



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

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: **OSP – 0069-10**

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: **Energy Labs, Inc.**

Manufacturer's Technical Representative: Ray Irani

Mailing Address: 1695 Cactus Rd, San Diego, CA 92154

Telephone: 619.671.0100 Email: rirani@energylabs.com

Product Information

Product Name: Custom Air Conditioning Units

Product Type: Custom Air Conditioning Units

Product Model Number: Various (See Attachment)

(List all unique product identification numbers and/or part numbers)

General Description: Custom air conditioning units and associated internal components.

Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid Floor Mount

Applicant Information

Applicant Company Name: **SEESTudio, Inc.**

Contact Person: Dan Junker, SE

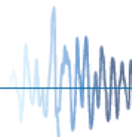
Mailing Address: 1281 9th Ave. San Diego, CA 92101, Suite 1101

Telephone: 619.606.5058 Email: djunker@seestudioinc.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant:  Date: 12.12.16

Title: Principal Engineer Company Name: SEESTudio, Inc.





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

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

Company Name: SEESTudio, Inc.

Name: Dan Junker, SE California License Number: S6178

Mailing Address: 1281 9th Ave. San Diego, CA 92101, Suite 1101

Telephone: 619.606.5058 Email: djunker@seestudioinc.com

Supports and Attachments Preapproval

- Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

Certification Method

- Testing in accordance with: ICC-ES AC156
- Other (Please Specify): _____

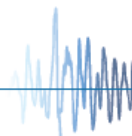
Testing Laboratory

Company Name: Clark Dynamic Test Laboratory, Inc.*

Contact Name: Robert Francis, General Manager

Mailing Address: 1801 Route 51 Jefferson Hills, PA 15025

Telephone: 412.387.1004 Email: rfrancis@clarktesting.com





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

Seismic Parameters

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

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

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

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

R_p (Equipment or component response modification factor) = 2.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = See Attachments

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 No

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

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

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

Tank(s) designed in accordance with ASME BPVC, 2015: Yes No

List of Attachments Supporting Special Seismic Certification

Test Report(s) Drawings Calculations Manufacturer's Catalog

Other(s) (Please Specify): SEES Component Certification Summary

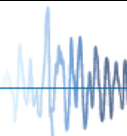
OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature:  Date: 3/6/17

Print Name: M. R. Karim Title: SHFR

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

Condition of Approval (if applicable): _____



SPECIAL SEISMIC CERTIFICATION

CERTIFIED COMPONENTS

TABLE **1**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: AHU Cabinets

CONSTRUCTION SUMMARY: CERTIFICATION PARAMETERS:

Certified unit construction shall be identical to cabinet construction of UUT's. Units shall be constructed in accordance with Energy Labs seismic details, including: floor to base frame connections, wall to floor panel connections, seismic bracing requirements including lateral restraint at a maximum of 144" in all directions.

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$
For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$

OPTIONS SUMMARY:

Panel material: galvanized steel or stainless steel in either 2" or 4" panel thickness; Panel liners: galvanized steel, galvanized BRT steel, aluminum, stainless steel or without liner; Access doors: galvanized steel or stainless steel up to 36" wide x 73" tall (Type S, F, FTB); Other items: Rainhoods, bellmouth transitions, air blenders

MOUNTING SUMMARY:

AHU's shall be fully supported around base frame perimeter and at 12'-0" maximum o.c. perpendicular to direction of air travel. Support shall be provided at both sides of all shipping split locations. Locations of vertical and lateral restraint, to be designed by SEOR on project specific basis, shall be provided at 8'-0" o.c. maximum.

NOTES:

S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Model Line	Model	Max Dimensions (in)				Weight (psf)	Description	UUT	
		Depth	Width	Height					
Custom Air Handling Unit (AHU)	Single Air Tunnel	40.0	40.0	33.0	Min.	100 Max.			
		...							
		576.0	1728.0	144.0	Max.				
	Double Air Tunnel	80.0	60.0	33.0	Min.				
		...							
		1152.0	1728.0	144.0	Max.				
	L - Shaped	Refer to supplemental drawings							
T - Shaped									
U - Shaped									

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS
TABLE 2

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: **Damper & Louvers**

CONSTRUCTION SUMMARY: CERTIFICATION PARAMETERS:

Galvanized carbon steel or stainless steel

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$
For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$

OPTIONS SUMMARY:
MOUNTING SUMMARY:

Mounted within AHU walls

NOTES:
 S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Sub-Component	Manufacturer	Max Dimensions (in)			Weight (lb)	Description	UUT
		Depth	Width	Height			
Outside Air Louver	Energy Labs, Inc.	5.0	12.0	10.0	9	Min	2
		...					
		5.0	72.0	120.0	297	Max.	2
Control Damper	Energy Labs, Inc.	6.0	12.0	7.0	10.0	Min.	1
		...					
		6.0	52.0	63.0	107		2
		...					
Acoustical Louver	Vibro-Acoustics	6.0	52.0	93.3	254	Max.	
		6.0	12.0	30.0	36	Min.	4
		...					
		6.0	30.0	120.0	210		4
		12.0	12.0	30.0	72		4
Control Damper	Tamco	...					
		4.0	12.0	12.0	5	Min.	
		...					
		4.0	60.0	60.0	125		
Damper with Ebtron AIR-IQ Flow Measuring System	Tamco	18.0	12.0	12.0	14	Gold and hybrid series probes and transmitters	4
		...					
		18.0	60.0	60.0	185	Max.	4

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS
TABLE 4.1

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Fans

CONSTRUCTION SUMMARY: CERTIFICATION PARAMETERS:

Painted carbon steel fan frame; carbon steel sheet metal housing; aluminum wheel

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$
For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$

OPTIONS SUMMARY:

0.5 – 150 Motor horsepower; manual or automatic Energy Labs, Inc. flow valves; 206, 240, or 360 voltage

MOUNTING SUMMARY:

Horizontal plenum fans connected to base with Energy Labs restrained vibration isolators.

NOTES:
 S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Plenum Fans	Energy Labs, Inc.	135	27.3	37.0	25.0	422	Horizontal Belt Drive	2
		150	29.0	38.0	27.8	496		
		165	32.4	51.0	30.0	679		
		182	33.3	52.0	33.0	865		
		200	34.5	55.0	36.0	933		
		222	36.5	58.5	39.8	1,180		
		245	38.4	60.5	42.8	1,311		
		270	40.6	63.5	47.3	1,407		
		300	44.1	68.0	51.0	1,585		9
		330	49.3	72.0	53.5	1,746		
		365	51.3	75.0	57.5	2,415		
		402	55.9	80.0	64.0	2,732		
		445	59.1	88.5	68.0	2,866		
		490	62.9	97.0	74.0	3,411		
		542	68.6	103.0	79.5	4,329		
		600	73.3	109.0	87.0	4,694	7	

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS
TABLE 4.2
MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Fans

CONSTRUCTION SUMMARY:		CERTIFICATION PARAMETERS:	
Painted carbon steel fan frame; carbon steel sheet metal housing; aluminum wheel		Building Code: CBC 2016	
OPTIONS SUMMARY:		Component Importance Factor: $I_p = 1.5$	
0.5 – 150 Motor horsepower; manual or automatic Energy Labs, Inc. flow valves; 206, 240, or 360 voltage		For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$	
		For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$	

MOUNTING SUMMARY:		NOTES:	
Horizontal plenum fans connected to base with Energy Labs restrained vibration isolators.		S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.	

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Plenum Fans	Energy Labs, Inc.	135	26.9	22.0	27.0	410	Horizontal Direct Drive	3
		150	28.3	23.0	28.9	515		
		165	29.0	25.0	31.3	642		
		182	30.5	26.0	32.3	887		
		200	34.0	29.0	34.9	949		
		222	39.5	32.5	37.4	1,171		
		245	41.0	34.5	40.4	1,334		
		270	43.5	37.5	43.5	1,498		
		300	45.5	42.0	48.0	1,479		
		330	52.0	46.0	52.3	1,741		
		365	51.0	49.0	56.5	1,880		
		402	57.5	54.0	61.3	2,010		
		445	64.5	58.5	65.3	2,112		
		490	67.5	63.0	71.3	2,941		5

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS

TABLE 4.3

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Fans

CONSTRUCTION SUMMARY:	CERTIFICATION PARAMETERS:
-----------------------	---------------------------

Painted carbon steel fan frame; carbon steel sheet metal housing; aluminum wheel

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$
For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$

OPTIONS SUMMARY:

0.5 – 150 Motor horsepower; manual or automatic Energy Labs, Inc. flow valves; 206, 240, or 360 voltage; 42" Max. steel frame plenum below inlet

MOUNTING SUMMARY:	NOTES:
-------------------	--------

Vertical inlet down fans w/o plenum connected with Energy Labs restrained vibration isolators to base. All other fans connect to frame with Energy Labs restrained vibration isolators and frame rigid mounted to base.

 S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Plenum Fans	Energy Labs, Inc.	135	30.5	29.0	29.0	414	Vertical Inlet Down Belt Drive	3
		150	33.3	30.0	30.0	471		
		165	36.5	32.0	32.0	577		
		182	37.5	33.0	33.0	773		
		200	40.5	36.0	36.0	841		
		222	44.3	39.5	39.5	1,066		
		245	48.3	41.5	41.5	1,213		
		270	51.8	44.5	44.5	1,256		
		300	55.5	49.0	49.0	1,096		
		330	61.5	56.0	49.4	1,831		
		365	65.5	59.0	51.9	1,897		
		402	73.0	64.0	56.1	2,152		
		445	77.0	68.5	59.3	2,251		
		490	84.0	73.0	63.0	2,449		
		542	89.5	79.0	67.8	3,268		
		600	99.0	85.0	73.4	3,592		8

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS
TABLE 4.5

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Fans

CONSTRUCTION SUMMARY:	CERTIFICATION PARAMETERS:
------------------------------	----------------------------------

Painted carbon steel fan frame; carbon steel sheet metal housing; aluminum wheel

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
For $z/h = 1.0$: $S_{DS} = 0.375g$, $F_p/W_p = 0.84$
For $z/h = 0.0$: $S_{DS} = 0.60g$, $F_p/W_p = 0.45$

OPTIONS SUMMARY:

0.5 – 150 Motor horsepower; manual or automatic Energy Labs, Inc. flow valves; 206, 240, or 360 voltage

MOUNTING SUMMARY:

Vertical inlet up fans connected with Energy Labs restrained vibration isolators and frame rigid mounted to base.

NOTES:

 S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Plenum Fans	Energy Labs, Inc.	135	30.5	29.0	26.0	647	Vertical Inlet Up Belt Drive	3
		150	33.3	30.0	27.0	721		
		165	36.5	32.0	30.3	864		
		182	37.5	33.0	31.5	1,065		
		200	40.5	36.0	33.1	1,151		
		222	44.3	39.5	34.6	1,408		
		245	48.3	41.5	37.2	1,595		
		270	51.8	44.5	39.6	1,656		
		300	55.5	49.0	42.3	1,524		
		330	61.5	56.0	49.4	2,300		
		365	65.5	59.0	51.9	2,380		
		402	73.0	64.0	56.1	2,685		
		445	77.0	68.5	59.3	2,831		
		490	84.0	73.0	63.0	3,108		
		542	89.5	79.0	67.8	3,933		
		600	99.0	85.0	73.4	4,284		10

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS
TABLE 5.1

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Furnaces

CONSTRUCTION SUMMARY:	CERTIFICATION PARAMETERS:
Furnaces installed within galvanized or stainless steel housing.	Building Code: CBC 2016 Component Importance Factor: $I_p = 1.5$ For $z/h = 1.0$: $S_{DS} = 1.55g$, $F_p/W_p = 2.12$ For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$
OPTIONS SUMMARY:	
MOUNTING SUMMARY:	NOTES:
Components installed within air handling unit connected to unit base and blankoffs.	S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Furnace	Beckett Furnace	HMB 200	21.5	101.5	21.0	83	Vertical Tube	3
		HMB 250	21.5	101.5	24.0	99		
		HMB 300	21.5	101.5	27.0	115		
		HMB 350	21.5	101.5	31.0	129		
		HMB 400	21.5	101.5	34.0	146		
		HMB 500	21.5	105.5	53.5	617		
		HMB 600	21.5	105.5	60.0	649		
		HMB 700	21.5	105.5	66.5	677		
		HMB 800	21.5	105.5	73.0	711		
		HMB 1050	21.5	105.5	98.8	945		
		HMB 1200	21.5	105.5	108.5	996		14
		HMB 160	37.5	101.5	18.0	83	Horizontal Tube	
		HMB 200	37.5	101.5	18.0	99		
		HMB 240	37.5	101.5	18.0	115		
		HMB 280	37.5	101.5	18.0	129		
		HMB 320	37.5	101.5	18.0	146		
		HMB 400	37.5	101.5	40.0	725		
		HMB 480	37.5	101.5	40.0	757		
		HMB 560	37.5	101.5	40.0	785		
		HMB 640	37.5	101.5	40.0	819		
HMB 840	37.5	101.5	59.5	989				
HMB 960	37.5	101.5	59.5	1040				
HMB 1280	37.5	101.5	79.0	1337		15		

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS

TABLE 6

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Miscellaneous Non-Active Components

CONSTRUCTION SUMMARY:	CERTIFICATION PARAMETERS:
OPTIONS SUMMARY:	Building Code: CBC 2016 Component Importance Factor: $I_p = 1.5$ For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$ For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$

MOUNTING SUMMARY:	NOTES:
Mounted within AHU	S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)		Description	UUT	
			Depth	Width	Height					
Sound Attenuator	Energy Labs, Inc.	Rectangular Silencers	36.0	6.0	26.0	65	Min.	Galvanized carbon steel or stainless steel; optional wrapped insulation; Individual module dim's listed		
			...							
			36.0	6.0	136.0	269				2
			...							
			84.0	17.8	136.0	526	Max.		3	
Filter Rack	Energy Labs, Inc.	Flat type 8 Vee type 8 Flat HEPA	3.0	12.0	12.0	6	Min.	Various filter efficiencies		
			...							
			3.0	36.0	72.0	30				2
			3.0	72.0	72.0	72				2
			3.0	48.0	96.0	103				1
			...							
			3.0	576.0	136.0	1728	Max.			
Humidifier Grid	Dri-Steem	Ultra-Sorb LV	4.0	15.0	21.0	48	Min.		2	
			...							
			4.0	135.0	125.0	315	Max.		3	

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS

 TABLE **7.1**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Controls

CONSTRUCTION SUMMARY:	CERTIFICATION PARAMETERS:
-----------------------	---------------------------

Sub-components mounted in Energy Labs, Inc. cabinets constructed of galvanized carbon steel or stainless steel OPTIONS SUMMARY: 206, 240, or 460 voltage	Building Code: CBC 2016 Component Importance Factor: $I_p = 1.5$ For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$ For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$
---	--

MOUNTING SUMMARY:	NOTES:
-------------------	--------

Cabinets flush or recess mounted on AHU walls	S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.
---	--

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
VFD	Yaskawa	E7 CIMR 0.5HP	6.3	5.5	11.0	7	Min.	
		...						
		E7 CIMR 1HP	6.3	5.5	11.0	7		2
		...						
	Square D	E7 CIMR 100HP	13.8	17.7	28.5	191	Max.	19
		Altivar 21 ATV 1.0HP	5.9	4.1	5.6	5	Min.	3
		...						
		Altivar 21 ATV 75HP	11.4	12.6	24.8	123		18
		Altivar 21 ATV 1.5HP	8.1	3.5	14.6	5		4
		...						
		Altivar 21 ATV 2HP	8.1	3.5	14.6	5	Max	1
		Danfoss	VLY FC-102 75HP	12.2	12.1	26.8	45	Min.
...								
VLY FC-102 350HP	16.4		33.1	62.6	650	Max	4	
Optional disconnect & bypass								

SPECIAL SEISMIC CERTIFICATION

CERTIFIED SUB-COMPONENTS

 TABLE **7.2**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
TABLE DESCRIPTION: Controls

CONSTRUCTION SUMMARY:	CERTIFICATION PARAMETERS:
-----------------------	---------------------------

Components installed within Energy Labs control cabinets (12Wx8Dx24H to 48Wx18Dx82H) constructed of galvanized or stainless steel.

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
For $z/h = 1.0$: $S_{DS} = 1.93g$, $F_p/W_p = 4.34$
For $z/h \leq 0.27$: $S_{DS} = 2.0g$, $F_p/W_p = 2.31$

OPTIONS SUMMARY:	NOTES:
------------------	--------

Subcomponents listed within this table are permitted to be installed within control cabinets. Transformers are encapsulated with copper windings.

NOTES:
 S_{DS} and z/h for each AHU shall be based on the lowest of the certified components or sub-components used.

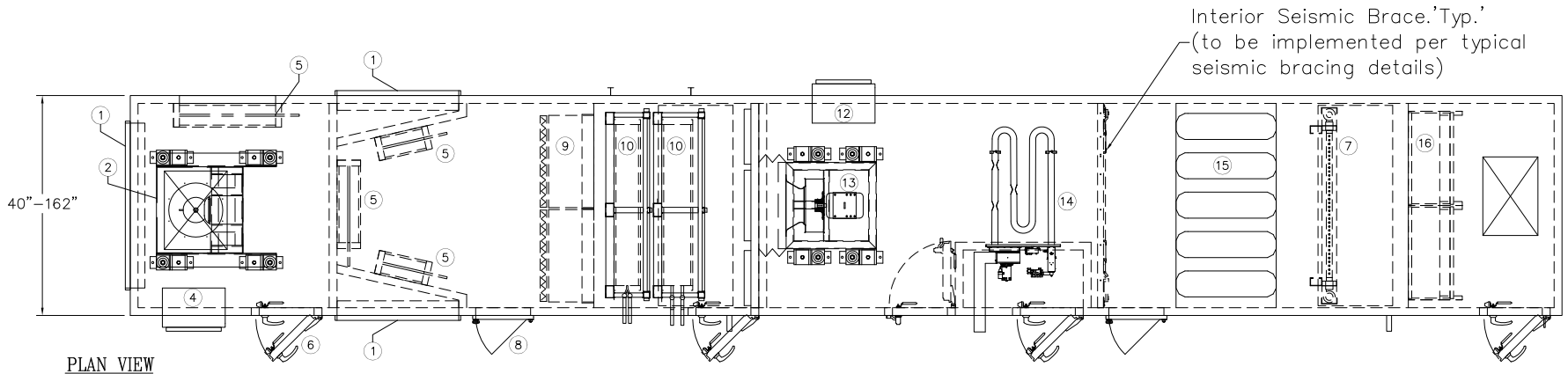
MOUNTING SUMMARY:	NOTES:
-------------------	--------

Control cabinets mounted either flush mount on unit walls or recess mounted within unit wall. Subcomponents listed below are connected to control cabinet.

Sub-Component	Manufacturer	Model	Description	Min.	Max.	UUT
Transformer	Schneider Electric	500VA		Min.		19
		...				
		3,000VA		Max.		19
	Cutler Hammer	24V 96VA		Min.		19
		...				
		24V 500VA		Max.		19
Disconnect Block	Schneider Electric	100A		Min.		19
		...				
		1000A		Max.		19
Motor Starter	Schneider Electric	2.5A		Min.		19
		...				
		220A		Max.		19
Circuit Breaker	Schneider Electric	2A		Min.		19
		...				
		8A		Max.		19
Position Switch	Schneider Electric	2-Position				19
		3-Position				19
Indicator Light	Sprecher & Schuh	DP7p, D7-N5W, D7-ALP				19
Relay	Sprecher & Schuh	24V		Min.		19
		...				
		120V		Max.		19
		24V		Min.		19
		...				
Fuses	Littlefuse	1A		Min.		19
		...				
		200A		Max.		19

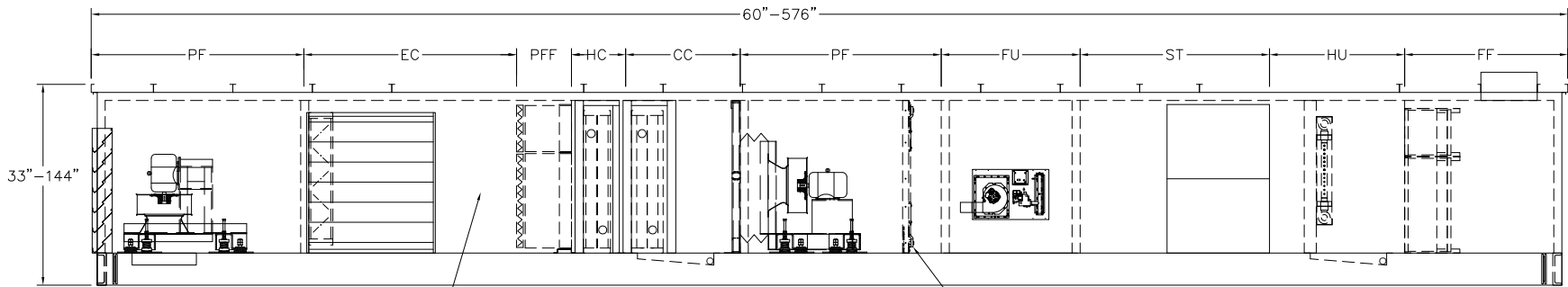
SINGLE TUNNEL UNIT

- | | |
|--------------------------------------|--------------------------------------|
| ① Louver (see Table 2) | ⑨ Pre & Final Filter (see Table 6) |
| ② Fan (see Table 4) | ⑩ Coils (see Table 3) |
| ④ Control Panel (see Table 7.2, 7.3) | ⑫ Control Panel (see Table 7.2, 7.3) |
| ⑤ Damper (see Table 2) | ⑬ Fan (see Table 4) |
| ⑥ Access Door (see Table 1) | ⑭ Gas furnace (see Table 5) |
| ⑦ Humidifier (see Table 6) | ⑮ Sound Traps (see Table 6) |
| ⑧ Access Door (see Table 1) | ⑯ Hepa Filters (see Table 6) |



Interior Seismic Brace.'Typ.'
(to be implemented per typical seismic bracing details)

PLAN VIEW



50% minimum of exterior wall surface to be solid wall or braced frame. Refer to typical seismic bracing detail for more information and general requirements.

Interior Seismic Brace.'Typ.'
(to be implemented per typical seismic bracing details)

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
7. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

SECTIONS:

- | | |
|---------------------------|-------------------------|
| AB = Air Blender | MB = Mixing Box |
| CC = Cooling Coil | MS = Moisture Separator |
| CU = Condensing Unit | MZ = Multizone |
| DE = Direct Evaporative | PF = Plenum Fan |
| DF = DWDI Fan | PFF = Pre/Final Filter |
| DX = DX Coil | PL = Plenum |
| EC = Economizer | PR = Pre-Filter |
| FF = Final Filter | SC = Steam Coil |
| FU = Furnace | ST = Sound Trap |
| HC = Heating Coil | VF = Vee Filter |
| IE = Indirect Evaporative | |

PROJECT ENGINEER: LE	07/08/10
DESIGN ENGINEER: JO	07/08/10
DESCRIPTION: Single Tunnel Unit	
DRAWING NAME:	
JOB NUMBER:	



9651 AIRWAY RD. SUITE E
SAN DIEGO, CA 92154
(619) 671-0100
OSP-0069-10

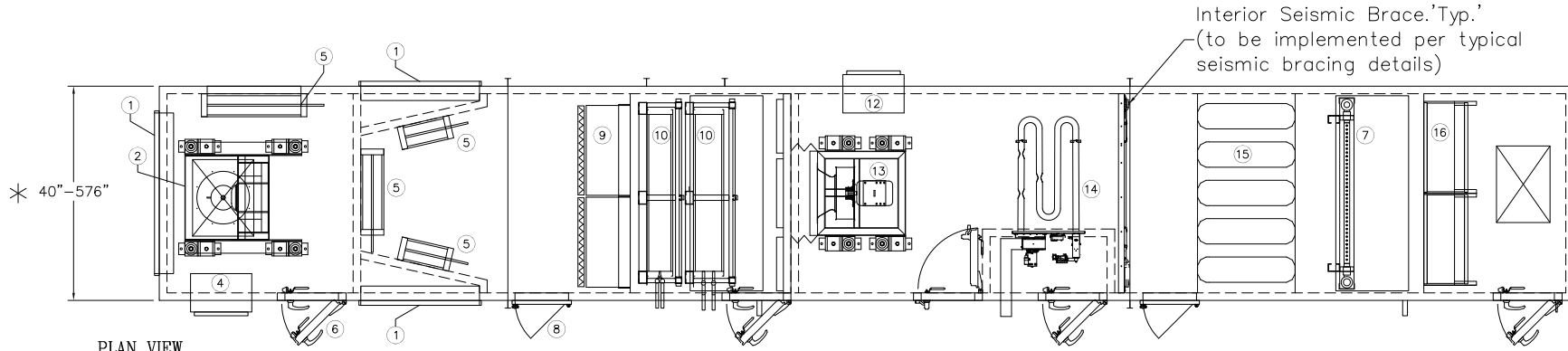
QTY:	
CFM:	
MODEL:	

JOB NAME:	<i>OSHPD-1 Single Tunnel Unit</i>
UNIT TAG:	Page 21 of 53

NO.	DATE	REVISION	DWN	APP
	03/06/2017			

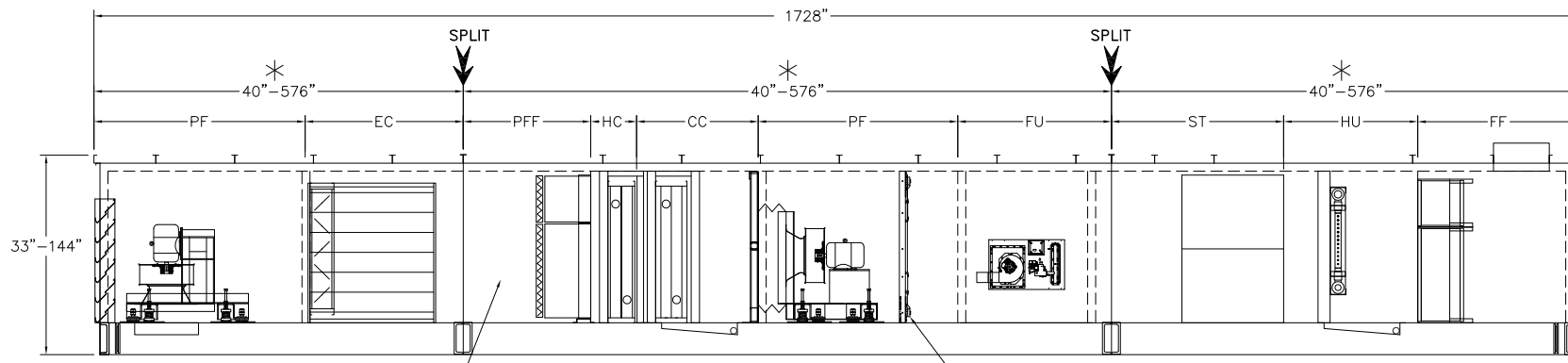
SINGLE TUNNEL UNIT WITH SPLITS

- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)



PLAN VIEW

Interior Seismic Brace.'Typ.'
(to be implemented per typical seismic bracing details)



50% minimum of exterior wall surface to be solid wall or braced frame. Refer to typical seismic bracing detail for more information and general requirements.

Interior Seismic Brace.'Typ.'
(to be implemented per typical seismic bracing details)

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

SIDE VIEW

- SECTIONS:**
- AB = Air Blender
 - CC = Cooling Coil
 - CU = Condensing Unit
 - DE = Direct Evaporative
 - DF = DWDI Fan
 - DX = DX Coil
 - EC = Economizer
 - FF = Final Filter
 - FU = Furnace
 - HC = Heating Coil
 - IE = Indirect Evaporative
 - MB = Mixing Box
 - MS = Moisture Separator
 - MZ = Multizone
 - PF = Plenum Fan
 - PFF = Pre/Final Filter
 - PL = Plenum
 - PR = Pre-Filter
 - SC = Steam Coil
 - ST = Sound Trap
 - VF = Vee Filter

*** SHIPPING RESTRICTIONS**

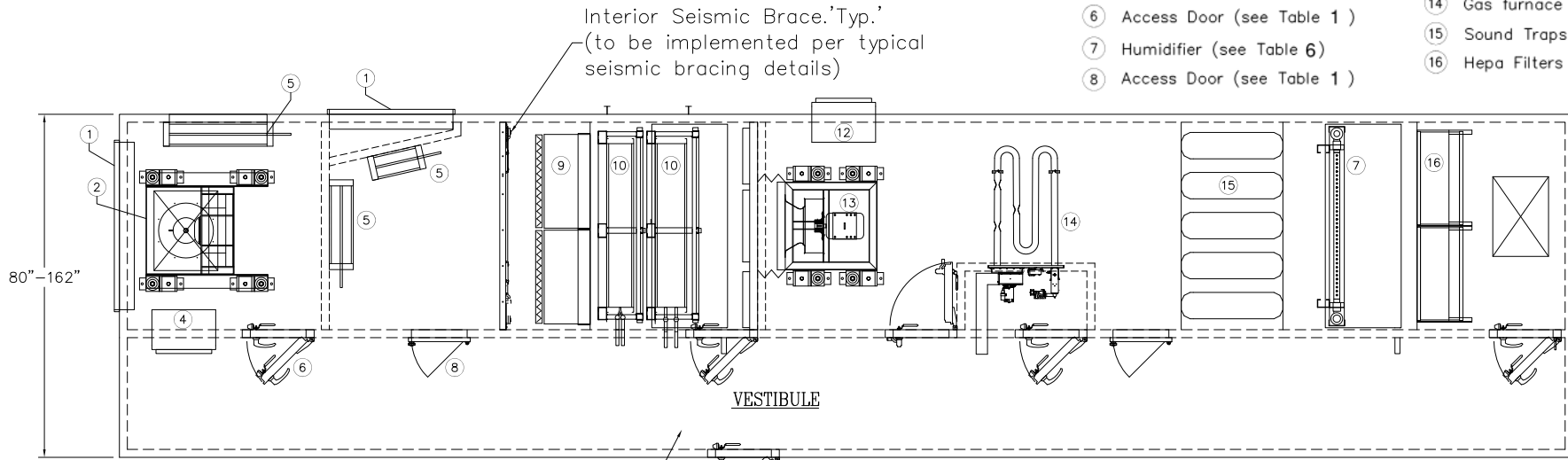
CABINET DIMENSIONS			
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162

<p>PROJECT ENGINEER: LE 07/08/10 DESIGN ENGINEER: JO 07/08/10 DESCRIPTION: Single tunnel unit with splits DRAWING NAME: JOB NUMBER:</p>	<p>9651 AIRWAY RD. SUITE E SAN DIEGO, CA 92154 (619) 671-0100 OSP-0069-10</p>	<p>QTY: CFM: MODEL:</p>	<p>JOB NAME: OSHPD-2 Single Tunnel Unit With Splits UNIT TAG: Page 22 of 53</p>
<p>NO. DATE 03/06/2017 REVISION DWN APP</p>			



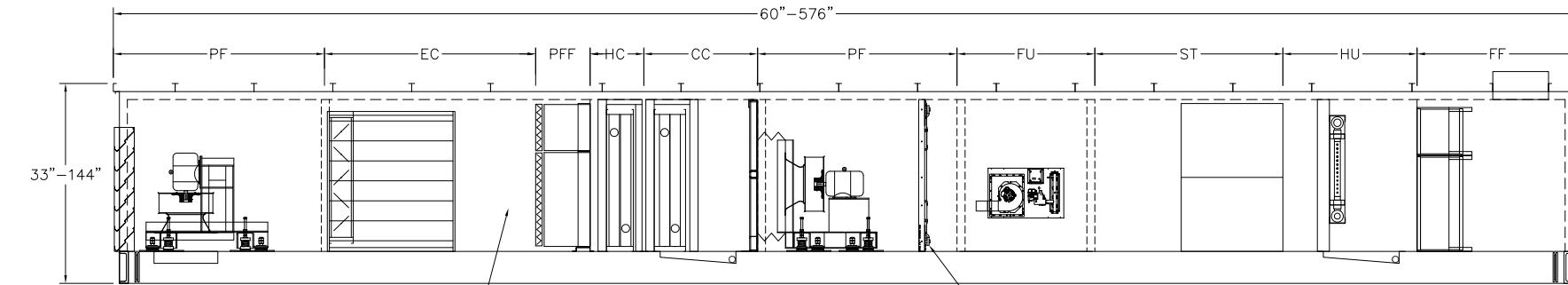
SINGLE TUNNEL UNIT WITH VESTIBULE

- | | |
|--------------------------------------|--------------------------------------|
| ① Louver (see Table 2) | ⑨ Pre & Final Filter (see Table 6) |
| ② Fan (see Table 4) | ⑩ Coils (see Table 3) |
| ④ Control Panel (see Table 7.2, 7.3) | ⑫ Control Panel (see Table 7.2, 7.3) |
| ⑤ Damper (see Table 2) | ⑬ Fan (see Table 4) |
| ⑥ Access Door (see Table 1) | ⑭ Gas furnace (see Table 5) |
| ⑦ Humidifier (see Table 6) | ⑮ Sound Traps (see Table 6) |
| ⑧ Access Door (see Table 1) | ⑯ Hepa Filters (see Table 6) |



PLAN VIEW

No seismic bracing required in vestibule region. 'Typ.'



SIDE VIEW

50% minimum of exterior wall surface to be solid wall or braced frame. Refer to typical seismic bracing detail for more information and general requirements.

Interior Seismic Brace. 'Typ.'
(to be implemented per typical seismic bracing details)

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
7. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

SECTIONS:

- | | |
|---------------------------|-------------------------|
| AB = Air Blender | MB = Mixing Box |
| CC = Cooling Coil | MS = Moisture Separator |
| CU = Condensing Unit | MZ = Multizone |
| DE = Direct Evaporative | PF = Plenum Fan |
| DF = DWDI Fan | PFF = Pre/Final Filter |
| DX = DX Coil | PL = Plenum |
| EC = Economizer | PR = Pre-Filter |
| FF = Final Filter | SC = Steam Coil |
| FU = Furnace | ST = Sound Trap |
| HC = Heating Coil | VF = Vee Filter |
| IE = Indirect Evaporative | |

PROJECT ENGINEER: LE	07/08/10
DESIGN ENGINEER: JO	07/08/10
DESCRIPTION: Single tunnel unit with vestibule	
DRAWING NAME:	
JOB NUMBER:	



9651 AIRWAY RD. SUITE E
SAN DIEGO, CA 92154
(619) 671-0100
OSP-0069-10

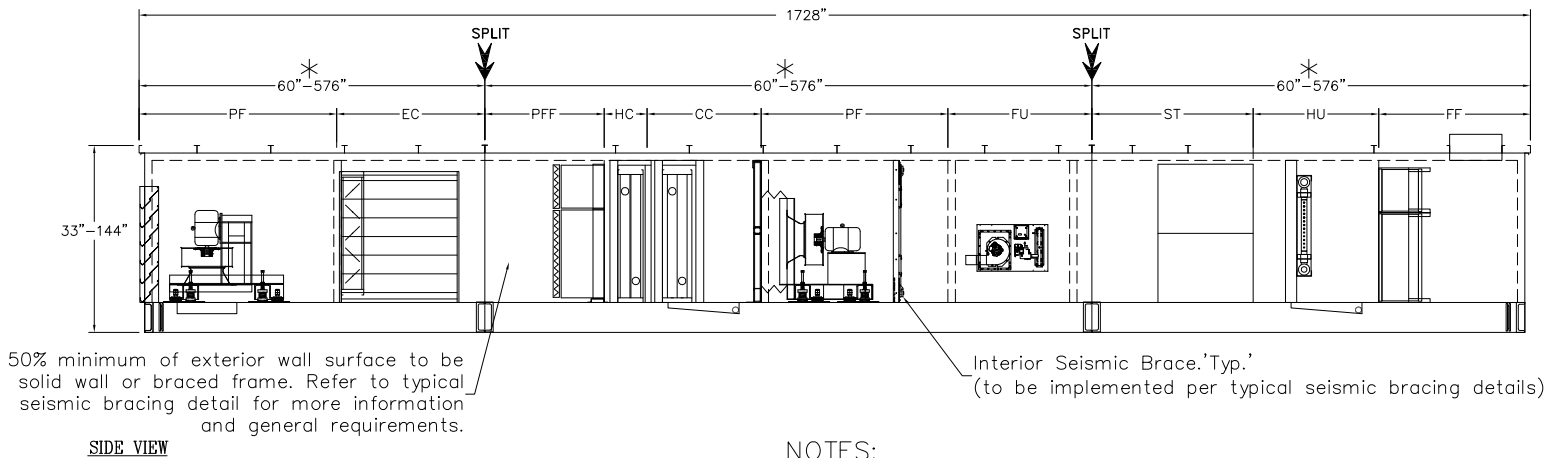
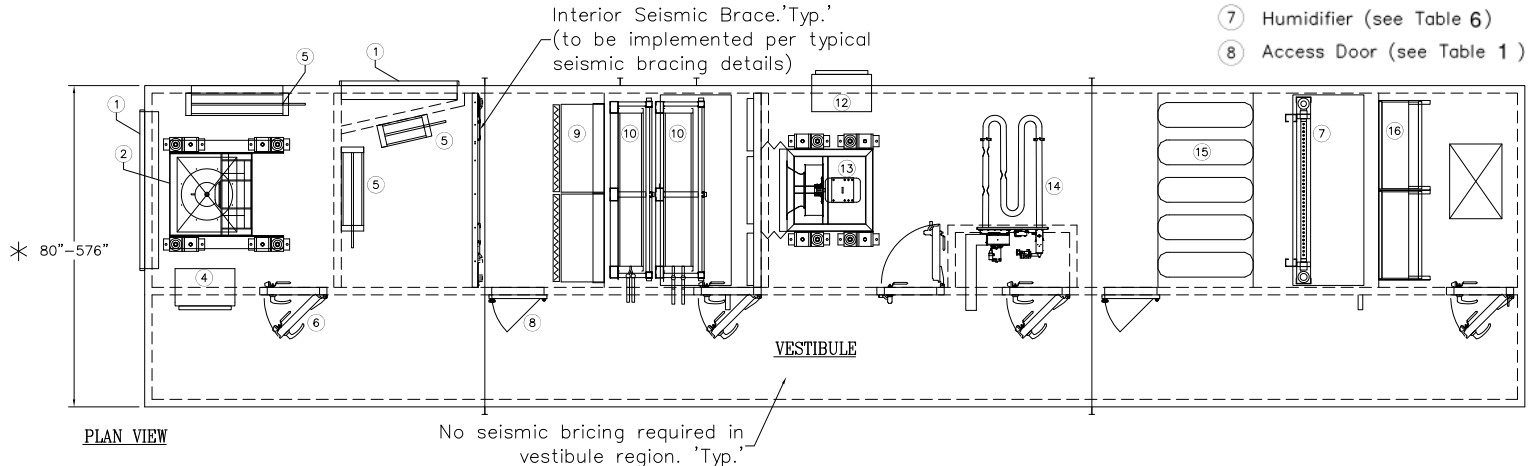
QTY:	JOB NAME:
CFM:	
MODEL:	UNIT TAG:

OSHPD - 3
<i>Single Tunnel Unit With Vestibule</i>
Page 23 of 53

NO.	DATE	REVISION	DWN	APP
	03/06/2017			

SINGLE TUNNEL UNIT WITH VESTIBULE AND SPLITS

- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)



NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

SECTIONS:

- AB = Air Blender
- CC = Cooling Coil
- CU = Condensing Unit
- DE = Direct Evaporative
- DF = DWDI Fan
- DX = DX Coil
- EC = Economizer
- FF = Final Filter
- FU = Furnace
- HC = Heating Coil
- IE = Indirect Evaporative
- MB = Mixing Box
- MS = Moisture Separator
- MZ = Multizone
- PF = Plenum Fan
- PFF = Pre/Final Filter
- PL = Plenum
- PR = Pre-Filter
- SC = Steam Coil
- ST = Sound Trap
- VF = Vee Filter

* SHIPPING RESTRICTIONS

	CABINET DIMENSIONS		
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162

PROJECT ENGINEER: LE	07/08/10
DESIGN ENGINEER: JO	07/08/10
DESCRIPTION: Single tunnel unit with vest and splits	
DRAWING NAME:	
JOB NUMBER:	



9651 AIRWAY RD. SUITE E
SAN DIEGO, CA 92154
(619) 671-0100
OSP-0069-10

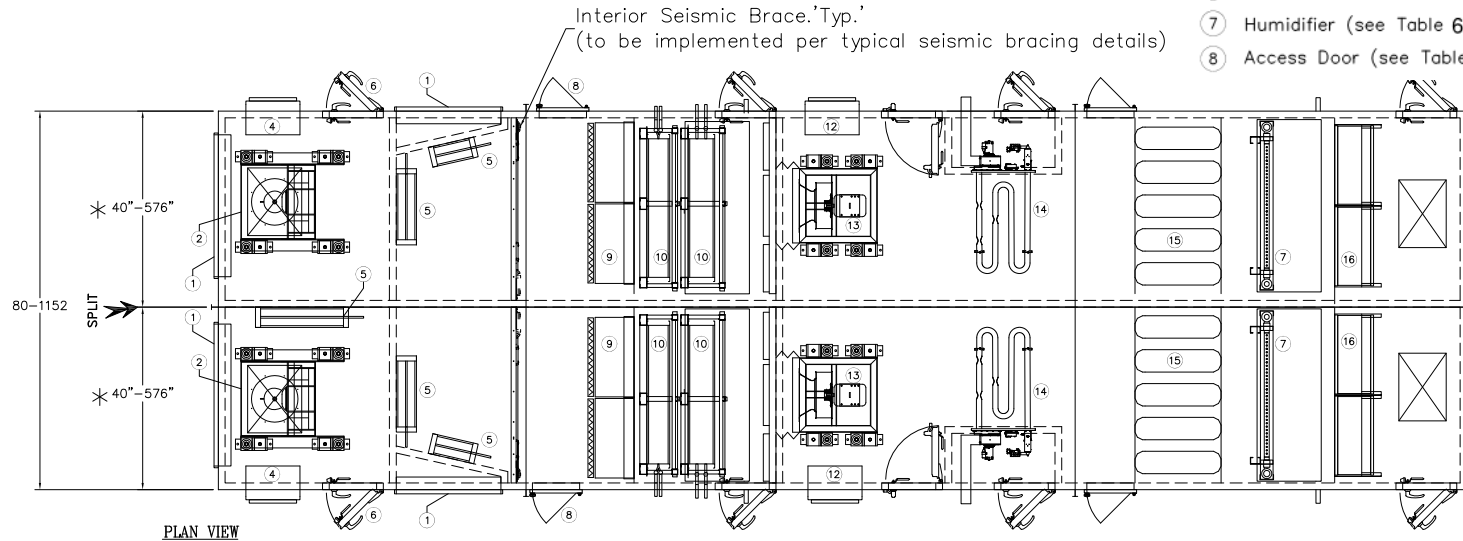
QTY:	
CFM:	
MODEL:	

JOB NAME:	OSHPD -4
	Single Tunnel Unit With Vest. and splits
UNIT TAG:	Page 24 of 53

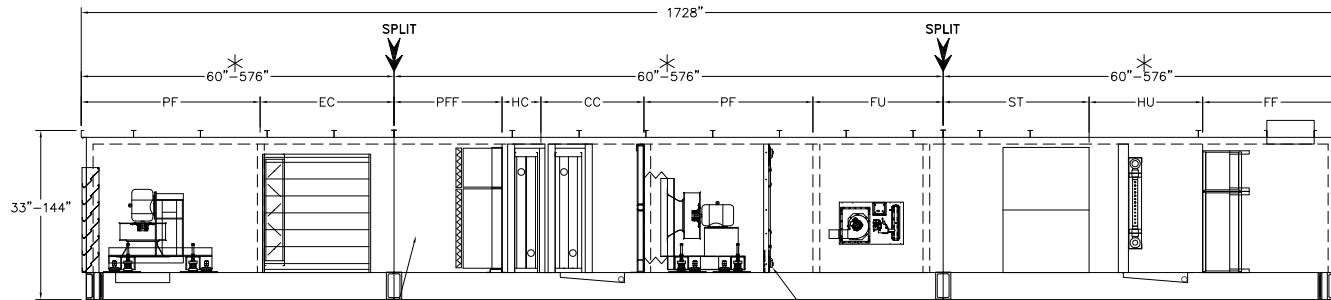
NO.	DATE	REVISION	DWN	APP
	03/06/2017			

DOUBLE TUNNEL UNIT WITH SPLITS

- | | |
|--|---|
| <ul style="list-style-type: none"> ① Louver (see Table 2) ② Fan (see Table 4) ④ Control Panel (see Table 7.2, 7.3) ⑤ Damper (see Table 2) ⑥ Access Door (see Table 1) ⑦ Humidifier (see Table 6) ⑧ Access Door (see Table 1) | <ul style="list-style-type: none"> ⑨ Pre & Final Filter (see Table 6) ⑩ Coils (see Table 3) ⑫ Control Panel (see Table 7.2, 7.3) ⑬ Fan (see Table 4) ⑭ Gas furnace (see Table 5) ⑮ Sound Traps (see Table 6) ⑯ Hepa Filters (see Table 6) |
|--|---|



PLAN VIEW



SIDE VIEW

50% minimum of exterior wall surface to be solid wall or braced frame. Refer to typical seismic bracing detail for more information and general requirements.

Interior Seismic Brace.'Typ.' (to be implemented per typical seismic bracing details)

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

SECTIONS:

- | | |
|---|--|
| <ul style="list-style-type: none"> AB = Air Blender CC = Cooling Coil CU = Condensing Unit DE = Direct Evaporative DF = DWDI Fan DX = DX Coil EC = Economizer FF = Final Filter FU = Furnace HC = Heating Coil IE = Indirect Evaporative | <ul style="list-style-type: none"> MB = Mixing Box MS = Moisture Separator MZ = Multizone PF = Plenum Fan PFF = Pre/Final Filter PL = Plenum PR = Pre-Filter SC = Steam Coil ST = Sound Trap VF = Vee Filter |
|---|--|

* SHIPPING RESTRICTIONS

	CABINET DIMENSIONS		
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162

PROJECT ENGINEER: LE	07/08/10
DESIGN ENGINEER: JO	07/08/10
DESCRIPTION: Double tunnel unit with splits	
DRAWING NAME:	
JOB NUMBER:	

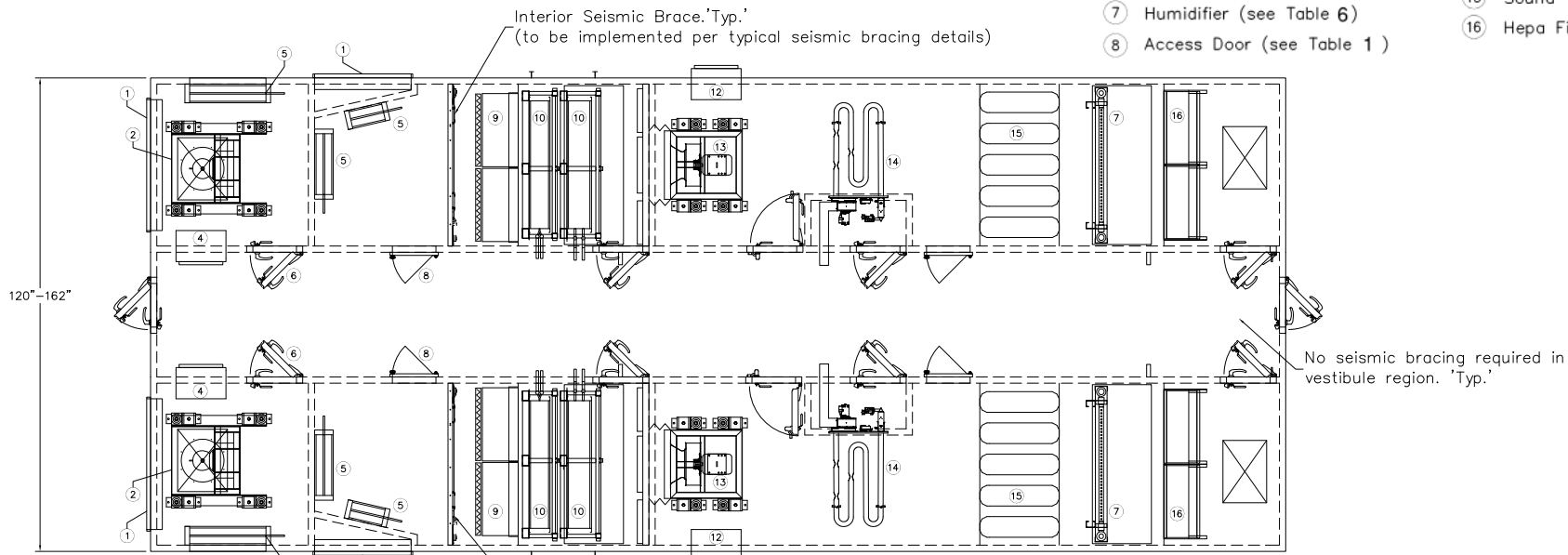


9651 AIRWAY RD. SUITE E
SAN DIEGO, CA 92154
(619) 671-0100
OSP-0069-10

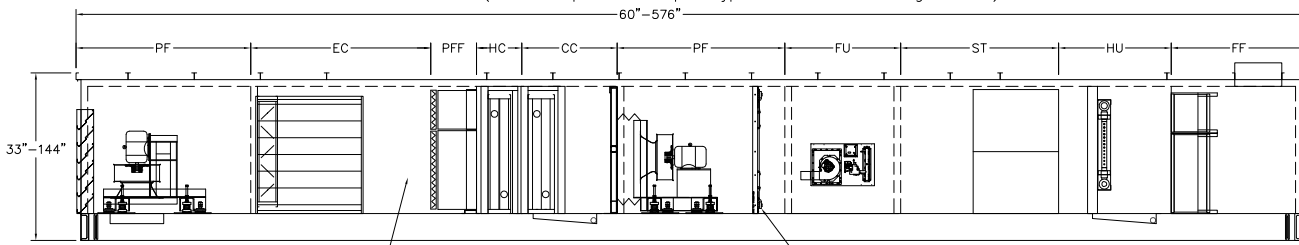
QTY:	JOB NAME:
CFM:	<i>OSHPD-5</i>
MODEL:	<i>Double Tunnel Unit With Splits</i>
	UNIT TAG: <i>Page 25 of 53</i>

DOUBLE TUNNEL UNIT WITH VESTIBULE IN THE MIDDLE

- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)



PLAN VIEW



SIDE VIEW

50% minimum of exterior wall surface to be solid wall or braced frame. Refer to typical seismic bracing detail for more information and general requirements.

NOTES:

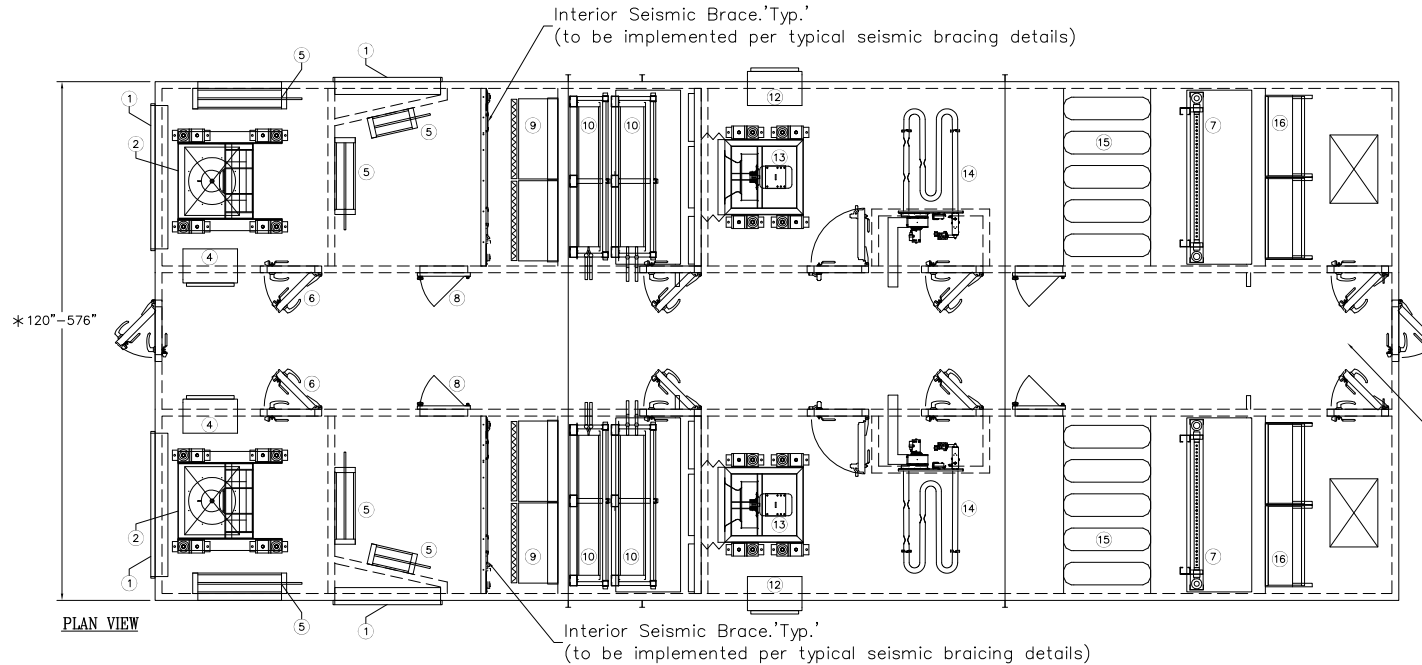
1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
7. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

- SECTIONS:**
- AB = Air Blender
 - CC = Cooling Coil
 - CU = Condensing Unit
 - DE = Direct Evaporative
 - DF = DWDI Fan
 - DX = DX Coil
 - EC = Economizer
 - FF = Final Filter
 - FU = Furnace
 - HC = Heating Coil
 - IE = Indirect Evaporative
 - MB = Mixing Box
 - MS = Moisture Separator
 - MZ = Multizone
 - PF = Plenum Fan
 - PFF = Pre/Final Filter
 - PL = Plenum
 - PR = Pre-Filter
 - SC = Steam Coil
 - ST = Sound Trap
 - VF = Vee Filter

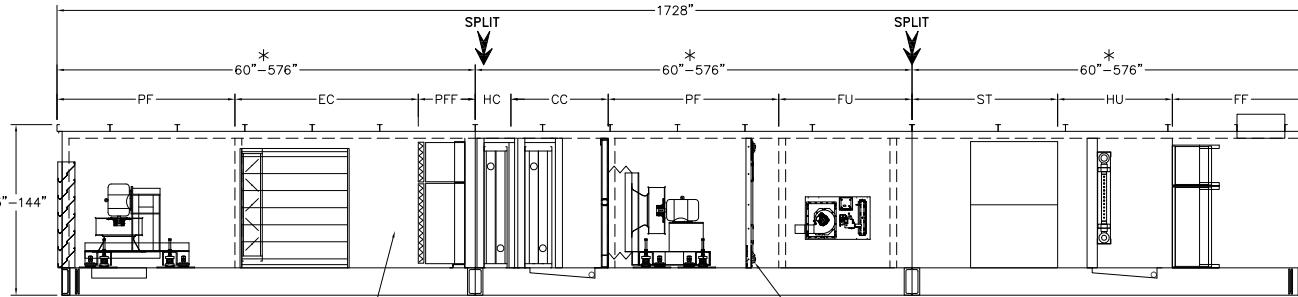
<p>PROJECT ENGINEER: LE 07/08/10 DESIGN ENGINEER: JO 07/08/10 DESCRIPTION: Single tunnel unit with vest. in the middle DRAWING NAME: JOB NUMBER:</p>	<p>QTY: CFM: MODEL:</p>	<p>JOB NAME: <i>OSHPD-6</i> <i>Double Tunnel Unit With Vest. in the Middle</i> UNIT TAG: Page 26 of 53</p>	<p>9651 AIRWAY RD. SUITE E SAN DIEGO, CA 92154 (619) 671-0100 OSP-0069-10</p>
<p>NO. DATE REVISION DWN APP</p>	<p>03/06/2017</p>		

DOUBLE TUNNEL UNIT WITH VESTIBULE IN THE MIDDLE

- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)



No seismic bracing required in vestibule region. 'Typ.'



50% minimum of exterior wall surface to be solid wall or braced frame. Refer to typical seismic bracing detail for more information and general requirements.

Interior Seismic Brace.'Typ.'
(to be implemented per typical seismic bracing details)

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

SECTIONS:

- AB = Air Blender
- CC = Cooling Coil
- CU = Condensing Unit
- DE = Direct Evaporative
- DF = DWDI Fan
- DX = DX Coil
- EC = Economizer
- FF = Final Filter
- FU = Furnace
- HC = Heating Coil
- IE = Indirect Evaporative
- MB = Mixing Box
- MS = Moisture Separator
- MZ = Multizone
- PF = Plenum Fan
- PFF = Pre/Final Filter
- PL = Plenum
- PR = Pre-Filter
- SC = Steam Coil
- ST = Sound Trap
- VF = Vee Filter

* SHIPPING RESTRICTIONS

	CABINET DIMENSIONS		
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162

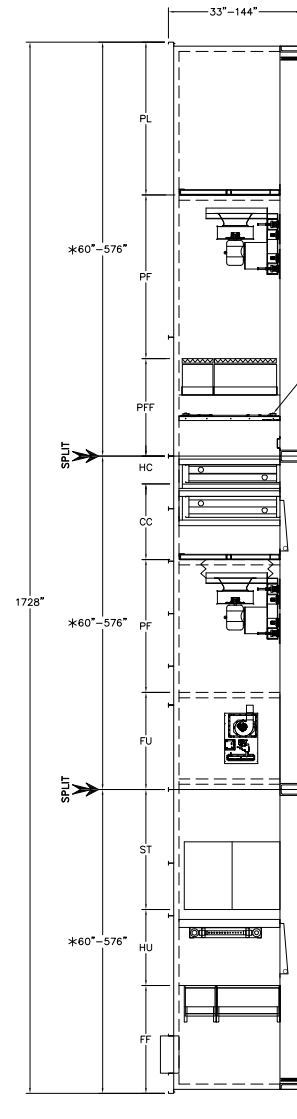
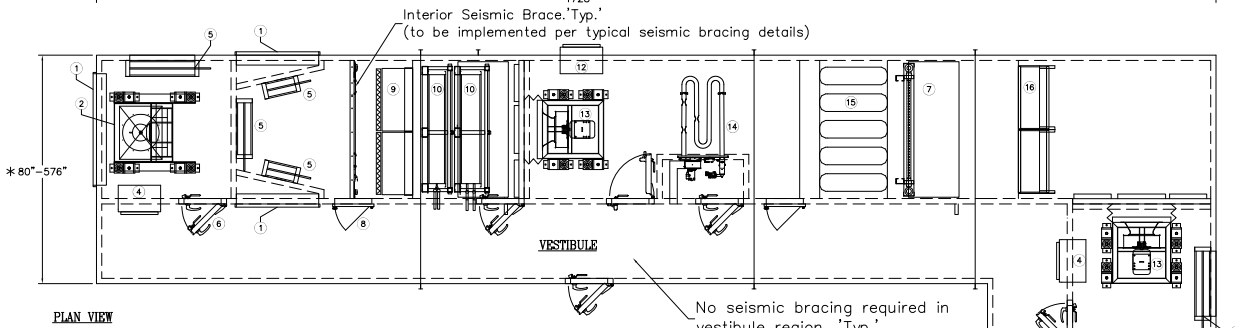
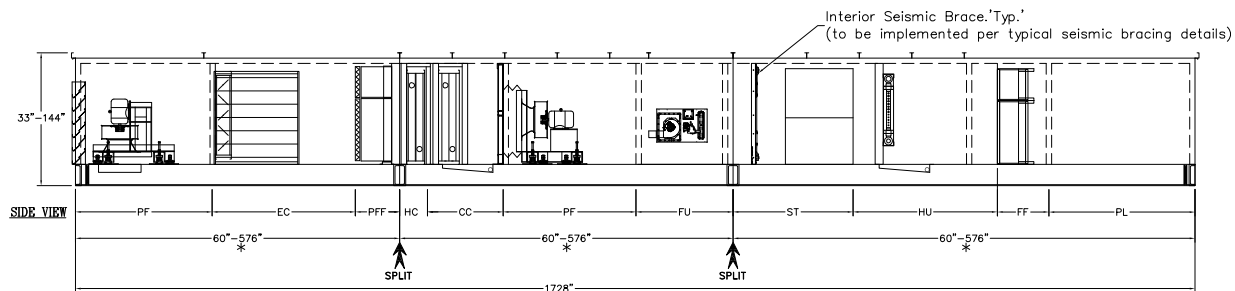
PROJECT ENGINEER: LE 07/08/10
 DESIGN ENGINEER: JO 07/08/10
 DESCRIPTION: Single tunnel unit with vest in the middle and split
 DRAWING NAME:
 JOB NUMBER:



9651 AIRWAY RD. SUITE E
 SAN DIEGO, CA 92154
 (619) 671-0100
 OSP-0069-10

QTY:
 CFM:
 MODEL:

JOB NAME:
 OSHPD-7
 Double Tunnel Unit With Vest. in the Middle and Split
 UNIT TAG:
 Page 27 of 53



- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)

L SHAPE UNIT WITH VESTIBULE AND SPLITS

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

*** SHIPPING RESTRICTIONS**

CABINET DIMENSIONS			
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162

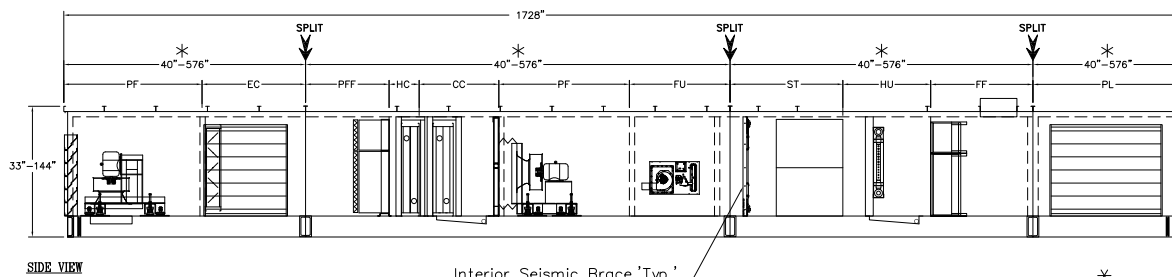
PROJECT ENGINEER: LE 07/08/10
 DESIGN ENGINEER: JO 07/08/10
 DESCRIPTION: L Shape unit with vestibule and splits
 DRAWING NAME:
 JOB NUMBER:



9651 AIRWAY RD. SUITE E
 SAN DIEGO, CA 92154
 (619) 671-0100
 OSP-0069-10

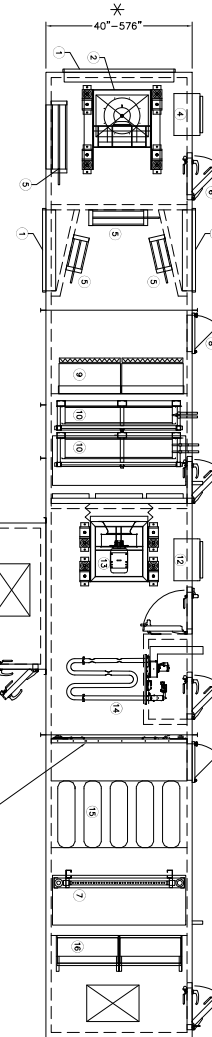
QTY:
 CFM:
 MODEL:

JOB NAME:
OSHPD-8
L Shape With Vestibule and Splits
 UNIT TAG:
 Page 28 of 53



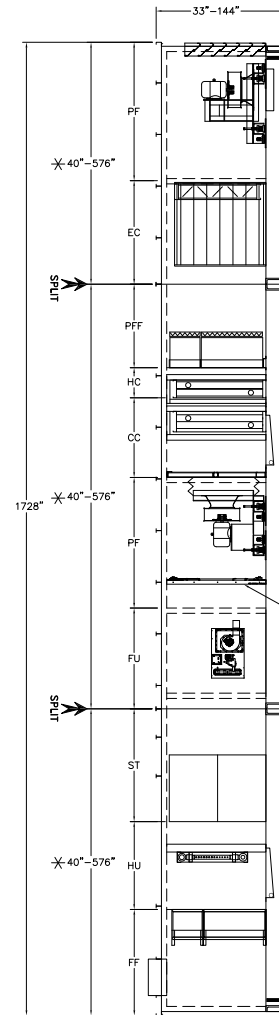
Interior Seismic Brace 'Typ.'
(to be implemented per typical
seismic bracing details)

T SHAPE UNIT WITH SPLITS



Interior Seismic Brace 'Typ.'
(to be implemented per typical
seismic bracing details)

Interior Seismic Brace 'Typ.'
(to be implemented per typical
seismic bracing details)



Interior Seismic Brace 'Typ.'
(to be implemented per typical
seismic bracing details)

- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)

- SECTIONS:**
- AB = Air Blender
 - CC = Cooling Coil
 - CU = Condensing Unit
 - DE = Direct Evaporative
 - DF = DWDI Fan
 - DX = DX Coil
 - EC = Economizer
 - FF = Final Filter
 - FU = Furnace
 - HC = Heating Coil
 - IE = Indirect Evaporative
 - MB = Mixing Box
 - MS = Moisture Separator
 - MZ = Multizone
 - PF = Plenum Fan
 - PFF = Pre/Final Filter
 - PL = Plenum
 - PR = Pre-Filter
 - SC = Steam Coil
 - ST = Sound Trap
 - VF = Vee Filter

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

*** SHIPPING RESTRICTIONS**

	CABINET DIMENSIONS		
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162

PROJECT ENGINEER: LE	07/08/10
DESIGN ENGINEER: JO	07/08/10
DESCRIPTION: T Shape unit with splits	
DRAWING NAME:	
JOB NUMBER:	

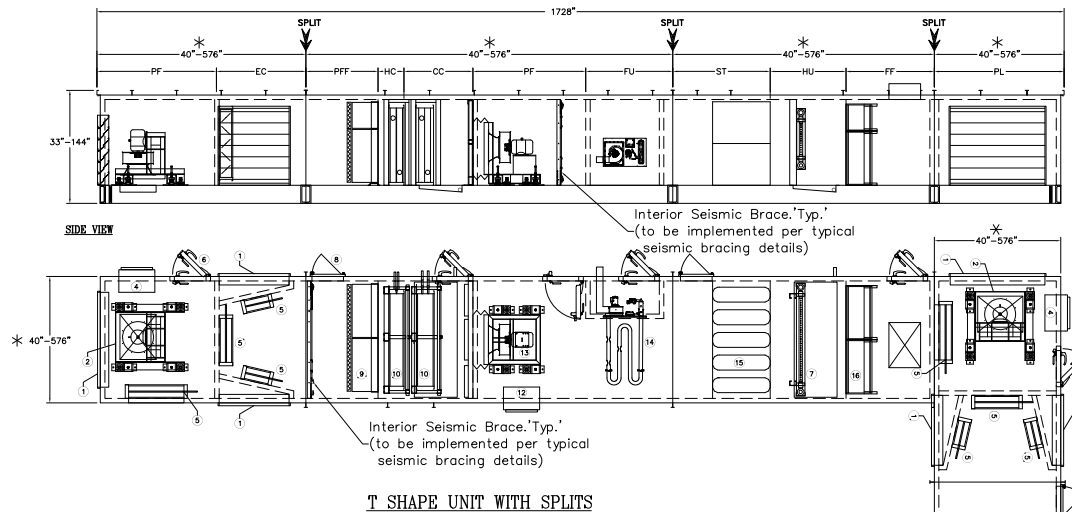
NO.	DATE	REVISION	DWN	APP
	03/06/2017			



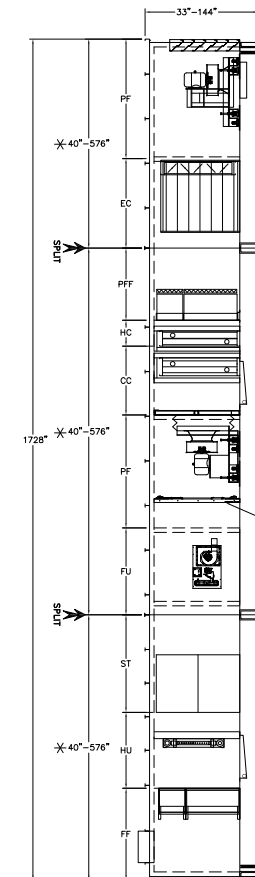
9651 AIRWAY RD. SUITE E
SAN DIEGO, CA 92154
(619) 671-0100
OSP-0069-10

QTY:	
CFM:	
MODEL:	

JOB NAME:	OSHPD-9 T Shape with splits
UNIT TAG:	Page 29 of 53



T SHAPE UNIT WITH SPLITS



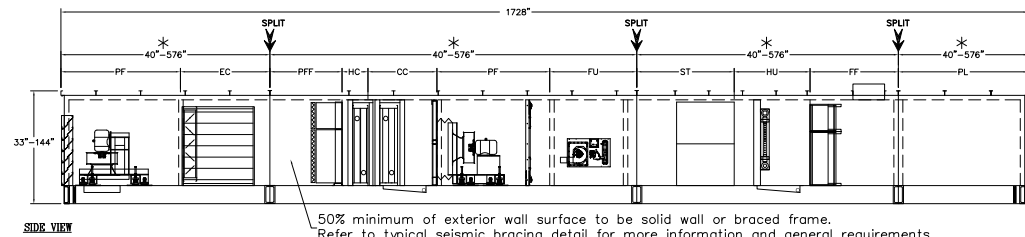
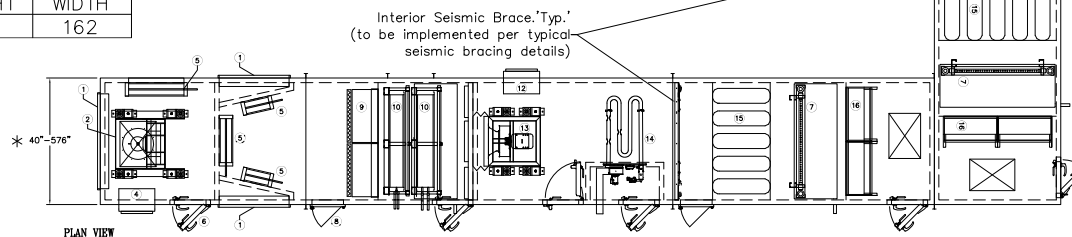
- ① Louver (see Table 2)
- ② Fan (see Table 4)
- ④ Control Panel (see Table 7.2, 7.3)
- ⑤ Damper (see Table 2)
- ⑥ Access Door (see Table 1)
- ⑦ Humidifier (see Table 6)
- ⑧ Access Door (see Table 1)
- ⑨ Pre & Final Filter (see Table 6)
- ⑩ Coils (see Table 3)
- ⑫ Control Panel (see Table 7.2, 7.3)
- ⑬ Fan (see Table 4)
- ⑭ Gas furnace (see Table 5)
- ⑮ Sound Traps (see Table 6)
- ⑯ Hepa Filters (see Table 6)

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Stacked coils can be provided with or without coil rack using seismic details.
4. All dimensions are in inches unless otherwise specified.
5. Control panel could be in various locations on the unit.
6. Unit base heights 4" to 12"
- *7. Split section dimensions will be defined by shipping restrictions.
8. Internal seismic braces to be implemented per the restrictions outlined on sheets "OSHPD Energy Labs Bracing" and "OSHPD Seismic Bracing Requirements".

* SHIPPING RESTRICTIONS

CABINET DIMENSIONS			
	LENGTH	HEIGHT	WIDTH
Max.	576	168	162



- SECTIONS:
- AB = Air Blender
 - CC = Cooling Coil
 - CU = Condensing Unit
 - DE = Direct Evaporative
 - DF = DWDI Fan
 - DX = DX Coil
 - EC = Economizer
 - FF = Final Filter
 - FU = Furnace
 - HC = Heating Coil
 - IE = Indirect Evaporative
 - MB = Mixing Box
 - MS = Moisture Separator
 - MZ = Multizone
 - PF = Plenum Fan
 - PFF = Pre/Final Filter
 - PL = Plenum
 - PR = Pre-Filter
 - SC = Steam Coil
 - ST = Sound Trap
 - VF = Vee Filter

NO.	DATE	REVISION	DWN	APP
	03/06/2017			

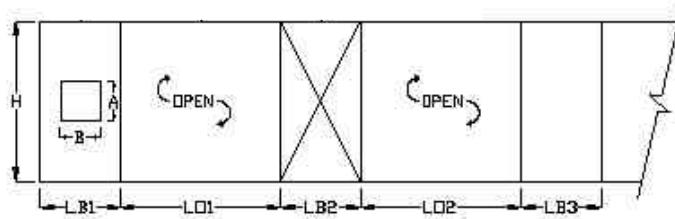
PROJECT ENGINEER: LE	07/08/10
DESIGN ENGINEER: JO	07/08/10
DESCRIPTION: U Shape unit with splits	
DRAWING NAME:	
JOB NUMBER:	

Energy Labs Inc
 9651 AIRWAY RD. SUITE E
 SAN DIEGO, CA 92154
 (619) 671-0100
 OSP-0069-10

QTY:	
CFM:	
MODEL:	

JOB NAME:	OSHPD-10 U Shape With Splits
UNIT TAG:	Page 30 of 53

LONGITUDINAL WALL BRACING SUMMARY:



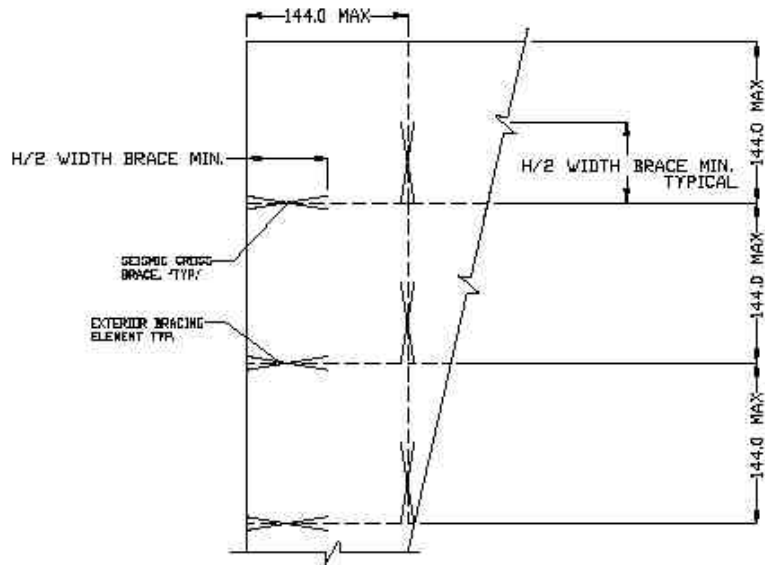
ELEVATION VIEW

①

SATISFACTORY BRACING REQUIREMENT:

$LB \geq H/2$, IN ORDER TO BE CONSIDERED BRACED WALL LENGTH
 $LB1 + LB2 + \dots + LBN \geq LO1 + LO2 + \dots + LON$
 $A, B \leq \text{MIN}(H/3, LB/3)$

INTERIOR SEISMIC BRACING REQUIREMENTS



PLAN VIEW

②

PROJECT ENGINEER: LE	07/26/10
DESIGN ENGINEER: JO	07/26/10
DESCRIPTION:	
DRAWING NAME:	
JOB NUMBER:	

NO.	DATE	REVISION	DWN	APP
	03/06/2017			



9651 AIRWAY RD. SUITE E
 SAN DIEGO, CA 92154
 (619) 671-0100

QTY:	
CFM:	
MODEL:	

JOB NAME:	<i>OSHPD</i>
	<i>Energy Labs Bracing</i>
UNIT TAG:	

7/20/10 – Energy Labs: Requirements and Restrictions of Seismic Bracing

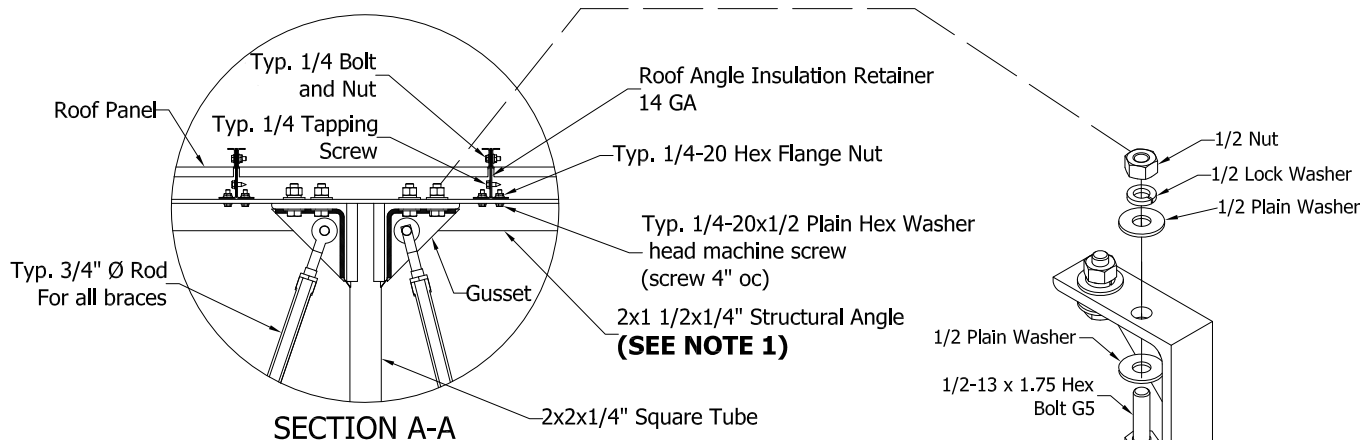
A. Interior Bracing Requirements

1. Standard construction implementing the OSHPD unit specific construction method upgrades are qualified for a maximum spacing between parallel bracing elements of 12'-0". Both directions along a unit must be considered in the below bracing requirements.
2. If parallel bracing elements are spaced at a distance less than 12'-0", an intermediate bracing element is not required for this cell of the enclosure.
3. If parallel bracing panel elements are spaced at a distance more than 12'-0", an intermediate bracing element is required for this cell of the enclosure.
4. This intermediate bracing element can be implemented parallel to these existing bracing units spaced at greater than 12'-0" wherever it is desired as long as it is insured that the new maximum distance between parallel bracing units has been reduced to less than 12'-0".
5. A bracing element can be a wall or braced tension frame as outlined below.
6. If a wall is utilized as a bracing element, the following conditions must be met:
 - a. Wall must be of typical panel construction, as detailed in the OSHPD approved drawing set.
 - b. Height to width ratio of the wall must not exceed 2.0.
7. Small openings may be permitted, providing this opening has a maximum dimension of the lesser of one third of the height of the total bracing element and one third the width of the bracing element.
8. If a braced tension frame is utilized as a bracing element, the following conditions must be met:
 - a. Braced tension frames must be detailed per OSHPD approved drawing set.
 - b. Height to with ratio of the wall must not exceed 2.0.
9. Seismically upgraded coil racks qualify as a bracing element.
10. Seismically upgraded fan pressure walls qualify as a bracing element. Note that frame upgrade is necessary only when pressure wall is being used as a bracing element.
11. Total height of enclosure may not exceed 12'-0".

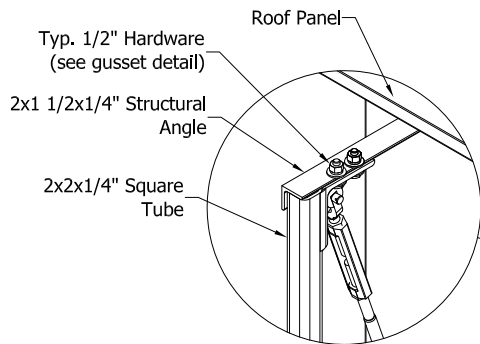
B. Interior Bracing Requirements

1. Exterior openings are defined to be at an exterior wall of the enclosure, created by the presence or louvers, vents, etc.
2. Exterior sections defined to be bracing elements must meet the conditions set forth in items 6 and 7 of Interior bracing requirements as set forth above.
3. Total length of bracing elements must be greater than or equal to length of exterior openings.
4. Total height of enclosure may not exceed 12'-0".

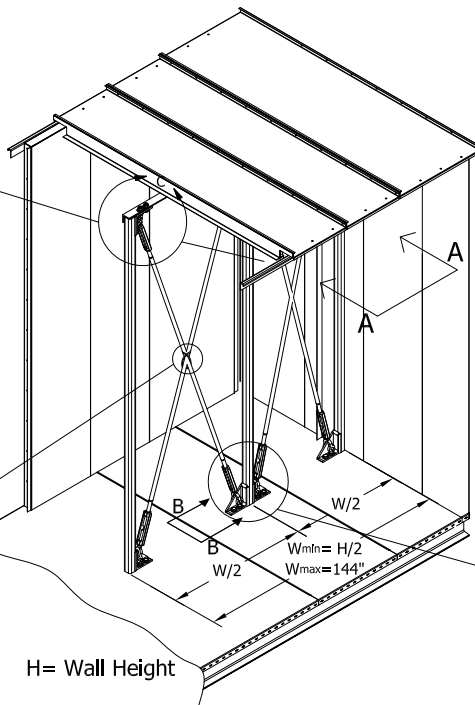
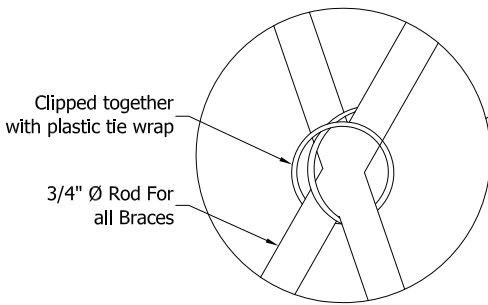
		PROJECT ENGINEER: LE		07/26/10	 9651 AIRWAY RD. SUITE E SAN DIEGO, CA 92154 (619) 671-0100	QTY:	JOB NAME: <i>OSHPD</i> <i>Seismic Bracing Requirimets</i>
		DESIGN ENGINEER: JO		07/26/10		CFM:	
		DESCRIPTION:				MODEL:	
		DRAWING NAME:				UNIT TAG:	
NO.	DATE	REVISION	DWN	APP			



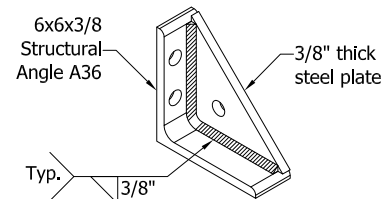
SECTION A-A



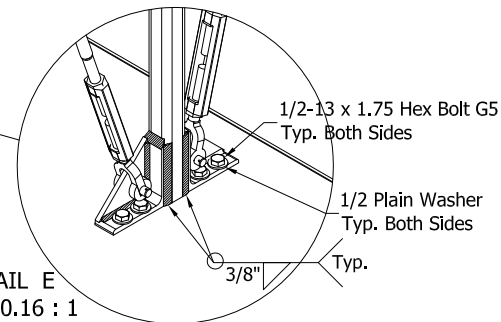
DETAIL C
SCALE 0.16 : 1



H = Wall Height



GUSSET
(Typ. top and bottom)



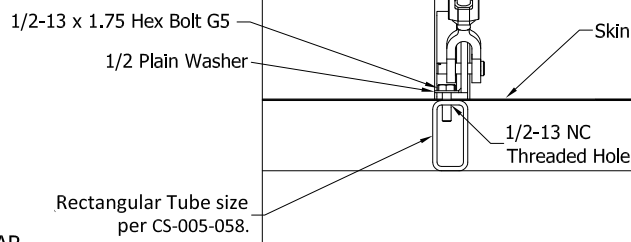
DETAIL E
SCALE 0.16 : 1

RESTRICTIONS:

- 1.- ROOF PANELS ARE TO BE A MAXIMUM OF 36" WIDE FOR OSHPD UNITS.
- 2.- INSULATION LINER RETENTION ANGLES MUST BE CONNECTED AT THE POINT OF INTERSECTION OF THE STRUCTURAL ANGLE.

NOTES:

- 1.- EXTEND STRUCTURAL ANGLE ON EITHER SIDE AS REQUIRED TO CONNECT TO A TOTAL OF 4 ROOF ANGLE INSULATION RETAINER MINIMUM.
- 1.- USE METHOD SHOWING IN THIS STANDARD TO INSTALL PERPENDICULAR CROSS BRACING IN TO THE INTERNAL UNIT.
- 2.- FOR MORE INFORMATION AND GENERAL REQUIREMENTS, SEE STANDARD CS-081-004 AND CS-081-005.
- 3.- PAINT CROSS BRACING BEFORE TO INSTALL. USE THE STANDARD ELI UNITS COLOR.



SECTION B-B



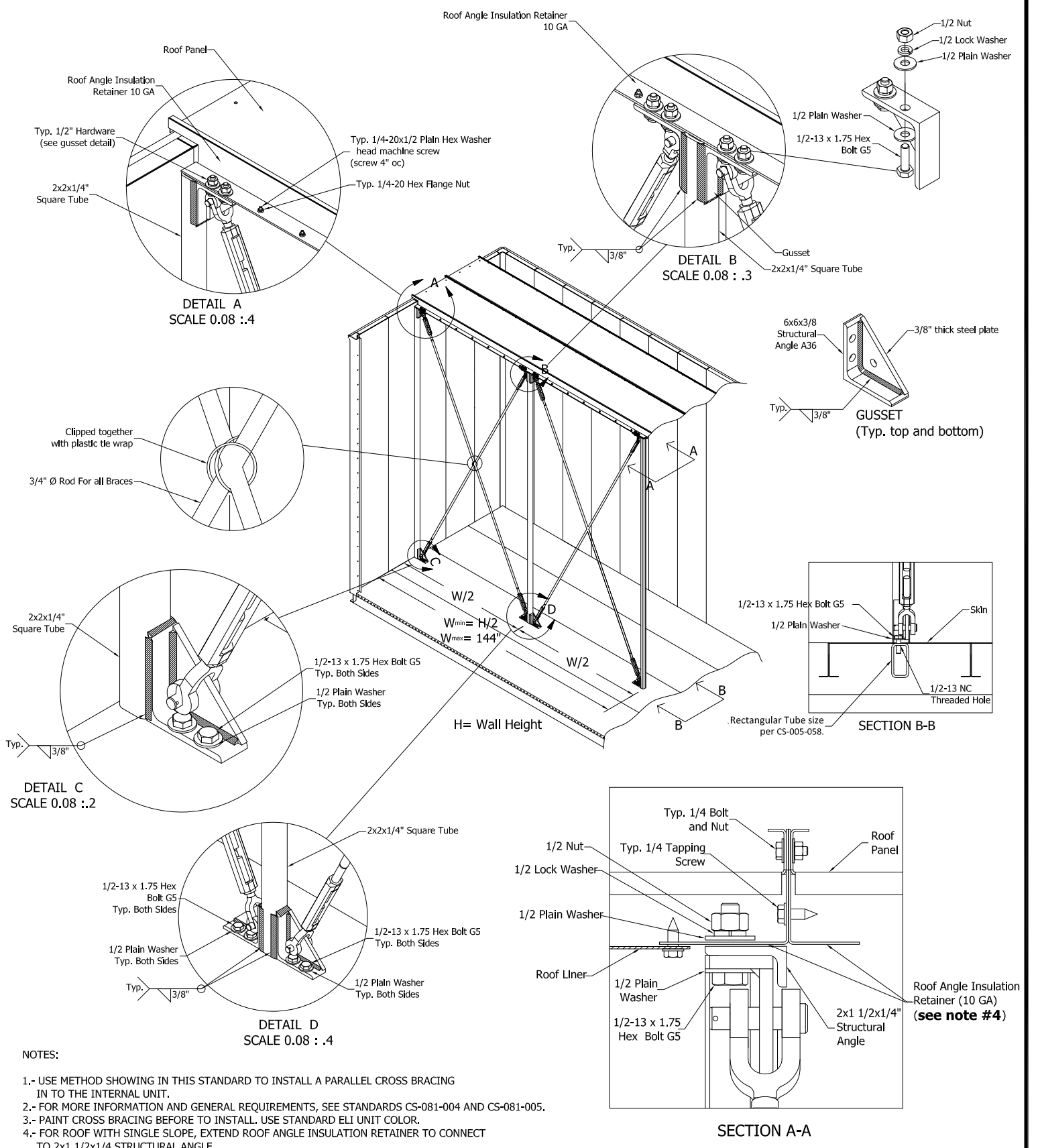
THIS DRAWING IS THE PROPERTY OF ENERGY LABS INC. AND CAN NOT BE REPRODUCED IN WHOLE OR IN PART, OR DELIVERED TO OTHERS WITHOUT EXPRESS WRITTEN CONSENT OF ENERGY LABS INC.

TITLE/TITULO:

**INTERNAL CROSS BRACING INSTALLATION
PERPENDICULAR CASE
(OSHPD SEISMIC CERTIFICATION)**

ENGINEERING CONSTRUCTION STANDARD

DRAWN BY/DIBUJADO POR: J. ORTEGA OSP-0069-10	ISSUED/LIBERADO: 08/03/10	DRAWING NO./NÚMERO DE DIBUJO: CS-081-002 Page 33 of 53
--	------------------------------	--



- NOTES:
- 1.- USE METHOD SHOWING IN THIS STANDARD TO INSTALL A PARALLEL CROSS BRACING IN TO THE INTERNAL UNIT.
 - 2.- FOR MORE INFORMATION AND GENERAL REQUIREMENTS, SEE STANDARDS CS-081-004 AND CS-081-005.
 - 3.- PAINT CROSS BRACING BEFORE TO INSTALL. USE STANDARD ELI UNIT COLOR.
 - 4.- FOR ROOF WITH SINGLE SLOPE, EXTEND ROOF ANGLE INSULATION RETAINER TO CONNECT TO 2x1 1/2x1/4 STRUCTURAL ANGLE.



THIS DRAWING IS THE PROPERTY OF ENERGY LABS INC. AND CAN NOT BE REPRODUCED IN WHOLE OR IN PART, OR DELIVERED TO OTHERS WITHOUT EXPRESS WRITTEN CONSENT OF ENERGY LABS INC.

TITLE/TITULO:
**INTERNAL CROSS BRACING INSTALLATION
 PARALLEL CASE
 (OSHPD SEISMIC CERTIFICATION)**

ENGINEERING CONSTRUCTION STANDARD

DRAWN BY/DIBUJADO POR: J. ORTEGA OSP-0069-10	ISSUED/LIBERADO: 08/03/10	DRAWING NO./NÚMERO DE DIBUJO: CS-081-003 Page 34 of 53
--	------------------------------	--

NO.	DATE/FECHA: 08/06/2017	REVISION/REVISIÓN	DWN
-----	------------------------	-------------------	-----

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **1**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Custom Test Unit

CONSTRUCTION SUMMARY:

Panel Construction: 2" 304 Stainless Steel Panel with combination of galvanized BRT, aluminum and stainless steel liners; Dampers: ELI Damper 7Hx12W (actuated); Doors: "F" Door 14Wx63H w/ window and "S" Door 14Wx63H w/ window; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Fans: ELI QuadraFan-(2) 165 (1hp) w/ ELI automatic and manual flow valves; Coils: ELI Coil rack with 24Lx24H/10 Row/10 FPI/ Cu- Bottom and 24Lx24H/10 Row/10 FPI/Al-Top; Filters: Filter rack with 2" Pre-filters and 12" Final HEPA filters; Gas Furnace: Beckett HMA-200 stainless steel housing; Control Enclosure: 14Wx33Hx10D with control components and Danfoss VFD 2 HP.

TEST PARAMETERS:

Building Code: CBC 2016
Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

MOUNTING SUMMARY:

Rigid floor mount with (4) 3/4"-10 grade 8 bolts

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
96.0	96.0	96.0	4,600	9.0	8.9	13.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **2**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Custom Test Unit

CONSTRUCTION SUMMARY:

Panel Construction: 4" Galvanized Steel Panel with Combination of Galvanized Liners and No Liners; Dampers: ELI Damper 52Wx63H (actuated); Louvers: OSA Louver 12Wx10H and OSA Louver 72Wx120H; Doors: "F" Door 18Wx63H w/ window and "S" Door 18Wx63H w/ window; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Fans: ELI Horizontal Belt Drive Plenum Fan 135 (1hp), ELI Quadra Fan - (2) 365 (60hp); Filter Rack: ELI 2" Pre-filter Vee Filter Bank; Sound Trap: ELI Model PB01 6Wx36L galvanized steel; Humidifier Grid: Dri-Steem Ultra-Sorb LV - 15Wx4Dx12H stainless steel; Control Enclosure: 18Wx33Hx10D with Controls and Yaskawa VFD 1 HP.

MOUNTING SUMMARY:

Rigid floor mount with (6) 3/4"-10 grade 8 bolts

TEST PARAMETERS:

Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$

Test Criteria: AC-156

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
144.0	96.0	144.0	8,500	12.1	3.0	16.9

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **3**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Custom Test Unit

CONSTRUCTION SUMMARY:

Panel Construction: 2" Galvanized Steel Panel with Galvanized Liners; Dampers: None; Louvers: None; Doors: "F" Door 18Wx63H w/ window and "S" Door 18Wx63H w/ window; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Fans: ELI Plenum Fan- Vert Invert Direct Drive 135 (1hp), Vert Invert Belt Drive 135 (1hp), Horiz Direct Drive 135 (1hp), Vert Belt Drive 135 (1hp), Vert Direct Drive 135 (1hp), Furnace: Beckett HMB-200V stainless; Coils: ELI 130Lx40.5H/4 Row/8 FPI - Cu, 130Lx40.5H/4 Rows/8 FPI - Al, 130Lx40.5H/4 Row/8 FPI - Al; Sound Trap: ELI Model LE09 18Wx84L stainless w/ wrapped insulation; Humidifier Grid: Dri-Steam Ultra-Sorb LV 135Wx4Dx125H; Control Enclosure: 16Wx30Hx10D with Controls and Square D VFD 1 HP.

MOUNTING SUMMARY:

Rigid floor mount with (4) 5/8" -10 grade 8 bolts

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

Test Sequence Description

- Run 1: (4) Walls in place
- Run 2: (2) Walls in place, opposite walls removed
- Run 3: (1) Wall in place
- Run 4: (0) Walls in place

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
144.0	144.0	144.0	12,000	1.7	2.3	3.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **4**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Custom Test Unit

CONSTRUCTION SUMMARY:

Panel Construction: 2" Galvanized Steel Panel with Galvanized Liners; Dampers: Tamco Damper with Ebtron Air-IQ System 12Hx12W and 60Hx60W; Louvers: Vibro-Acoustics Acoustical Louvers 30Hx12W and 120Hx30W; Doors: "F" Door 18Wx63H w/ window and "S" Door 18Wx63H w/ window; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Air Flow Probes: Ebtron 12" and 120" Duct/Plenum probes and Gold and Hybrid transmitters, Ebtron "Bleed" Airflow Sensor; Coils: ELI stacked coils (no rack) (2)129Wx63H/4 Rows/14 FPI-Cu top and bottom; Desiccant Wheel: Rotor Source, Inc. 550 mm wheel with carbon steel frame and 1730 mm wheel with stainless steel frame; UV Lights: UVDI light fixtures with 18", 24" and 36" fixture mounted on frame; Controls: 82"x40" enclosure with Danfoss VLT 1.5 HP and 350 HP and controls; Louvers: (DxWxH) 6"x12"x30", 6"x30"x120" and 12"x12"x30"

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

MOUNTING SUMMARY:

Rigid floor mount with (6) 1/4"x6" fillet welds

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
144.0	147.0	144.0	9,760	5.3	3.5	15.2

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **5**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 490 Plenum Fan (100hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Horizontal; Drive: Direct Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Energy Labs automatic flow valve

MOUNTING SUMMARY:

Spring isolated base mounted to air handling unit base frame. Base skid used to replicate UUT base frame. Skid rigid mounted with (8) 1/2" x 1" long fillet welds. Fan attached to skid with (4) Energy Labs 1" deflection spring isolators.

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
63.0	68.0	71.0	3,400	1.6	2.3	3.9

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **6**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 490 Plenum Fan (40hp)

CONSTRUCTION SUMMARY:

 Construction: Steel frame with sheet metal housing; Orientation: Vertical Inlet Down; Drive: Direct Drive;
 Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:
TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

MOUNTING SUMMARY:

Spring Isolated base mounted to air handling unit base frame. Base skid used to replicate UUT base frame. Skid rigid mounted with (8) 1/2" x 2" long fillet welds. Fan attached to skid with (4) Energy Labs 1" deflection spring isolators.

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
73.0	84.0	63.0	3,000	2.3	2.3	3.1

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **7**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 600 Plenum Fan (100hp)

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Construction: Steel frame with sheet metal housing; Orientation: Horizontal; Drive: Belt Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Energy Labs automatic flow valve	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Spring Isolated base mounted to air handling unit base frame. Base skid used to replicate UUT base frame. Skid rigid mounted with (8) 1/2" x 1" long fillet welds. Fan attached to skid with (4) Energy Labs 1" deflection spring isolators.	Contents were included in testing per operating conditions.

UUT IMAGE



UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
109.0	73.0	87.0	6,000	< 1.3	1.6	3.1

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **8**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 600 Plenum Fan (50hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Vertical Inlet Down; Drive: Belt Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:
TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

MOUNTING SUMMARY:

Spring Isolated base mounted to air handling unit base frame. Base skid used to replicate UUT base frame. Skid rigid mounted with (8) 1/2" x 1" long fillet welds. Fan attached to skid with (4) Energy Labs 1" deflection spring isolators.

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
85.0	99.0	73.0	4,400	2.3	2.3	3.9

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **9**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 300 Plenum Fan (30hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Horizontal; Drive: Belt Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Energy Labs automatic flow valve

MOUNTING SUMMARY:

Spring Isolated base mounted to air handling unit base frame. Base skid used to replicate UUT base frame. Skid rigid mounted with (8) 1/2" x 1" long fillet welds. Fan attached to skid with (4) Energy Labs 1" deflection spring isolators.

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
68.0	44.0	51.0	1,800	< 1.3	< 1.3	3.1

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **10**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 600 Plenum Fan (50hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Vertical Inlet Up; Drive: Belt Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Energy Labs automatic flow valve

MOUNTING SUMMARY:

Mounted to fan frame with Energy Labs, Inc. vibration isolators. Fan frame rigidly mounted with (8) 1/2"-13 grade 5 bolts.

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
85.0	99.0	73.0	4,300	2.6	2.0	3.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
0.375	1.00	0.60	0.45	0.25	0.10

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **11**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 542 Plenum Fan (100hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Vertical Inlet Up; Drive: Direct Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Energy Labs automatic flow valve

MOUNTING SUMMARY:

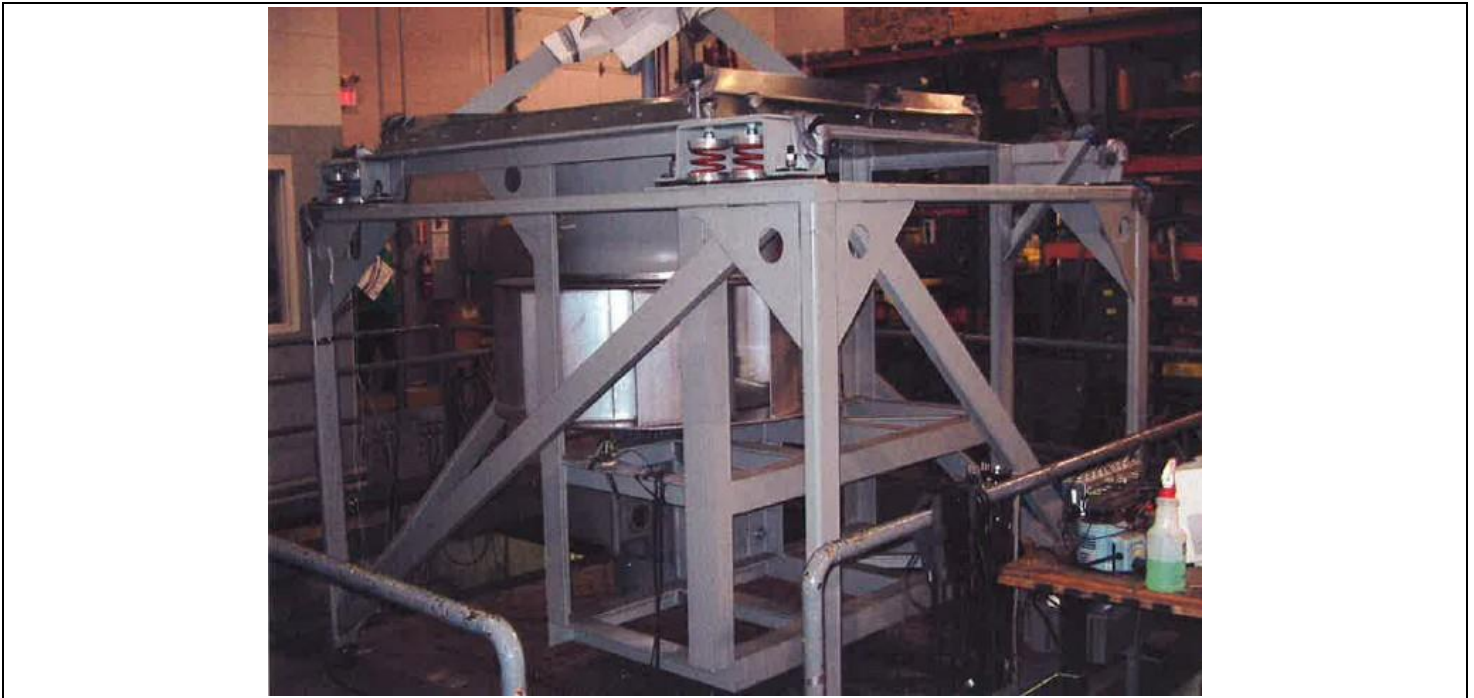
Mounted to fan frame with vibration isolators. Fan frame rigidly mounted with (8) 1/2"-13 grade 5 bolts.

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
79.0	90.0	68.0	3,400	2.7	4.5	4.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
0.94	1.00	1.50	1.13	0.63	0.25

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **12**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 135 Plenum Fan (2hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Vertical Inlet Down with Plenum; Drive: Direct Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Ebtron Duct & Plenum probes

MOUNTING SUMMARY:

Mounted to fan frame with vibration isolators. Fan frame rigidly mounted with (6) ¼" x 6" long fillet welds

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Weight provided does not include plenum. Height provided included 20" plenum. Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
30.6	29.0	46.0	450	25.4	25.2	4.8

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **13**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Size 600 Plenum Fan (150hp)

CONSTRUCTION SUMMARY:

Construction: Steel frame with sheet metal housing; Orientation: Vertical Inlet Down with Plenum; Drive: Direct Drive; Wheel: Aluminum; Voltage: 206V / 240V / 460V

OPTIONS SUMMARY:

Ebtron Duct & Plenum probes

MOUNTING SUMMARY:

Mounted to fan frame with vibration isolators. Fan frame rigidly mounted with (6) ¼" x 6" long fillet welds

TEST PARAMETERS:
Building Code: CBC 2016

Component Importance Factor: $I_p = 1.5$
Test Criteria: AC-156

NOTES:

Weight provided does not include plenum. Height provided included 42" plenum. Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
99.0	85.0	115.8	3,400	1.9	2.5	3.9

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **14**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Beckett HMB Series Gas Heater (HMB-1200)

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Galvanized carbon steel housing	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Series configuration of HMB400 furnaces	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Component mounted within AHU per manufacturer's details. Mounting replicated with (6) ½"-13 Grade 5 Bolts to shake table & (4) 3/8"-16 grade 5 bolts to wall mount fixture	Contents were included in testing per operating conditions.

UUT IMAGE



UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
106.0	22.0	109.0	1,010	> 33.3	22.6	> 33.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.55	1.00	2.48	1.86	1.03	0.41

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **15**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Beckett HMB Series Gas Heater (HMB-1280)

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Galvanized carbon steel housing	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Parallel configuration of HMB400 furnaces	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Component mounted within AHU per manufacturer's details. Mounting replicated with (6) ½"-13 Grade 5 Bolts to shake table & (4) 3/8"-16 grade 5 bolts to wall mount fixture	Contents were included in testing per operating conditions.

UUT IMAGE



UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
102.0	38.0	79.0	1,450	> 33.3	24.1	> 33.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **16**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Beckett HMA Series Gas Heater (HMA-960)

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Galvanized carbon steel housing	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Parallel configuration of HMA400 furnaces	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Component mounted within AHU per manufacturer's details. Mounting replicated with (6) ½"-13 Grade 5 Bolts to shake table & (4) 3/8"-16 grade 5 bolts to wall mount fixture	Contents were included in testing per operating conditions.

UUT IMAGE



UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
101.0	32.0	101.0	970	> 33.3	24.2	> 33.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

UUT **17**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Danfoss VLT Series VFD (VLT FC-102P55K1T4 - 75hp)

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Painted carbon steel housing	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Voltage: 206V / 240V / 460V	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Component mounted within AHU per manufacturer's details. Mounting replicated with wall mount fixture with (4) 3/8"-16 grade 5 bolts	Contents were included in testing per operating conditions.

UUT IMAGE



UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
12.0	12.0	27.0	100	> 33.3	> 33.3	> 33.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

UUT **18**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Square D ATV Series VFD (ATV21HD55N4 - 75 hp)

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Painted carbon steel housing	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Voltage: 206V / 240V / 460V	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Component mounted within AHU per manufacturer's details. Mounting replicated with wall mount fixture with (4) 3/8"-16 grade 5 bolts	Contents were included in testing per operating conditions.

UUT IMAGE



UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
13.0	11.0	25.0	150	> 33.3	> 33.3	> 33.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53

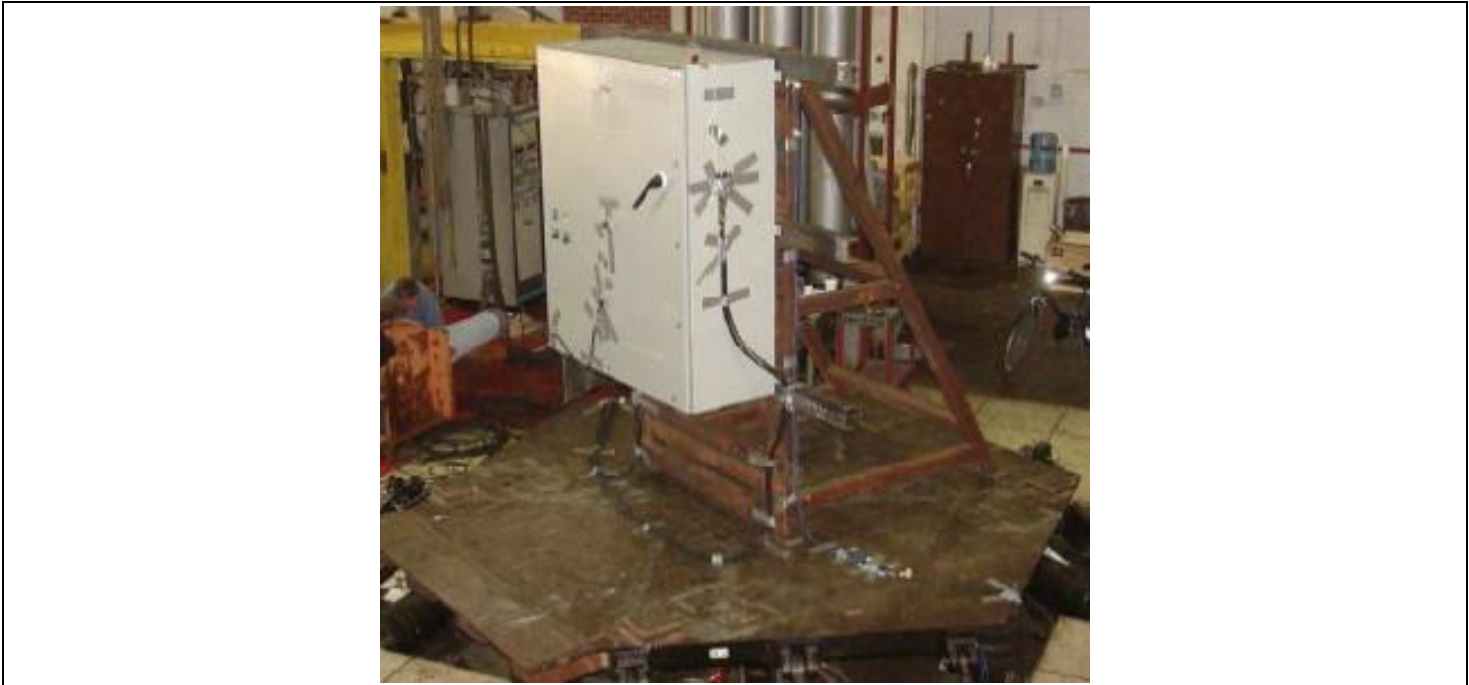
SPECIAL SEISMIC CERTIFICATION

UNIT UNDER TEST (UUT) DESCRIPTION

 UUT **19**

MANUFACTURER: Energy Labs, Inc.
MODEL LINE: Custom Air Handling Units (AHU)
MODEL NUMBER: Control Panel

CONSTRUCTION SUMMARY:	TEST PARAMETERS:
Yaskawa ATV Series VFD Mounted inside Energy Labs, Inc. Control Enclosure	Building Code: CBC 2016
OPTIONS SUMMARY:	Component Importance Factor: $I_p = 1.5$
Additional controls: disconnect, circuit breakers, fuse blocks, contactors, motor protector, relays, transformers, timers, selector switches, indicator lights, controllers	Test Criteria: AC-156
MOUNTING SUMMARY:	NOTES:
Component mounted within AHU per manufacturer's details. Mounting replicated with wall mount fixture with (8) 3/8"-16 grade 5 bolts	Contents were included in testing per operating conditions.

UUT IMAGE

UUT PROPERTIES

Dimensions (in)			Weight (lb)	First Natural Frequency (Hz)		
Depth	Width	Height		F-B	S-S	Vert
46.0	18.0	60.0	630	> 33.3	> 33.3	> 33.3

UNIT MAINTAINED STRUCTURAL INTEGRITY AND REMAINED OPERATIONAL

PER MANUFACTURER REQUIREMENTS WHEN SUBJECTED TO THE FOLLOWING TEST PARAMETERS

S_{Ds} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
1.93	1.00	3.09	2.32	1.29	0.53