMA3R (6"x24"x24") Terminal blocks; **Damper:** Ruskin CD50 (8"x100"x120"), Huntair HD6 (8"x100"x120");
Actuator: Belimo AF24-MFT, Seimens GCA131.1P, Seimens GCA226.1U; **Cool Fan:** U.S. Toyo 120V-240V; HEPA Filter; Disconnect Switch & Circuit Breaker; MSP

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
11600	96	240	144	4.7	3.9	14.1

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	2.0	1.0	1.5	3.2	2.4	1.33	0.53

Test Mounting Details:

Four (4) walls in place



All test units contain an integrated structural base frame. This unit was mounted directly to the seismic table using sixteen (16) 1/2" - 13 grade 5 hex head bolts (8 bolts per both exterior sides) with flat washers and lock 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

1801194-CR-001-R3

TRU
COMPLIANCE

Manufacturer: Nortek Air Solutions, LLC

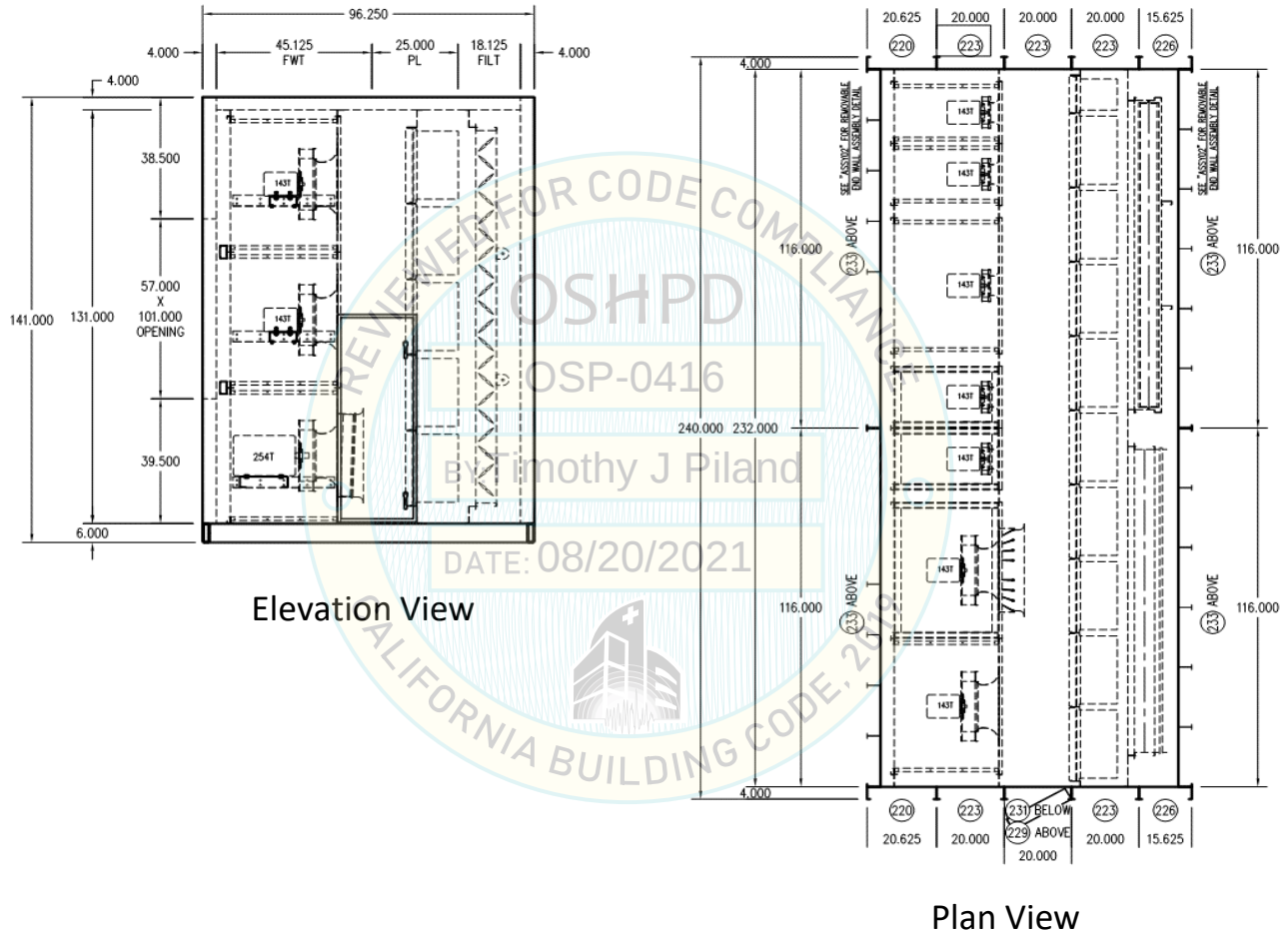
Model Line: Fanwall Technology™

Model Number: CSU-40K

Serial Number: 2097-03

UUT 4a

Unit Drawings



UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

Model Line: Fanwall Technology™

Model Number: CSU-20K STM/DX

Serial Number: 0120-01

UUT 5

Product Construction Summary:

Wall: 4" Panels 4 Variations - (A) 16 ga. stainless steel wall with 0.040" aluminum perforated liner, (B) 16 ga. galv carbon steel wall with 20 ga. galv. carbon steel solid liner, (C) 16 ga. stainless steel wall with 20 ga. stainless steel solid liner, (D) 16 ga. galv. carbon steel wall with 22 ga. stainless steel perforated liner, **Roof:** inner - 16 ga. stainless steel, outer - 16 ga. galv. carbon steel, sloped roof. **Base:** 12" tall stainless structural tubing, 12 ga. galv. carbon steel skin with 16 ga. galv. carbon steel liner and 16 ga. carbon steel subfloor.

Options/Subcomponent Summary:

Louver: AML6 Louver (6"x36"x60"), AML3 Louver (3"x100"x120"), **Damper:** SD50 Smoke Damper (5"x33"x57"), SD50 Smoke Damper (5"x96"x120"), AMS050 Damper (15"x48"x96"), AMS050 Damper (15"x24"x36"), **Fan Motor:** 22" P200 ECMI 6kW, 12" P200 ECMI 3.4kW, 22" P200 Toshiba 15hp motor, **UV Lights:** UVR UV Lights, **Coils:** Huntair DX Coil (8.5"x 150"x45"), Huntair DX Coil (8.5"x56"x45"), Luvata DX Coil (8.5"x 150"x45"), Luvata DX Coil (8.5"x56"x45"), **Fanwall:** 2(w) x 4(h) Gen II 22" Fan Wall, 2(w) x 4(h) Gen II 12" Fan Wall, 2(w) x 4(h) Gen II 22" Fan Wall, Fan wheels constructed of aluminum and polymer, **Electrical Cabinet:** Nema 1 (16"x56"x90"), Nema 1 (10"x28"x40") **VFD:** Danfoss 1hp and 15hp FC101 VFD; **Actuator:** Belimo AF120, Honeywell MS4120F; **Cool Fan:** Rittal 120V-240V; **Power Supply ; Reactor ; Terminal Block ; VFD ; PLC Controls ; Pressure Gauge:** Dwyer Magnesense MS2

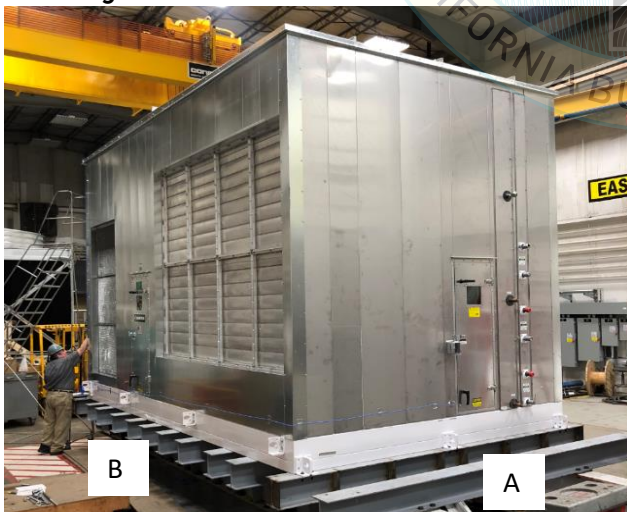
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
24400	138	244	160	7.3	6.0	13.1

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	2.0	1.0	1.5	3.2	2.4	1.67	0.67
		2.5	0.0					

Test Mounting Details:



All test units contain an integrated structural base frame. This unit was mounted to a I beam fixture using twelve (12) 5/8" SAE grade 8 hex head bolts with flat washers and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer: Nortek Air Solutions, LLC

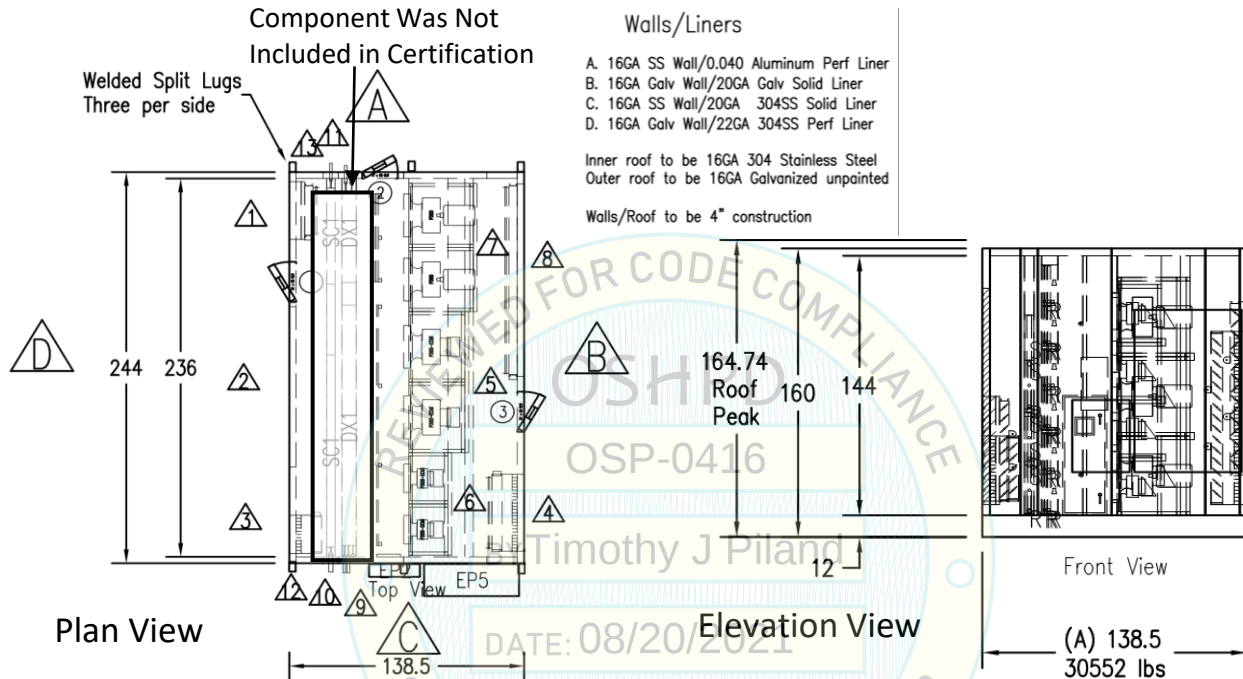
Model Line: Fanwall Technology™

Model Number: CSU-20K STM/DX

Serial Number: 0120-01

UUT 5

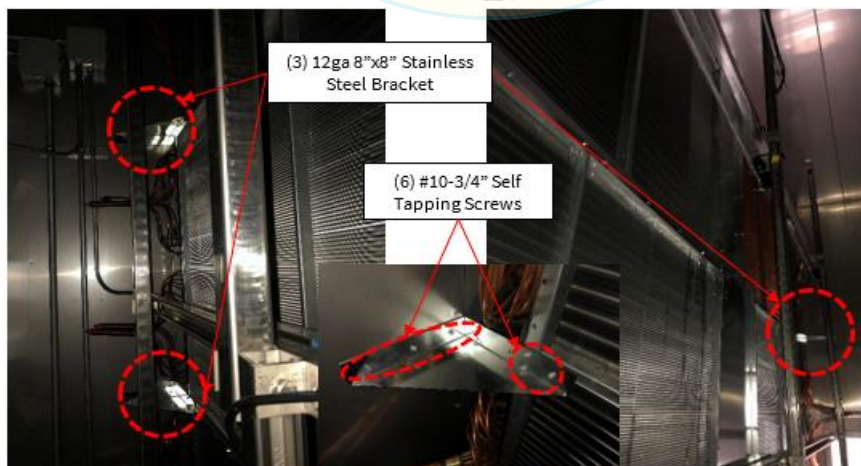
Unit Drawings



Note: Steam coil is not certified.

Seismic Upgrades Implemented:

The seismic upgrade for UUT5 consisted of mounting (3) 12 ga. 8"x8" stainless steel brackets to the wall and coil rack using (6) #10-3/4" self tapping screws. (2) were mounted to the rear of the unit, and (1) mounted to the front of the unit above the door.



UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 8
Model Line:	Fanwall Technology™	
Model Number:	CSU-20K CHW	
		Serial Number: 000139-006

Product Construction Summary:

Wall/Roof: Standard 4" Panels, 16 ga. galv. carbon steel exterior with 20 ga. galv. carbon steel liner; **Base:** 8" carbon steel structural tubing, 16 ga. galv. carbon steel base skin with 20 ga. galv. carbon steel liner; **Door:** (1) 4" thick, 24"(W) x 64"(H) no window

Options/Subcomponent Summary:

Chilled Water Coil: 12 FPI, 10 row, copper, stacked mounting - qty. 1 (48"Hx184"Wx15"D); 12 FPI, 10 row, aluminum, stacked mounting - qty. 1 (63"Hx184"Wx15"D); **Damper:** Ruskin CD 50 (60"x120"); **Louvers:** Huntair (60"Wx120"H), Ruskin ELF6375DX (60"Wx120"H); **Pressure Gage:** Dwyer Photohelic 3001; **Electrical Panel:** NEMA1; **Actuator:** AFBUP-S

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
14,762	130	204	135	7.46	9.75	10.97

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	2.0 2.5	1.0 0.0	1.5	3.2	2.4	1.67	0.67

Test Mounting Details:

(4) Walls in place, no Internal Bracing



All test units contain an integrated structural base frame. This unit was mounted to a I beam fixture using fourteen (14) 5/8" SAE grade 8 hex head bolts with flat washers and lock washers. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3

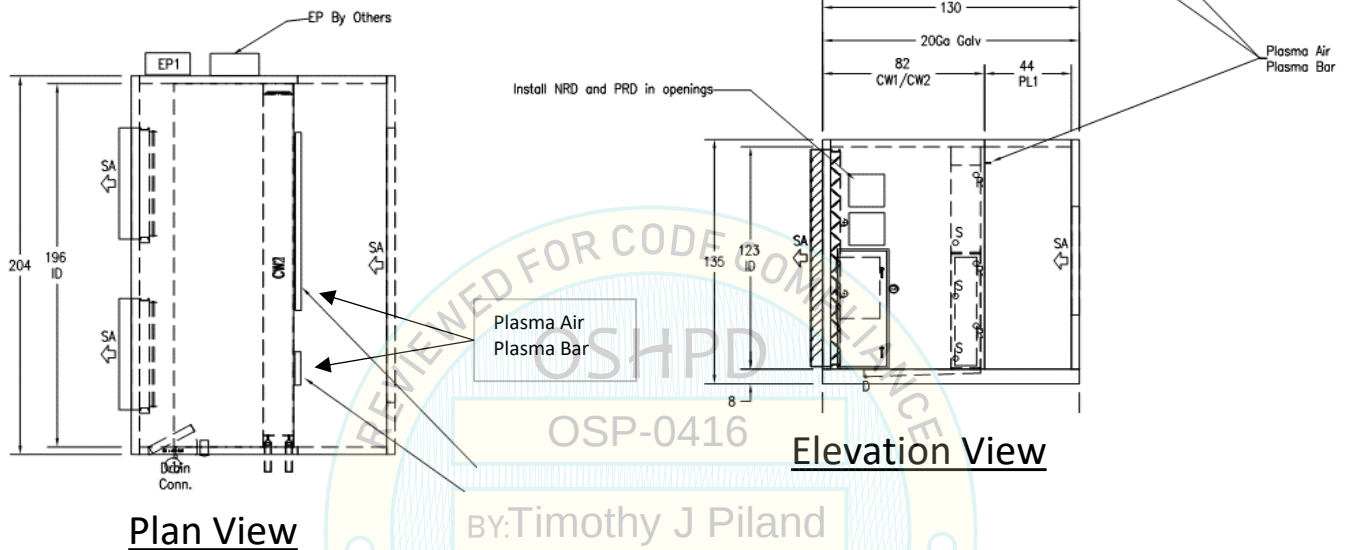


Manufacturer: Nortek Air Solutions, LLC
Model Line: Fanwall Technology™
Model Number: CSU-20K CHW

Serial Number: 000139-006

UUT 8

Unit Drawings



Seismic Upgrades Implemented (required for large coils as defined in table 5):

(1) 1/4"-14 screws top and bottom of coil at 10" o.c. max spacing, (2) 2-12ga. c-channel stiffeners¹ each side of coil, (3) 1/4"-14 screws at 10" o.c. max spacing along each c-channel stiffener.



Notes:

¹Stainless steel c-channels tested, stiffener channels may also be constructed of carbon steel.

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UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 9
Model Line:	Fanwall Technology™	
Model Number:	3x2 Fanwall Retrofit	
		Serial Number: N/A

Product Construction Summary:

Fan Cells: 2x2 aluminum extruded members, coplanar and extended coplanar panels are 0.040" aluminum and 22 ga. Stainless steel sheet-solid and perforated.
(6) 57Dx44Wx44H fan cells with 22" wheel (2Wx3H configuration) with extended coplanar

Options/Subcomponent Summary:

Fan Wheel: 22" Aluminum and Polymer fan wheels; **Motor:** NAS 6kW, ECMI 6HP, Baldor 15HP, Toshiba 15HP; **VFD:** ABB ACH550 150HP, ABB ACH580 150HP, Danfoss FC101 125HP, Yaskawa Z1000 125HP, NAS 9.5HP & 10HP, Siemens 3HP & 10HP, Schneider ATV 212 10HP

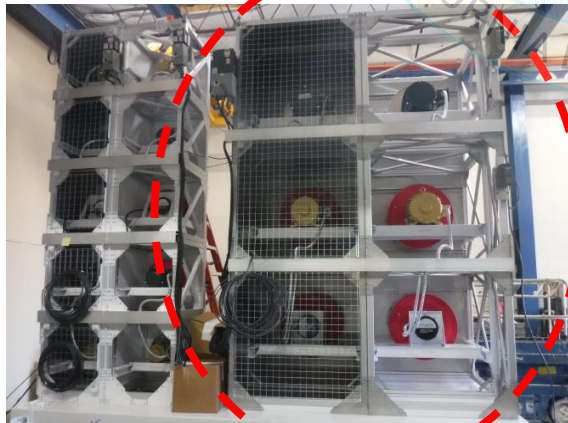
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
3363	57	88	134	4.6	4.4	19.4

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	2.20	1.0	1.5	3.52	2.64	2.35	0.94
		3.52	0.0					

Test Mounting Details:



Unit was attached to base fixture with (54) #12 Sheet Metal Screws
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 10
Model Line:	Fanwall Technology™	
Model Number:	5x2 Fanwall Retrofit	
		Serial Number: N/A

Product Construction Summary:

Fan Cells: 2x2 aluminum extruded members, coplanar and extended coplanar panels are 0.040" aluminum and 22 ga. Stainless steel sheet-solid and perforated.
(10) 28Dx25Wx27H fan cells with (2) 10" wheels and (8) 12" wheels (2Wx5H configuration) without extended coplanar

Options/Subcomponent Summary:

Fan Wheel: 12" Aluminum and Polymer fan wheels & 10" Aluminum and Polymer fan wheel; **Motor:** Baldor 1HP, Toshiba 1HP, NAS 2.5kW, ECMI 2.5HP; **VFD:** ABB ACH550 3HP, ABB ACH580 3HP, ABB ACS320 1HP, Danfoss FC101 1HP, Yaskawa V1000 1HP, Yaskawa Z1000 3HP, NAS 1HP & 1.5HP & 3HP & 3.5HP, Schneider ATV 212 1HP

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1824	28	50	137	4.6	4.3	18.9

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	2.20	1.0	1.5	3.52	2.64	2.35	0.94
		3.52	0.0					

Test Mounting Details:



Unit was attached to base fixture with (48) #12 Sheet Metal Screws
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 11a
Model Line:	Fanwall Technology™	
Model Number:	Electrical Panel - NEMA 4	
Serial Number:		N/A

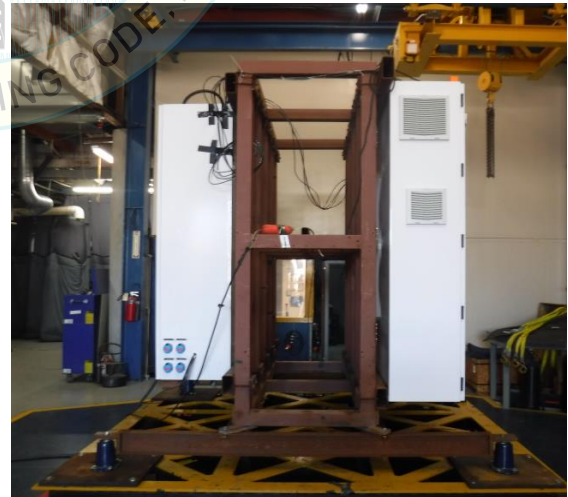
Product Construction Summary:
Stainless Steel Enclosure (12 Gage)

Options/Subcomponent Summary:
VFD: Danfoss FC101 1HP, Danfoss VLT 150HP, Yaskawa Z1000 3HP & 25HP; **Disconnect Switch & Circuit Breaker:** Siemens 400A Circuit Breaker; **Circuit Breaker:** Eaton 16A & 20A; **Fuse Holder and Fuse:** Bussman 15A, 30A, and 60A; **Distribution Block:** Marathon 665A; **Contactors:** Siemens 150A; **MSP:** Siemens 14A to 20A; **Power Supply:** Siemens 2.5A; **Transformer:** Micron; **PLC Controls:** Siemens Controller, Expansion Module; **Thermostat:** Pfennenberg; **Transducer:** Dwyer, Huntair/Setra; **Cool Fan:** Hoffman

UUT Properties						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
982.5	18	56	86	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	2.10 2.20	1.0 0.0	1.5	3.36	2.52	1.47	0.59	

Test Mounting Details:



Unit was attached to wall fixture with (8) 3/8" Grade 8 Bolts. Wall fixture was isolated with (4) Mason Industry SSLFH-C-1750 spring isolators.

Unit maintained structural integrity and remained functional per manufacturer requirement.

Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 11b
Model Line:	Fanwall Technology™	
Model Number:	Electrical Panel - NEMA 4	
		Serial Number: N/A

Product Construction Summary:
Stainless Steel Enclosure (12 Gage)

Options/Subcomponent Summary:
VFD: Danfoss FC101 1HP, Danfoss VLT 150HP, Yaskawa Z1000 3HP & 25HP; **Disconnect Switch & Circuit Breaker:** Siemens 400A Circuit Breaker; **Circuit Breaker:** Eaton 16A & 20A; **Fuse Holder and Fuse:** Bussman 15A, 30A, and 60A; **Distribution Block:** Marathon 665A; **Contactors:** Siemens 150A; **MSP:** Siemens 14A to 20A; **Power Supply:** Siemens 2.5A; **Transformer:** Micron; **PLC Controls:** Siemens Controller, Expansion Module; **Thermostat:** Pfennenberg; **Transducer:** Dwyer, Huntair/Setra; **Cool Fan:** Hoffman

UUT Properties									
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)					
	Depth	Width	Height	Front-Back		Side-Side		Vertical	
982.5	18	56	86	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	2.23	1.0	1.5	3.57	2.68	1.82	0.73
			2.73	0.0					

Test Mounting Details:



Unit was attached to wall fixture with (8) 3/8" Grade 8 Bolts. Wall fixture was rigidly attached to shake table.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



Manufacturer:	Nortek Air Solutions, LLC	UUT 12a
Model Line:	Fanwall Technology™	
Model Number:	Electrical Panel - NEMA 1	
Serial Number:		N/A

Product Construction Summary:

Carbon Steel Enclosure (12 Gage)

Options/Subcomponent Summary:

VFD: NAS 1HP, 3HP, & 10HP; **Disconnect Switch & Circuit Breaker:** Siemens 60A Disconnect and Circuit Breaker; **Circuit Breaker:** Eaton 16A; **Fuse Holder and Fuse:** Bussman 5A, 10A, 100A, & 200A; **Distribution Block:** Marathon 175A; **Power Supply:** Eaton 5A and 10A Output; **Transformer:** Micron; **Reactor:** ICI 14A; **Terminal Block:** Phoenix 15A, 30A, & 30A Grounding Terminals; **PLC Controls:** Siemens Power Supply, Controller, Touch Screen, Communication Module; **Thermostat:** Pfennenberg; **Cool Fan:** San Ace 172

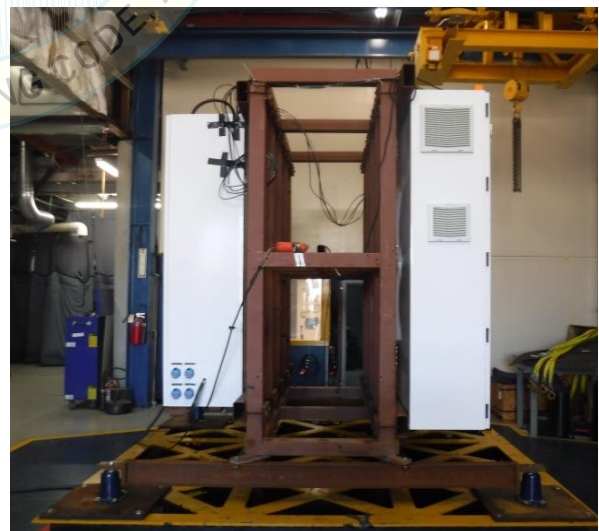
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1032	20	56	86	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	2.10 2.20	1.0 0.0	1.5	3.36	2.52	1.47	0.59

Test Mounting Details:



Unit was attached to wall fixture with (8) 3/8" Grade 8 Bolts. Wall fixture was isolated with (4) Mason Industry SSLFH-C-1750 spring isolators.

Unit maintained structural integrity and remained functional per manufacturer requirement.

Contents were included in testing per operating conditions.

TRU Compliance, by Structural Integrity Associates, Inc.

844-TRU-0200 | info@trucompliance.com

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



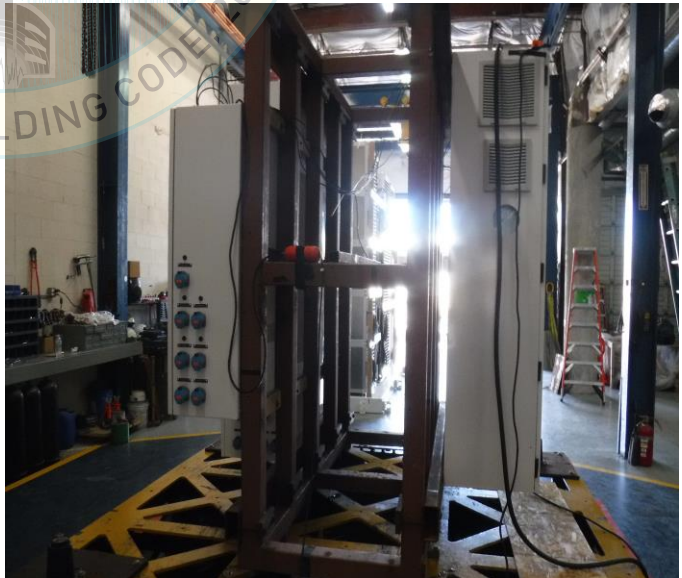
Manufacturer:	Nortek Air Solutions, LLC	UUT 12b
Model Line:	Fanwall Technology™	
Model Number:	Electrical Panel - NEMA 1	
		Serial Number: N/A

Product Construction Summary:
Carbon Steel Enclosure (12 Gage)

Options/Subcomponent Summary:
VFD: NAS 1HP, 3HP, & 10HP; **Disconnect Switch & Circuit Breaker:** Siemens 60A Disconnect and Circuit Breaker; **Circuit Breaker:** Eaton 16A; **Fuse Holder and Fuse:** Bussman 5A, 10A, 100A, & 200A; **Distribution Block:** Marathon 175A; **Power Supply:** Eaton 5A and 10A Output; **Transformer:** Micron; **Reactor:** ICI 14A; **Terminal Block:** Phoenix 15A, 30A, & 30A Grounding Terminals; **PLC Controls:** Siemens Power Supply, Controller, Touch Screen, Communication Module; **Thermostat:** Pfennenberg; **Cool Fan:** San Ace 172

UUT Properties										
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)						
	Depth	Width	Height	Front-Back	Side-Side	Vertical				
1032	20	56	86	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		2.23	1.0	1.5	3.57	2.68	1.82	0.73
				2.73	0.0					

Test Mounting Details:



Unit was attached to wall fixture with (8) 3/8" Grade 8 Bolts. Wall fixture was rigidly attached to shake table.
 Unit maintained structural integrity and remained functional per manufacturer requirement.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



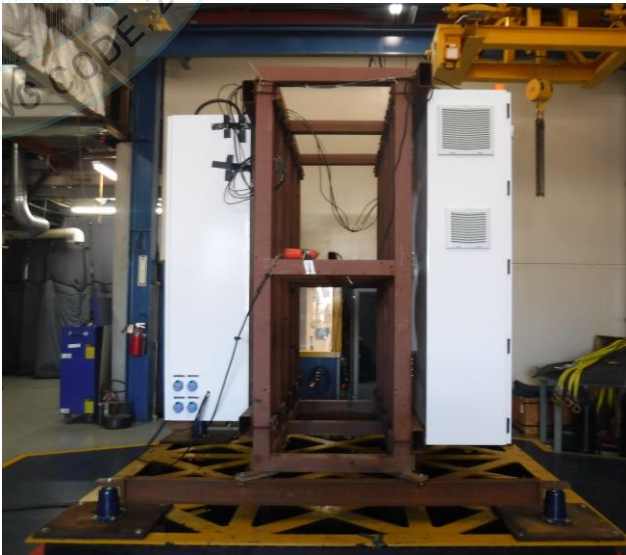
Manufacturer:	Nortek Air Solutions, LLC	UUT 13a
Model Line:	Fanwall Technology™	
Model Number:	Electrical Panel - NEMA 4	
Serial Number:		N/A

Product Construction Summary:
Stainless Steel Enclosure (12 Gage)

Options/Subcomponent Summary:
VFD: ABB ACH550 3HP & 150HP, ABB ACS320 1HP & 20HP, Yaskawa V1000 1HP, Yaskawa Z1000 20HP; **Disconnect Switch & Circuit Breaker:** Siemens 300A Circuit Breaker, Eaton 16A & 400A Non-fused Disconnect; **Circuit Breaker:** Eaton 10A; **Fuse Holder and Fuse:** Bussman 1A & 400A; **Distribution Block:** Marathon 310A, 380A; **Contactors:** Siemens 7A; **MSP:** Siemens 1.8A to 2.5A, Siemens 14A to 20A; **Power Supply:** Siemens 10A; **Transformer:** Micron; **Reactor:** TCI 185A; **Terminal Block:** Pheonix 15A; **PLC Controls:** Siemens Power Supply; **Thermostat:** Pfennenberg; **Transducer:** Dwyer; **Cool Fan:** Hoffman, San Ace 172; **HMI Screen:** Niagara; **Expander:** Niagara; **Controller:** Niagara; **Contact Switch:** Pheonix

UUT Properties										
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)						
	Depth	Width	Height	Front-Back		Side-Side		Vertical		
403.5	14	38	54	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		2.10	1.0	1.5	3.36	2.52	1.47	0.59
				2.20	0.0					

Test Mounting Details:

Unit was attached to wall fixture with (6) 3/8" Grade 8 Bolts. Wall fixture was isolated with (4) Mason Industry SSLFH-C-1750 spring isolators.
 Unit maintained structural integrity and remained functional per manufacturer requirement.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

1801194-CR-001-R3



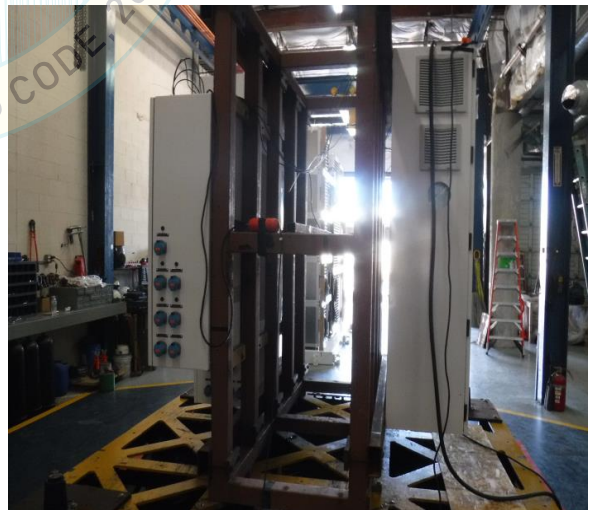
Manufacturer:	Nortek Air Solutions, LLC	UUT 13b
Model Line:	Fanwall Technology™	
Model Number:	Electrical Panel - NEMA 4	
Serial Number:		N/A

Product Construction Summary:
Stainless Steel Enclosure (12 Gage)

Options/Subcomponent Summary:
VFD: ABB ACH550 3HP & 150HP, ABB ACS320 1HP & 20HP, Yaskawa V1000 1HP, Yaskawa Z1000 20HP; **Disconnect Switch & Circuit Breaker:** Siemens 300A Circuit Breaker, Eaton 16A & 400A Non-fused Disconnect; **Circuit Breaker:** Eaton 10A; **Fuse Holder and Fuse:** Bussman 1A & 400A; **Distribution Block:** Marathon 310A, 380A; **Contactors:** Siemens 7A; **MSP:** Siemens 1.8A to 2.5A, Siemens 14A to 20A; **Power Supply:** Siemens 10A; **Transformer:** Micron; **Reactor:** TCI 185A; **Terminal Block:** Phoenix 15A; **PLC Controls:** Siemens Power Supply; **Thermostat:** Pfennenberg; **Transducer:** Dwyer; **Cool Fan:** Hoffman, San Ace 172; **HMI Screen:** Niagara; **Expander:** Niagara; **Controller:** Niagara; **Contact Switch:** Phoenix

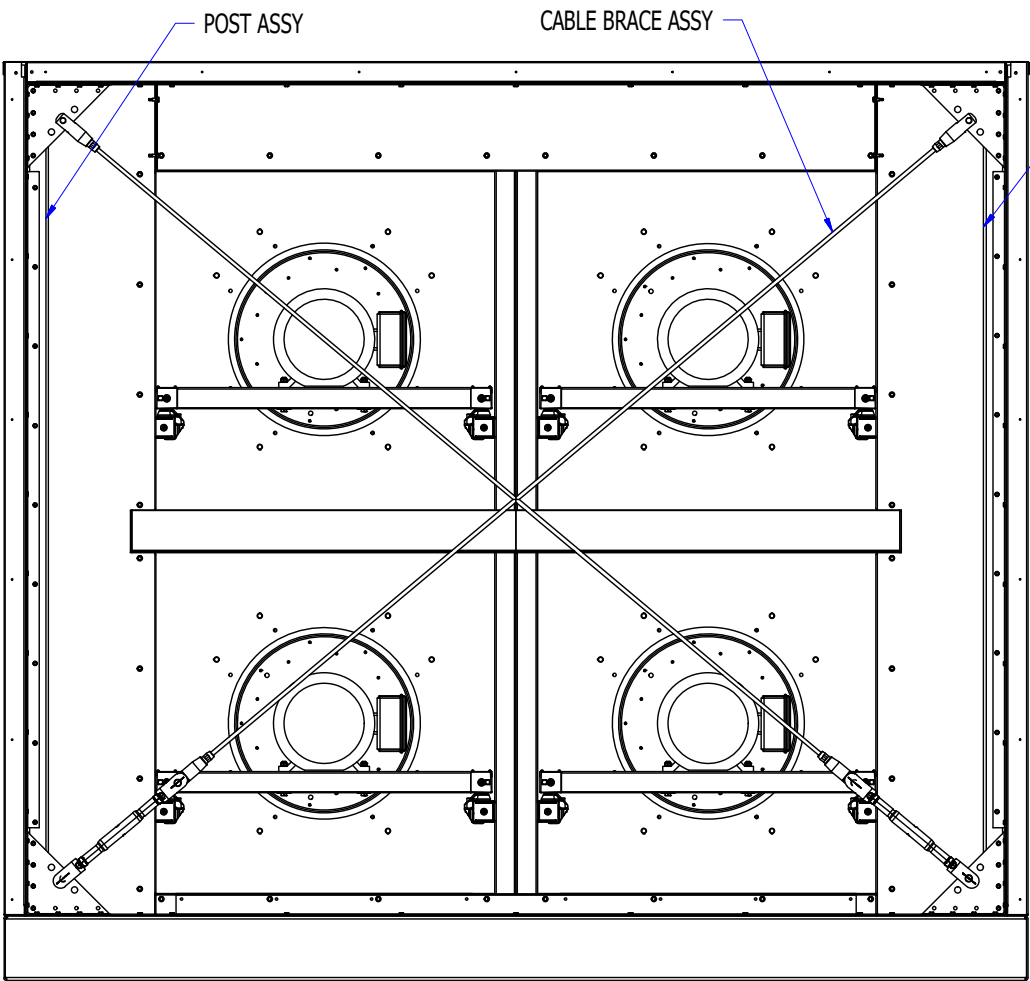
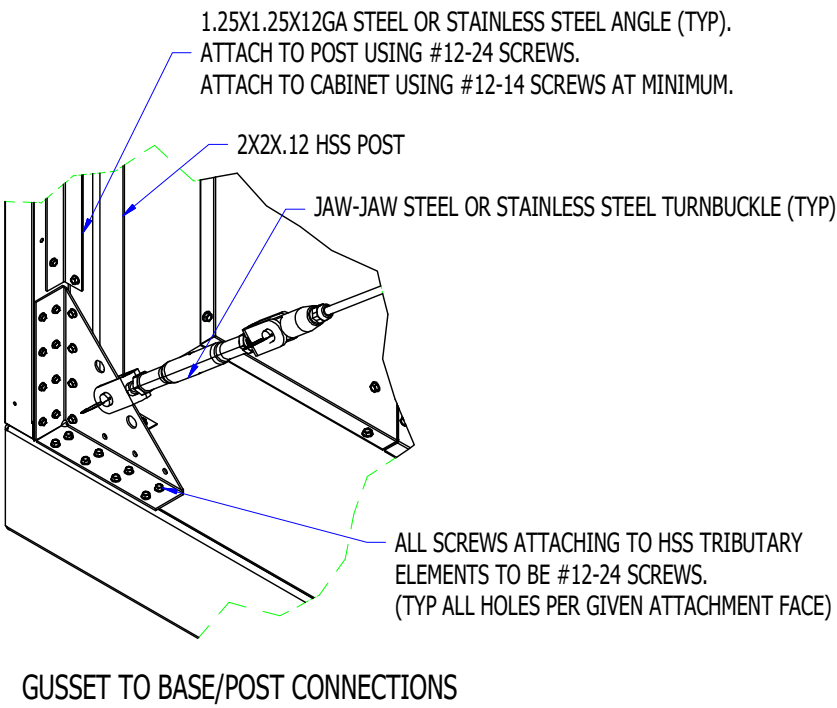
UUT Properties									
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)					
	Depth	Width	Height	Front-Back	Side-Side	Vertical			
403.5	14	38	54	N/A	N/A	N/A			
UUT Highest Passed Seismic Run Information									
Building Code		Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2019		ICC-ES AC156	2.23	1.0	1.5	3.57	2.68	1.82	0.73
			2.73	0.0					

Test Mounting Details:

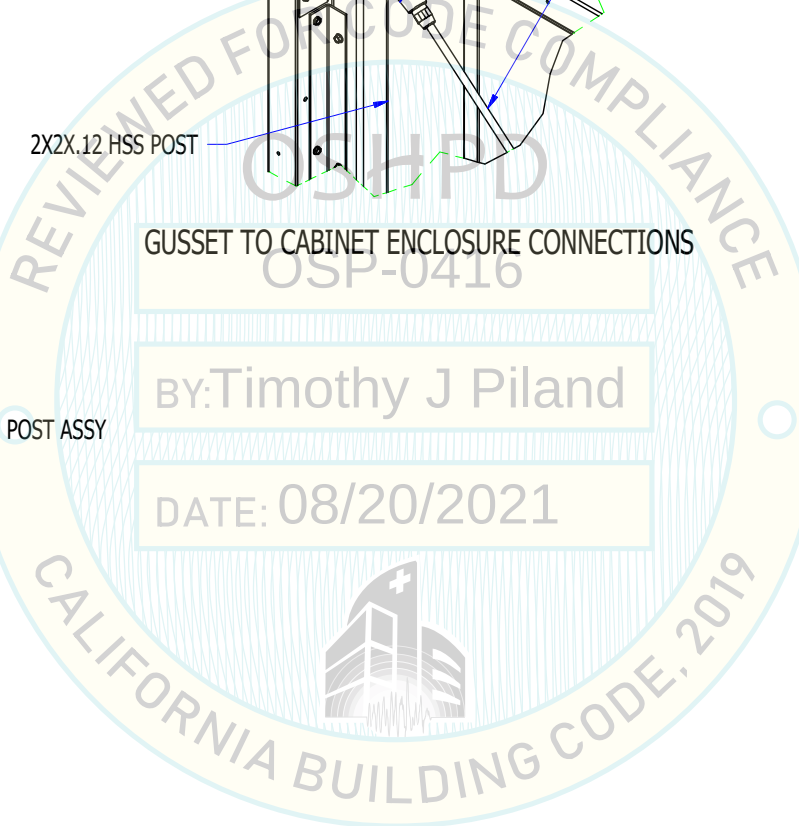
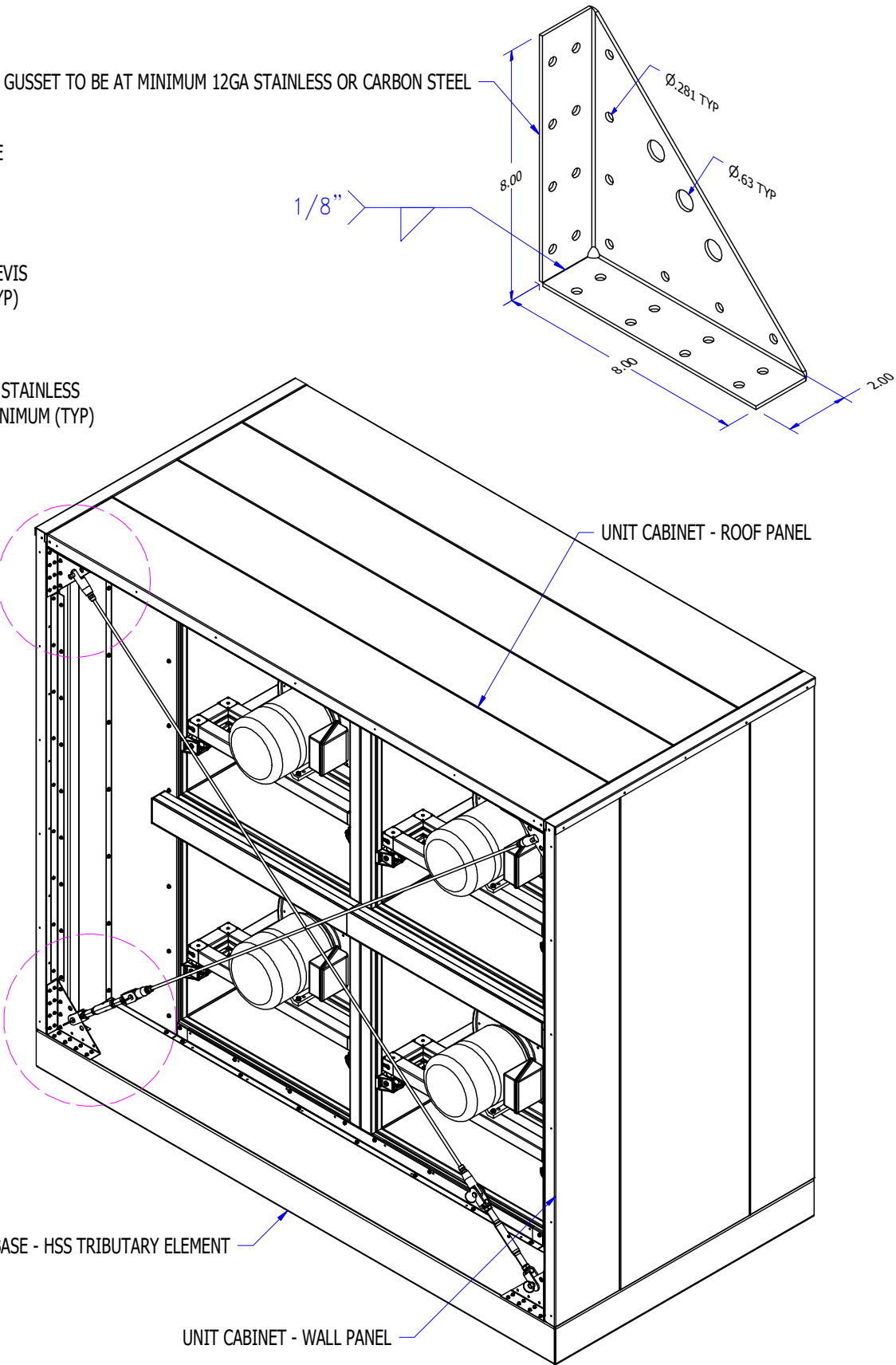
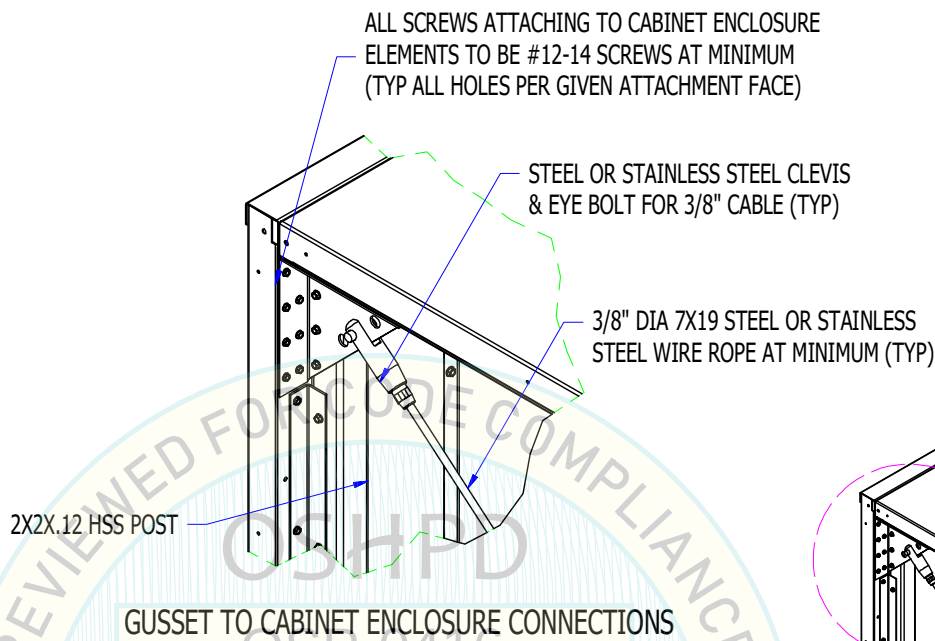


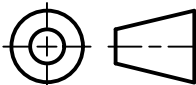
Unit was attached to wall fixture with (6) 3/8" Grade 8 Bolts. Wall fixture was rigidly attached to shake table.
 Unit maintained structural integrity and remained functional per manufacturer requirement.
 Contents were included in testing per operating conditions.

BRACING REQUIRED FOR GEN II FANWALL TECHNOLOGY™ ONLY.

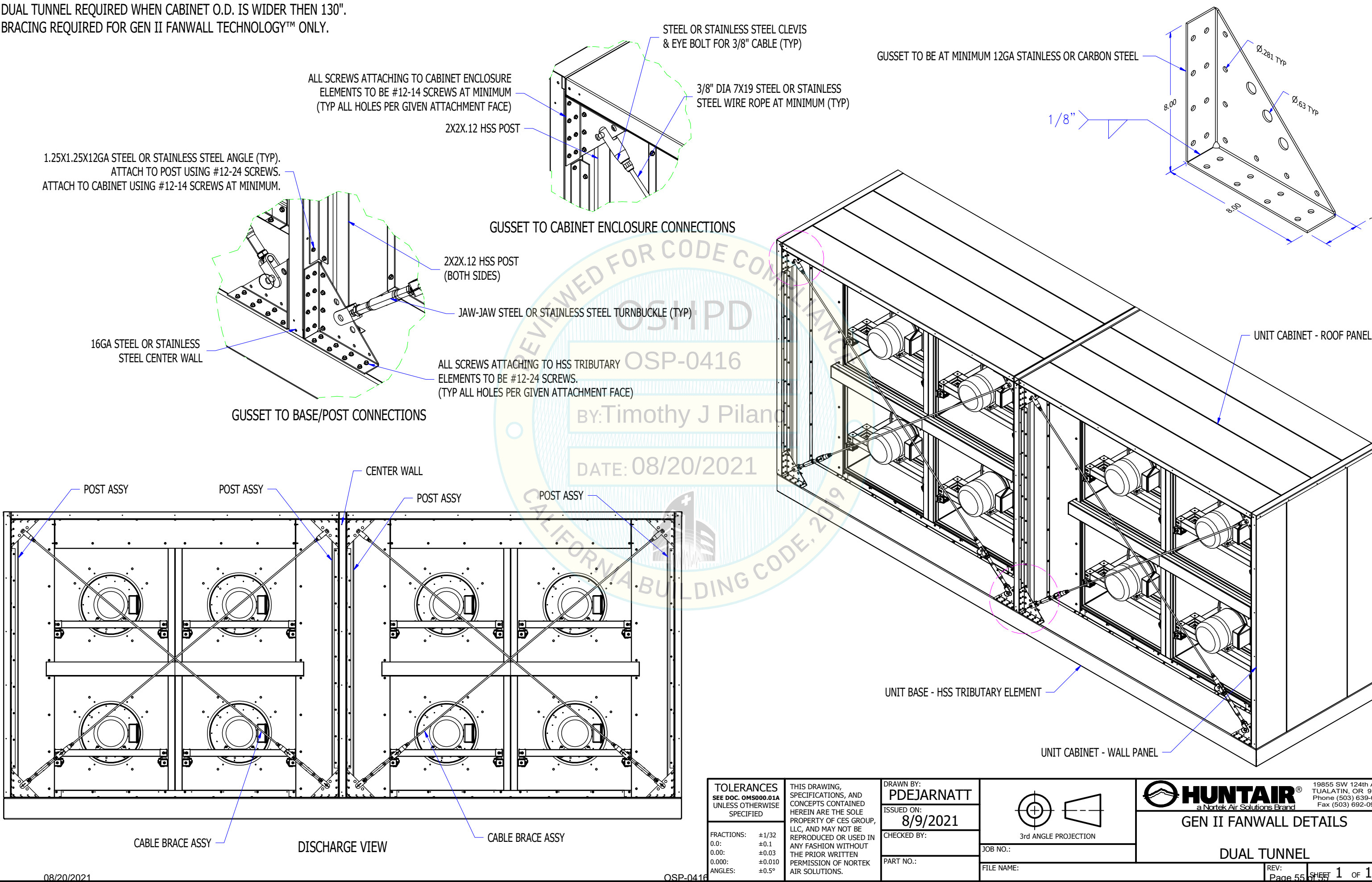


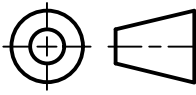
DISCHARGE VIEW



TOLERANCES SEE DOC. OMS000.01A UNLESS OTHERWISE SPECIFIED FRACTIONS: ±1/32 0.0: ±0.1 0.00: ±0.03 0.000: ±0.010 ANGLES: ±0.5°	THIS DRAWING, SPECIFICATIONS, AND CONCEPTS CONTAINED HEREIN ARE THE SOLE PROPERTY OF CES GROUP, LLC, AND MAY NOT BE REPRODUCED OR USED IN ANY FASHION WITHOUT THE PRIOR WRITTEN PERMISSION OF NORTEK AIR SOLUTIONS.	DRAWN BY: PDEJARNATT ISSUED ON: 8/9/2021 CHECKED BY: PART NO.:	 3rd ANGLE PROJECTION JOB NO.: FILE NAME:	 HUNTAIR a Nortek Air Solutions Brand 19855 SW 124th AVE. TUALATIN, OR 97062 Phone (503) 639-0113 Fax (503) 692-0958 GEN II FANWALL DETAILS SINGLE TUNNEL REV: 1 Page 54 of 55
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DUAL TUNNEL REQUIRED WHEN CABINET O.D. IS WIDER THEN 130".
BRACING REQUIRED FOR GEN II FANWALL TECHNOLOGY™ ONLY.



TOLERANCES SEE DOC. OMS000.01A UNLESS OTHERWISE SPECIFIED	THIS DRAWING, SPECIFICATIONS, AND CONCEPTS CONTAINED HEREIN ARE THE SOLE PROPERTY OF CES GROUP, LLC, AND MAY NOT BE REPRODUCED OR USED IN ANY FASHION WITHOUT THE PRIOR WRITTEN PERMISSION OF NORTEK AIR SOLUTIONS.	DRAWN BY: PDEJARNATT		 3rd ANGLE PROJECTION	 HUNTAIR® a Nortek Air Solutions Brand	19855 SW 124th AVE. TUALATIN, OR 97062 Phone (503) 639-0113 Fax (503) 692-0958	
		ISSUED ON: 8/9/2021				GEN II FANWALL DETAILS	
		CHECKED BY:					
		PART NO.:					
FRACTIONS: ±1/32 0.0: ±0.1 0.00: ±0.03 0.000: ±0.010 ANGLES: ±0.5°		JOB NO.:		DUAL TUNNEL		REV:	SHEET 1 OF 1
		FILE NAME:				Page 55 of 55	