APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0118

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Alliance Air Products

Manufacturer's Technical Representative: Stewart Gerold

Mailing Address: 2285 Michael Faraday Drive, Suite 15, San Diego, CA 92154

Telephone: (619) 428-9688 Email: sgerold@allianceairproducts.com

Product Information

Product Name: Air Handling Units

Product Type: Fans

Product Model Number: Custom Air Handlers

General Description: Custom air handling units and associated internal componets

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

Applicant Information

Applicant Company Name: Alliance Air Products

Contact Person: Stewart Gerold

Mailing Address: 2285 Michael Faraday Drive, Suite 15, San Diego, CA 92154

Telephone: (619) 428-9688 Email: sgerold@allianceairproducts.com

Title: Engineering Manager

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

Company Name: JUNKER ENGINEERING GROUP

Name: Dan Junker California License Number: S6178

Mailing Address: 8950 Jefferson Ave, La Mesa, CA 91941

Telephone: (619) 606-5058 Email: dan@junkereng.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: CLARK TESTING LABORATORY, INC.

Contact Person: Suzanne Mazon

Mailing Address: 1801 Route 51, Jefferson Hills PA 15025

Telephone: (412) 387-1001 Email: smazon@clarktesting.com

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 5.63

S_{DS} (Design spectral response acceleration at short period, g) = 2.5

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 2.0 (with internal vibration isolated components).

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

HCAI Approval (For Office Use Only) - Approval Expires on 09/13/2028

Date: 9/13/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: S_{DS} (g) = 2.5 z/h = 1

Condition of Approval (if applicable):

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Alliance AIR PRODUCTS

Special Seismic Certification

Certified Components

TABLE **1**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **AHU Cabinets**

Construction Summary:

Certified unit construction shall be identical to cabinet construction of UUT's. Refer to supplemental drawings included herein for detailing requirements, materials of construction, and required seismic bracing. Units shall be constructed in accordance with Alliance Air Products typical seismic details. 2" deep 16ga Insulated panels constructed of SS, GS, or AL. 22ga solid or perforated wall liners (SS,GS,AL). 14ga to 10ga floor panels (SS,CS,AL). 1.5-2.0lb fiberglass or urethane foam insulation. 4" to 10" deep base framing (SS,GS) or 4" to 6" deep base framing (AL) perimeter channel.
** Cable cross-bracing required on all approved sections as detailed and spaced per the attached drawings

Options Summary:

With or without splits. With or without vestibule. Refer to supplemental drawings included herein for approved AHU cabinet layouts & configurations. Indoor or outdoor (NEMA 1 or NEMA 3R). Units within dimensions listed below certified for interior section, end section, or enclosed section.

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Rigid Floor Mount. SEOR to design anchorage.

Notes:

Model Line	Model	Max Dimensions (in)			Weight (psf)	Description		UUT
		Depth	Width	Height				
Custom Air Handling Unit (AHU)	AHU Cabinets	96.0	96.0	96.0	100 Max.	Min.		
		...						
		81.0,76.0	104.0	110.0			(SS Tested)	1A,1B
		96.0	104.0	142.0			(AL Tested)	2
		134.0	104.0	142.0			(AL Tested)	3
		117.0	146.0	144.0			(GS Tested)	4A,4B
		95.0	146.0	146.0			(GS Tested)	5
		107.0	146.0	146.0			(GS Tested)	6
		111.6	146.0	144.0			(GS Tested)	7
		120.4	146.0	144.0			(GS Tested)	8
		...						
		134.0*	146.0	146.0		Max.		
* Maximum individual Module Depth								

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Certified Sub-Components

TABLE **2.1**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Fans**

Construction Summary:

Aluminum Wheel and Carbon Steel Frame (All models).
Note: Fan base construction on all models must be identical to that which successfully passed seismic testing. All changes made to address anomalies during testing must be implemented into certified units (must use 3/8" snubber plates).

Options Summary:

5-75 Motor horsepower; 208, 230, or 460 voltage. Motors per Table 2.4

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted to AHU base frame with vibration isolators.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Plenum Fans	Twin City	EPF/EPQ 122	22.4	20.0	20.0	241	Direct Drive	1A
		EPF/EPQ 150	23.6	22.0	22.5	250		
		EPF/EPQ 165	24.8	24.0	25.5	262		
		EPF/EPQ 182	30.9	26.0	26.0	375		
		EPF/EPQ 200	32.3	29.0	28.5	388		
		EPF/EPQ 222	36.1	32.0	31.5	574		
		EPF/EPQ 245	37.8	34.0	34.0	592		
		EPF/EPQ 270	41.1	38.0	37.5	714		
		EPF/EPQ 300	43.3	42.0	41.5	755		
		EPF/EPQ 330	46.9	46.0	46.0	1164		
		EPF/EPQ 365	51.3	51.0	50.5	1531		
		EPF/EPQ 402	54.9	56.0	56.0	1751		6,6

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Special Seismic Certification

Certified Sub-Components

TABLE **2.2**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Fans**

Construction Summary:

Aluminum Wheel and Carbon Steel Frame (All models).
Note: Fan base construction on all models must be identical to that which successfully passed seismic testing. All changes made to address anomalies during testing must be implemented into certified units (must use 3/8" snubber plates).

Options Summary:

5-75 Motor horsepower; 208, 230, or 460 voltage. Motors per Table 2.4

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted to AHU base frame with vibration isolators.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Plenum Fans	Twin City	EPF/EPQ 122	13.8	34.8	20.0	237	Belt Drive	1A
		EPF/EPQ 150	15.8	39.0	22.5	254		
		EPF/EPQ 165	17.0	41.0	25.5	269		
		EPF/EPQ 182	19.0	45.8	26.0	312		
		EPF/EPQ 200	21.4	48.8	28.5	334		
		EPF/EPQ 222	23.0	51.8	31.5	431		
		EPF/EPQ 245	25.1	56.8	34.0	502		
		EPF/EPQ 270	27.1	63.8	37.5	541		
		EPF/EPQ 300	30.5	67.8	41.5	593		
		EPF/EPQ 330	33.8	71.8	46.0	649		
		EPF/EPQ 365	36.6	76.8	50.5	797		
		EPF/EPQ 402	39.5	85.5	56.0	954		
		EPF/EPQ 445	43.6	99.8	62.0	1120		
		EPF/EPQ 490	47.1	104.8	68.0	1405		
		EPF/EPQ 542	51.1	115.3	75.5	1599		
		EPF/EPQ 600	57.6	115.3	76.0	1944		8

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Certified Sub-Components

TABLE **2.3**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Fans**

Construction Summary:

Aluminum Wheel and Carbon Steel Frame (All models).
Note: Fan base construction on all models must be identical to that which successfully passed seismic testing. All changes made to address anomalies during testing must be implemented into certified units (must use 3/8" snubber plates).

Options Summary:

5-75 Motor horsepower; 208, 230, or 460 voltage. Motors per Table 2.4

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted to AHU base frame with vibration isolators.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
Modular Plenum Fans	Twin City / AAP	EPFLN182	31.1	32.0	32.0	496		1A
		EPFLN182	31.1	32.0	64.0	992		
		EPFLN182	31.1	32.0	96.0	1488		
		EPFLN182	31.1	64.0	64.0	1984		
		EPFLN182	31.1	64.0	96.0	2480		
		EPFLN182	31.1	64.0	128.0	2976		
		EPFLN182	31.1	96.0	96.0	3472		2

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TABLE **2.4**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Fan Motors**

Construction Summary:

Component construction specific to model number listed below.

Options Summary:

208, 230, or 460 voltage.

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted to fan frame.

Notes:

Sub-Component	Manufacturer	Model	Weight (lb)	Description		UUT
Fan Motors	Baldor	EM 5 HP	114	Min.		1A,1A
		...				
		EM 75 HP	913	Max.		8
	TECO / Westinghouse	MAX-E2 5 HP	114	Min.		1A
		...				
		MAX-E2 15 HP	350			2
		...				
		MAX-E2 50 HP	845	Max.		6,6

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Certified Sub-Components

TABLE **3**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Coils**

Construction Summary:

Galvanized or Stainless Steel Casing and Drain Pan; Aluminum or Copper Fins; Tube Wall Thickness: 0.016-0.049; Fin Thickness: 0.006-0.010; Fins per Inch: 4-10; 1-10 Rows;
Note: Coil construction on all models must be identical to that which successfully passed seismic testing. All changes made to address anomalies during testing must be implemented into certified units (ensure coil is centered in rack, 16 GA horizontal plate to cabinet wall at mid-height).

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Options Summary:

Single or stacked configuration; Hot Water or Chilled Water.

Mounting Summary:

Mounted within AHU. Coils shall be mounted in coil rack as tested.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)		Description	UUT
			Depth	Width	Height				
Coil	Alliance Air Products, LLC	HW/CW-12Wx12H	1 Row	12.0	12.0		Min.		
					...				
		HW/CW-24Wx24H	10 Row	24.0	24.0			*(Al fins, GS Casing tested)*	2
		HW/CW-24Wx24H	10 Row	24.0	24.0			*(Cu fins, SS Casing tested)*	2
		HW/CW-130Wx60H	8 Row	130.0	60.0			*(Al fins, GS Casing tested)*	5
		HW/CW-130Wx60H	4 Row	130.0	60.0			*(Cu fins, SS Casing tested)*	5
					...				
		HW/CW-130Wx69H	10 Row	130.0	69.0		Max.		

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Certified Sub-Components

TABLE **4**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Miscellaneous Components**

Construction Summary:

Doors: Galvanized or Stainless Steel Exterior. Galvanized, Stainless Steel, or Aluminum Interior. 2" Injected Polyurethane Insulation.

Options Summary:

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted within AHU.

Notes:

Sub-Component	Manufacturer	Max Dimensions (in)			Weight (lb)	Description		UUT
		Depth	Width	Height				
Doors	Alliance Air Products, LLC	2.0	12.0	12.0		Min.		1B
		...						
		2.0	18.0	36.0				1B
		2.0	18.0	42.0				3
		2.0	18.0	60.0				4,A2,5
		2.0	24.0	60.0				6,2,7
		2.0	36.0	72.0				3
		...						
		2.0	36.0	72.0		Max.		
Sound Traps	Commercial Acoustics	36.0	12.0	12.0	29	Min.		1B
		...						
		48.0	48.0	48.0	438	Max.		3,3
UV Lights	Sterile Air		18.0			Min.		2
		...						
			48.0			Max.		5
Humidifier	Pure Humidifier Insty/Fast-Pac	3.0	21.0	15.0	65	Min.		2
		...						
		5.0	125.0	130.0	160	Max.		5

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Certified Sub-Components

TABLE **5**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Louvers & Dampers**

Construction Summary:

Dampers: Aluminum (All models)
Louvers: Stainless Steel, Aluminum, or Galvanized Steel

Options Summary:

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted within AHU walls.

Notes:

Sub-Component	Manufacturer	Max Dimensions (in)			Weight (lb)	Description		UUT
		Depth	Width	Height				
Dampers	Alliance Air Products, LLC & TAMCO	4.0	22.0	12.0	4	Min.		1A
		...						
		4.0	40.0	48.0	58			4,4
		...						
		4.0	48.0	108.0	120	Max.		3
Louvers	Alliance Air Products, LLC	5.0	22.0	15.0	7	Min.	(Stainless Steel Tested)	1A
		...						
		5.0	40.0	48.0	170		(Galvanized Steel Tested)	4,4
		...						
		5.0	50.0	115.0	320	Max.	(Aluminum Tested)	3

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Certified Sub-Components

TABLE **6**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Filters**

Construction Summary:

Galvanized or Stainless Steel Frame.

Options Summary:

Flat HEPA Frame. 30-99.99% Filter Efficiency.

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted within AHU.

Notes:

Sub-Component	Manufacturer	Max Dimensions (in)			Weight (lb)	Description		UUT
		Depth	Width	Height				
Filter Frames	Alliance Air Products, LLC	3.0	24.0	24.0	7	Min.	1 x 1 Cell	
		...						
		3.0	96.0	36.0	44		4 x 1.5 Cell, SS Tested	1B
		3.0	108.0	48.0	60		4.5 x 2 Cell, GS Tested	2
		3.0	120.0	132.0	181		5 x 5.5 Cell, GS Tested	4A
		...						
		3.0	120.0	132.0	181	Max.	5.5 x 5.5 Cell	
Pre-Filter	Flanders	2.0	12.0	24.0	1	Min.		1B
		...						
		2.0	24.0	24.0	2	Max.		1B
Final Filter	Flanders	4.0	12.0	24.0	4	Min.		2
		...						
		4.0	24.0	24.0	7	Max.		2
HEPA Filter	Flanders	12.0	12.0	24.0	26	Min.		4A
		...						
		12.0	24.0	24.0	38	Max.		4A

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Special Seismic Certification

Certified Sub-Components

TABLE **7**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Furnaces**

Construction Summary:

Component construction specific to model listed below. All stainless steel construction.

Options Summary:

Horizontal or drum and tube type.

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted within AHU.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description		UUT
			Depth	Width	Height				
Furnace	HeatCo	250,000 BTU	75.1	24.0	17.5	142	Min.	*Horizontal Type*	1B
		...							
		400,000 BTU	75.1	33.6	17.5	221	Max.	*Horizontal Type*	3
		250,000 BTU	50.0	30.0	28.0	540	Min.	*Drum and Tube Type*	3
		...							
		2,250,000 BTU	109.0	77.5	46.6	2,391	Max.	*Drum and Tube Type*	7

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Special Seismic Certification

Certified Sub-Components

TABLE **8**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Variable Frequency Drives (VFD's)**

Construction Summary:

Component construction specific to model listed below.

Options Summary:

208/230 or 460V.

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: I_p = 1.5

S_{DS} at z/h = 1.0: S_{DS} = 2.5g

Mounting Summary:

Mounted within AHU.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description	UUT
			Depth	Width	Height			
VFD	ABB	ACH-550 1.0 HP	12.6	17.4	33.4	35		1A
		ACH-550 2 HP	12.6	17.4	33.4	35		
		ACH-550 3 HP	12.6	17.4	33.4	35		
		ACH-550 5 HP	12.6	17.4	33.4	35		
		ACH-550 7.5 HP	12.6	17.4	33.4	38		
		ACH-550 10 HP	12.6	17.4	33.4	54		
		ACH-550 15 HP	12.6	17.4	33.4	54		
		ACH-550 20 HP	14.4	20.5	37.7	54		
		ACH-550 25 HP	14.4	20.5	37.7	63		
		ACH-550 30 HP	14.4	20.5	37.7	63		
		ACH-550 40 HP	14.4	20.5	37.7	63		
		ACH-550 50 HP	14.4	20.5	47.7	163		
		ACH-550 60 HP	19.1	28.1	47.7	163		
		ACH-550 75 HP	19.1	28.1	47.7	163		
		ACH-550 100 HP	19.1	28.1	47.7	163		8

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Special Seismic Certification

Certified Sub-Components

TABLE **9**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Table Description: **Starter Panels**

Construction Summary:

Painted galvanized carbon steel enclosure.

Options Summary:

208/230 or 460V.

Certification Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

S_{DS} at z/h = 1.0: $S_{DS} = 2.5g$

Mounting Summary:

Mounted within AHU.

Notes:

Sub-Component	Manufacturer	Model	Max Dimensions (in)			Weight (lb)	Description		UUT
			Depth	Width	Height				
Starter Panel Enclosure	Alliance Air Products, LLC	5 HP	8.0	20.0	24.0	51	Min.		1B
		...							
		100HP	12.0	30.0	40.0	128	Max.		6
Control Transformer	Eaton	0.1 kVA					Min.		1B, 6
		...							
		2.0 kVA					Max.		1B, 6
Fuses	LittleFuse	0.5 A					Min.		1B, 6
		...							
		225.0 A					Max.		1B, 6
Disconnect	Eaton	30.0 A					Min.		1B, 6
		...							
		400.0 A					Max.		1B, 6
Contactors	Eaton	9.0 A					Min.		1B
		...							
		115.0 A					Max.		1B
	ABB	9.0 A					Min.		6
		...							
		115.0 A					Max.		6
Overload	Eaton	1.0 A					Min.		1B
		...							
		125.0 A					Max.		1B
	ABB	1.0 A					Min.		6
		...							
		125.0 A					Max.		6
Selector Switch	Eaton	M22							1B
	ABB	M2							6

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Special Seismic Certification

Unit Under Test (UUT) Description

UUT **Summary**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

UUT	Unit description	Test	Report	S_{DS}	z/h	I_P
1A	Small Cabinet Section 1 *(Inlet & Outlet Walls Removed)*	EL:10059	Clark	2.5	1.0	1.5
1B	Small Cabinet Section 2 *(Inlet & Outlet Walls Removed)*	EL:10059	Clark	2.5	1.0	1.5
2	Medium Cabinet Section 1 *(Inlet & Outlet Walls Removed)*	EL:10059	Clark	2.5	1.0	1.5
3	Medium Cabinet Section 2 *(Outlet Wall Removed)*	EL:10058	Clark	2.5	1.0	1.5
4A	Large Cabinet Section 1 *(Inlet Wall Removed)*	EL:10058	Clark	2.5	1.0	1.5
4B	Large Cabinet Section 2 *(Inlet & Outlet Walls) Removed)*	EL:10058	Clark	2.5	1.0	1.5
5	Large Cabinet Section 3 *(Inlet & Outlet Walls Removed)*	EL:10053	Clark	2.5	1.0	1.5
6	Large Cabinet Section 4 *(Inlet & Outlet Walls Removed)*	EL:10060	Clark	2.5	1.0	1.5
7	Large Cabinet Section 5A *(Inlet & Outlet Walls Removed)*	EL:10060	Clark	2.5	1.0	1.5
8	Large Cabinet Section 5B *(Inlet & Outlet Walls Removed)*	EL:10053	Clark	2.5	1.0	1.5

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Unit Under Test (UUT) Description

UUT **1A,1B**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype - Small Cabinet Sections 1 & 2

Construction Summary:

2" deep 16ga SS Wall Panels. 20ga SS, 20ga perforated SS, 20ga GS, 20ga perforated GS, 0.02" AL wall liners. 6" deep stainless steel base channels. 16ga SS floor lining. SS door. 3lb fiberglass insulation.

Options Summary:

Model 122 Direct Drive Aluminum Fan w/ 5 HP Baldor Motor. Model 122 Belt Drive Carbon Steel Fan w/ 5 HP Baldor Motor. Model 182 Single Fan Aluminum Stacked Fan w/ 5 HP TECO/Westinghouse Motor. 12"x12" Door. 18"x36" Door. 36" Deep Sound Trap.22"x12" Damper. 22"x15" Louver. 4x1.5 Cell Filter Frame w/ Pre-filters. 250,000 BTU Furnace. 1.0 HP NEMA 3 VFD. 5 HP Starter Panel.

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 35" o.c. at perimeter framing parallel to airflow.

Test Parameters:

Building Code: CBC 2022

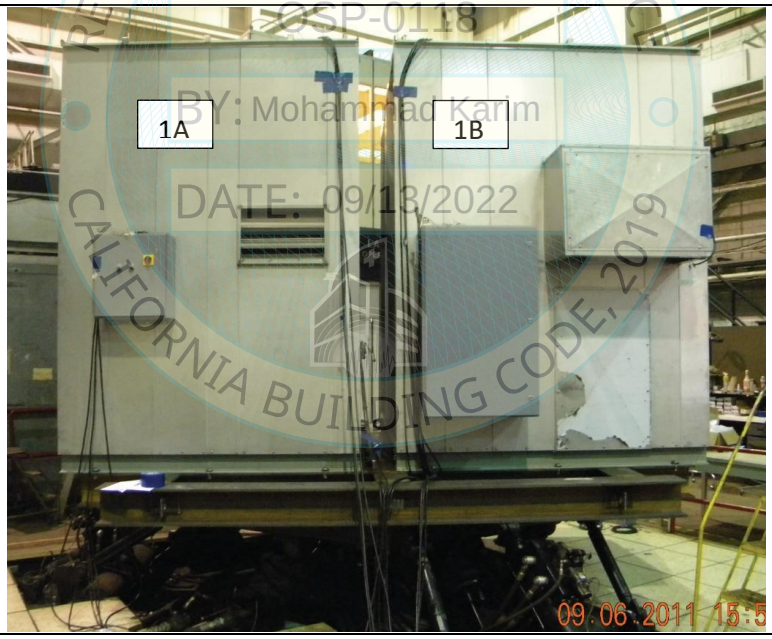
Component Importance Factor: I_p = 1.5

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
81.0(A), 76.0(B)	104.0	110.0	7,845	3.0	3.3	2.8

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)
2.5	1.00	4.00	3.00	1.67	0.67

Special Seismic Certification

Unit Under Test (UUT) Description

UUT **2**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype - Medium Cabinet Section 1

Construction Summary:

2" deep 0.063" thick AL wall panels. No Liner, 0.02" AL liner, 0.02" perforated AL Liner. 6" deep AL channel base framing. 0.06" AL floor lining. 1.5lb fiberglass insulation. Injected foam insulation. AL Door. Coils mounted in coil rack.

Options Summary:

Model 182 Nine (9) Carbon Steel & Aluminum Fan Stacked Fan w/ 15 HP TECO/Westinghouse Motor. 10 Row CW-24Wx24H Copper Coil, 10 fpi, 0.016" Tube Thickness, 0.006" Fin Thickness. 10 Row CW-24Wx24H Aluminum Coil, 10 fpi, 0.049" Tube Thickness, 0.006" Fin Thickness. (1) 18" UV Light. 4.5x2 Cell Filter Frame w/ Final Filters. 21"x15"Humidifier. 24Wx60H Door. 18Wx60H Door.

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 45" o.c. at perimeter framing parallel to airflow.

Test Parameters:

Building Code: CBC 2022

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
96.0	104.0	142.0	5,635	7.5	7.5	12.6

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)
2.5	1.00	4.00	3.00	1.67	0.67

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Special Seismic Certification

Unit Under Test (UUT) Description

UUT **3**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype - Medium Cabinet Section 2

Construction Summary:

2" deep 0.063" thick AL wall panels. 0.125" AL treadplate floor lining. No Liner, 20ga perforated GS, 20ga GS wall liners. 6" deep AL channel base framing. 1.5lb fiberglass insulation. Injected foam insulation. AL Door.

Options Summary:

18"x42" Door. 36"x72" Door. (2) 48"x48" Sound Trap. 48"x108" Damper. 50"x115" Louver. 250,000 BTU Furnace. 400,000 BTU Furnace.

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 64" o.c. at perimeter framing parallel to airflow.

Test Parameters:

Building Code: CBC 2022

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
134.0	104.0	142.0	4,270	4.6	15.9	13.5

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)
2.5	1.00	4.00	3.00	1.67	0.67

Special Seismic Certification

Unit Under Test (UUT) Description

UUT **4A,4B**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype – Large Cabinet Sections 1 & 2

Construction Summary:

2" deep 14ga GS wall panels. 20ga GS, 20ga perforated GS wall liners. 10ga GS floor lining. 10" deep carbon steel channel base framing. 1.5lb fiberglass insulation. GS door.

Options Summary:

GS Flat HEPA Filter Frame. 5H x 5W, 24x24x2 30% PF. 5H x 1W, 24x12x2 30% PF. 5H x 5W, 24x24x12 95% FF. 5H x 1W, 24x12x12 95% FF. 18"x60" Door. (2) 40W x 48H nearwall opening, 1 GS Damper, 1 GS Louver. (2) 40W x 48H farwall opening1 GS Damper, 1 GS Louver.

Test Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

Test Criteria: AC-156

Mounting Summary:

Rigid floor mount with 3/4" grade 5 bolts at 55" o.c. at perimeter framing parallel to airflow.

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
117.0	146.0	144.0	5,270	7.0	11.9	>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)
2.5	1.00	4.00	3.00	1.67	0.67

Special Seismic Certification

Unit Under Test (UUT) Description

UUT **5**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype – Large Cabinet Section 3

Construction Summary:

2" deep 14ga GS wall panels. 20ga GS, 22ga GS wall liners, .125" carbon steel treadplate floor lining. 10" deep carbon steel channel base framing. GS Door. 1.5 lb fiberglass insulation. Coils mounted in coil rack.

Options Summary:

4 Row HW/CW-130Wx60H Copper Coil, 8 fpi, 0.02" tube thickness, 0.01" Fin Thickness. 8 Row HW/CW-130Wx60H Aluminum Coil, 8 fpi, 0.02" tube thickness, 0.01" Fin Thickness. 16ga GS, SS drain pan. 16ga SS, GS casing. 18"x60" Door. 24"x60" Door. (5) 48" UV Lights. SS 125"x130" Humidifier.

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 44" o.c. at perimeter framing parallel to airflow.

Test Parameters:

Building Code: CBC 2022

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
95.0	146.0	146.0	6,850	17.4	5.9	18.2

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)
2.5	1.00	4.00	3.00	1.67	0.67

Special Seismic Certification

Unit Under Test (UUT) Description

UUT **6**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype – Large Cabinet Section 4

Construction Summary:

2" deep 16ga GS wall panels. 22ga GS, 22ga perforated GS wall liners. 16ga GS floor lining. 10" deep carbon steel channel base framing. GS Door. 1.5 lb fiberglass insulation.

Options Summary:

(2) Model 402 Direct Drive Aluminum Fans w/ 50 HP TECO/Westinghouse Motors, Carbon Steel Frame. 24"x60" Door. 100 HP Starter Panel.

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 51" o.c. at perimeter framing parallel to airflow.

Test Parameters:

Building Code: CBC 2022

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
107.0	146.0	146.0	6,900	3.4	3.1	3.0

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)
2.5	1.00	4.00	3.00	1.67	0.67

Special Seismic Certification

Unit Under Test (UUT) Description

UUT **7**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype – Large Cabinet Section 5A

Construction Summary:

2" deep 16ga GS wall panels. 20ga GS wall liners. 14ga GS floor lining. 10" deep carbon steel channel base framing. GS Door. 1.5 lb fiberglass insulation.

Options Summary:

SS 2,250,000 BTU Furnace. 24"x60" Door. 74" Vestibule.

Test Parameters:

Building Code: CBC 2022

Component Importance Factor: $I_p = 1.5$

Test Criteria: AC-156

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 52" o.c. at perimeter framing parallel to airflow.

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
111.6	146.0	144.0	6,170	3.6	10.6	9.5

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)
2.5	1.00	4.00	3.00	1.67	0.67

Special Seismic Certification

Unit Under Test (UUT) Description

UUT **8**

Manufacturer: Alliance Air Products, LLC

Model Line: Custom Air Handling Unit (AHU)

Model number: Test Prototype – Large Cabinet Section 5B

Construction Summary:

2" deep 16 ga GS wall panels. 20 ga GS wall liners. 16 ga GS floor lining. 10" deep carbon steel channel base framing. GS door. 3 lb fiberglass insulation.

Options Summary:

Model 600 direct drive aluminum fan w/ 75 HP Baldor motor, carbon steel frame. 100 HP VFD.

Mounting Summary:

Rigid floor mount with 5/8" grade 5 bolts at 57" o.c. at perimeter framing parallel to airflow.

Test Parameters:

Building Code: CBC 2022

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
120.4	146.0	144.0	8,125	2.7	2.4	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)
2.5	1.00	4.00	3.00	1.67	0.67

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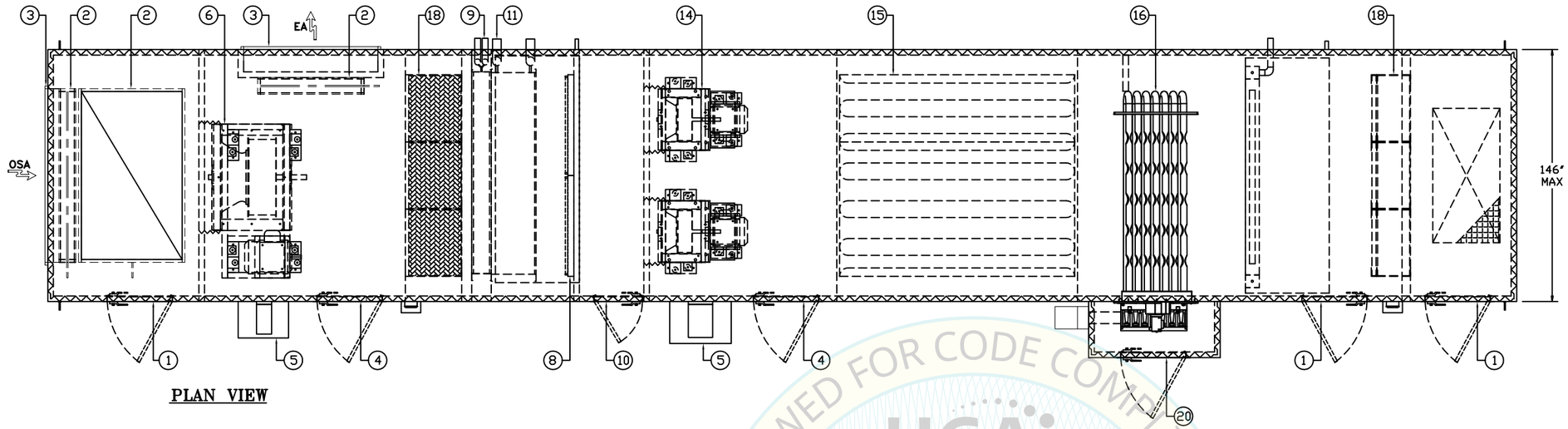

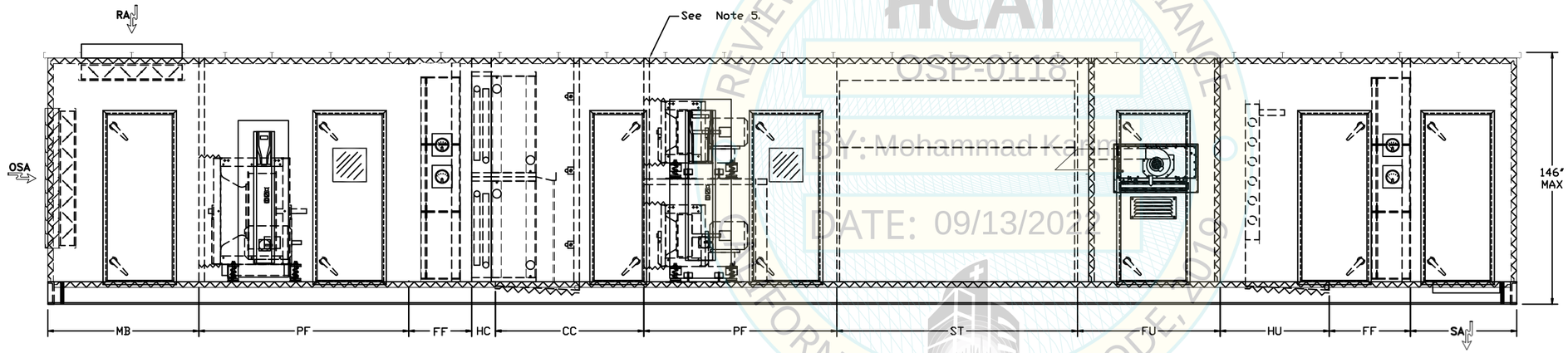

1. Access Door (See Table 4)
2. Damper (See Table 5)
3. Louver (See Table 5)
4. Access Door (See Table 4)
5. VFD & enclosure (See Table 8)
6. Fan & motor (See Table 2)
7. Louver (See Table 5)
8. UV Lights (See Table 4)
9. Heating Coil (See Table 3)
10. Access Door (See Table 4)
11. Cooling Coil (See Table 3)
12. Access Door (See Table 4)
13. Starter Panel (See Table 9)
14. Fan & motor (See Table 2)
15. Sound Traps (See Table 4)
16. Gas Furnace (See Table 7)
17. Access Door (See Table 4)
18. Filters (See Table 6)
19. Access Door (See Table 4)
20. Access Door (See Table 4)

SECTIONS :

CC = Cooling Coil
PF = Plenum Fan
ST = Sound Trap
FF = Flat Filter
FU = Furnace
HC = Heating Coil
HU = Humidifier
MB = Mixing Box

NOTES :

1. Wall insulation 2" & 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Coil rack is required for stacked coils.
4. Unit base heights 4" to 10". Base material steel, aluminum.
5. Two (2) sets of internal seismic cross bracing required @ 10'-0"o.c. max. (Typ. @ each section inlet). See Internal Cross Bracing Sheet for details.
6. Seismic cross bracing to be installed @ each side of shipping splits within AHU.
7. Shipping splits may be located at any section.

Lifting lug locations on mechanical drawing are for representation only. Actual lifting locations will vary depending enginering review.

SCHEMATIC LINE DRAWINGS FOR AIR HANDLING UNITS

Alliance AIR PRODUCTS
2285 Michael Faraday Dr. Suite 15
San Diego, CA 92154
Phone (619) 428-9688
Fax (619) 428-9689

Project Name:	OSP Inline Unit	Model:	TBD	PROJECT ENGINEER TSIEBER	
				DESIGN ENGINEER GSALGADO	
Unit Tag:	AHU-1	Qty. :	(1) ONE EACH	DATE 05-01-12	SCALE N/A / DWG UNITS N/A
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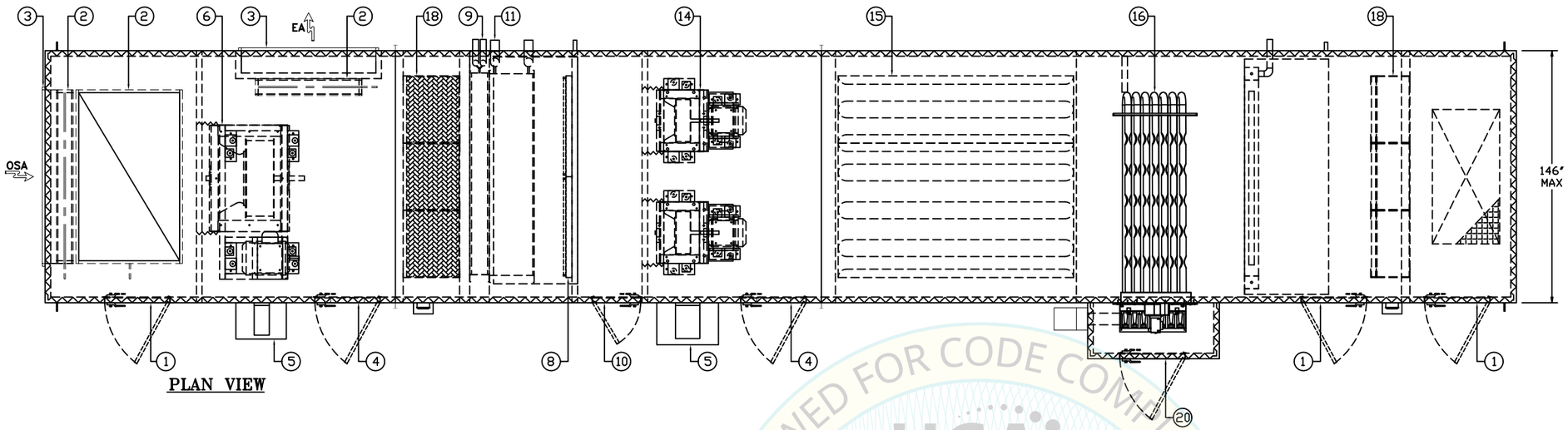
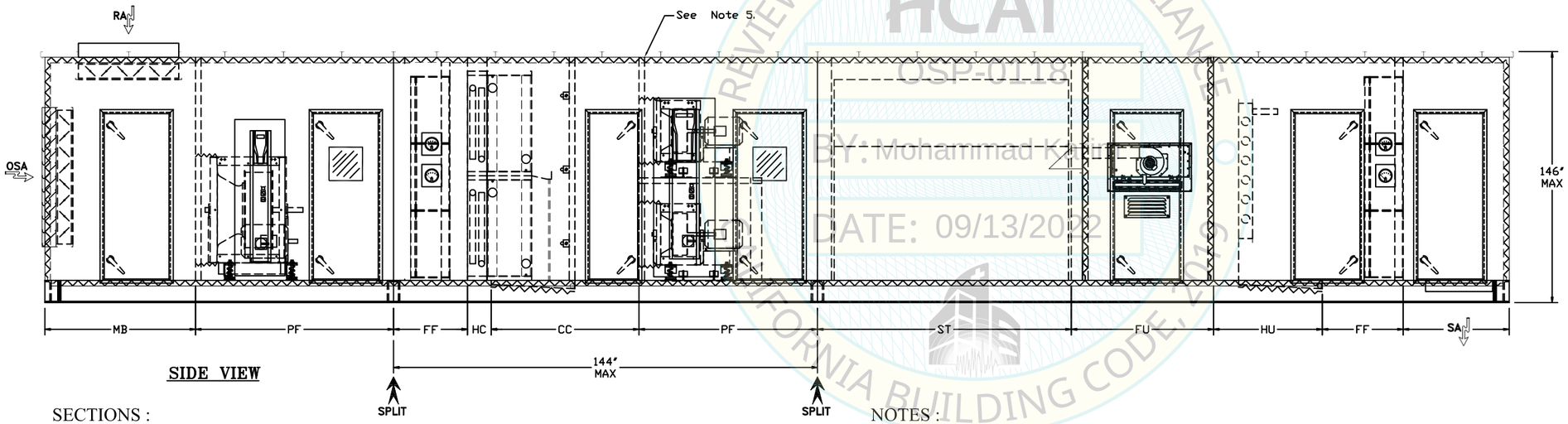


PLAN VIEW



SIDE VIEW

SECTIONS :

CC = Cooling Coil
PF = Plenum Fan
ST = Sound Trap
FF = Flat Filter
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HC = Heating Coil
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1. Access Door (See Table 4)
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3. Louver (See Table 5)
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6. Fan & motor (See Table 2)
7. Louver (See Table 5)
8. UV Lights (See Table 4)
9. Heating Coil (See Table 3)
10. Access Door (See Table 4)
11. Cooling Coil (See Table 3)
12. Access Door (See Table 4)
13. Starter Panel (See Table 9)
14. Fan & motor (See Table 2)
15. Sound Traps (See Table 4)
16. Gas Furnace (See Table 7)
17. Access Door (See Table 4)
18. Filters (See Table 6)
19. Access Door (See Table 4)
20. Access Door (See Table 4)

NOTES :

1. Wall insulation 2" & 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Coil rack is required for stacked coils.
4. Unit base heights 4" to 10". Base material steel, aluminum.
5. Two (2) sets of internal seismic cross bracing required @ 10'-0"o.c. max. (Typ. @ each section inlet). See Internal Cross Bracing Sheet for details.
6. Seismic cross bracing to be installed @ each side of shipping splits within AHU.
7. Shipping splits may be located at any section.

SCHEMATIC LINE DRAWINGS FOR AIR HANDLING UNITS

Lifting lug locations on mechanical drawing are for representation only. Actual lifting locations will vary depending enginering review.

Alliance AIR PRODUCTS
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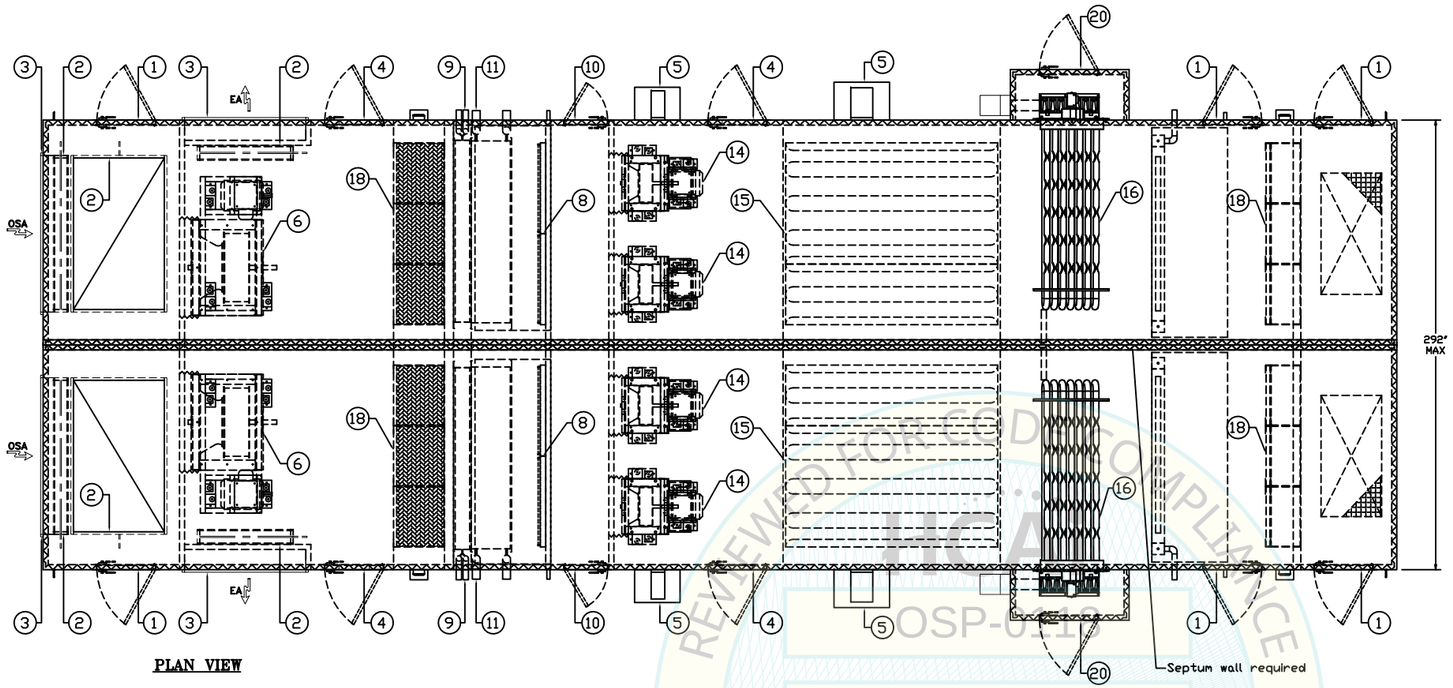
Project Name:	OSP Inline Unit w/ Splits	Model:	TBD	PROJECT ENGINEER TSIEBER	
				DESIGN ENGINEER GSALGADO	
Unit Tag:	AHU-1	Qty. :	(1) ONE EACH	DATE 05-01-12	SCALE N/A / DWG UNITS N/A
				FILE: Bid\2012\1205\1201-001\Sub...\Mech...\MD-AHU1-1205-001.dwg	

No.	DATE		DWN	APP
1	6/12/17	SEE REVISION SHEET	J.M.	L.P.



PLAN VIEW

SIDE VIEW

1. Access Door (See Table 4)
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SECTIONS :

AB = Air Blender
CC = Cooling Coil
DF = DWDI Fan
DX = DX Coil
EC = Economizer
FF = Flat Filter
FU = Furnace
HC = Heating Coil
HU = Humidifier
MB = Mixing Box

NOTES :

1. Wall insulation 2" & 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Coil rack is required for stacked coils.
4. Unit base heights 4" to 10". Base material steel, aluminum.
5. Two (2) sets of internal seismic cross bracing required @ 10'-0"o.c. max. (Typ. @ each section inlet). See Internal Cross Bracing Sheet for details.
6. Seismic cross bracing to be installed @ each side of shipping splits within AHU.
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SCHEMATIC LINE DRAWING FOR AIR HANDLING UNITS

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Unit Tag:	AHU-1	Qty. :	(1) ONE EACH	DATE 05-01-12	SCALE N/A | DWG UNITS N/A
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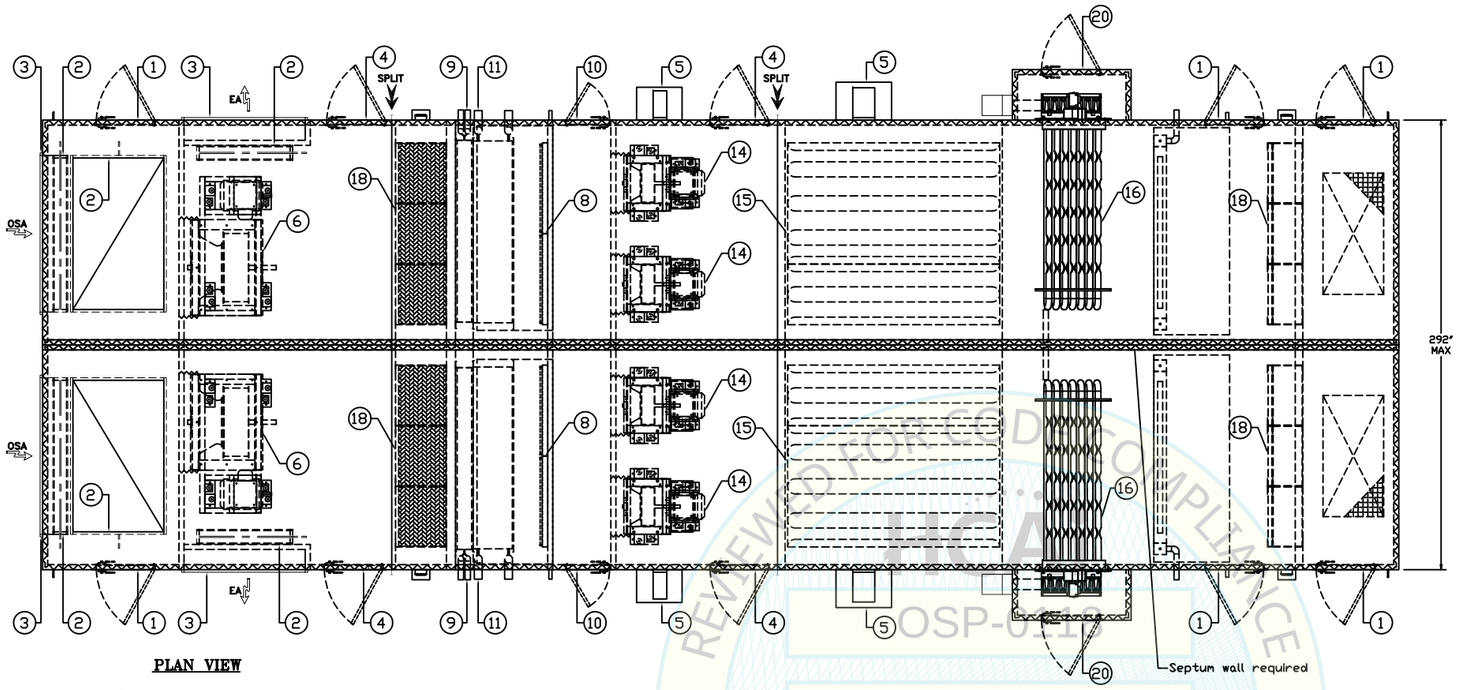
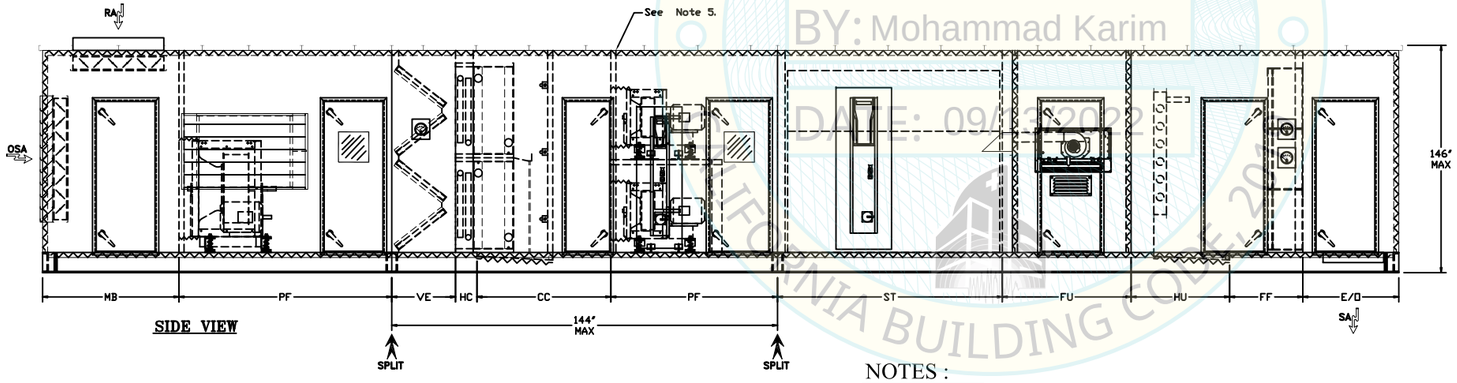
No.	DATE		DWN	APP
1	6/12/17	SEE REVISION SHEET	J.M.	L.P.



PLAN VIEW



SIDE VIEW

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CC = Cooling Coil
DF = DWDI Fan
DX = DX Coil
EC = Economizer
FF = Flat Filter
FU = Furnace
HC = Heating Coil
HU = Humidifier
MB = Mixing Box

NOTES :

1. Wall insulation 2" & 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Coil rack is required for stacked coils.
4. Unit base heights 4" to 10". Base material steel, aluminum.
5. Two (2) sets of internal seismic cross bracing required @ 10'-0"o.c. max. (Typ. @ each section inlet). See Internal Cross Bracing Sheet for details.
6. Seismic cross bracing to be installed @ each side of shipping splits within AHU.
7. Shipping splits may be located at any section.

Lifting lug locations on mechanical drawing are for representation only. Actual lifting locations will vary depending enginering review.

SCHEMATIC LINE DRAWING FOR AIR HANDLING UNITS

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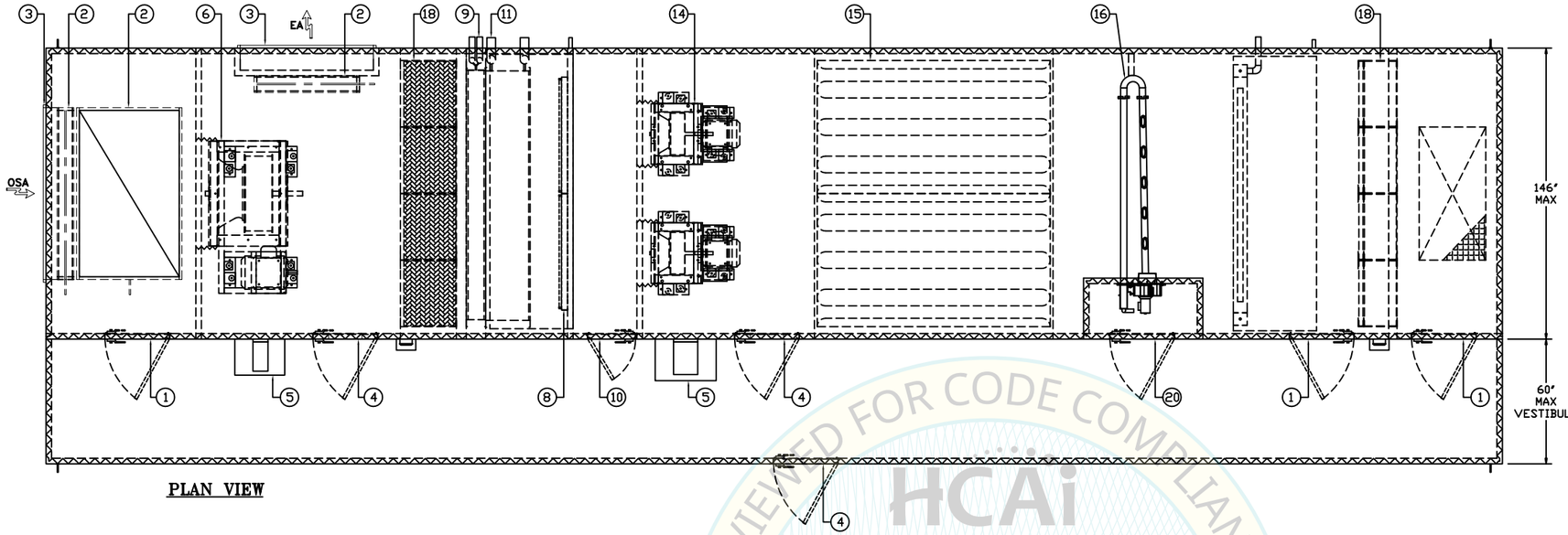
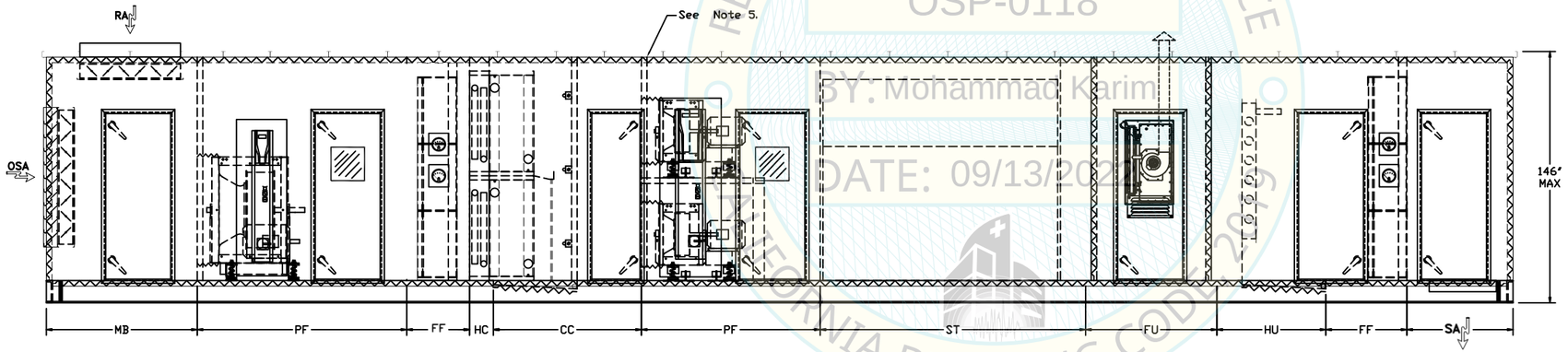
Project Name:	OSP Inline Unit w /Splits	Model:	TBD	PROJECT ENGINEER TSIEBER	
				DESIGN ENGINEER GSALGADO	
Unit Tag:	AHU-1	Qty. :	(1) ONE EACH	DATE 05-01-12	SCALE N/A | DWG UNITS N/A
				FILE: Bid\2012\1205\1201-001\Sub...\Mech...\MD-AHU1-1205-001.dwg	



PLAN VIEW



SIDE VIEW

SECTIONS :

CC = Cooling Coil
PF = Plenum Fan
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17. Access Door (See Table 4)
18. Filters (See Table 6)
19. Access Door (See Table 4)
20. Access Door (See Table 4)

NOTES :

1. Wall insulation 2" & 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Coil rack is required for stacked coils.
4. Unit base heights 4" to 10". Base material steel, aluminum.
5. Two (2) sets of internal seismic cross bracing required @ 10'-0"o.c. max. (Typ. @ each section inlet). See Internal Cross Bracing Sheet for details.
6. Seismic cross bracing to be installed @ each side of shipping splits within AHU.
7. Shipping splits may be located at any section.

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SCHEMATIC LINE DRAWINGS FOR AIR HANDLING UNITS

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2285 Michael Faraday Dr. Suite 15
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Phone (619) 428-9688
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Project Name:	OSP Inline Unit	Model:	TBD
Unit Tag:	AHU-1	Qty. :	(1) ONE EACH

PROJECT ENGINEER TSIEBER
DESIGN ENGINEER GSALGADO
DATE 05-01-12 | SCALE N/A | DWG UNITS N/A
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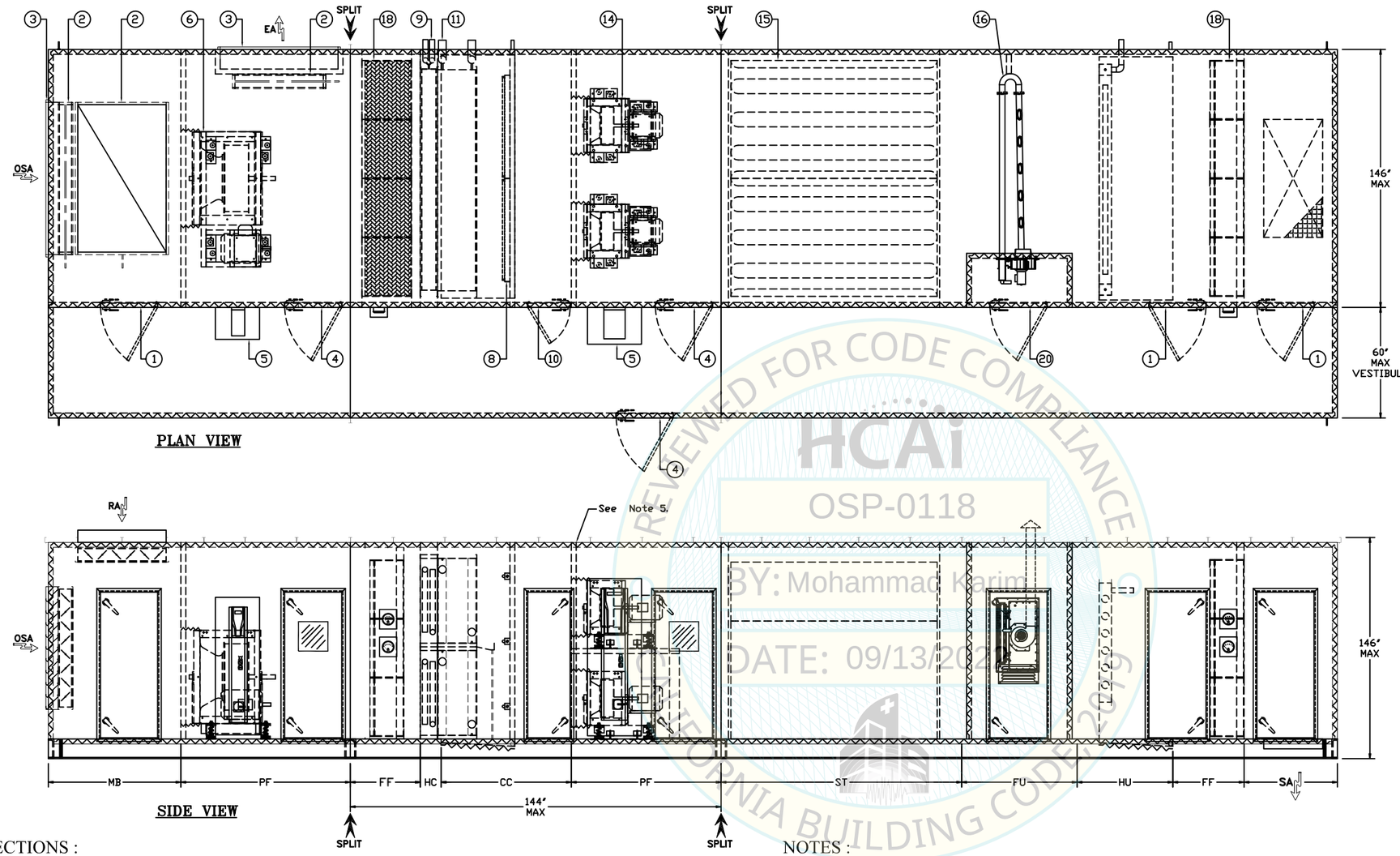

PLAN VIEW

SIDE VIEW

1. Access Door (See Table 4)
2. Damper (See Table 5)
3. Louver (See Table 5)
4. Access Door (See Table 4)
5. VFD & enclosure (See Table 8)
6. Fan & motor (See Table 2)
7. Louver (See Table 5)
8. UV Lights (See Table 4)
9. Heating Coil (See Table 3)
10. Access Door (See Table 4)
11. Cooling Coil (See Table 3)
12. Access Door (See Table 4)
13. Starter Panel (See Table 9)
14. Fan & motor (See Table 2)
15. Sound Traps (See Table 4)
16. Gas Furnace (See Table 7)
17. Access Door (See Table 4)
18. Filters (See Table 6)
19. Access Door (See Table 4)
20. Access Door (See Table 4)

SECTIONS :

CC = Cooling Coil
PF = Plenum Fan
ST = Sound Trap
FF = Flat Filter
FU = Furnace
HC = Heating Coil
HU = Humidifier
MB = Mixing Box

NOTES :

1. Wall insulation 2" & 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel, Aluminum.
3. Coil rack is required for stacked coils.
4. Unit base heights 4" to 10". Base material steel, aluminum.
5. Two (2) sets of internal seismic cross bracing required @ 10'-0"o.c. max. (Typ. @ each section inlet). See Internal Cross Bracing Sheet for details.
6. Seismic cross bracing to be installed @ each side of shipping splits within AHU.
7. Shipping splits may be located at any section.

Lifting lug locations on mechanical drawing are for representation only. Actual lifting locations will vary depending enginering review.

SCHEMATIC LINE DRAWINGS FOR AIR HANDLING UNITS

Alliance AIR PRODUCTS
2285 Michael Faraday Dr. Suite 15
San Diego, CA 92154
Phone (619) 428-9688
Fax (619) 428-9689

Project Name:	OSP Inline Unit	Model:	TBD	PROJECT ENGINEER TSIEBER	
				DESIGN ENGINEER GSALGADO	
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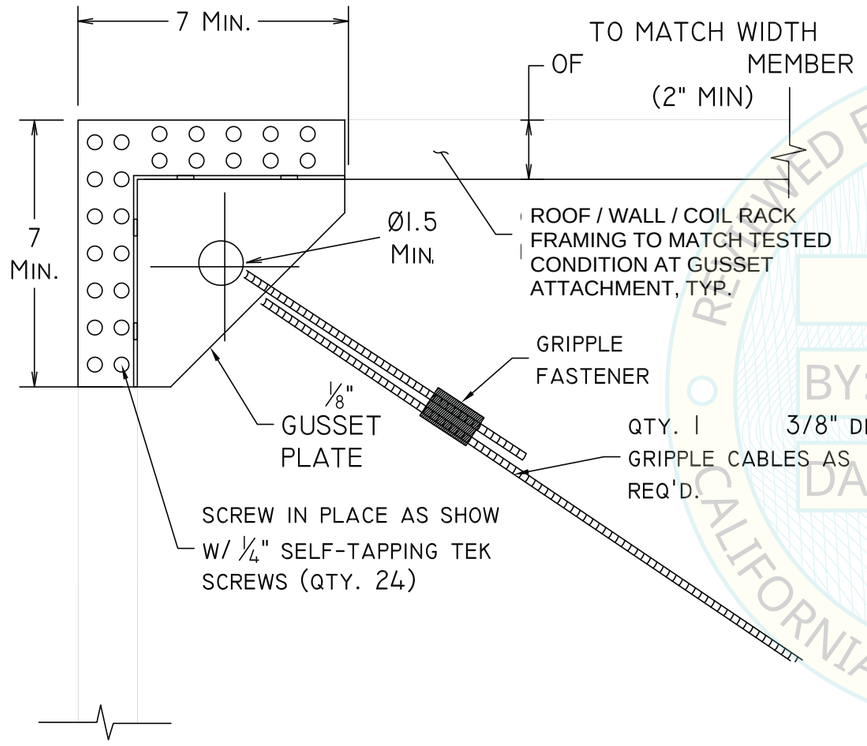
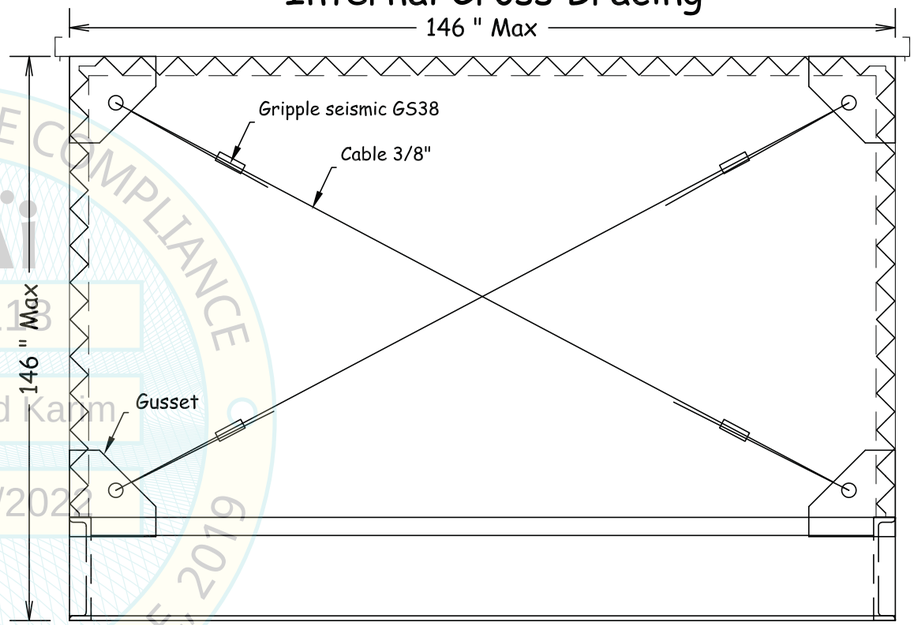
				FILE: Bid\2012\1205\1201-001\Sub...\Mech...\MD-AHU1-1205-001.dwg	



Internal Cross Bracing



Notes:
1.- Two (2) sets of X-cable braces and gussets required at a max. spacing of 10'.
2.- Seismic restraints to be installed at each side of a shipping split within the AHU.

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Project Name:	Internal Cross Bracing	PROJECT ENGINEER TSIEBER	
		DESIGN ENGINEER IMORENO	
Unit Tag:	Gusset	DATE 06-06-12	SCALE NA DWG UNITS INCHES
		FILE: \\Project\1600\16003\TEMP 1109-1662\MFG\Gusset\Gusset.dwg	