oshpd
Office of Statewide Health Planning and Development

Facilities Development Division
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APPLICATION FOR PREAPPROVAL

SPECIAL SEISMIC CERTIFICATION OF EQUIPMENT AND COMPONENTS

For Office Use Only

APPLICATION NO.

OSP – 0075-10

Check whether application is: NEW [X] RENEWAL [ ]

1.0

HUNTAIR
Manufacturer

Brian Motland
Manufacturer's Technical Representative

11555 SW Myslony St., Tualatin, OR 97062
Mailing Address

(503) 403-4469
Telephone

bmotland@huntair.com
E-mail Address

2.0

Air Handling Unit and Internal Components
Product Name

Air Handling Unit
Product Type

Please refer to attachment for complete list of products tested.
Product model No (List all unique product identification numbers and/or serial numbers)

General Description: Rigid base mounted air handling units without internal or external isolators designed and tested for a modular, arbitrary configuration shown in attached drawings. Internal Components shall be limited to those listed in the attached product matrices.

3.0

Tobolski|Watkins Engineering, Inc.
Applicant Company Name

Matthew J. Tobolski, Ph.D., P.E.
Contact Person

3710 Ruffin Road, San Diego, CA 92123 USA
Mailing Address

(858) 381-5843
Telephone

mtobolski@tobolskiwatkins.com
E-mail Address

I hereby agree to reimburse the Office of Statewide Health Planning and Development for the actual costs incurred by the department for review.

Signature of Applicant

September 16, 2010
Date

President and CEO
Title

Tobolski|Watkins Engineering, Inc.
Company Name

4.0 ***Registered Design Professional Preparing the Report***

Tobolski|Watkins Engineering, Inc.
Company Name

Matthew J. Tobolski, Ph.D., P.E. — *Contact Name*
C 72806 — *California License Number*

3710 Ruffin Road, San Diego, CA 92123
Mailing Address

(858) 381-5843 — *Telephone*
mtobolski@tobolskiwatkins.com — *E-mail Address*

5.0 ***California Licensed Structural Engineer Review and Acceptance of the Report***

Tobolski|Watkins Engineering, Inc.
Company Name

Derrick A. Watkins, S.E. — *Contact Name*
S 5257 — *California License Number*

3710 Ruffin Road, San Diego, CA 92123
Mailing Address

(858) 381-5843 — *Telephone*
dwatkins@tobolskiwatkins.com — *E-mail Address*

6.0 ***Anchorage Pre-Approval***

☐ *Anchorage is pre-approved under OPA-*
(Separate application for anchorage pre-approval is required)

☒ Anchorage is not Pre-approved

7.0 ***Certification Method***

☒ *Testing in accordance with:* ☒ *ICC-ES AC-156* ☐ *Other (Please Specify):*

☐ *Analysis*

☐ *Experience data*

☐ *Combination of Testing, Analysis, and/or Experience Data (Please Specify):*

8.0 ***Testing Laboratory (if applicable)***

Clark Dynamic Test Laboratory — *Company Name*
J.R. Antenucci, Test Manager — *Contact Name*

1801 Route 51 South, Jefferson Hills, PA 15025
Mailing Address

(412) 382-5500 — *Telephone*
jrantenucci@clarkdynamic.com — *E-mail Address*

9.0 *Approval Parameters*

Design in accordance with ASCE 7-05 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = 1.50g

S_{DS} (Spectral response acceleration at short period) = 2.0g

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

R_p (Equipment or component response modification factor) = 6.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio)= 1.0

Equipment or Component fundamental period(s) = See Attachments

Building period limits (if any) = None

Overall dimensions and weight (or range) = See Attachments

Equipment or Components @ grade designed in accordance with ASCE 7-05 Chapter 15: ☐ Yes ☒ No
Design Basis of Equipment or Components (V/W) = n/a

S_{DS} (Spectral response acceleration at short period) = n/a

S_1 (Spectral response acceleration at 1 second period) = n/a

R (Response modification coefficient)= n/a

Ω_0 (System overstrength factor) = n/a

C_d (Deflection amplification factor) = n/a

I_p (Importance factor) = n/a

Height to Center of Gravity above base = n/a

Equipment or Component fundamental period(s) = n/a

Overall dimensions and weight (or range thereof) = n/a

Tank(s) designed in accordance with ASME BPVC, 2007: ☐ Yes ☒ No

10.0 *List of attachments supporting the special seismic certification of equipment or components:*

☒ *Test Report* ☒ *Drawings* ☐ *Manufacturer's Catalog*

☐ *Calculations* ☒ *Others (Please Specify): Attachments*

11.0 *OSHPD Approval* *(For Office Use Only)*

Signature & Date: **10/6/10**	**December 31, 2016** *Approval Expiration Date*
Chris Tokas, SHFR *Name & Title*	S_{DS} (g) = **2.0** z/h = **1.0** *Special Seismic Certification Valid Up to*

Condition of Approval (if any): **Approval is limited to rigid base mounted units with components, configurations, and bracing shown in the attachments without any internal or external isolators.**

HUNTAIR®

TOBOLSKI | WATKINS ENGINEERING, INC

Custom Air Handling Units
Tested Components Summary

OSHPD UUT #1	
96" x 96" x 96"	
Construction Details	
Cabinet	Indoor - Hard Mounted
	Standard 2" panels
	External - 16 ga. G90 galvanized steel
	Liner & blankoffs - Solid 20 ga. G90 galvanized steel, SS in Coil Section
Base	Steel Structural Channel
	Skin - 16 ga. G90 galvanized steel
	Liner - Solid 20 ga. G90 galvanized steel
Doors	Door 1: 18.5(W) x 61.5(H), 2" thickness, with thermal break window
	Door 2: 12.5(W) x 61.5(H), 2" thickness, no window
Openings	Damper: Huntair OSA, 48(W) x 30(H), Belimo 120V Actuator
	Louver: Huntair OSA or Exh., 26(W) x 60(W)
Test Details	
*Unit designed to swap between Heat Transfer Coil 2 with filter rack for additional testing Run 1: (4) Walls in place, Heat Transfer Coil 2 (see below) Run 2: (4) Walls in place, filter rack (see below)	

Component Details

Component	Dimensions				Lowest Natural Frequency		
	Length (in)	Width (in)	Height (in)	Approx. Weight (lbs)	F-B (Hz)	S-S (Hz)	V (Hz)
Cabinet (with Heat Transfer Coil 2)	96.25	96	96	7,450	17.2	18.5	20.5
Cabinet (with filter rack)	96.25	96	96	6,250	Not Available		
Heat Transfer Coil (HT1): Huntair, 7 FPI, 1 row, aluminum, staggered mounting - qty. 2	40	8	85.5	300	21.9	20.3	34
Heat Transfer Coil (HT2): Huntair, 6 FPI, 12 rows, copper, stacked mounting -qty. 2 high	83	20	40.5	2,300	15.2	10.7	20.8
Filter Rack: Type 8, 4" pre-filter, 12" final filter	12	92	88	375	Not Available		
Humidifier: Mfg. Vapac	8	24	24	38			
Electrical Control Panel (NEMA 1) (1a) - VFD 1: ABB ACH550 150 HP - VFD 2: Yaskawa E7 150 HP	20	56	72	1,000			
Electrical Control Panel (NEMA 3R) (1b) - PLC - Yaskawa V1000 1,10,20 HP VFD's - ABB ACH320 1,20 HP VFD's	12	36	48	500			

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HUNTAIR® TOBOLSKI | WATKINS ENGINEERING, INC

Custom Air Handling Units
Tested Components Summary

OSHPD UUT #2	
108" x 144" x 144"	
Construction Details	
Cabinet	Outdoor - Hard Mounted
	Standard 4" panels
	External - 16 ga. G90 galvanized steel
	Liner & blankoffs - Solid 20 ga. G90 galvanized steel
Base	Steel Structural Channel
	Skin - 16 ga. G90 galvanized steel
	Liner - Solid 20 ga. G90 galvanized steel
Doors	Door 1: 18.5(W) x 61.5(H), 2" thickness, with thermal break window
	Door 2: 30.5(W) x 24.5(H), 2" thickness, no window
Openings	Damper: Ruskin (Return Air), 60(W) x 36(H), Belimo Actuator
	Louver: Ruskin (Exhaust), 40(W) x 36(H)
Test Details	
Run 1: (4) walls in place Run 2: (3) walls in place with cable bracing at filter rack Run 3: (2) walls in place with cable bracing at filter rack and coil Run 4: (2) walls in place without cable bracing	

Component Details

Component	Dimensions				Lowest Natural Frequency		
	Length (in)	Width (in)	Height (in)	Approx. Weight (lbs)	F-B (Hz)	S-S (Hz)	V (Hz)
Cabinet	108.25	144	144.25	9,050	4	6.6	20.7
FANWALL®: 3 fans, vertical upflow (2 up, 1 down), 10" and 22" wheels, welded cells, 1HP and 15HP motors	38.5	131	136	2,400	20.6	23.7	20.6
Heat Transfer Coil (HT3): Huntair, 14 FPI, 2 rows, aluminum, stacked mounting - qty. 3 high	127	10	40.5	990	16	6.6	21
HEPA Filters and Rack: Loaded	12	140	140	1,900	6.8	6.6	20.8
Electrical Control Panel (NEMA 12) (2a) - VFD: Danfoss VLT 100 HP - Recesses panel construction	16	28	42	450	Not Available		
MSP Enclosure (NEMA 4) (2b)	11	16	16	30			

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HUNTAIR®

TOBOLSKI | WATKINS ENGINEERING, INC

Custom Air Handling Units
Tested Components Summary

OSHPD UUT #3								
96" x 240" x 144"								
Construction Details								
Cabinet	Outdoor - Hard Mounted							
	Standard 4" panels							
	External - .080" thick, 5052 aluminum							
	Liner & blankoffs - .063" thick, 5052 aluminum							
Base	Aluminum Structural Tubing							
	Skin - 5052 Aluminum, .188" thick treadplate							
	Liner - Solid 20 ga. G90 galvanized steel							
Door	12.5(W) x 61.5(H), 2" thickness, no window							
Openings	Damper 1: Ruskin (Supply Air), 100(W) x 120(H), Siemens Actuators (Qty 2 - 120V, 24V)							
	Damper 2: Huntair (Supply Air), 100(W) x 120(H), 24V Belimo Actuator							
Test Details								
Run 1: (4) walls in place Run 2: (2) walls in place, cable bracing on damper wall only								
Component Details								
Component	Dimensions				Lowest Natural Frequency			
	Length (in)	Width (in)	Height (in)	Approx. Weight (lbs)	F-B (Hz)	S-S (Hz)	V (Hz)	
Cabinet	96.25	240	144.5	11,600	4.7	3.9	16	
FANWALL®: - 29 fans, 10" and 22" wheels - horizontal standard, 5 cell(W) x 7 cell(H) - welded and riveted cells - Back Draft Dampers - 1HP and 20HP motors	34	212	131	8,000	4.7	32.7	19.7	
Filter Rack: 4" pre-filter, 12" final filter, Type 8	12	236	140	500	4.7	18.4	n/a	
Hoffman Enclosure (NEMA 1) - Terminal Blocks	6	24	24	50	Not Available			
Damper	10	100	120	500	4.7	23.8	14.1	

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HUNTAIR® TOBOLSKI | WATKINS ENGINEERING, INC

Construction and Component Information

Table 1: Unit Construction Details	
Cabinet Panel Material	Aluminum Galvanized Steel
Cabinet Panel Depth	2" Nominal 4" Nominal
Liner Material	Aluminum Galvanized Steel Stainless Steel
Base Construction	Structural Channel or Tube Height: 4" to 15" Aluminum or Steel

Table 2: Access Door Details			
Door Size		Width 12" (min) ← → 48" (max)	UUT
	12" (min) Height ↕ 96" (max)	Seismic tested doors:	-
		18.5"(W) x 61.5"(H)	1,2
		12.5"(W) x 61.5"(H)	1,3
		30.5"(W) x 24.5"(H)	2
		* Door size can be any value within height and width range	-
Construction	Thickness: 2" or 4" Door Material: Powder Coat 16 Gauge Steel, Aluminum Liner Material: Galv., 304SS, 316SS, Aluminum Thermal Break Wireglass Windows (8"x8" or 12"x12")		

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Table 3: Air Louver Details			
Huntair		Width 8" (min) ⟷ 60" (max)	UUT
	6" (min) Height 120" (max)	Seismic Tested Louvers: 26" (W) x 60" (H) * Damper size can be any value within height and width range	- 1 -
Ruskin		Width 8" (min) ⟷ 60" (max)	UUT
	6" (min) Height 120" (max)	Seismic Tested Louvers: 40" (W) x 36" (H) * Damper size can be any value within height and width range	- 2 -
Construction	Louver Depth: 6" Material: Aluminum or Galvanized Steel Flange Options: Front, Rear, Double		

* Dimensions represent minimum and maximum for single louver

Table 4: Air Damper Details			
Huntair		Width 8" (min) ⟷ 100" (max)	UUT
	6" (min) Height 120" (max)	Seismic Tested Dampers: 48"(W) x30"(H) 100" (W) x 120" (H) * Louver size can be any value within height and width range	- 1 3 -
Ruskin		Width 8" (min) ⟷ 100" (max)	UUT
	6" (min) Height 120" (max)	Seismic Tested Dampers: 60"(W) x 36"(H) 100"(W) x 120"(H) * Louver size can be any value within height and width range	- 2 3 -
Construction	Material: Aluminum or Galvanized Steel Blade Orientation: Opposed or Parallel Flange Options: Front, Rear, Double Actuators: Electric or Pneumatic		

* Dimensions represent minimum and maximum for single damper

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Internal Component Information

= Shaker Table Tested

FANWALL TECHNOLOGY

Table 5: Fan Wheel/Motor Sizing						
Motor HP / **Motor Weight**		1 (min) / 55 lbs	15 / 218 lbs	20 (max) / 291 lbs	Fan Weight	UUT
Fan Size	10"	X	X	X	6 lbs (min)	2,3
	12"	X	X	X		
	14"	X	X	X		
	16"	X	X	X		
	18"	X	X	X		
	20"	X	X	X		
	22"	X	X	X	35 lbs (max)	2,3
UUT		2,3	2	3		

* Motor HP can be any value within minimum and maximum range (at 0.5 HP increments)

Table 6: Fan Cell Sizing									
			Height						
Fan Size	**Depth**	**Width**	20"	24"	28"	32"	36"	40"	44"
10", 12"	24" - 44"	20"	X	X	X	X	X	X	X
		24"	X*	X	X	X	X	X	X
		25"	X	X	X	X	X	X	X
		28"	X	X	X	X	X	X	X
		32"	X	X	X	X	X	X	X
		36"	X	X	X	X	X	X	X
14"	24" - 44"	24"	X	X	X	X	X	X	X
		28"	X	X	X	X	X	X	X
		32"	X	X	X	X	X	X	X
		36"	X	X	X	X	X	X	X
16", 18", 20"	32" - 48"	28"	X	X	X	X	X	X	X
		32"	X	X	X	X	X	X	X
		36"	X	X	X	X	X	X	X
		40"	X	X	X	X	X	X	X
		44"	X	X	X	X	X	X	X
22"	32" - 48"	36"	X	X	X	X	X	X	X
		40"	X	X	X	X	X	X	X
		44"	X	X	X	X	X	X	X*
UUT			2,3						2,3

*Welded and Riveted construction

Minimum cell weight - 100 pounds, Maximum cell weight - 366 pounds plus motor/fan wheel above.

32" cell depth tested

Dimensions can be any size within minimum to maximum range

Max fan cell quantity limited to height and width of cabinet dimensions

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Table 7: FANWALL Configuration	
Horizontal Shaft	1) Stand Alone 2) Stacked 3) Adjacent 4)Multiple Stacked and Adjacent Cells
Vertical Shaft	1) Stand Alone 2) Adjacent 3)Multiple Adjacent Cells

INTERNAL COMPONENTS

Table 8: Heat Transfer Coil Configuration					
Characteristic	**Range**		**Coil Seismic Testing**		
	Min	Max	UUT 1		UUT 2
			HT 1	HT 2	HT 3
Coil Quantity	-	-	2	2	3
Fin Height (in)	6	96"	85.5	40.5	40.5
Fin Length (in)	12	180"	40	83	127
Row Quantity	1	12	1	12	2
Tube Wall Thickness (in)	.020	.049"	.020	.020	.020
Header Sizes (in)	1 1/4	4"	1 1/2	2	1.5
Fin Spacing (fins/in)	5	14	7	6	14
Fin Thickness (in)	-	-	-	-	
- Alum	0.0075	0.0095	.008	-	.008
- Copper	0.006	.010	-	.006	-
Configuration	Stacked Stand Alone Staggered				
Coil Type	CW, HW, NFS, Dx				

Table 9: Additional Non-Active Components		
Component	**Manufacturer**	**UUT**
Sound Attenuator	Huntair	2
Air Blender	Blender Products	
Humidifier Grids	Vapac	1
Filter Rack - Type 8	Huntair	1, 3
Filter Frames - HEPA	Huntair, AFF, Camfill Farr	2
Filter Frames - Type 8 Holding	Huntair	1, 3
UV Lights	UV Resources	

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Electrical Information

Electrical Enclosure Details

Table 10: Control & VFD Enclosures										
Height	Width									UUT
	20"	24"	28"	36"	42"	48"	56"	60"	72"	
24"	X	X	X	X	X	X	X	X	X	
30"	X	X	X	X	X	X	X	X	X	
36"	X	X	X	X	X	X	X	X	X	
42"	X	X	X	X	X	X	X	X	X	2a
48"	X	X	X	X	X	X	X	X	X	1b
54"	X	X	X	X	X	X	X	X	X	
60"	X	X	X	X	X	X	X	X	X	
66"	X	X	X	X	X	X	X	X	X	
72"	X	X	X	X	X	X	X	X	X	1a
78"	X	X	X	X	X	X	X	X	X	
84"	X	X	X	X	X	X	X	X	X	
90"	X	X	X	X	`	X	X	X	X	
-	-	-	-	-	-	-	-	-	-	
Depth	Min.								Max.	
	12"	13"	14"	15"	16"	17"	18"	19"	20"	
UUT	1b				2a				1a	

* Letters a & b represent seperate panels on one unit
Height and Width range from minimum to maximum in 1" increments
Minimum and Maximum weight range from 30 lbs to 750 lbs
Type: NEMA 1, 3R, 4 and 12
Manufacturer: Huntair

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HUNTAIR® TOBOLSKI | WATKINS ENGINEERING, INC

Table 11: Power Distribution & MSP Enclosures

Height	Width									UUT
	6"	10"	16"	20"	24"	30"	36"	42"	48"	
8"	X	X	X	X	X	X	X	X	X	
12"	X	X	X	X	X	X	X	X	X	
16"	X	X	X	X	X	X	X	X	X	2b
20"	X	X	X	X	X	X	X	X	X	
24"	X	X	X	X	X	X	X	X	X	3
30"	X	X	X	X	X	X	X	X	X	
36"	X	X	X	X	X	X	X	X	X	
42"	X	X	X	X	X	X	X	X	X	
48"	X	X	X	X	X	X	X	X	X	
Depth	Min.								Max.	
	6"	8"	10"	12"	14"	16"	18"		20"	
UUT	3		2b							

* Letters a & b represent seperate panels on one unit
Height and Width range from minimum to maximum in 1" increments
Minimum and Maximum weight range from 5 lbs to 200 lbs
Type: NEMA 1, 3R, 4 and 12
Manufacturers: Huntair, Hoffman

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Electrical Components:

Table 12: Power Distribution & MSP Electrical Components				
	Smallest	Largest	UUT 2b	UUT 3
Disconnect Switch	30 A	600 A	60A	-
Circuit Breaker	15 A	400 A	-	-
Dist. Block	175 A	665 A	-	-
Fuse Holder	30 A	400 A	-	-
Fuse	1 A	400 A	-	-
Contactor	7 A	300 A	-	-
MSP	0.7-1.0 A	45-63 A	11.0 - 16.0	-
Terminal Block	10 A	60 A	-	30 A
Power panel can hold up to 20 Sets of components One set includes contactor, MSP, Fuse, Fuse Holder				

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Table 13: Control & VFD Electrical Components								
	Disconnect Switch & Circuit Breaker	Fuse Holder & Fuse	Distribution Block	Contactor	MSP	Transformer	Power Supply	Reactor
Minimum	30 A	1 A	175 A	7 A	0.7-1.0 A	50 VA	1.3 A	7 A
	60 A	5 A	310 A	9 A	1.1-1.6 A	250 VA	4 A	9 A
	100 A	10 A	380 A	12 A	1.8-2.5 A	500 VA	10 A	12 A
	200 A	15 A	665 A	17 A	3.5-5.0 A	750 VA	20 A	17 A
	400 A	30 A		28 A	5.5-8.0 A	1000 VA	40 A	28 A
		60 A		50 A	9.0-12.5 A	2000 VA		50 A
		100 A		80 A	11-16 A	3000 VA		80 A
		200 A		115 A	14-20 A			115 A
		400 A		150 A	22-32 A			150 A
				225 A	36-45 A			225 A
Maximum				300 A	45-63 A			300 A
Control Panel also includes lights, switches, relays, PLC, HMI, Sensors, Enclosure Cooling/Heating Components								
UUT 1a	400A	400A	665A	7, 50, 150	0.7-, 9-, 14-, 45-	750, 3000	None	None
UUT 1b	200A	30A	175A	None	None	500 VA	4A	150A
UUT 2a	200A	None	None	None	5.5 - 8.0A	150 VA	None	None

Additional:

- 208/230/460VAC
- MSP with auxiliary contact
- Power block
- Starters
- PLC Controls
- 120/240VAC Relays/Buses
- Timers
- Hand/Off/Auto switches
- Indicator lights
- Ground lugs
- Standard Copper Wiring (TTHN, THW, MTW)

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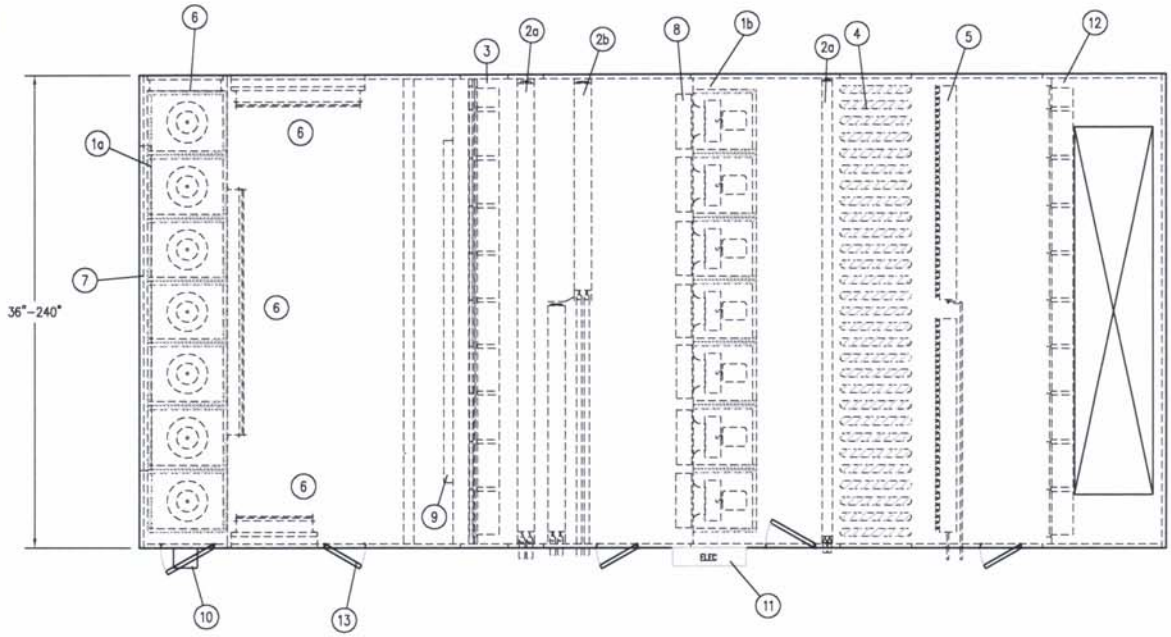
Table 14: Additional Components		
-		UUT
Thermostat		All
Transducer/Display		1b
PLC Controls	Circuit Breaker	1b
	Power Supply	1b
	Controller	1b
	Analog in/out Module	1b
	Modbus Module	1b
	Ethernet Module	1b
	Touch Screen (6" min to 19" max)	1b
Cooling Fan (4" min to 6" max)		all

* All additional components included in seismic testing for this certification

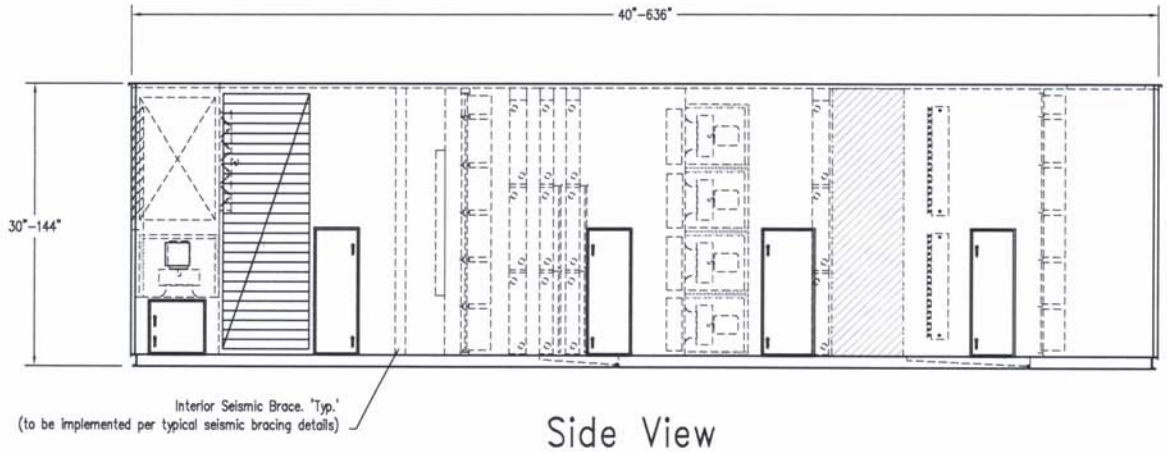
Table 15: Variable Frequency Drive														
VFD Size (HP)	ABB ACH320	Weight (lbs)	ABB ACH550	Weight (lbs)	ABB ACS800	Weight (lbs)	Yaskawa V1000	Weight (lbs)	Yaskawa E7	Weight (lbs)	Yaskawa A1000	Weight (lbs)	Danfoss VLT	Weight (lbs)
1 (min)	X	2	X	14	X	20	X	2	X	6	X	7	X	50
10	X		X		X		X	9	X		X		X	
20	X	11	X		X		X	12	X		X		X	
100			X		X				X		X		X	170
150 (max)			X	190	X	190			X	196	X	192	X	211
UUT	UUT 1b		UUT 1a				UUT 1b		UUT 1a				UUT 2a	

* VFD size can be anywhere within minimum to maximum HP range

(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door



Plan View



Side View

Construction Notes:

1. All dimensions inches unless stated otherwise
2. Insulation thickness/panel size: 2" and 4"
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height)
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. All splits shall maintain structural continuity between sections.
7. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD

Single Tunnel Unit

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
(503) 639-0113 FAX (503) 639-1269

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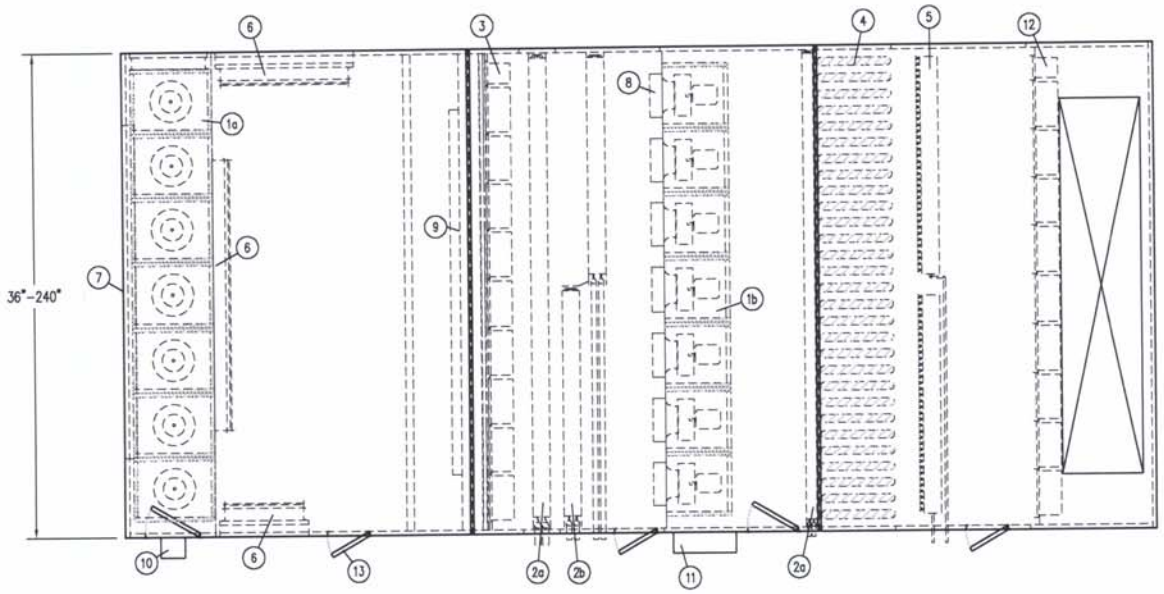
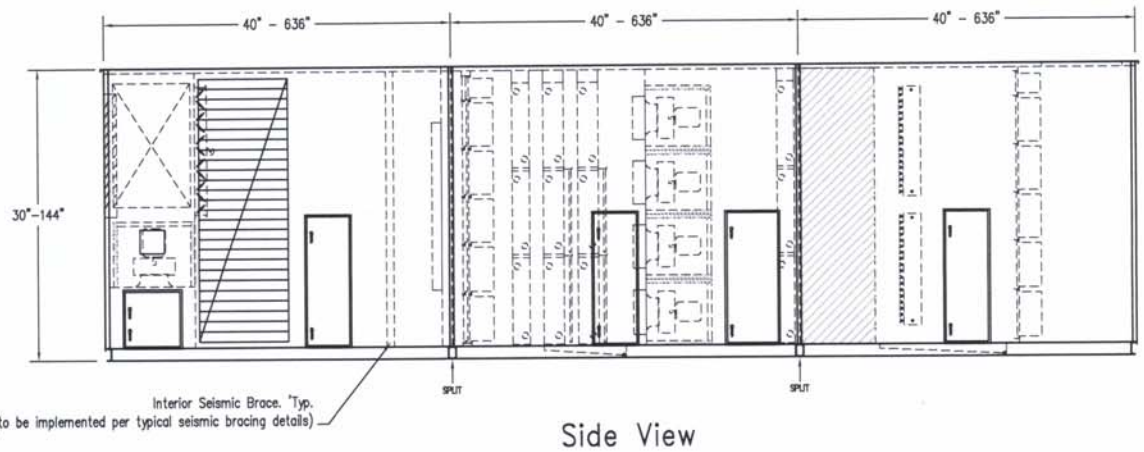
JOB NO.	DWG NO	REV.
2010		A

(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door



Plan View



Side View

Construction Notes:
1. All dimensions inches unless stated otherwise
2. Insulation thickness/panel size: 2" and 4"
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height)
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. All splits shall maintain structural continuity between sections.
7. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD
Single Tunnel With Splits

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
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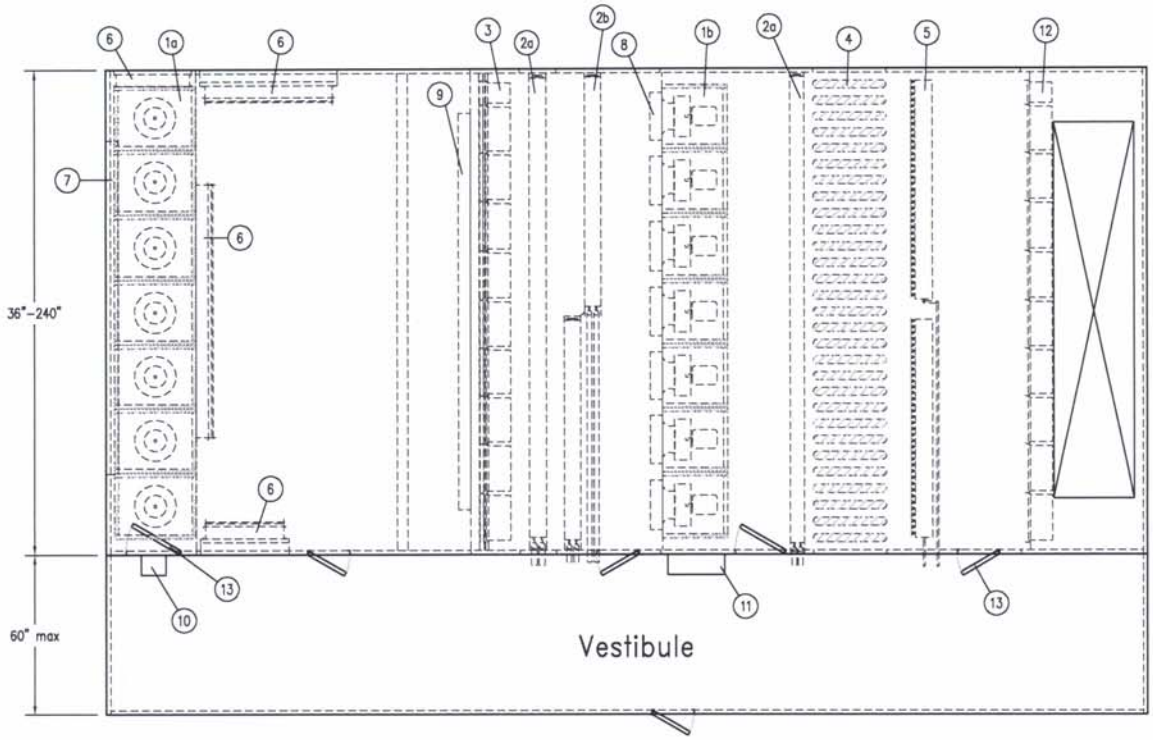
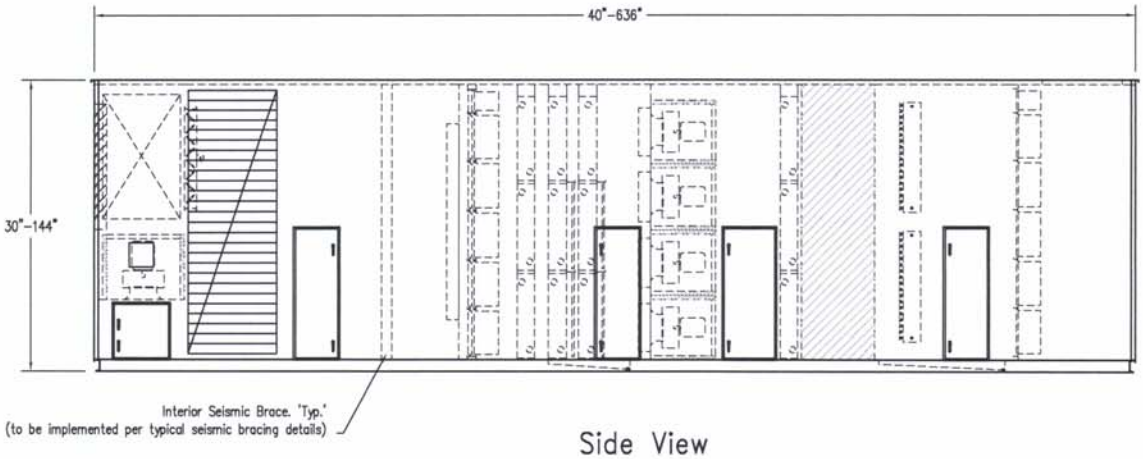
JOB NO 2010 | DWG NO | REV A

DHB

(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door



Plan View



Side View

Construction Notes:
1. All dimensions inches unless stated otherwise
2. Insulation thickness/panel size: 2" and 4"
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height)
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. All splits shall maintain structural continuity between sections.
7. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD
Single Tunnel with Vestibule

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
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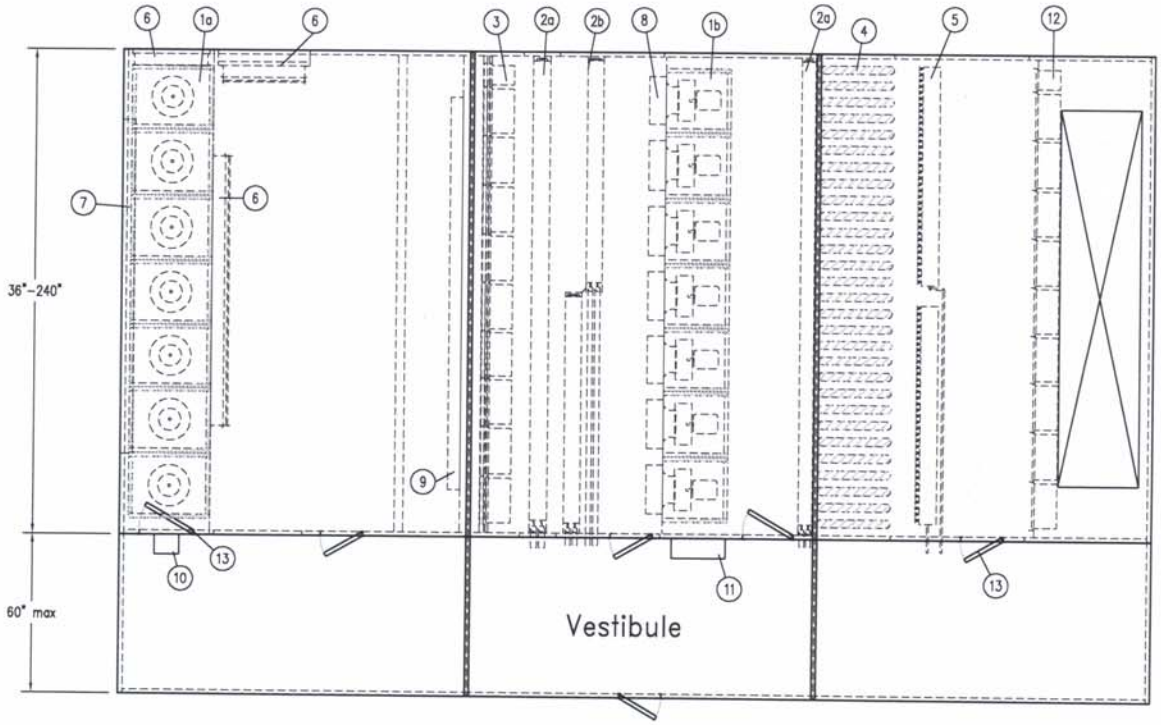
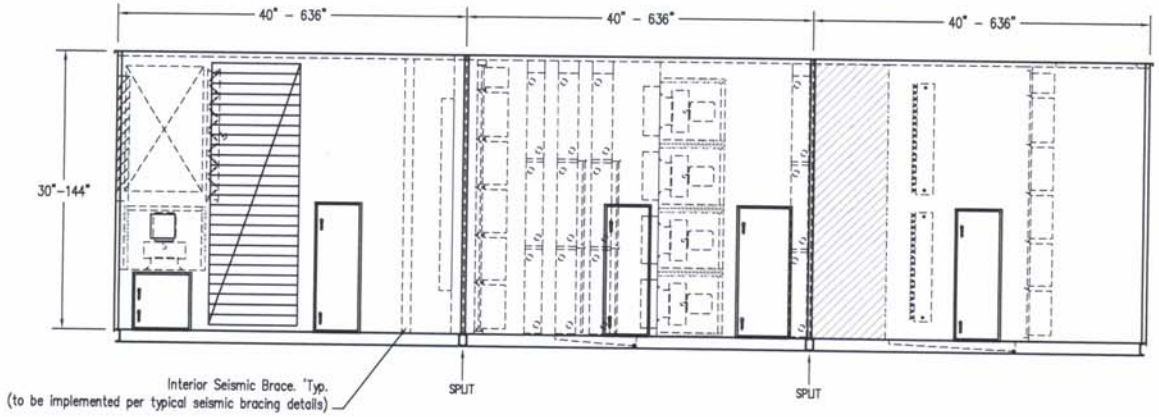
1868

(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door



Plan View



Side View

Construction Notes:

1. All dimensions inches unless stated otherwise
2. Insulation thickness/panel size: 2" and 4"
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height)
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. All splits shall maintain structural continuity between sections.
7. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD

Single Tunnel With Vestibule and Splits

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
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DWG NO
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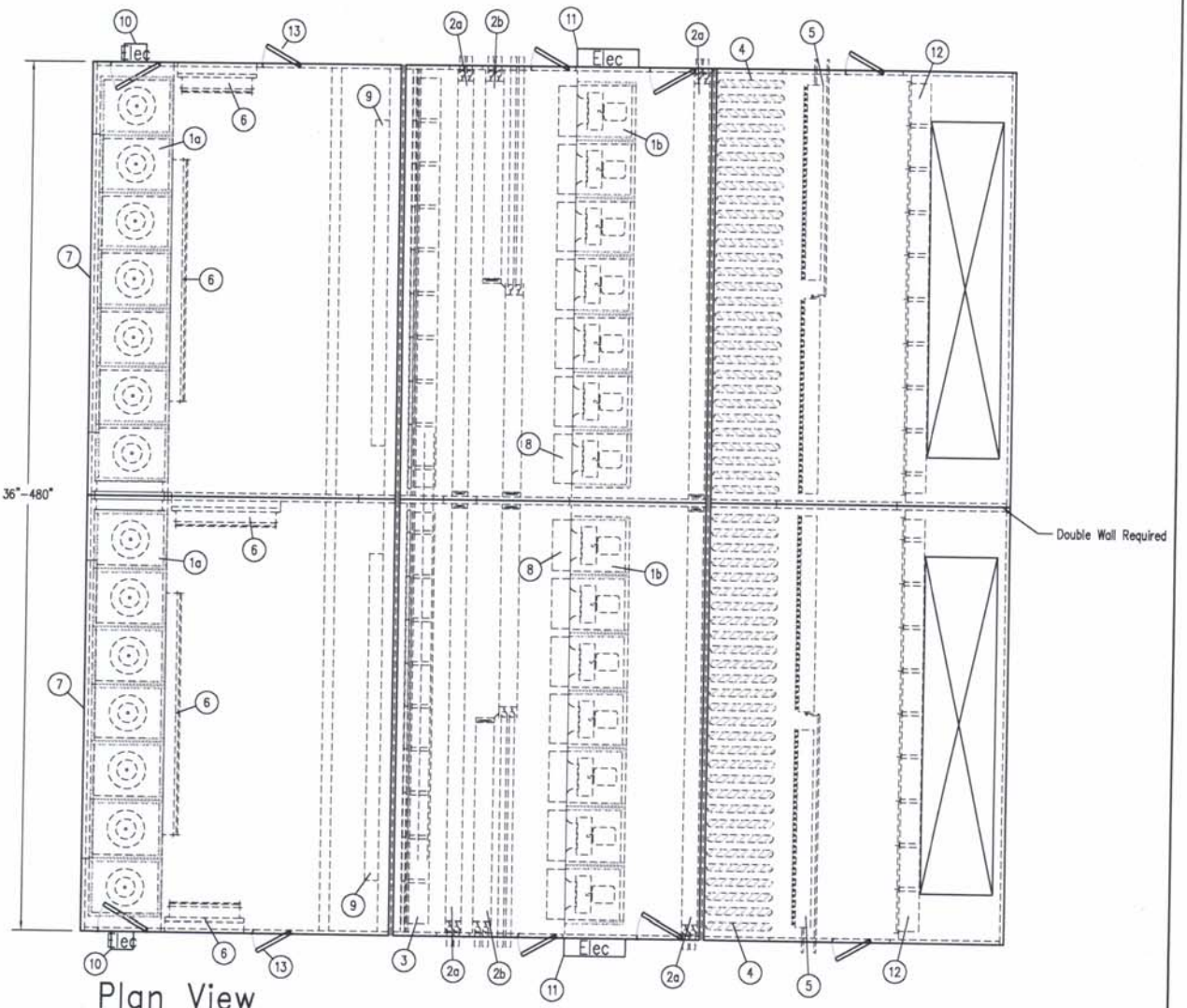
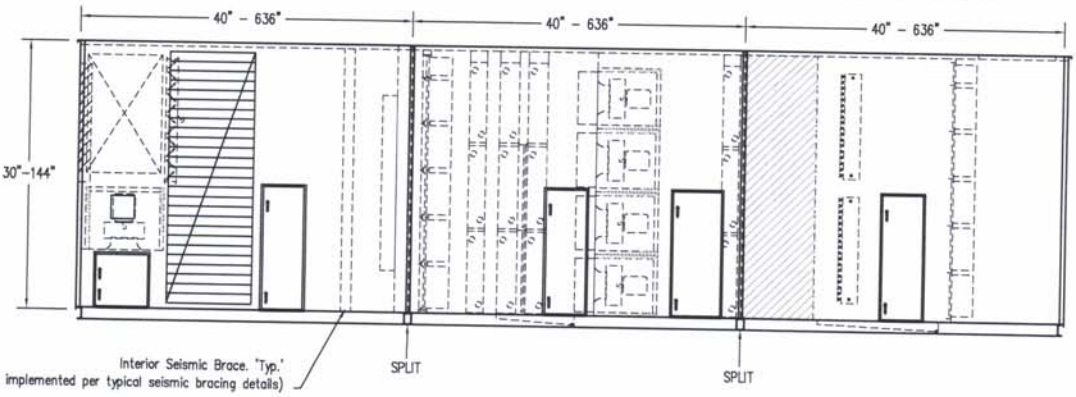


Plan View

Side View



(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door

Construction Notes:

1. All dimensions inches unless stated otherwise.
2. Insulation thickness/panel size: 2" and 4".
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height).
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. Each separate base frame must be anchored around entire perimeter, including double wall location.
7. All splits shall maintain structural continuity between sections.
8. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

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Double Tunnel with Splits

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
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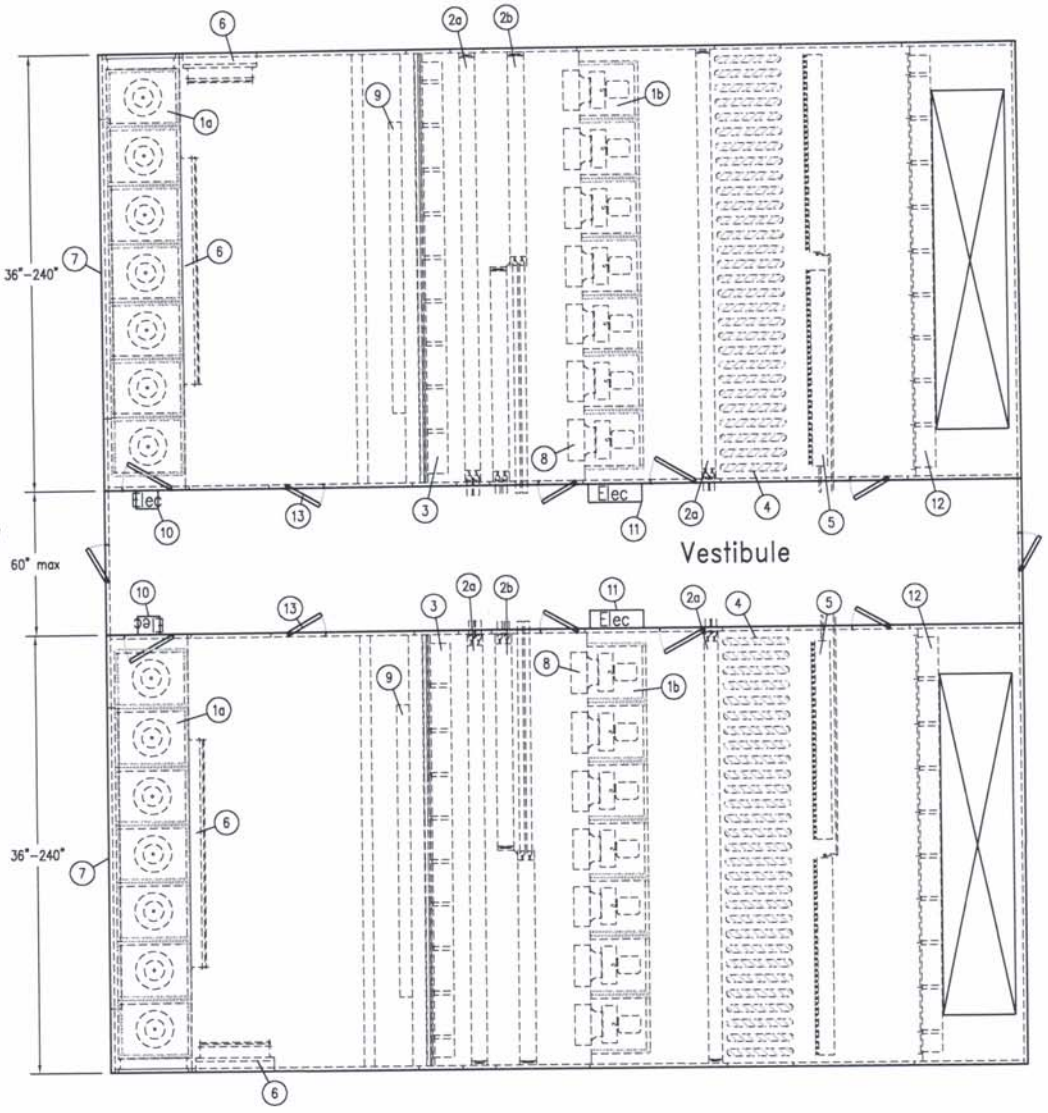
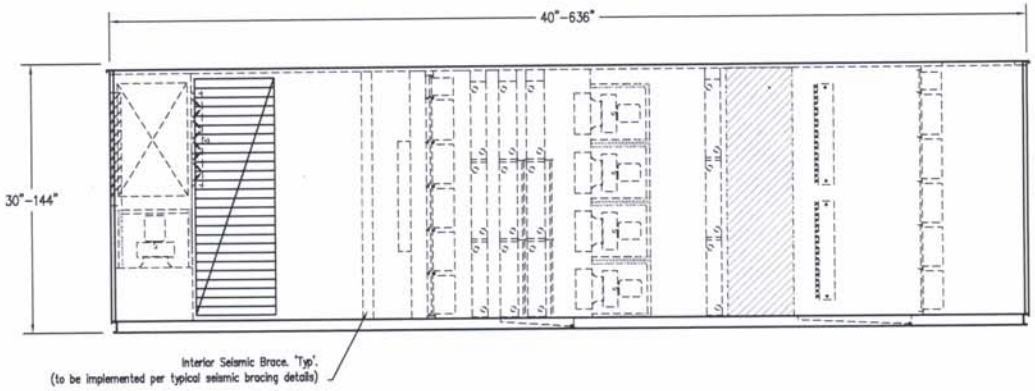
Plan View



Side View



(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door

Construction Notes:

1. All dimensions inches unless stated otherwise.
2. Insulation thickness/panel size: 2" and 4".
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height).
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. Each separate base frame must be anchored around entire perimeter, including double wall location.
7. All splits shall maintain structural continuity between sections.
8. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

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Double Tunnel With Vestibule

HUNTAIR
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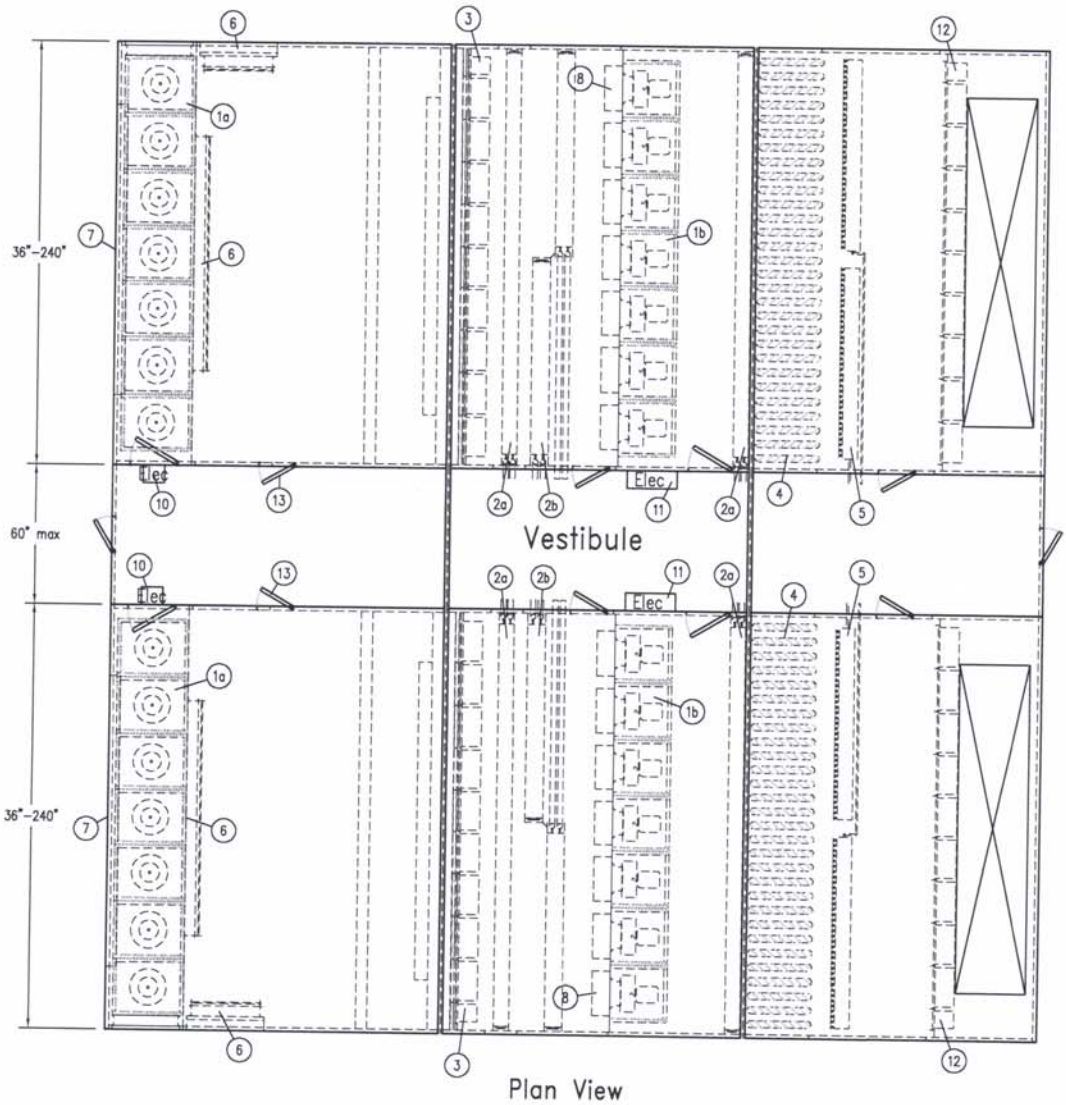

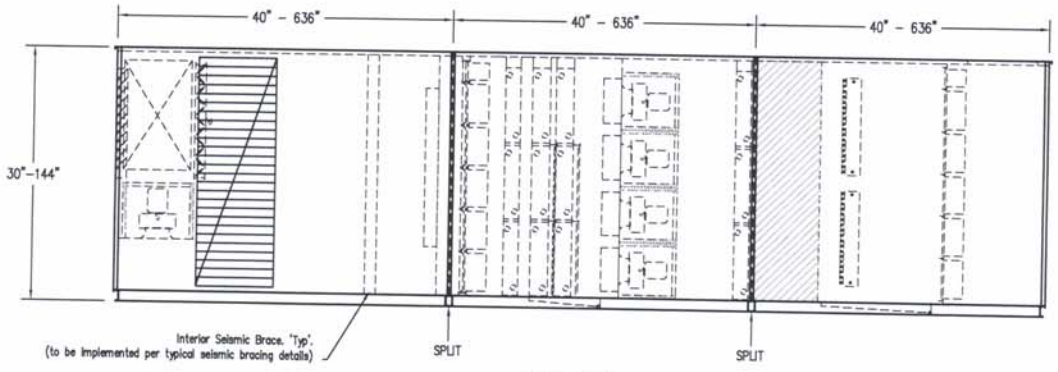

(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door

Construction Notes:

1. All dimensions inches unless stated otherwise.
2. Insulation thickness/panel size: 2" and 4".
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height).
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. Each separate base frame must be anchored around entire perimeter, including double wall location.
7. All splits shall maintain structural continuity between sections.
8. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD

Double Tunnel With Vestibule and Splits

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
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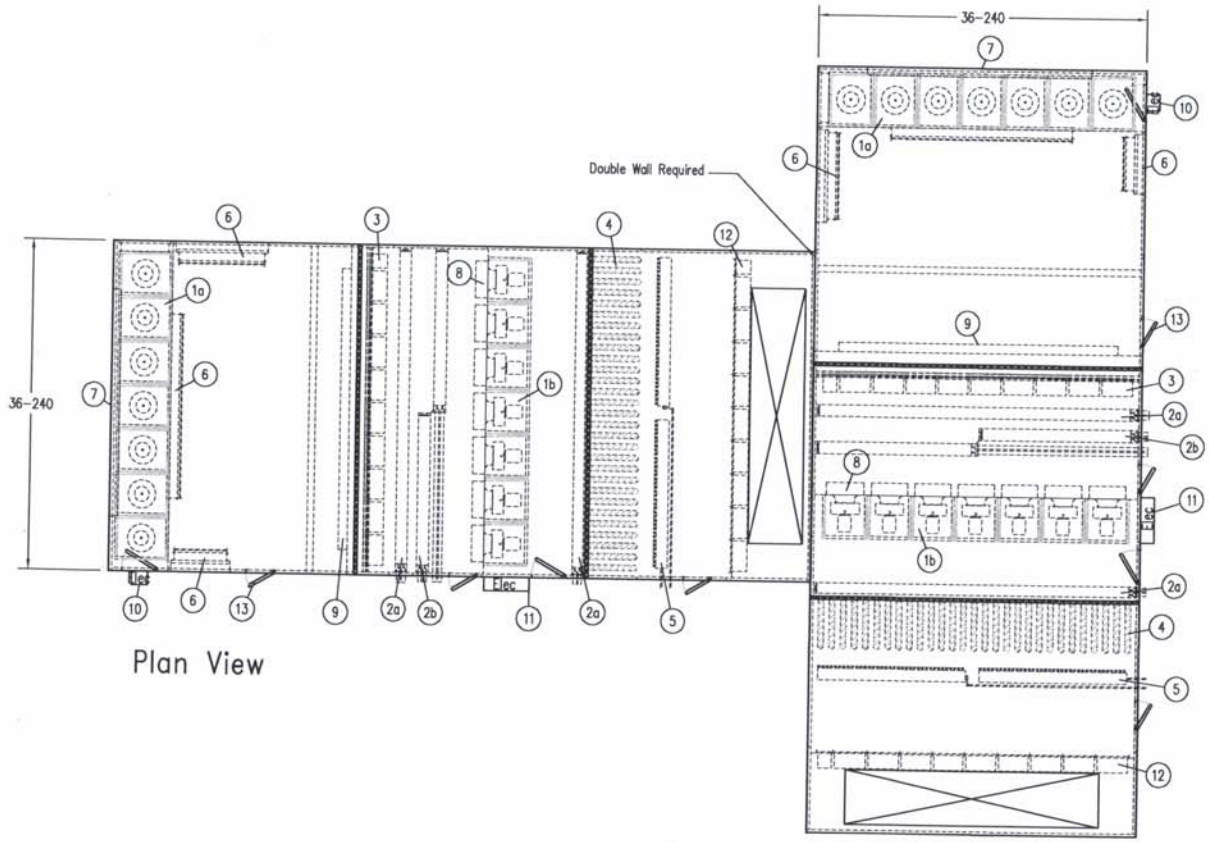
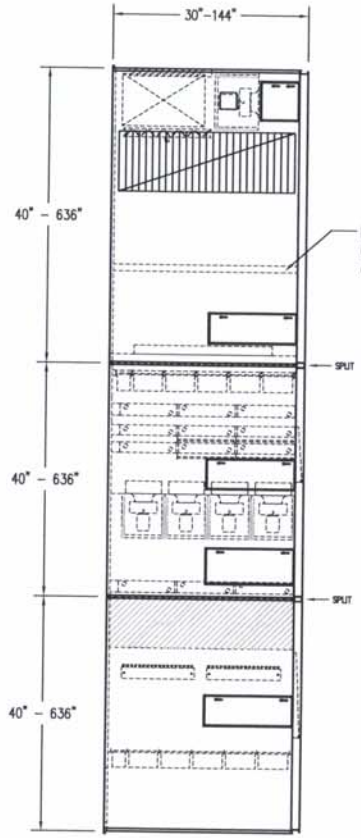
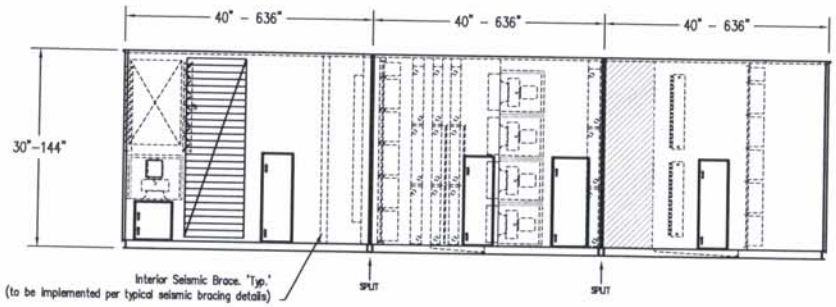




1a FANWALL (Vertical)
1b FANWALL (Horizontal)
2a Heat Transfer Coils (Stacked)
2b Heat Transfer Coils (Staggered)
3 Pre/Final Filters
4 Sound Trap
5 Humidifier
6 Damper
7 Louver
8 Back-draft Damper
9 Air Blender
10 Electrical Panel (MSP)
11 Control Panel (VFD/PLC)
12 HEPA Filters
13 Access Door



Construction Notes:

1. All dimensions inches unless stated otherwise.
2. Insulation thickness/panel size: 2" and 4".
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height).
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. Each separate base frame must be anchored around entire perimeter, including double wall location.
7. All splits shall maintain structural continuity between sections.
8. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD

T-Unit With Splits

HUNTAIR
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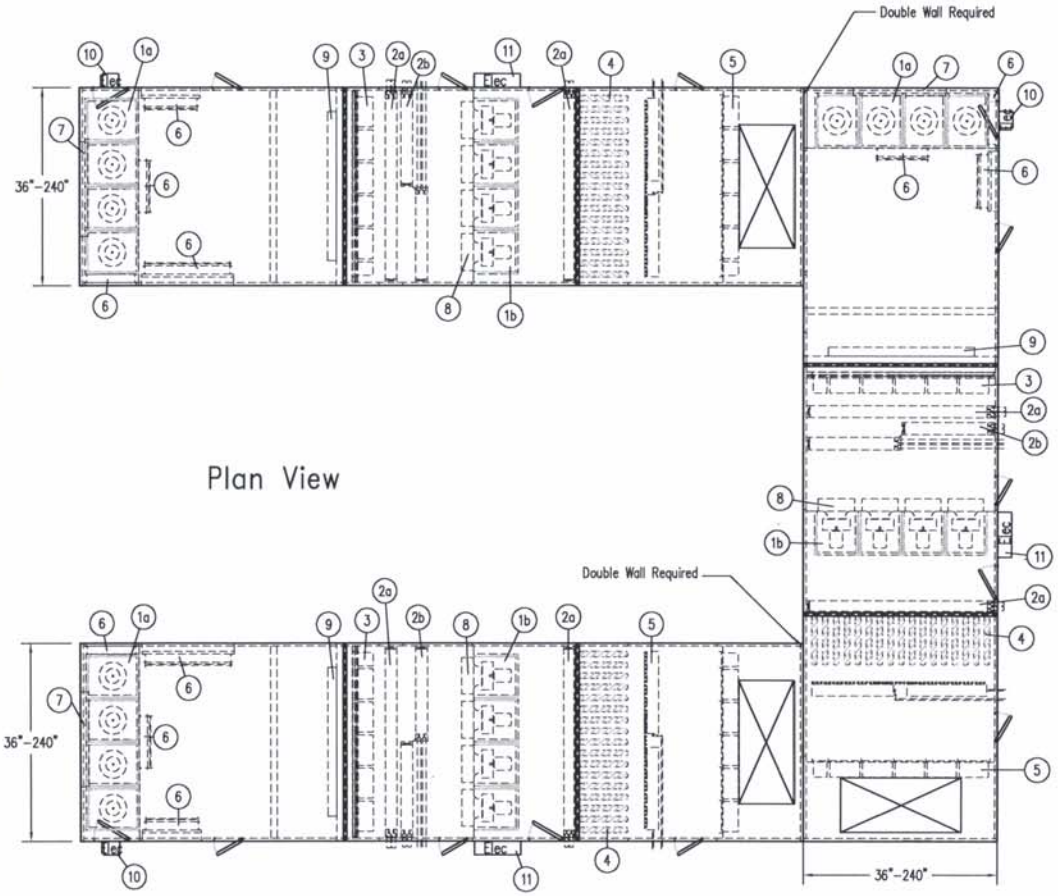
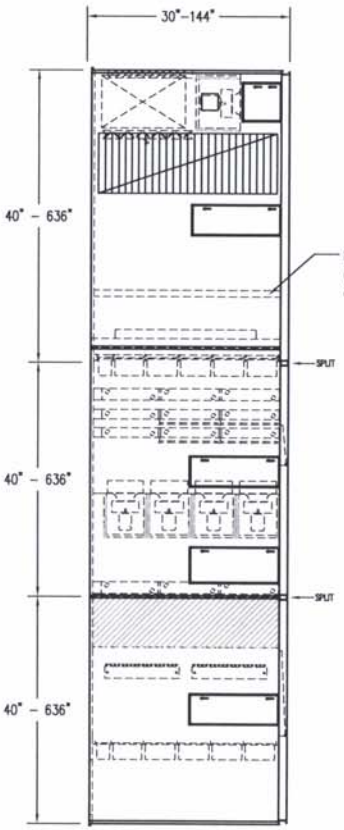
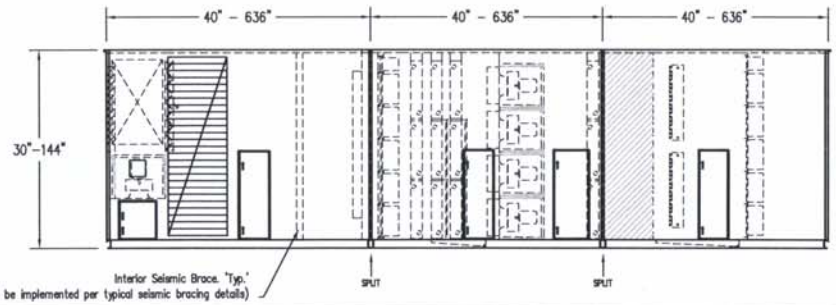


1a FANWALL (Vertical)
1b FANWALL (Horizontal)
2a Heat Transfer Coils (Stacked)
2b Heat Transfer Coils (Staggered)
3 Pre/Final Filters
4 Sound Trap
5 Humidifier
6 Damper
7 Louver
8 Back-draft Damper
9 Air Blender
10 Electrical Panel (MSP)
11 Control Panel (VFD/PLC)
12 HEPA Filters
13 Access Door



Side View



Side View

Construction Notes:
1. All dimensions inches unless stated otherwise.
2. Insulation thickness/panel size: 2" and 4".
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height).
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. Each separate base frame must be anchored around entire perimeter, including double wall location.
7. All splits shall maintain structural continuity between sections.
8. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD

U-Unit With Splits

HUNTAIR
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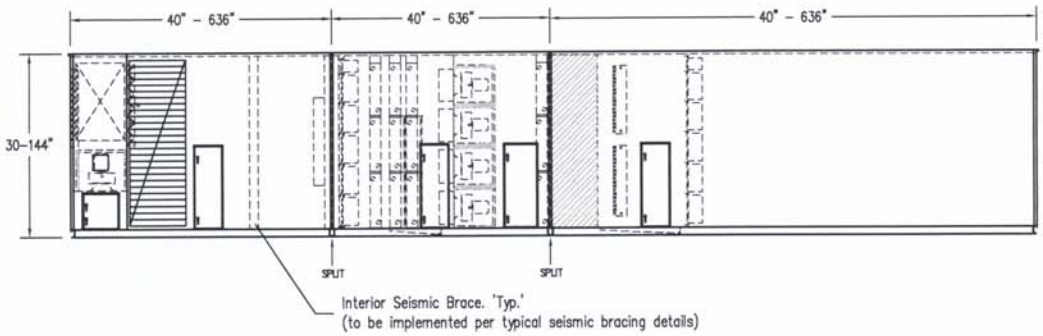
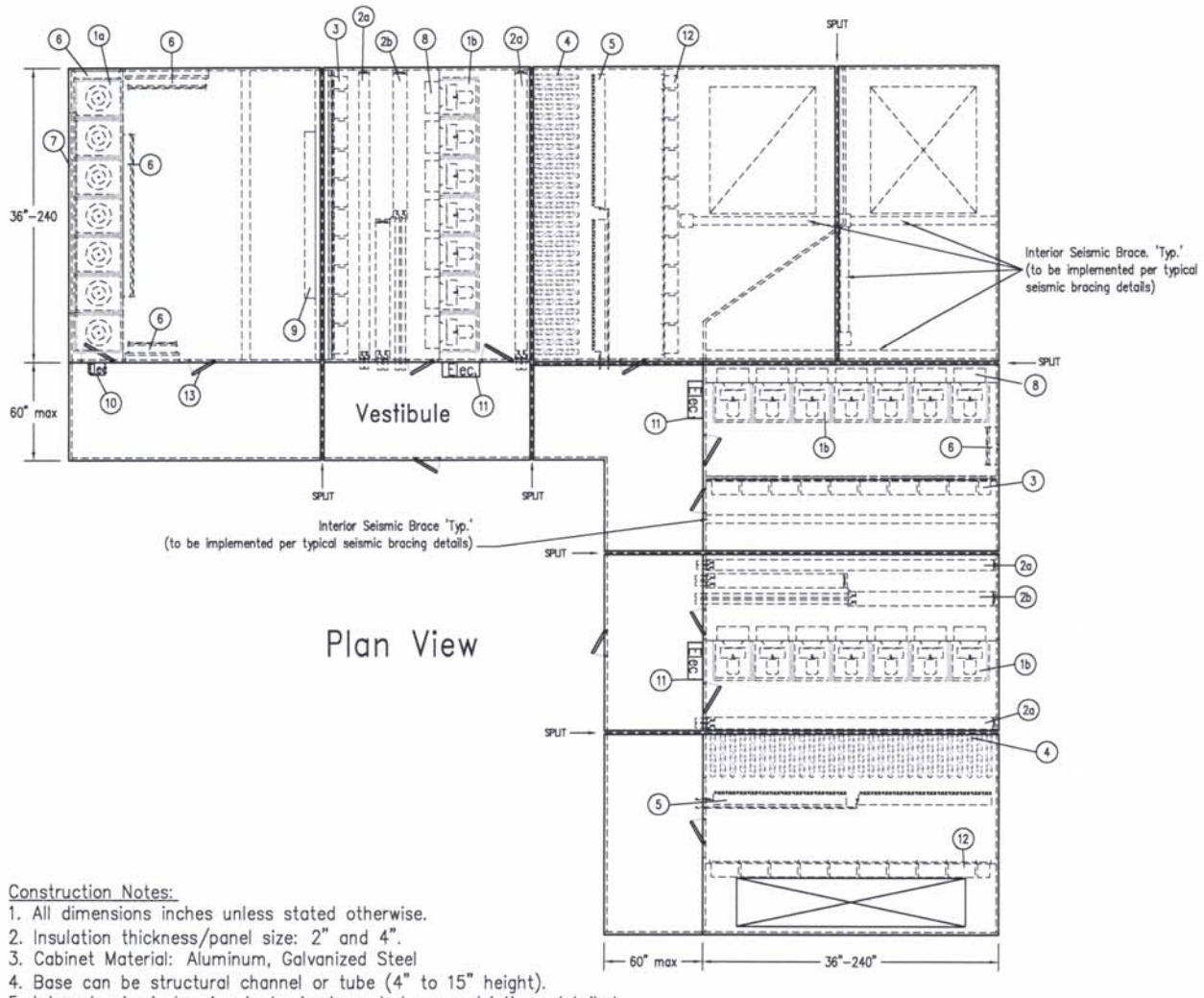
JOB NO. 2010 | DWG NO | REV A

24/28

(1a) FANWALL (Vertical)
(1b) FANWALL (Horizontal)
(2a) Heat Transfer Coils (Stacked)
(2b) Heat Transfer Coils (Staggered)
(3) Pre/Final Filters
(4) Sound Trap
(5) Humidifier
(6) Damper
(7) Louver
(8) Back-draft Damper
(9) Air Blender
(10) Electrical Panel (MSP)
(11) Control Panel (VFD/PLC)
(12) HEPA Filters
(13) Access Door

Side View





Plan View

Construction Notes:
1. All dimensions inches unless stated otherwise.
2. Insulation thickness/panel size: 2" and 4".
3. Cabinet Material: Aluminum, Galvanized Steel
4. Base can be structural channel or tube (4" to 15" height).
5. Internal seismic bracing to be implemented per restrictions detailed on sheet "Seismic Mounting Brackets Unit Assembly – Bracing."
6. Each separate base frame must be anchored around entire perimeter, including double wall location.
7. All splits shall maintain structural continuity between sections.
8. All transverse base members to be designed for tributary dead load & full capacity of seismic braced frame elements.

OSHPD

L-Unit With Vestibule and Splits

HUNTAIR
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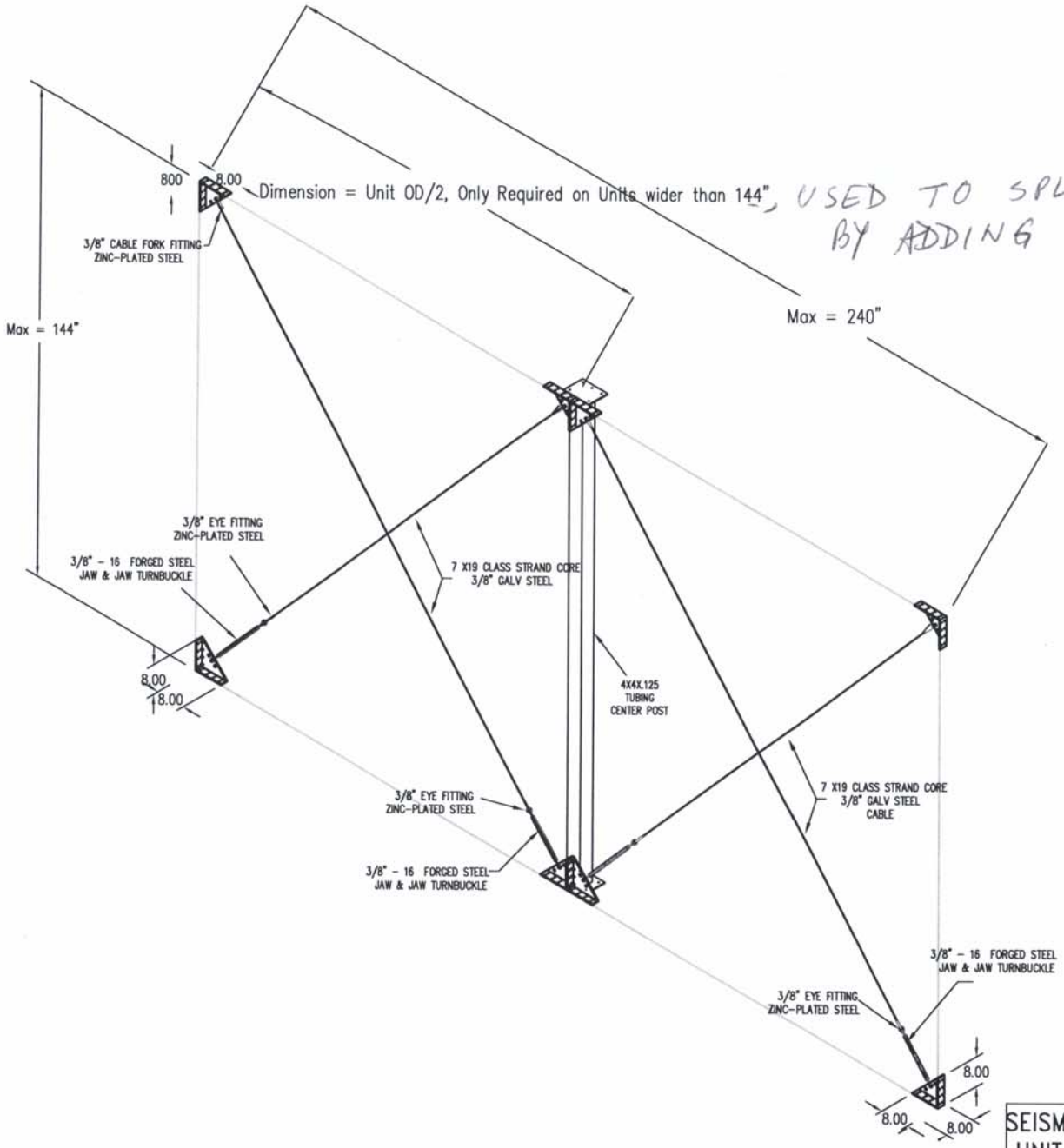
25/20



USED TO SPLIT BRACE SPAN BY ADDING POST IN THE MIDDLE.

SEISMIC MOUNTING BRACKETS
UNIT ASSEMBLY - BRACING

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
(503) 639-0113 FAX (503) 639-1269

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BRIAN MOTLAND					OF

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2010		

Interior Bracing Requirements

1. Interior bracing required only when spacing between parallel bracing elements exceeds 8'–0" in direction of airflow.
2. Interior bracing is not required when parallel bracing elements are spaced less than 8'–0".

Bracing Elements Include:

i. Coil
ii. Fanwall
iii. Filter Rack with brace
iv. Dampers with brace
v. Louvers with Brace
vi. Stand–Alone Brace

Note: all of the above bracing elements must run the full width and height of the enclosure

If a wall is utilized as a bracing element, the following conditions must be met:

Wall must be of typical panel construction, as detailed in the OSHPD approved drawing set.
Height to width ratio of the wall must not exceed 2.0.

Small openings may be permitted in a wall considered to be a bracing element, 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.

Exterior openings are defined to be at an exterior wall of the enclosure, created by the presence or louvers, vents, etc.

Total length of exterior wall must be greater than or equal to length of exterior openings.

Total height of enclosure may not exceed 12'–0".

SEISMIC MOUNTING BRACKETS UNIT ASSEMBLY – BRACING NOTES			HUNTAIR 11555 SW MYSLONY STREET TUALATIN, OR 97062 (503) 639-0113 FAX (503) 639-1269		
DRAWN BY	DATE 10/01/10	LAYOUT	TIME STAMP	SCALE 1:70	SHEET OF
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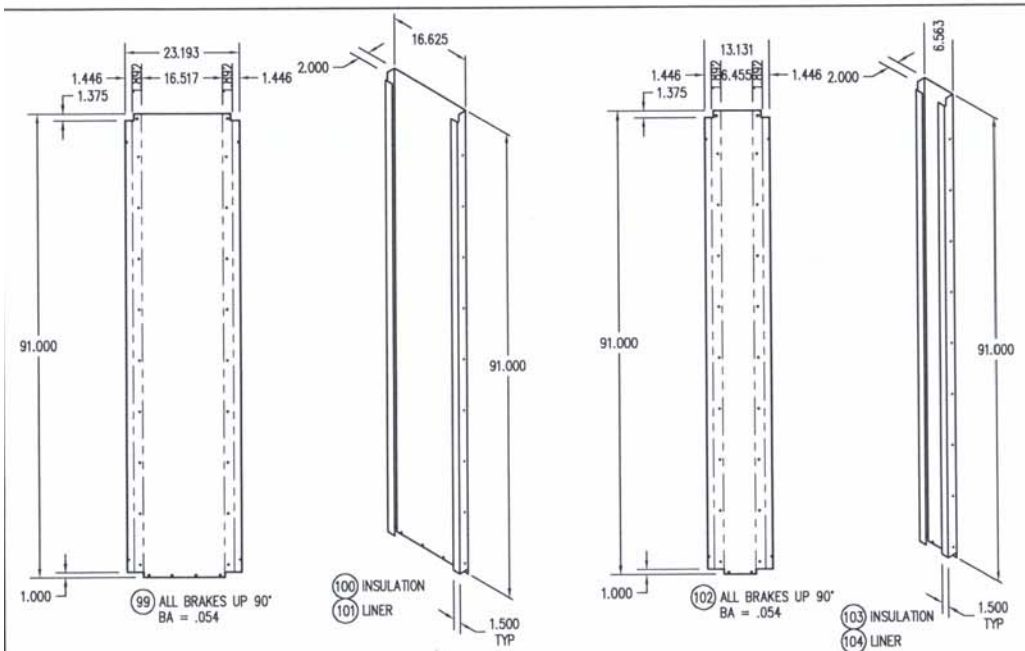

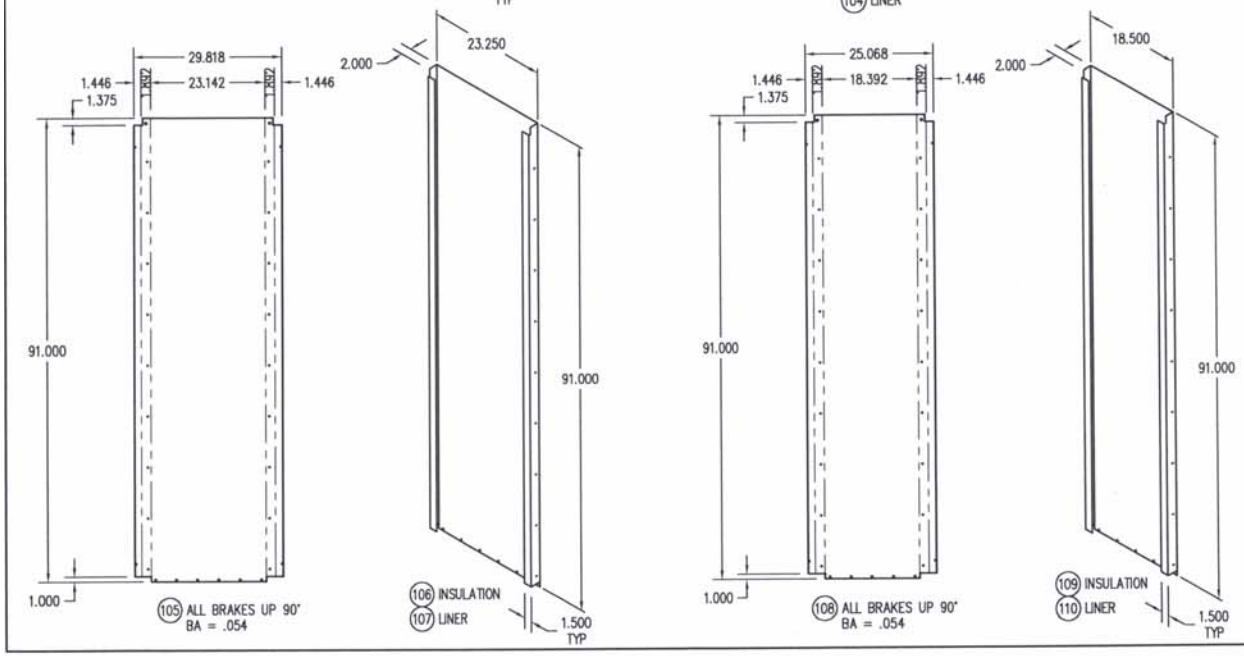

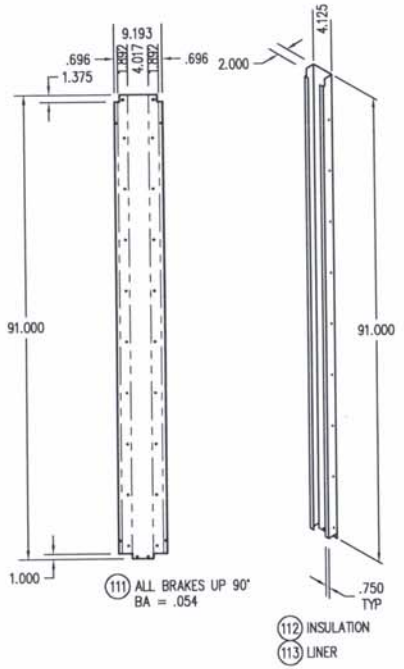

ITEM	NOMENCLATURE	DESCRIPTION	QTY ONE	TOTAL QTY	WELD	PAINT	NOTE	PART NUMBER	REV	BOX	SOURCE
99	WALL PANEL	23.193 x 91.000 x 16GA BR GALV G90	2	2		NONE				A	P3
* 100	INSULATION	16.125 x 90.000 x 137-00-13 3# 2"	2	2		NONE	99			A	INSUL
* 101	LINER	14.625 x 88.375 x 20GA BR GALV G90	2	2		NONE				A	H SHR
102	WALL PANEL	13.131 x 91.000 x 16GA BR GALV G90	2	2		NONE				A	P3
* 103	INSULATION	6.063 x 90.000 x 137-00-13 3# 2"	2	2		NONE	102			A	INSUL
* 104	LINER	4.563 x 88.375 x 20GA BR GALV G90	2	2		NONE				A	H SHR
105	WALL PANEL	29.818 x 91.000 x 16GA BR GALV G90	1	1		NONE				A	P3
* 106	INSULATION	22.750 x 90.000 x 137-00-13 3# 2"	1	1		NONE	105			A	INSUL
* 107	LINER	21.250 x 88.375 x 20GA STAINLESS STEEL	1	1		NONE				A	H SHR
108	WALL PANEL	25.068 x 91.000 x 16GA BR GALV G90	1	1		NONE				A	P3
* 109	INSULATION	18.000 x 90.000 x 137-00-13 3# 2"	1	1		NONE	108			A	INSUL
* 110	LINER	16.500 x 88.375 x 20GA BR GALV G90	1	1		NONE				A	H SHR
111	WALL PANEL	9.193 x 91.000 x 16GA BR GALV G90	1	1		NONE				A	P3
* 112	INSULATION	3.625 x 90.000 x 137-00-13 3# 2"	1	1		NONE	111			A	INSUL
* 113	LINER	3.625 x 88.375 x 20GA BR GALV G90	1	1		NONE				A	H SHR

OSHPD UNIT 8X8X8

HUNTAIR
11555 SW MYSLONY STREET TUALATIN, OR 97062
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DRAWN BY: JOSHUA JOHNSTON | DATE: 6/16/10 | LAYOUT | TIME STAMP | SCALE: 1:24 | SHEET: 8 OF 35

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