



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
OFFICE OF STATEWIDE HOSPITAL PLANNING AND DEVELOPMENT**

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

OFFICE USE ONLY

APPLICATION #: OSP-0740

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Vertiv; Energy Labs

Manufacturer's Technical Representative: Frederick Kamps

Mailing Address: Vertiv, 505 N. Cleveland Ave., Westerville, MN 43082

Telephone: (952) 220-8044 Email: frederick.q.kamps@vertiv.com

Product Information

Product Name: Energy Labs Custom Air Conditioning Units

Product Model Number(s): Energy Labs Custom Air Conditioning Units

Product Category: Air Conditioning Units

Product Sub-Category: Air Conditioning Units - Custom

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

Mounting Description: Rigid floor mounted unit with internally isolated and rigid mounted subcomponents

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

Applicant Information

Applicant Company Name: Vertiv; Energy Labs

Contact Person: Frederick Kamps

Mailing Address: 261 School Ave., Suite 400, Excelsior, MN 55331

Telephone: (952) 232-9167 Email: frederick.q.kamps@vertiv.com

Title: Staff Engineer





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

Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.

Name: LACHEZAR HANDZHIYSKI California License Number: S6515

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

Telephone: (669) 437-0200 Email: Lhandzhiyski@StructInt.com

Certification Method

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

Other (Please Specify): _____

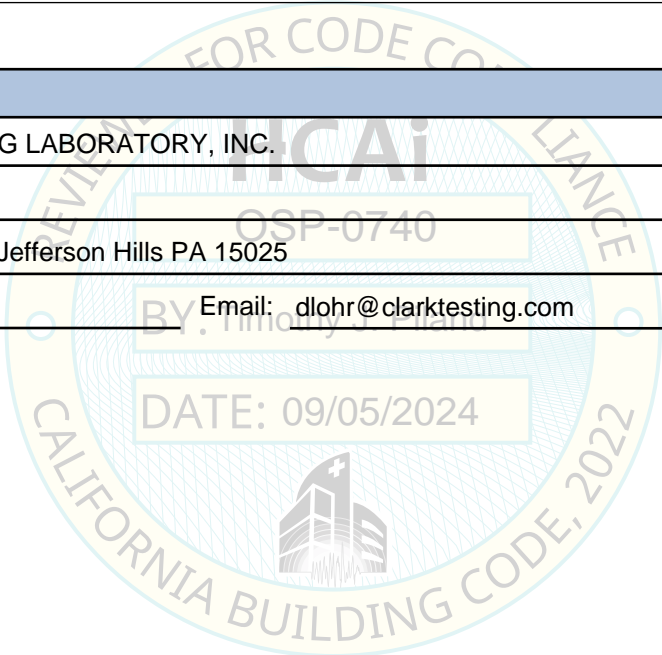
Testing Laboratory

Company Name: CLARK TESTING LABORATORY, INC.

Contact Person: Devon Lohr

Mailing Address: 1801 Route 51, Jefferson Hills PA 15025

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





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 4.34 (SDS = 1.93, z/h = 0); 1.45 (SDS = 1.93, z/h = 0)

SDS (Design spectral response acceleration at short period, g) = 1.93

a_p (Amplification factor) = 2.5 (internally isolated)

R_p (Response modification factor) = 2.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

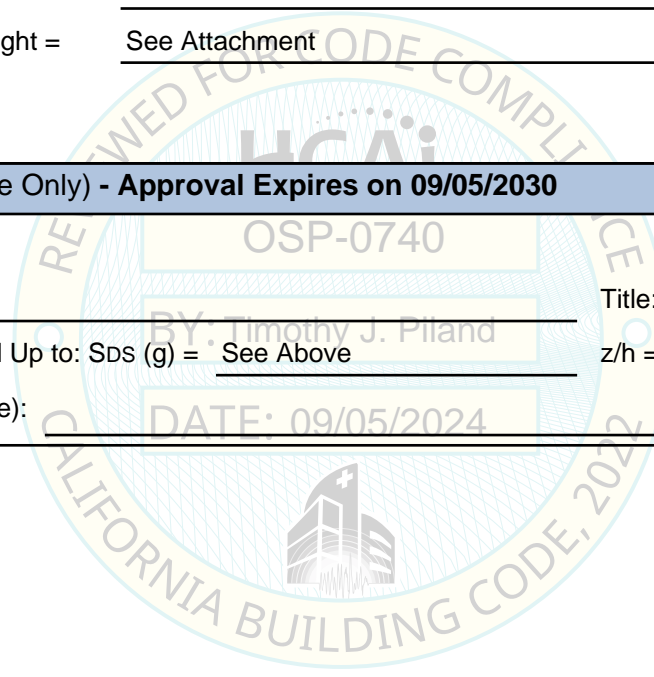
HCAI Approval (For Office Use Only) - Approval Expires on 09/05/2030

Date: 9/5/2024

Name: Timothy Piland Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = See Above z/h = See Above

Condition of Approval (if applicable): DATE: 09/05/2024



SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	TABLE 1
Model Line: Vertiv Custom Air Handling Units (AHU)	

Certified Product Construction Summary:
 Certified unit construction shall be identical to cabinet construction of UUT's. Units shall be constructed in accordance with Vertiv seismic details, including: floor to base frame connections, wall to floor panel connections, seismic bracing requirements.

Certified Options Summary:
Panel material: galvanized carbon steel or stainless steel in either 2" or 4" panel thickness; **Panel liners:** galvanized carbon steel, aluminum, stainless steel or without liner; **Access doors:** galvanized carbon steel or stainless steel up to 36" wide x 73" tall (Type S, F, FTB); materials used in each test unit are listed in the UUT summaries.

Mounting Configuration:
 Base mounted - rigid
 Note: Installed mounting must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT ²	
		Depth	Width	Height				
Custom Air Handling Units	4 walls	No Limit	40.0	33.0	-	Lower Range, <88.5 psf	Extrap.	
		...	...	...	...		Extrap.
		96.0	96.0	102.0	4,600	UUT: 71.9 psf	1	
		144.0	96.0	144.0	8,500	UUT: 88.5 psf	2a	
		144.0	144.0	144.0	12,000	UUT: 83.3 psf	3a	
		144.0	147.0	144.0	9,760	UUT: 66.4 psf	4	
		...	...	...	...		Extrap.
		No Limit	147.0	144.0	-	Upper Range, <88.5 psf	Extrap.	
		3 walls (Inlet, Outlet, or Sidewall Removed)	No Limit	40.0	33.0	-	Lower Range, <50.4 psf	Extrap.
				Extrap.
	144.0		96.0	144.0	4,837	UUT: 50.4 psf	2b	
	...		...	...	...		Extrap.
	No Limit		144.0	144.0	-	Upper Range, <50.4 psf	Extrap.	
	2 walls (Inlet and Outlet Wall Removed)	No Limit	40.0	33.0	-	Lower Range, <72.6 psf	Extrap.	
		...	...	...	...		Extrap.
		144.0	96.0	144.0	4,154	UUT: 43.3 psf,	2c	
		144.0	144.0	144.0	10,461	UUT: 72.6 psf,	3b	
		...	...	...	...		Extrap.
			No Limit	144.0	144.0	-	Upper Range, <72.6 psf	Extrap.

Notes:
 1. For bracing requirements, see OSHPD Brace Detail sheet in line drawings at end of OSP
 2. UUT2 and UUT3 were tested in multiple configurations (a, b, c, etc.) as shown in Table 1 and the UUT summaries. Tested subcomponents listed in the following tables were tested in all configurations unless otherwise noted.

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	TABLE 1
Model Line: Vertiv Custom Air Handling Units (AHU)	

Certified Product Construction Summary:
 Certified unit construction shall be identical to cabinet construction of UUT's. Units shall be constructed in accordance with Vertiv seismic details, including: floor to base frame connections, wall to floor panel connections, seismic bracing requirements.

Certified Options Summary:
Panel material: galvanized carbon steel or stainless steel in either 2" or 4" panel thickness; **Panel liners:** galvanized carbon steel, aluminum, stainless steel or without liner; **Access doors:** galvanized carbon steel or stainless steel up to 36" wide x 73" tall (Type S, F, FTB); materials used in each test unit are listed in the UUT summaries.

Mounting Configuration:
 Base mounted - rigid
 Note: Installed mounting must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line	Model	Dimensions (in)			Weight (lbs.)	Notes	UUT ²
		Depth	Width	Height			
Custom Air Handling Units	1 wall (Inlet, Outlet, and Sidewall Removed)	No Limit	40.0	33.0	-	Lower Range, <67.4 psf	Extrap.
			Extrap.
		144.0	144.0	144.0	9,707	UUT: 67.4 psf	3c
			Extrap.
	0 walls (All Walls Removed)	No Limit	144.0	144.0	-	Upper Range, <67.4 psf	Extrap.
		No Limit	40.0	33.0	-	Lower Range, <62.2 psf	Extrap.
			Extrap.
		144.0	144.0	144.0	8,954	UUT: 62.2 psf	3d
			Extrap.
		No Limit	144.0	144.0	-	Upper Range, <62.2 psf	Extrap.

Notes:
 1. For bracing requirements, see Brace Detail sheets in line drawings at end of OSP
 2. UUT2 and UUT3 were tested in multiple configurations (a, b, c, etc.) as shown in Table 1 and the UUT summaries.
 Subcomponents listed in the following tables were tested in all configurations unless otherwise noted.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Dampers and Louvers	TABLE 2
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
Outside Air Louver (Vertiv)	OA Louver	5.0	12.0	10.0	9	Galvanized Carbon Steel		2
		...	...	...	...		Interp.	
		5.0	72.0	120.0	297		2	
Control Damper (Vertiv)	Low Leak Damper	6.0	12.0	7.0	10	Galvanized Carbon Steel Frame, Aluminum Blade		1
		...	...	...	...		Interp.	
		6.0	52.0	63.0	107		2	
Acoustical Louver (Vibro-Acoustics)	ALA-MV / ALA-HV	6.0	12.0	30.0	36	Galvanized Carbon Steel or Stainless Steel	<i>UUT: galv. carbon steel</i>	4
		...	...	...	...		Interp.	
		6.0	30.0	120.0	210		<i>UUT: galv. carbon steel</i>	4
		12.0	12.0	30.0	72		<i>UUT: stainless steel</i>	4
Damper w/ Ebtron AIR-IQ Flow Measuring System ¹ (Tamco)	AIR-IQ	18.0	12.0	12.0	14	Galvanized Carbon Steel or Stainless Steel	<i>UUT: stainless steel</i>	4
		...	...	...	...		Interp.	
		18.0	60.0	60.0	185		<i>UUT: galv. carbon steel</i>	4

Notes:
1. Gold and hybrid series probes and transmitters.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Chilled Water, Hot Water, and Steam	TABLE 3
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line (Manufacturer)	Model ¹	Dimension (in) ²			Weight (lbs.) ²	Material	Notes	UUT
		Rows	Width	Height				
Water Coils and Steam Coils ¹ (Vertiv)	5WC, 5WH, 5S (Seismic Coil Rack) 1-4 rows	1	24.0	24.0	67	Copper Tubes; Aluminum or Copper Fins; Galvanized Carbon Steel Casing	<i>0.625" φ tube, 1 row, 0.008" Al or 0.008" Cu fins, 10 FPI or less</i>	Extrap.
		...	...	...	...		Extrap.	
		4	130.0	40.5	442		<i>0.625" φ tube, 4 rows, 0.008" Al fins, 8 FPI, 16 Ga. carbon steel casing, in 3 high stack, QTY2</i>	3
		4	130.0	40.5	795		<i>0.625" φ tube, 4 rows, 0.008" Cu fins, 8 FPI, 16 Ga. carbon steel casing, in 3 high stack, QTY1</i>	3
		...	...	...	...		Extrap.	
		4 ³	130.0 ³	121.5 ³	1,679 ³		<i>0.625" φ tube, 4 row or less, 0.008" Al or 0.008" Cu fins, 10 FPI or less</i>	Extrap. ³

Notes:

1. Steam coils construction is identical to the water coil construction (heating and cooling).
2. Weights and dimensions listed represent individual coils except where noted.
3. Max. tested weight and dimensions of total coil stack shown in this row. Combination of coil size, stacking, tube, fin, and row options cannot exceed maximum certified dimensions and weight for total coil stack.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Chilled Water, Hot Water, and Steam	TABLE 3
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line (Manufacturer)	Model ¹	Dimension (in) ²			Weight (lbs.) ²	Material	Notes	UUT
		Rows	Width	Height				
Water Coils and Steam Coils ¹ (Vertiv)	5WC, 5WH, 5S (Seismic Coil Bracing, No Coil Rack) 1 - 10 Rows	1	24.0	24.0	67	Copper Tubes; Aluminum or Copper Fins; Galvanized Carbon Steel Casing	<i>0.625" φ tube, 1 row, 0.008" Al or 0.008" Cu fins, 10 FPI</i>	Extrap.
		...	...	...	...		Extrap.	
		2	129.0	63.0	1,200		<i>0.625" φ tube, 2 rows, 0.008" Cu fins, 10 FPI, 16 Ga. carbon steel casing, stacked 2 high, QTY 2</i>	4
		...	...	...	...		Interp.	
		10	24.0	24.0	176		<i>0.625" φ tube, 10 rows, 0.008" Al fins, 10 FPI, 16 Ga. carbon steel casing, stacked 2 high</i>	1
		10	24.0	24.0	297		<i>0.625" φ tube, 10 rows, 0.008" Cu fins, 10 FPI, 16 Ga. carbon steel casing, stacked 2 high</i>	1
		...	...	...	...		Extrap.	
		10 ³	129.0 ³	126.0 ³	2,400 ³		<i>0.625" φ tube, 10 row or less, 0.008" Al or 0.008" Cu fins, 10 FPI or less</i>	Extrap. ³

Notes:

1. Steam coils construction is identical to the water coil construction (heating and cooling).
2. Weights and dimensions listed represent individual coils except where noted.
3. Max. tested weight and dimensions of total coil stack shown in this row. Combination of coil size, stacking, tube, fin, and row options cannot exceed maximum certified dimensions and weight for total coil stack.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Horizontal Fans (Belt Drive)	TABLE 4.1
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
Plenum Fans (Vertiv)	135	27.3	37.0	25.0	422	Painted Carbon Steel Fan Frame; Carbon Steel Sheet Metal Housing; Aluminum Wheel	UUT2: 1hp, 230-460/60/3	2
	150	29.0	38.0	27.8	496		Interp.	
	165	32.4	51.0	30.0	679		Interp.	
	182	33.3	52.0	33.0	865		Interp.	
	200	34.5	55.0	36.0	933		Interp.	
	222	36.5	58.5	39.8	1,180		Interp.	
	245	38.4	60.5	42.8	1,311		Interp.	
	270	40.6	63.5	47.3	1,407		Interp.	
	300	44.1	68.0	51.0	1,800		UUT9: 30hp, 230-460/60/3	9
	330	49.3	72.0	53.5	1,746		Interp.	
	365	51.3	75.0	57.5	2,415		Interp.	
	402	55.9	80.0	64.0	2,732		Interp.	
	445	59.1	88.5	68.0	2,866		Interp.	
	490	62.9	97.0	74.0	3,411		Interp.	
	542	68.6	103.0	79.5	4,329		Interp.	
600	73.3	109.0	87.0	6,000	UUT7: 100hp, 230-460/60/3	7		

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Horizontal Fans (Direct Drive)	TABLE 4.2
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
Plenum Fans (Vertiv)	135	26.9	22.0	27.0	410	Painted Carbon Steel Fan Frame; Carbon Steel Sheet Metal Housing; Aluminum Wheel	<i>UUT3: 1hp, 230-460/60/3</i>	3
	150	28.3	23.0	28.9	515		Interp.	
	165	29.0	25.0	31.3	642		Interp.	
	182	30.5	26.0	32.3	887		Interp.	
	200	34.0	29.0	34.9	949		Interp.	
	222	39.5	32.5	37.4	1,171		Interp.	
	245	41.0	34.5	40.4	1,334		Interp.	
	270	43.5	37.5	43.5	1,498		Interp.	
	300	45.5	42.0	48.0	1,479		Interp.	
	330	52.0	46.0	52.3	1,741		Interp.	
	365	51.0	49.0	56.5	1,880		Interp.	
	402	57.5	54.0	61.3	2,010		Interp.	
	445	64.5	58.5	65.3	2,112		Interp.	
	490	67.5	63.0	71.3	3,400		<i>UUT5: 100hp, 230-460/60/3</i>	5

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Vertical Inlet Down Fans (Belt Drive)	TABLE 4.3
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022 **Seismic Certification Limits:** $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
Plenum Fans (Vertiv)	135	30.5	29.0	29.0	414	Painted Carbon Steel Fan Frame; Carbon Steel Sheet Metal Housing; Aluminum Wheel	UUT3: 1hp, 230-460/60/3	3
	150	33.3	30.0	30.0	471		Interp.	
	165	36.5	32.0	32.0	577		Interp.	
	182	37.5	33.0	33.0	773		Interp.	
	200	40.5	36.0	36.0	841		Interp.	
	222	44.3	39.5	39.5	1,066		Interp.	
	245	48.3	41.5	41.5	1,213		Interp.	
	270	51.8	44.5	44.5	1,256		Interp.	
	300	55.5	49.0	49.0	1,096		Interp.	
	330	61.5	56.0	49.4	1,831		Interp.	
	365	65.5	59.0	51.9	1,897		Interp.	
	402	73.0	64.0	56.1	2,152		Interp.	
	445	77.0	68.5	59.3	2,251		Interp.	
	490	84.0	73.0	63.0	2,449		Interp.	
	542	89.5	79.0	67.8	3,268		Interp.	
600	99.0	85.0	73.4	4,400	UUT8: 50hp, 230-460/60/3	8		

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Vertical Inlet Down Fans (Direct Drive)	TABLE 4.4
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022	Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$	$I_p = 1.5$
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Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
Plenum Fans (Vertiv)	135	30.5	29.0	26.0	450	Painted Carbon Steel Fan Frame; Carbon Steel Sheet Metal Housing; Aluminum Wheel	UUT3: 1hp; UUT12: 2hp; 230-460/60/3	3, 12
	150	33.3	30.0	27.0	471		Interp.	
	165	36.5	32.0	30.3	577		Interp.	
	182	37.5	33.0	31.5	773		Interp.	
	200	40.5	36.0	33.1	841		Interp.	
	222	44.3	39.5	34.6	1,066		Interp.	
	245	48.3	41.5	37.2	1,213		Interp.	
	270	51.8	44.5	39.6	1,256		Interp.	
	300	55.5	49.0	42.3	1,096		Interp.	
	330	61.5	56.0	49.4	1,586		Interp.	
	365	65.5	59.0	51.9	1,652		Interp.	
	402	73.0	64.0	56.1	1,907		Interp.	
	445	77.0	68.5	59.3	2,006		Interp.	
	490	84.0	73.0	63.0	3,000		UUT6: 40hp, 230-460/60/3	6
	542	89.5	79.0	67.8	3,023		Interp.	
	600	99.0	85.0	73.8	3,400		UUT13: 150 hp, 230-460/60/3	13

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Controls	TABLE 5.2
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022	Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$	$I_p = 1.5$
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Component Type	Manufacturer	Model	Description	Notes	UUT
Transformer	Schneider Electric	500VA			19
		...		Interp.	
		3,000VA		19	
	Cutler Hammer	24V 96VA		19	
		...		Interp.	
		24V 500VA		19	
Disconnect Block	Schneider Electric	100A		19	
		...		Interp.	
		1000A		19	
Motor Starter	Schneider Electric	2.5A		Mounted in galvanized carbon steel Vertiv cabinets	19
		...			Interp.
		220A			19
Circuit Breaker	Schneider Electric	2A	19		
		...	Interp.		
		8A	19		
Position Switch	Schneider Electric	2-Position	19		
		3-Position	19		
Indicator Light	Sprecher & Schuh	DP7p, D7-N5W, D7-ALP		19	
Fuses	Littlefuse	1A		19	
		...	Interp.		
		200A	19		

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv Table Description: Miscellaneous Active Controls							TABLE 5.4	
Model Line: Vertiv Custom Air Handling Units (AHU)								
Building Code: CBC 2022		Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$ $I_p = 1.5$						
Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
UV Light (UVDI - Fixture/Bulb)	18" Fixture/Bulb	2.5	18.0	3.5	7	N/A		4
	24" Fixture/Bulb	2.5	24.0	3.5	10			4
	36" Fixture/Bulb	2.5	36.0	3.5	12			4
UV Light Frame (Vertiv)	Smallest Frame	3.0	12.0	12.0	37	Galvanized Carbon Steel	60" max between vertical supports	4
	...	...	...	...	...			Interp.
	Largest Frame	3.0	576.0	133.0	45			4
Desiccant Dehumidification Cassette (PPSC) (Rotor Source, Inc.)	550mm Wheel	9.5	26.0	26.0	45	Galvanized Carbon Steel or Stainless Steel	UUT: carbon steel	4
	...	...	...	...	...		Interp.	
	1730mm Wheel	13.5	76.1	76.1	795		UUT: stainless steel	4
Probe (Ebtron)	12"	1.2	12.0	1.2	2	Aluminum or Stainless Steel	Duct, Plenum, Fan inlet; UUT4 included aluminum and stainless steel versions	4
	...	...	...	...	...			Interp.
	13"	2.0	1.3	10.0	2			12
	13"	1.8	1.3	6.5	2			12
	64"	1.8	1.3	48.0	4			13
	...	...	...	...	...			Interp.
	120"	1.1	120.0	1.1	4			4
Bleed Airflow (Ebtron)	EF-X2000-B	3.8	2.7	1.0	1	N/A		4
Airflow Transmitter (Ebtron)	Gold Transmitter	2.5	6.7	9.3	2.2	N/A		4
	Hybrid Transmitter	2.0	5.8	6.5	1.2			4

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	Table Description: Miscellaneous Non-Active Controls	TABLE 6
Model Line: Vertiv Custom Air Handling Units (AHU)		

Building Code: CBC 2022	Seismic Certification Limits: $S_{DS} = 1.93 g$ $z/h = 1.0$	$I_p = 1.5$
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Model Line (Manufacturer)	Model	Dimension (in)			Weight (lbs.)	Material	Notes	UUT
		Depth	Width	Height				
Sound Attenuator (Vertiv)	Rectangular Silencers	36.0	6.0	26.0	65	Galvanized Carbon Steel or Stainless Steel	<i>Optional wrapped insulation; Individual module dim's listed</i>	Extrap.
		...	...	...	...			Extrap.
		36.0	6.0	136.0	269			2
		...	...	...	...			Interp.
Filter Rack ¹ (Vertiv)	Flat Type 8 Flat HEPA	3.0	24.0	12.0	6	Flat Type 8 HEPA Flat	<i>Various Filter Efficiencies</i>	3
		...	...	...	...			Extrap.
		3.0	36.0	72.0	92			1
		3.0	50.0	50.0	356			1
Filter Rack ¹ (Vertiv)	Vee Type 8	22.0	72.0	84.0	151		<i>Various Filter Efficiencies</i>	2
Humidifier Grid (DriSteem)	Ultra-Sorb LV	4.0	15.0	21.0	48			2
		...	...	...	...			Interp.
		4.0	135.0	125.0	315			3

Notes:
1. Filter racks wider than tested are permitted if multiple filter rack modules are installed side by side. Each module must be within listed weight and dimensions. Each module must use its own supports and attachments, matching the tested supports and attachments.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498



Manufacturer: Vertiv Model Line: Vertiv Custom Air Handling Units (AHU)								
UUT	Unit Description (mounting)	Report Number (UUT#)	Testing Lab	Year Tested	ISO 17025 Accredited?	S _{DS}	z/h	I _p
1	Air Handling Cabinet (base mounted - rigid)	EL:9224 (OSHPD Unit 1)	Clark Testing	2010	No	1.93	1.0	1.5
2a	Air Handling Cabinet: (4 Walls in Place) (base mounted - rigid)	EL:9225 (OSHPD Unit 2)	Clark Testing	2010	No	1.93	1.0	1.5
2b	Air Handling Cabinet: (3 Walls in Place) (base mounted - rigid)	EL:9225 (OSHPD Unit 2 - 1 wall removed)	Clark Testing	2010	No	1.93	1.0	1.5
2b	Air Handling Cabinet: (2 Walls in Place) (base mounted - rigid)	EL:9225 (OSHPD Unit 2 - 2 walls removed)	Clark Testing	2010	No	1.93	1.0	1.5
3a	Air Handling Cabinet: (4 Walls in Place) (base mounted - rigid)	EL:9237 (OSHPD Unit 3)	Clark Testing	2010	No	1.93	1.0	1.5
3b	Air Handling Cabinet: (2 Walls in Place) (base mounted - rigid)	EL:9237 (OSHPD Unit 3 - 2 walls removed)	Clark Testing	2010	No	1.93	1.0	1.5
3c	Air Handling Cabinet: (1 Wall in Place) (base mounted - rigid)	EL:9237 (OSHPD Unit 3 - 3 walls removed)	Clark Testing	2010	No	1.93	1.0	1.5
3d	Air Handling Cabinet: (0 Walls in Place) (base mounted - rigid)	EL:9237 (OSHPD Unit 3 - 4 walls removed)	Clark Testing	2010	No	1.93	1.0	1.5
4	Air Handling Cabinet (base mounted - rigid)	2010-0133-TR-001 (UUT1)	Clark Testing	2011	No	1.93	1.0	1.5
5	Size 490 Plenum Fan (100hp) (base mounted - isolated)	EL:8901 (Horizontal DD 4545 AH-1-2)	Clark Testing	2009	No	1.93	1.0	1.5
6	Size 490 Plenum Fan (40hp) (base mounted - isolated)	EL:8901 (Vertical DD 4545 AH-4)	Clark Testing	2009	No	1.93	1.0	1.5

Notes:
 1. Clark Testing was not ISO 17025 accredited at the time of testing but has been reviewed by TRU Compliance and found to meet the requirements for ICC-ES AC156 testing. Review form is on file with TRU Compliance.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	UUT 1
Model Line: Vertiv Custom Air Handling Units (AHU)	
Model Number: Air Handling Cabinet	
Serial Number: N/A	
Test Report: EL: 9224 (OSHPD Unit 1)	

UUT Properties							
Weight (lbs.)	psf	Dimension (in)			Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Front-Back	Side-Side	Vertical
4,600	71.9	96.0	96.0	102.0	9.0	8.9	13.3

UUT Highest Passed Seismic Run Information									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2022	ICC-ES AC156 (2010)	1.93	1.0	1.5	3.09	2.32	1.29	0.52	

Product Construction Summary: **Test Mounting Details:**

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



Options/Subcomponent Summary:		
Description	Mfr.	Part Number
Coils	Vertiv	Al: 5WH-1010 Cu: 5WH-1010
Control Damper	Vertiv	EL Damper 6Dx12Wx7H
Filter Rack (36"Wx72"H)	Vertiv	Flat Type 8
Filter Rack (50"Wx50"H)	Vertiv	HEPA
Furnace: Vertical Tube	Beckett Furnace	HMA 200
Plenum Fans: QuadraFan Array Horizontal (DD)	Vertiv	165 (x2)
VFD	Square D	Altivar 21 ATV 2HP

UUT1 was base mounted - rigid using four (4) 3/4"-10 Grade 5 hex head bolts with nuts, flat washers and lock washers. Torqued to 250 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

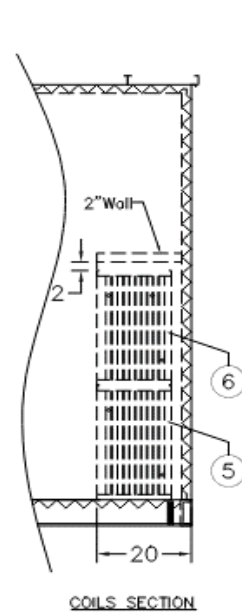
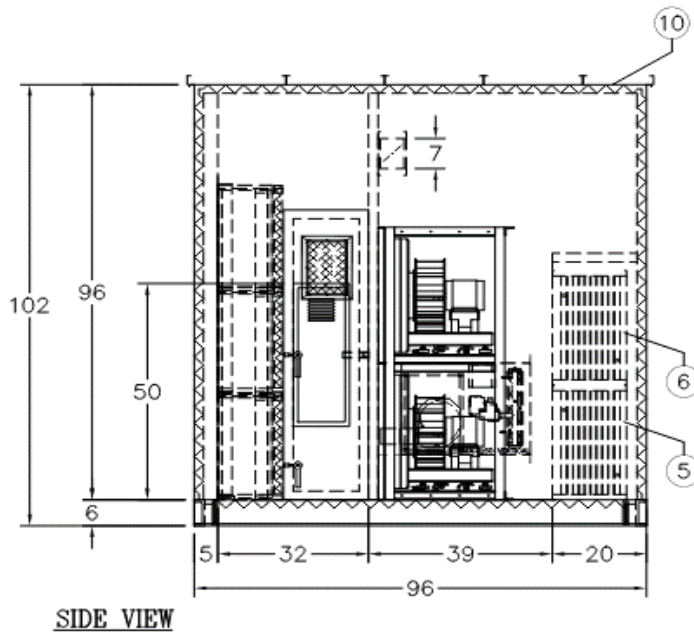
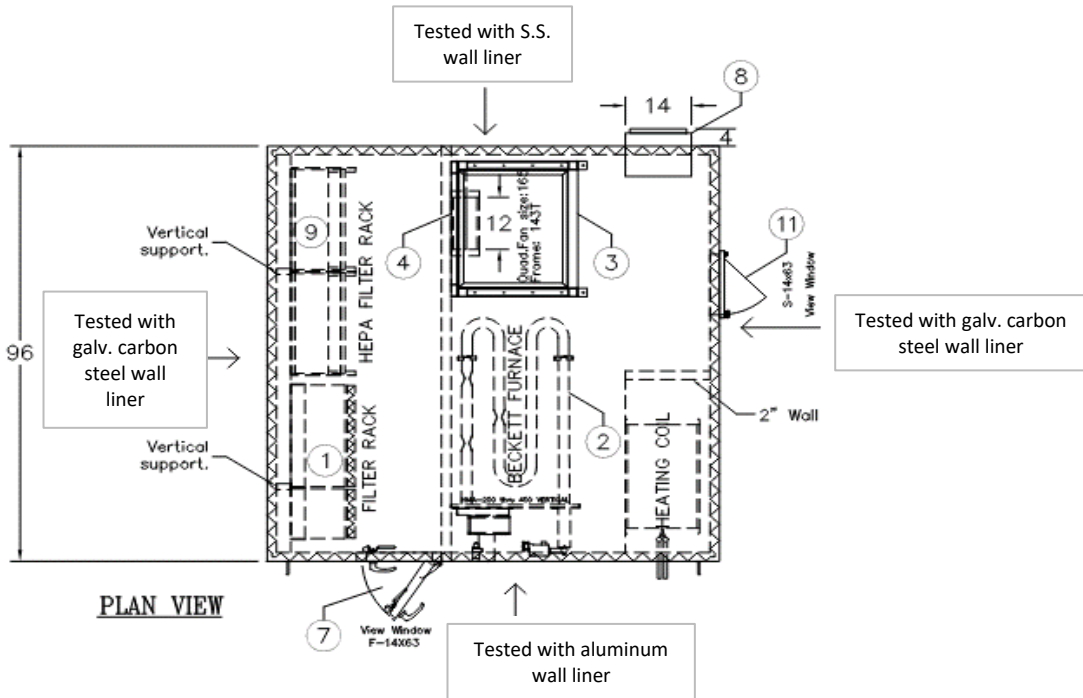


UUT 1

Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet
Serial Number: N/A

Test Report: EL: 9224 (OSHPD Unit 1)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

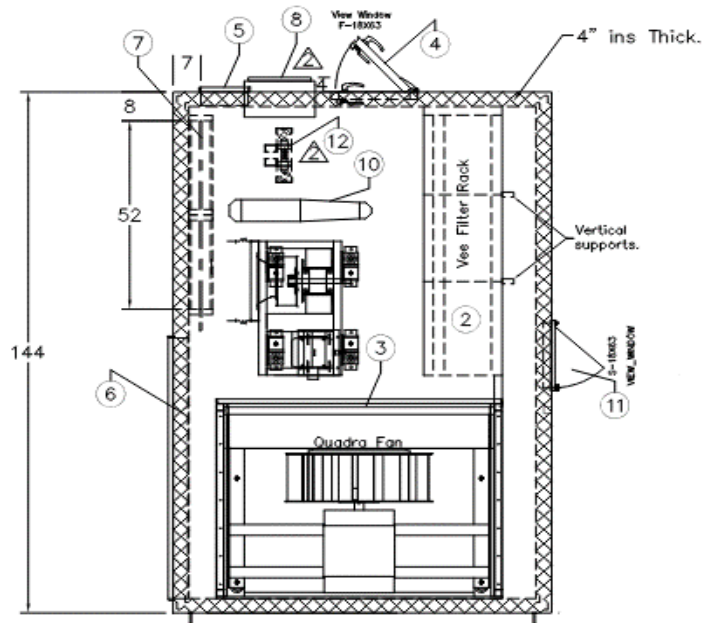


UUT 2a

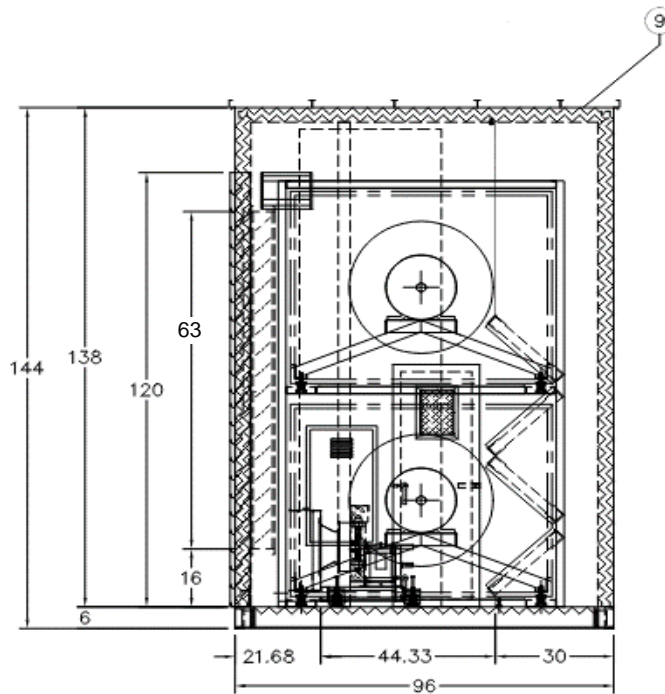
Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (4 Walls in Place)
Serial Number: N/A

Test Report: EL: 9225 (OSHDP Unit 2)

Unit Drawings:



PLAN VIEW



SIDE VIEW

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

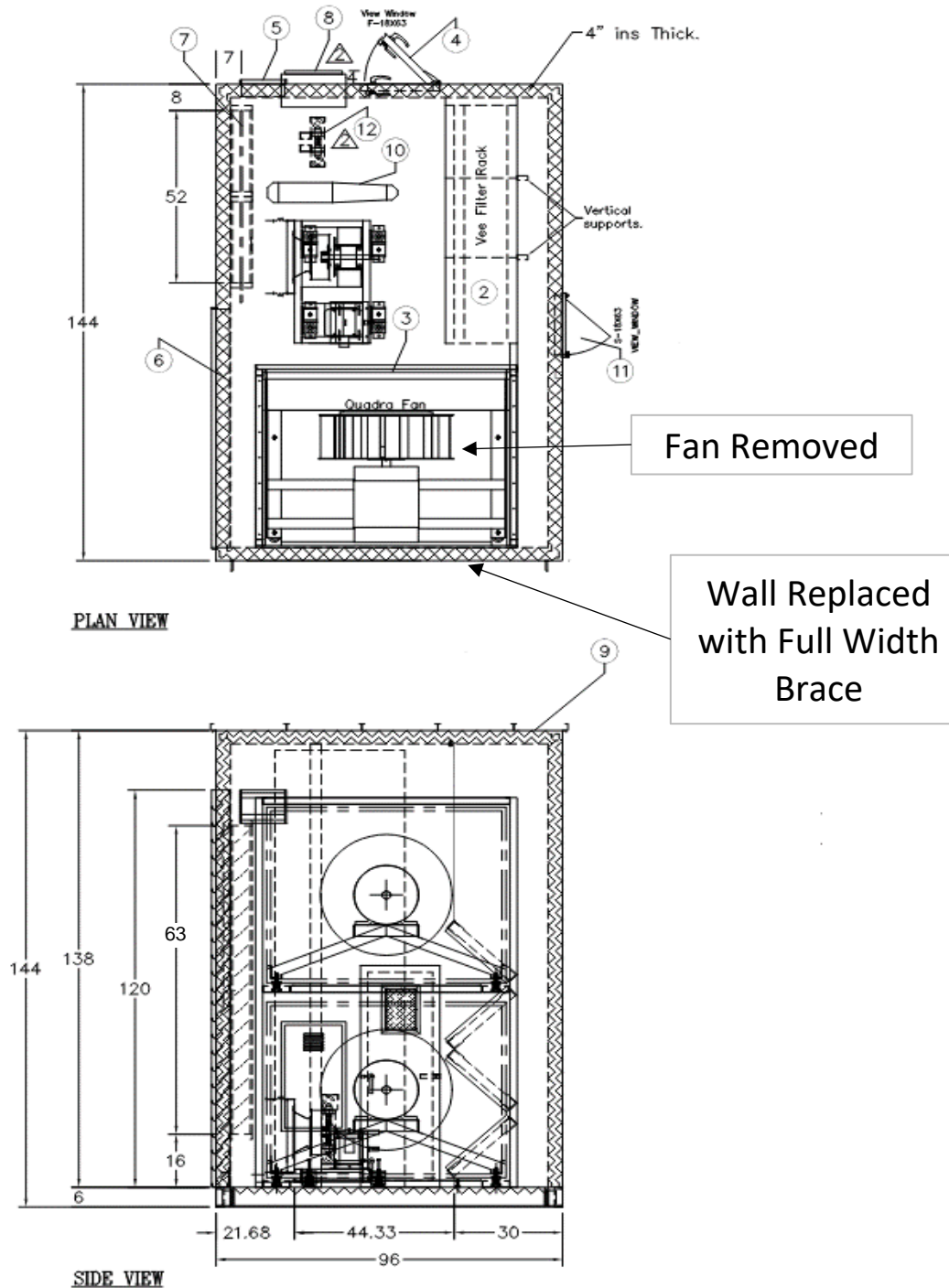


UUT 2b

Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (3 Walls in Place)
Serial Number: N/A

Test Report: EL: 9225 (OSHPD Unit 2 - 1 wall removed)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

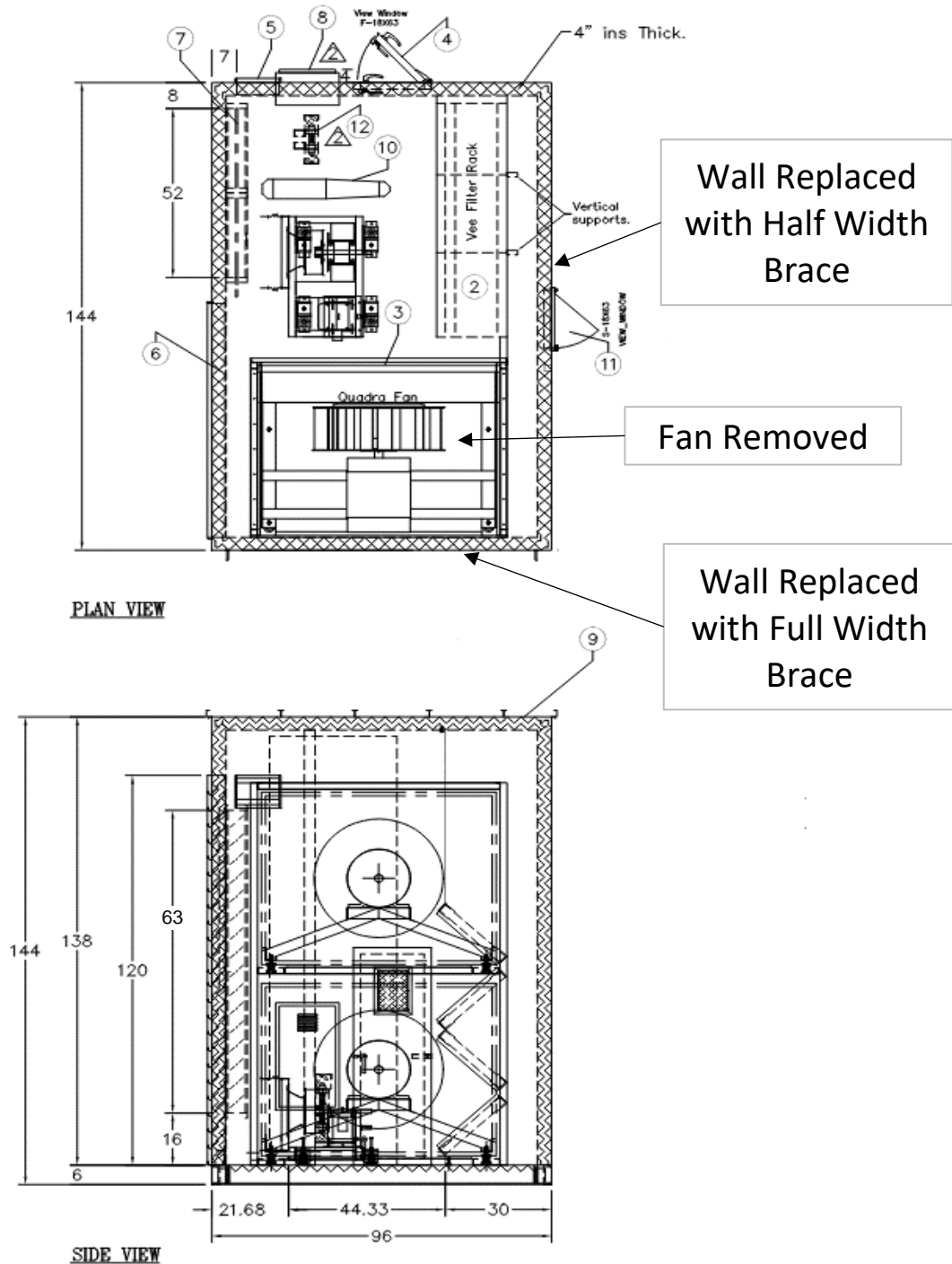


Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (2 Walls in Place)
Serial Number: N/A

UUT 2c

Test Report: EL: 9225 (OSHDP Unit 2 - 2 walls removed)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET


TRU PROJECT NO. 2300498



Manufacturer:	Vertiv	UUT 3a
Model Line:	Vertiv Custom Air Handling Units (AHU)	
Model Number:	Air Handling Cabinet: (4 Walls in Place)	
Serial Number:	N/A	
Test Report: EL: 9225 (OSHPD Unit 3)		

UUT Properties							
Weight (lbs.)	psf	Dimension (in)			Lowest Natural Frequency (Hz)		
		Depth	Width	Height	Front-Back	Side-Side	Vertical
12,000	83.3	144.0	144.0	144.0	1.7	2.3	3.3

UUT Highest Passed Seismic Run Information									
Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)	
CBC 2022	ICC-ES AC156 (2010)	1.93	1.0	1.5	3.09	2.32	1.29	0.52	

Product Construction Summary:	Test Mounting Details:
<p>Panel Construction: 2" Galvanized Carbon Steel Panel with Galvanized Liners;</p> <p>Dampers: None; Louvers: None;</p> <p>Doors: Carbon Steel "F" Door 18Wx63H w/ window and "S" Door 18Wx63H w/ window;</p> <p>Voltage: 206V / 240V / 460V</p>	

Options/Subcomponent Summary:		
Description	Mfr.	Part Number
Coils	Vertiv	Al: 5WC-0408 (x2) Cu: 5WC-0408
Furnace: Vertical Tube	Beckett Furnace	HMB 200
Humidifier Grid	DriSteem	Ultra-Sorb LV
Plenum Fans: Horizontal Fans (DD)	Vertiv	135
Plenum Fans: Vertical Inlet Down Fans (BD)	Vertiv	135
Plenum Fans: Vertical Inlet Down Fans (DD)	Vertiv	135
Plenum Fans: Vertical Inlet Up Fans (BD)	Vertiv	135
Plenum Fans: Vertical Inlet Up Fans (DD)	Vertiv	135
Sound Attenuator	Vertiv	Rectangular Silencers
VFD	Square D	Altivar 21 ATV 1.0HP

UUT3a was base mounted - rigid to the fixture using eight (8) 3/4"-10 Grade 5 hex head bolts with nuts, flat washers and lock washers. Torqued to 250 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

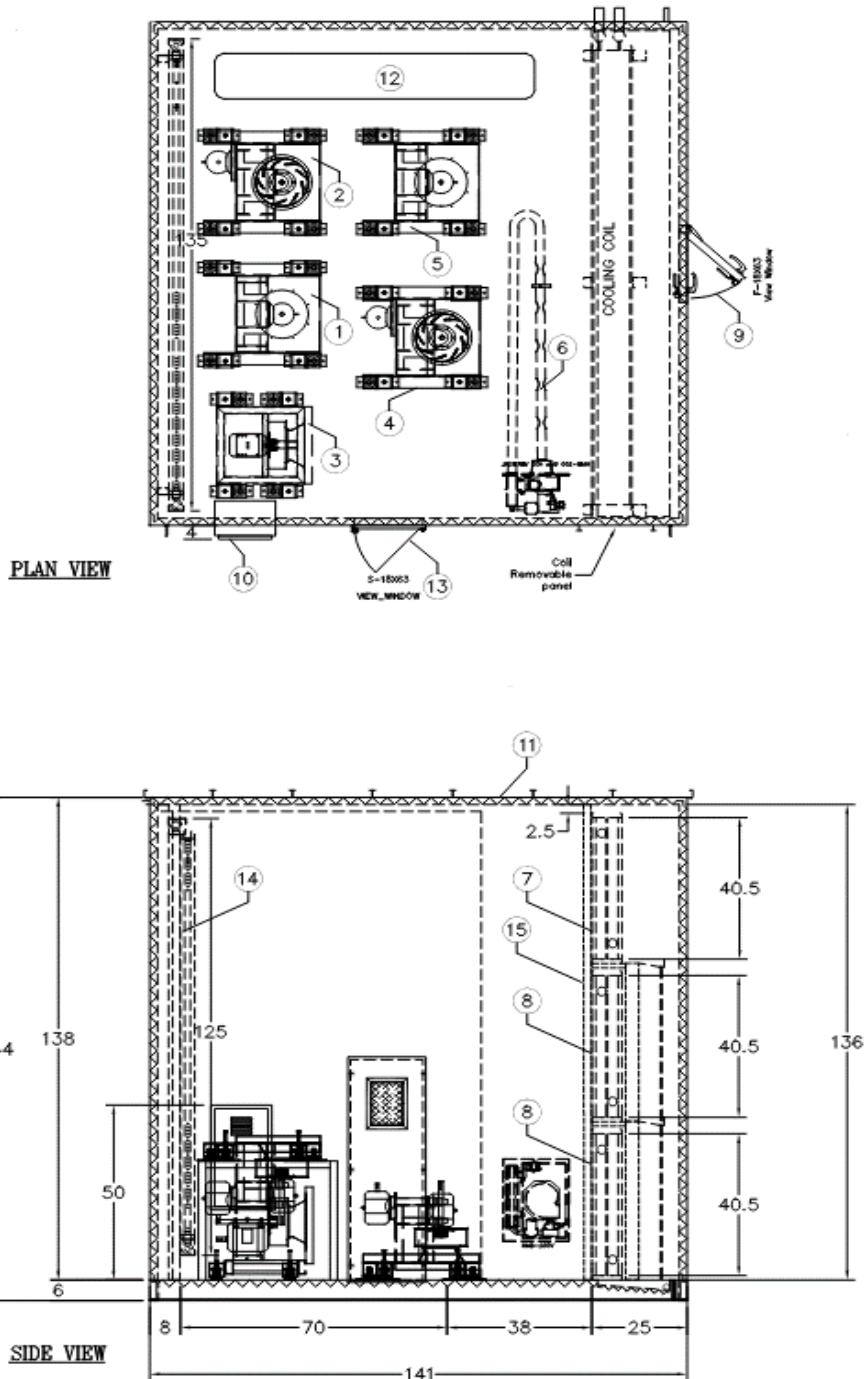


UUT 3a

Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (4 Walls in Place)
Serial Number: N/A

Test Report: EL: 9225 (OSHDP Unit 3)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

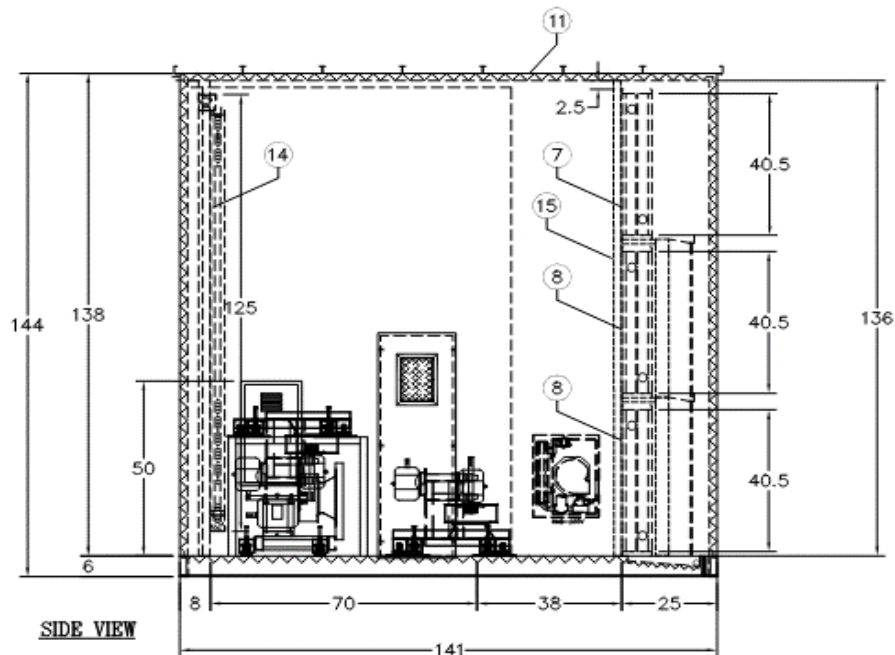
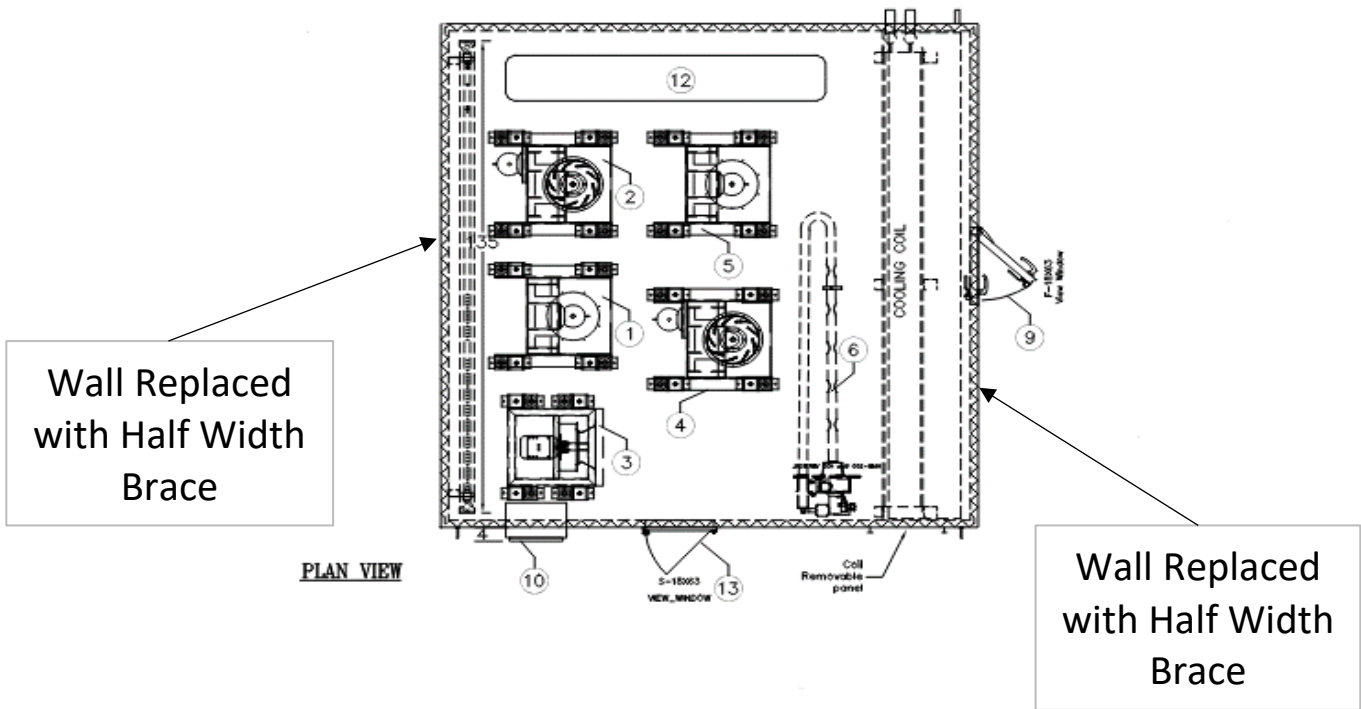


UUT 3b

Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (2 Walls in Place)
Serial Number: N/A

Test Report: EL: 9225 (OSHPD Unit 3 - 2 walls removed)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

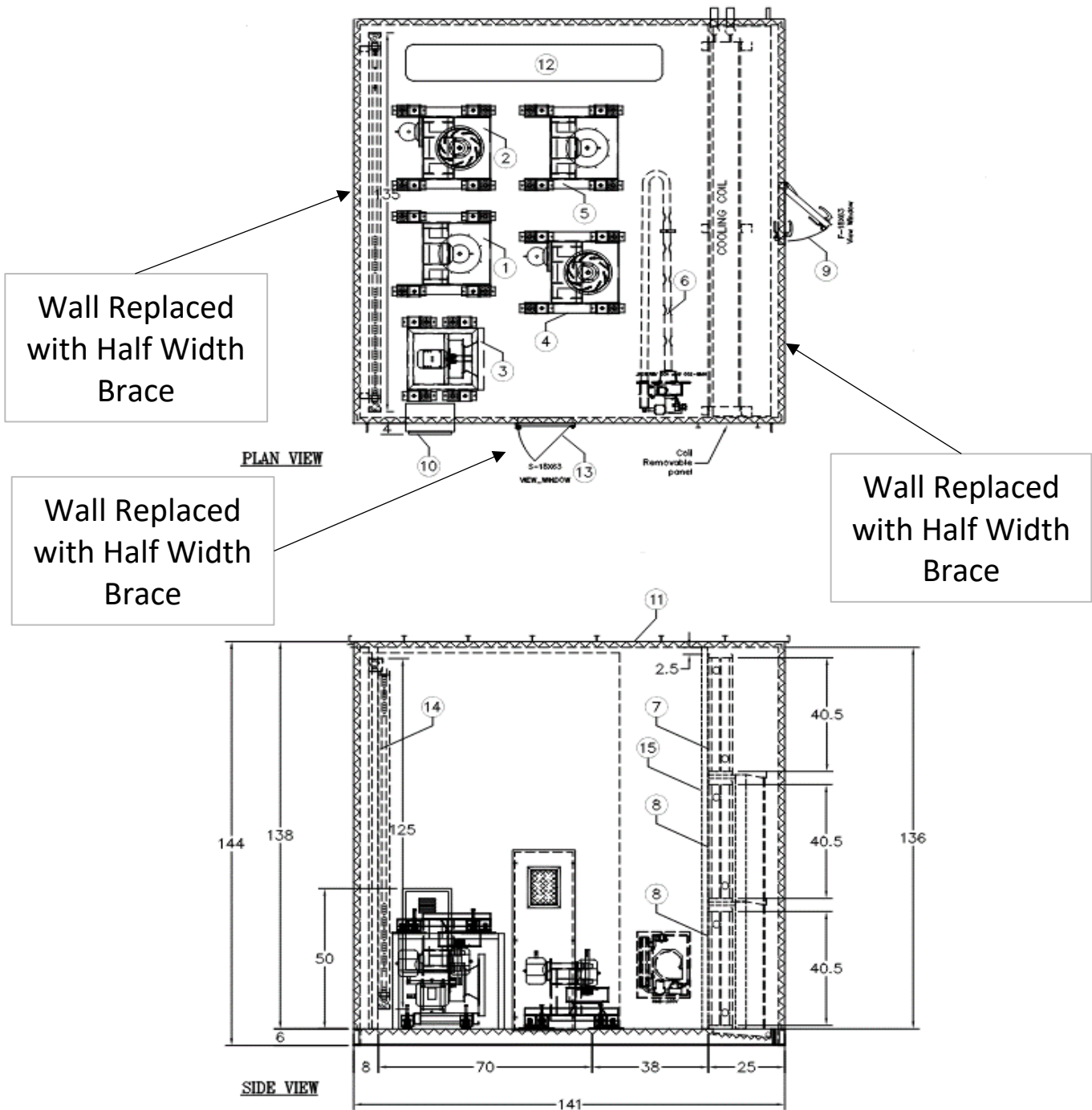


Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (1 Wall in Place)
Serial Number: N/A

UUT 3c

Test Report: EL: 9225 (OSHPD Unit 3 - 3 walls removed)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498



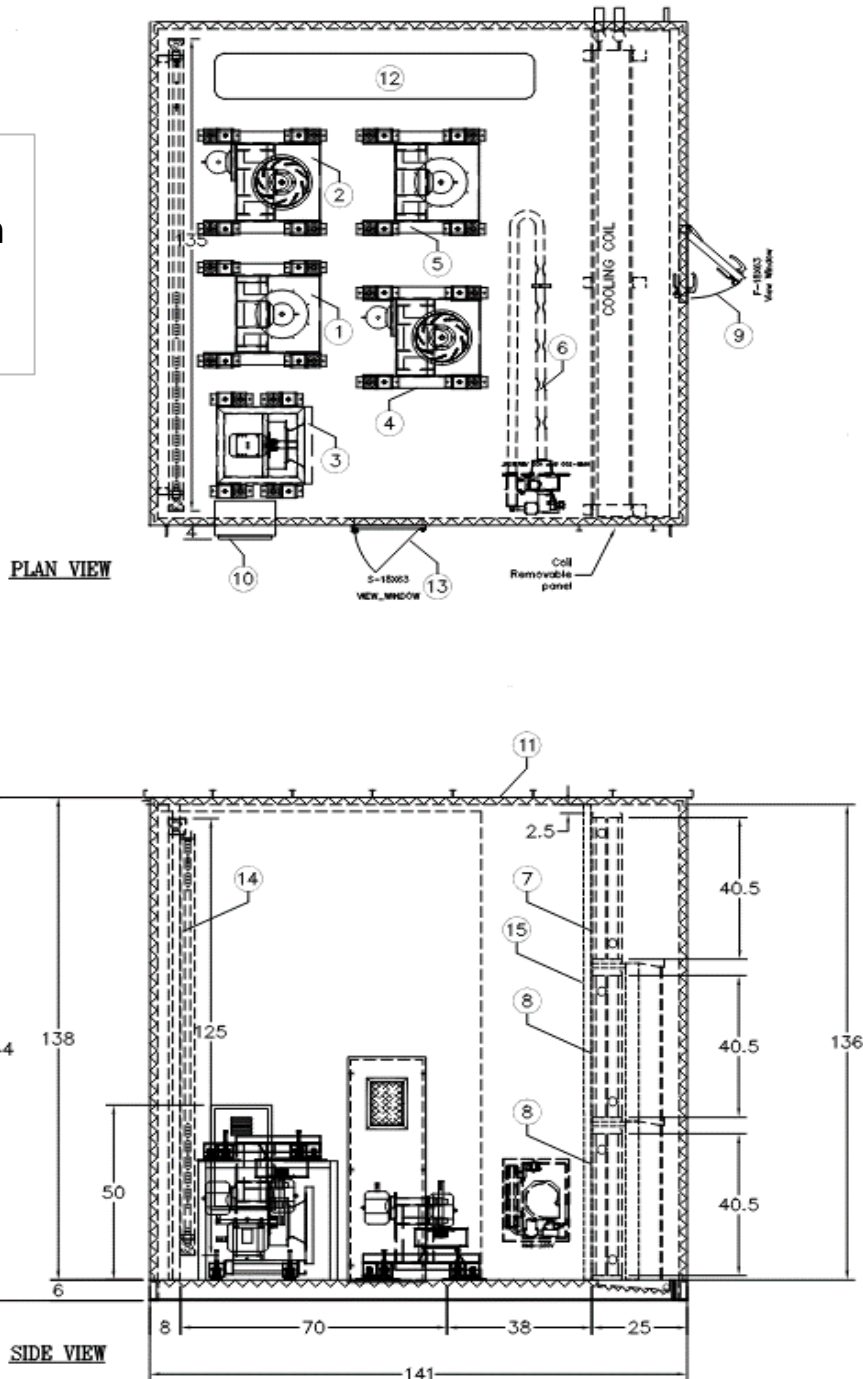
Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet: (0 Walls in Place)
Serial Number: N/A

UUT 3d

Test Report: EL: 9225 (OSHPD Unit 3 - 4 walls removed)

Unit Drawings:

All Walls
Replaced with
Half Width
Braces



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498

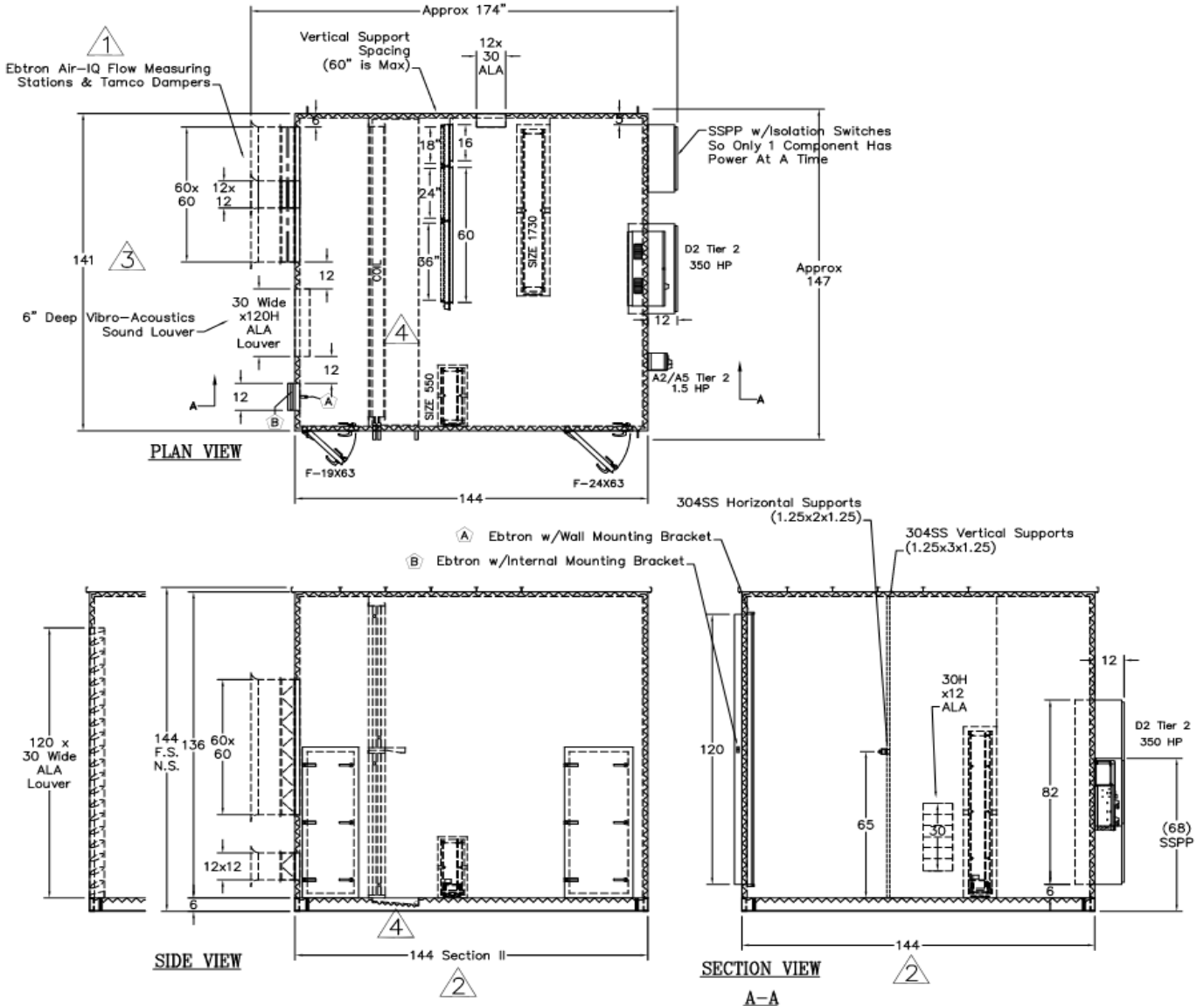


Manufacturer: Vertiv
Model Line: Vertiv Custom Air Handling Units (AHU)
Model Number: Air Handling Cabinet:
Serial Number: N/A

UUT 4

Test Report: 2010-0133-TR-001 (UUT1)

Unit Drawings:



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	UUT 12
Model Line: Vertiv Custom Air Handling Units (AHU)	
Model Number: Size 135 Plenum Fan (2hp)	
Serial Number: N/A	

Test Report: 2010-0133-TR-001 (UUT2)

UUT Properties

Weight (lbs.) ¹	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height ²	Front-Back	Side-Side	Vertical
450	30.6	29.0	46.0	25.4	25.2	4.8

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _P	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2022	ICC-ES AC156 (2010)	1.93	1.0	1.5	3.09	2.32	1.29	0.52

Product Construction Summary: Test Mounting Details:

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

Options/Subcomponent Summary:

Description	Mfr.	Part Number
Plenum Fans: Vertical Inlet Down Fans (DD)	Vertiv	135
Probe	Ebtron	13"



Test Mounting Details:

¹Weight provided does not include plenum
²Height provided included 20" plenum.

UUT12 was base mounted - isolated to fan frame with Vertiv, Inc. single spring isolators. Fan frame base mounted - rigid using six (6) 1/4" x 6" long fillet welds. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 2300498



Manufacturer: Vertiv	UUT 19
Model Line: Vertiv Custom Air Handling Units (AHU)	
Model Number: Control Panel	
Serial Number: N/A	

Test Report: EL:8887 (AHI (SSPP) Controller Cabinet)

UUT Properties

Weight (lbs.)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
630	46.0	18.0	60.0	N/A	N/A	N/A

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S _{DS} (g)	z/h	I _p	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
CBC 2022	ICC-ES AC156 (2010)	1.93	1.0	1.5	3.09	2.32	1.29	0.52

Product Construction Summary: Test Mounting Details:

Construction: Yaskawa ATV Series VFD Mounted inside carbon steel Vertiv Control Enclosure



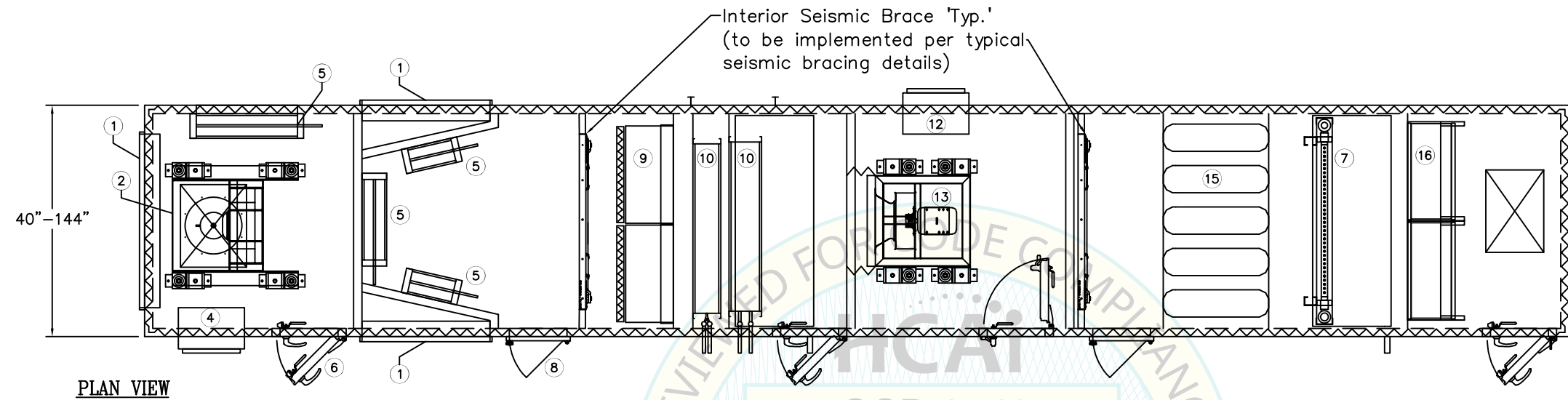
Options/Subcomponent Summary:

Description	Mfr.	Part Number
Controllers, Expanders, and HMI	Automated Logic	I/O FLEX6126, I/O PRO812, I/O FLEX8160, I/O PROEx48U
Circuit Breaker	Schneider Electric	2A, 8A
Disconnect Block	Schneider Electric	100A, 1000A
Fuses	Littlefuse	1A, 200A
Indicator Light	Sprecher & Schuh	DP7p, D7-N5W, D7-ALP
Motor Starter	Schneider Electric	2.5A, 220A
Position Switch	Schneider Electric	2-Position, 3-Position
Relay	Sprecher & Schuh	24V, 120V
VFD	Yaskawa	E7 CIMR 100HP

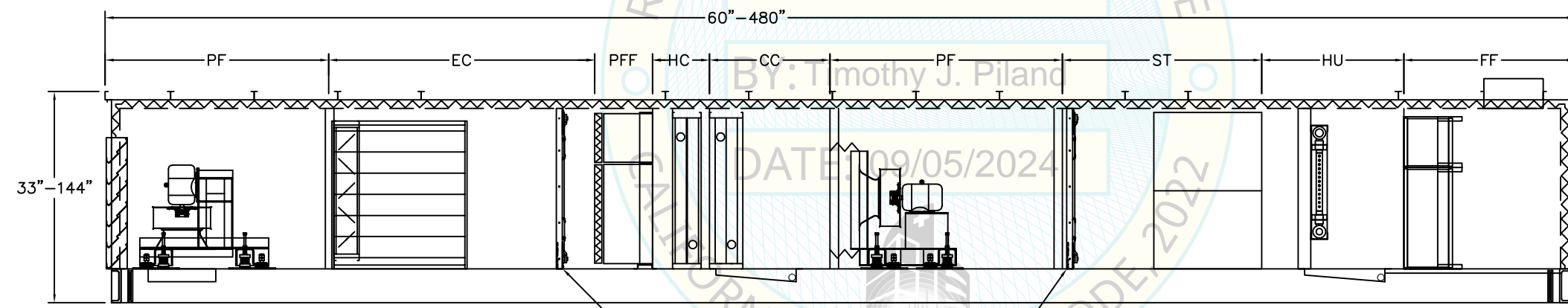
UUT19 was wall mounted - rigid to the wall fixture using eight (8) 3/8"-16 Grade 5 bolts with flat washers and lock washers. Torqued to 31 ft-lbs. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.

SINGLE TUNNEL UNIT

- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters



PLAN VIEW



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

- NOTES:**
1. Wall insulation 2" and 4".
 2. Cabinet Material: Galvanized Steel, Stainless Steel.
 3. Stacked coils can be provided with or without coil rack.
 4. Control panel could be in various locations on the unit.
 5. Unit base heights 6"
 6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
 7. Seismic requirements are based on installed condition, not shipped condition.
 8. All shipping splits shall maintain structural continuity between sections.

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DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED INCHES (PRIMARY)		
X	± 1/8	± .125
.x	± 1/16	± .0625
.xx	± 1/16	± .0625
.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

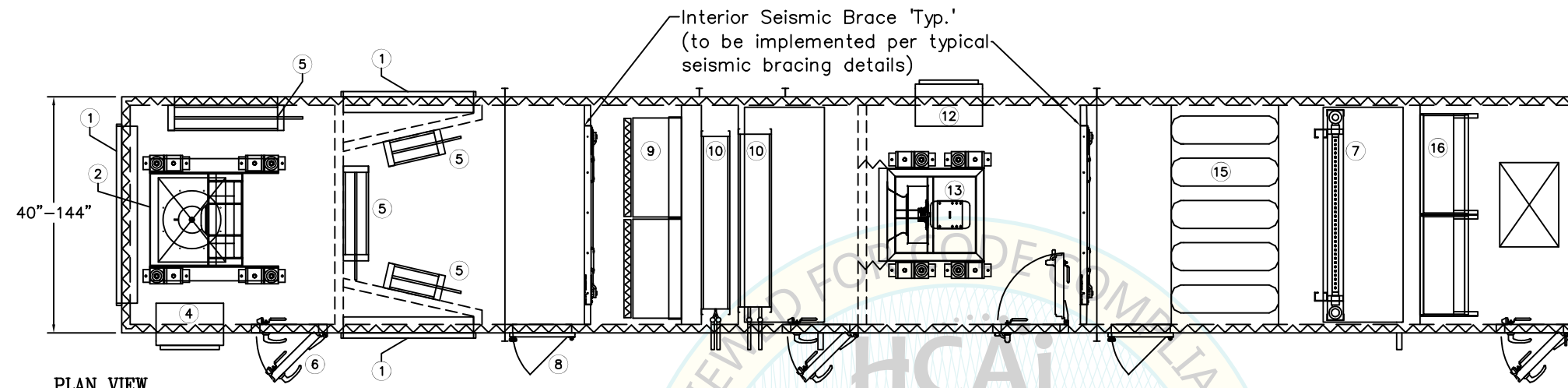
PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD,
SAN DIEGO
CALIFORNIA 92154



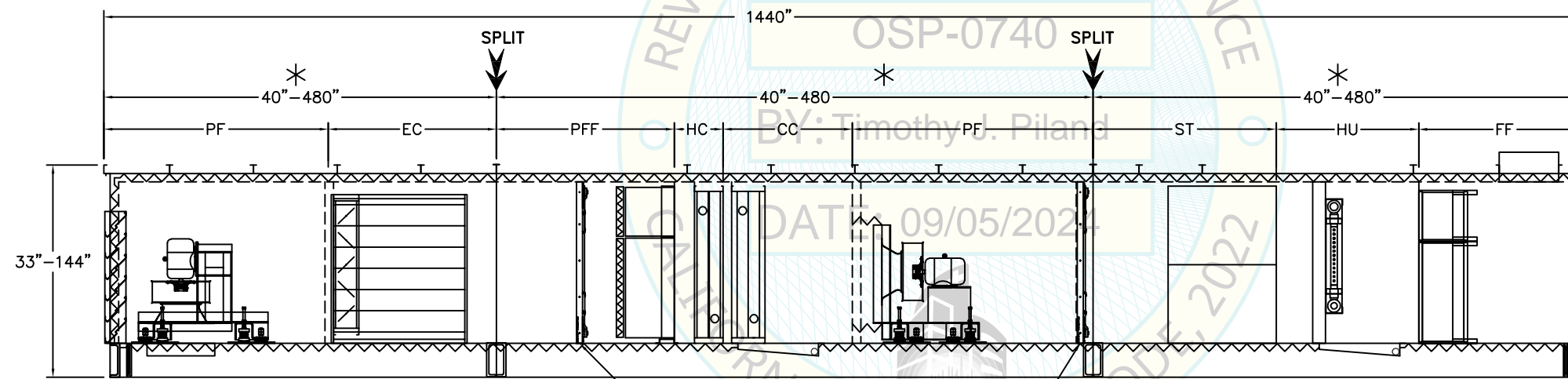
DESCRIPTION: OSHPD Renewal	JOB NAME: HCAI-1 Single Tunnel Unit	SHEET: 1
DRAWING BY: Jalcaraz	UNIT TAG: AHU-1	
DATE: 08/05/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_1

SINGLE TUNNEL UNIT WITH SPLITS

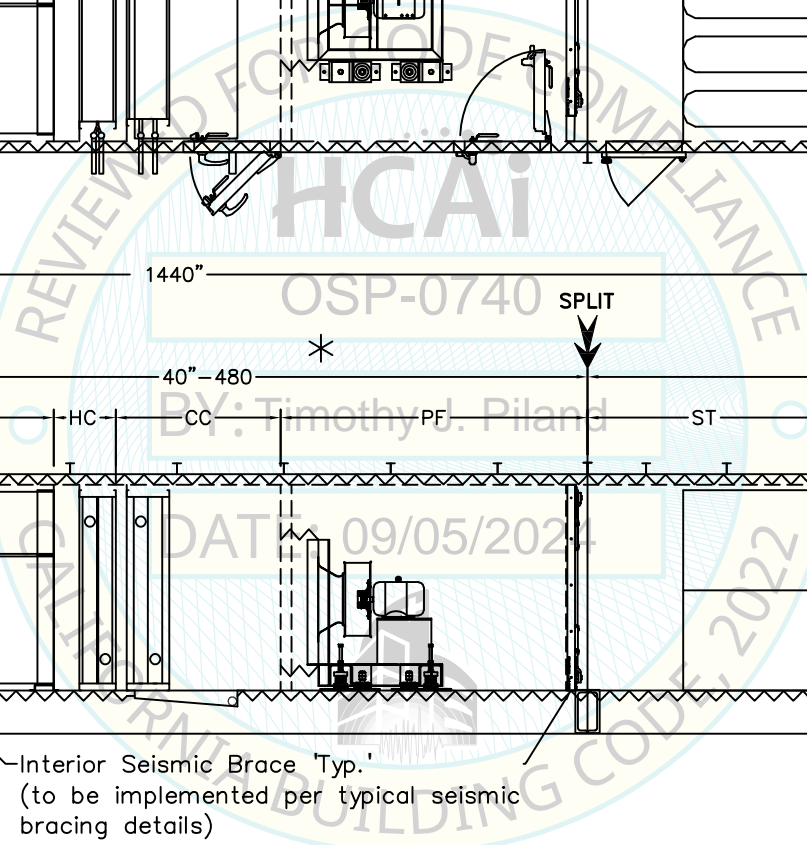
- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters



PLAN VIEW



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

NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel.
3. Stacked coils can be provided with or without coil rack.
4. Control panel could be in various locations on the unit.
5. Unit base heights 6"
6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
7. Seismic requirements are based on installed condition, not shipped condition.
8. All shipping splits shall maintain structural continuity between sections.

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DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED INCHES (PRIMARY)		
X	± 1/8	± .125
.x	± 1/16	± .0625
.xx	± 1/16	± .0625
.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

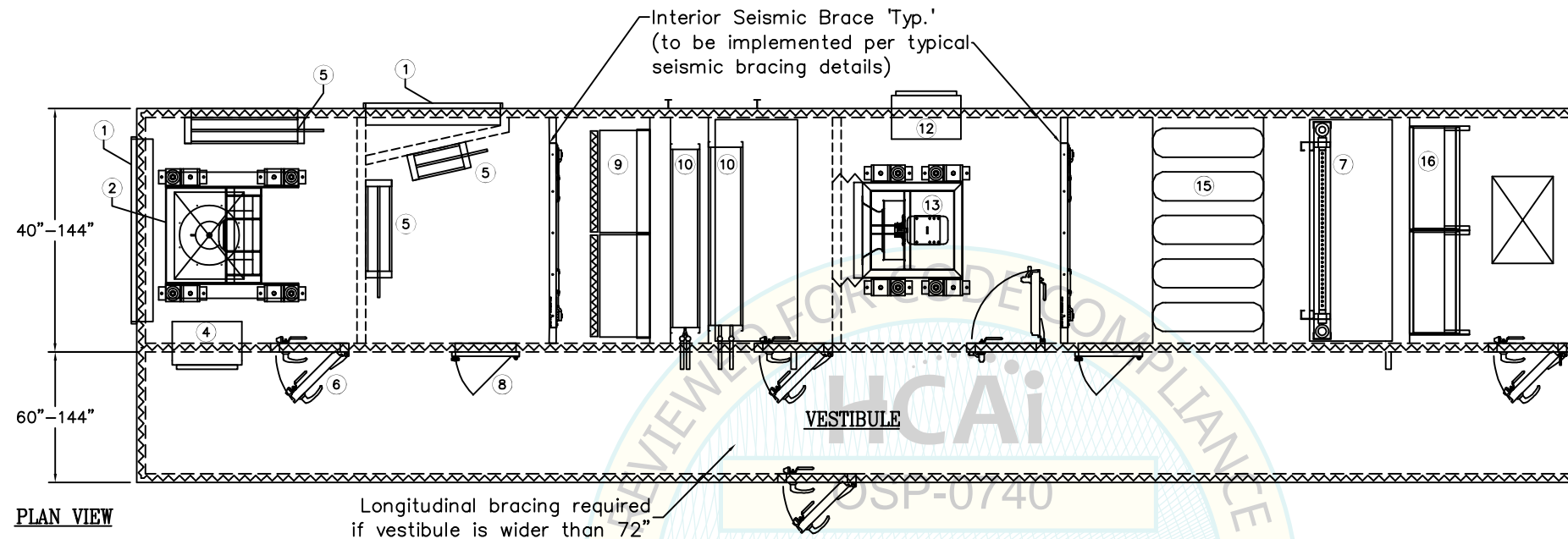
PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD, SAN DIEGO CALIFORNIA 92154



DESCRIPTION: OSHD Renewal	JOB NAME: HCAI-2 Single Tunnel Unit With Splits	SHEET: 2
DRAWING BY: Jalcaraz	UNIT TAG: AHU-2	
DATE: 08/05/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_2

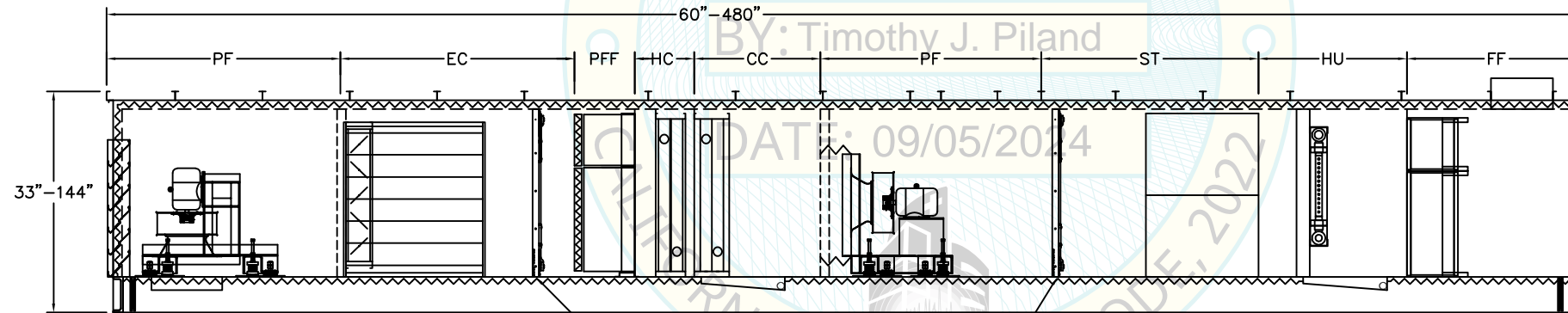
SINGLE TUNNEL UNIT WITH VESTIBULE

- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters



PLAN VIEW

Longitudinal bracing required if vestibule is wider than 72"



SIDE VIEW

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

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.
3. Stacked coils can be provided with or without coil rack.
4. Control panel could be in various locations on the unit.
5. Unit base heights 6"
6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
7. Seismic requirements are based on installed condition, not shipped condition.
8. All shipping splits shall maintain structural continuity between sections.

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X	± 1/8	± .125
.x	± 1/16	± .0625
.xx	± 1/16	± .0625
.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

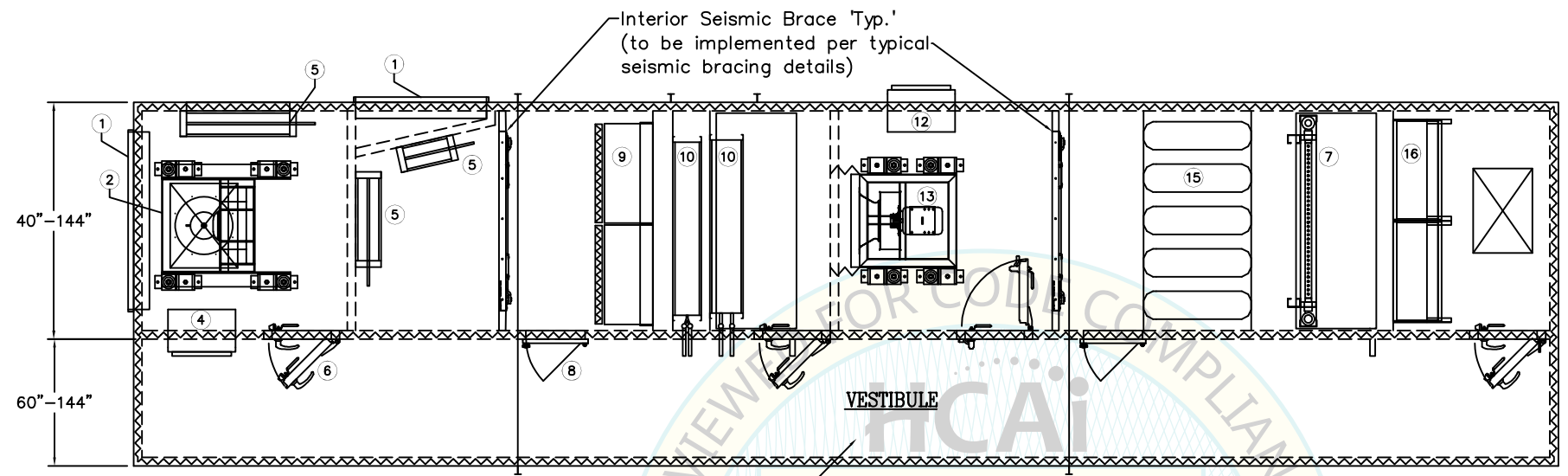
PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD, SAN DIEGO CALIFORNIA 92154



DESCRIPTION: OSHPD Renewal	JOB NAME: HCAI -3 Single Tunnel Unit With Vestibule	SHEET: 3
DRAWING BY: Jalcaraz	UNIT TAG: AHU-3	
DATE: 07/31/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_3

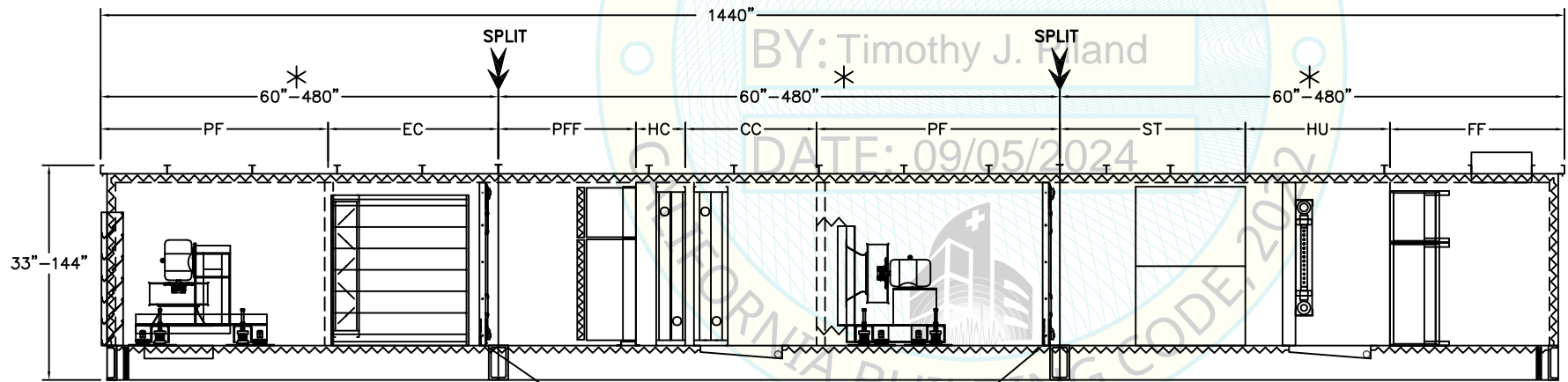
SINGLE TUNNEL UNIT WITH VESTIBULE AND SPLITS

- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters



PLAN VIEW

Longitudinal bracing required if vestibule is wider than 72"



SIDE VIEW

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

- 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.
 3. Stacked coils can be provided with or without coil rack.
 4. Control panel could be in various locations on the unit.
 5. Unit base heights 6"
 6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
 7. Seismic requirements are based on installed condition, not shipped condition.
 8. All shipping splits shall maintain structural continuity between sections.

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X	± 1/8	± .125
.x	± 1/16	± .0625
.xx	± 1/16	± .0625
.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

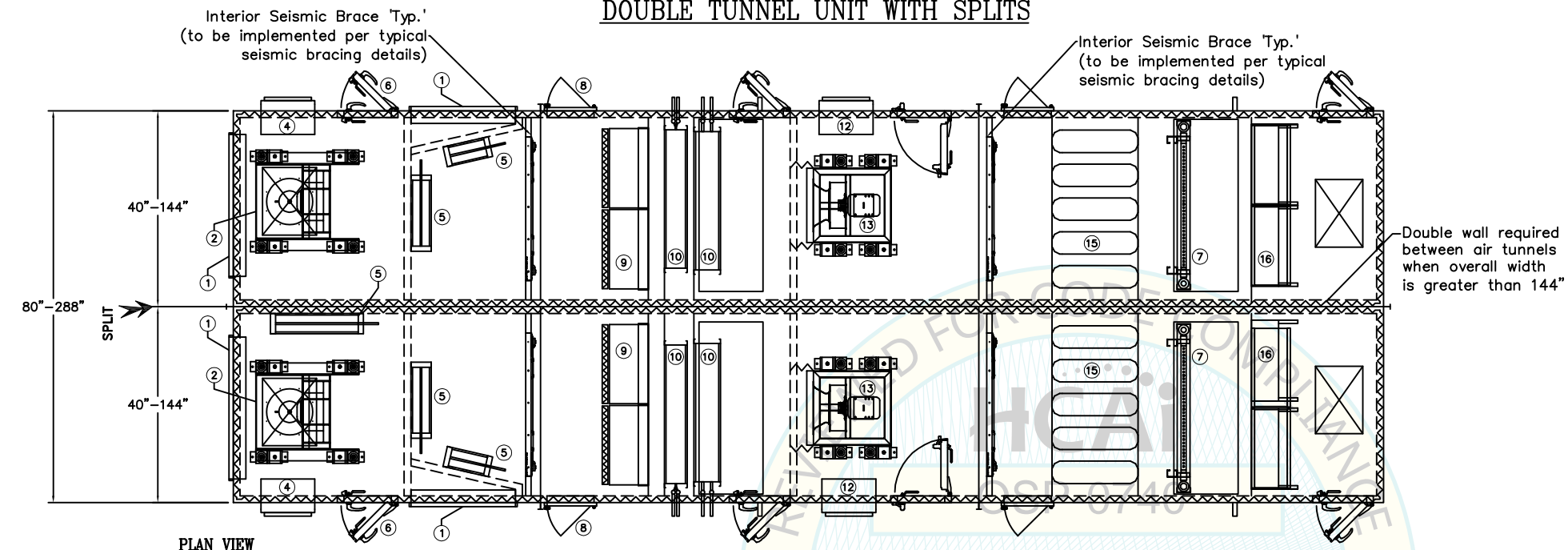
PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD,
SAN DIEGO
CALIFORNIA 92154



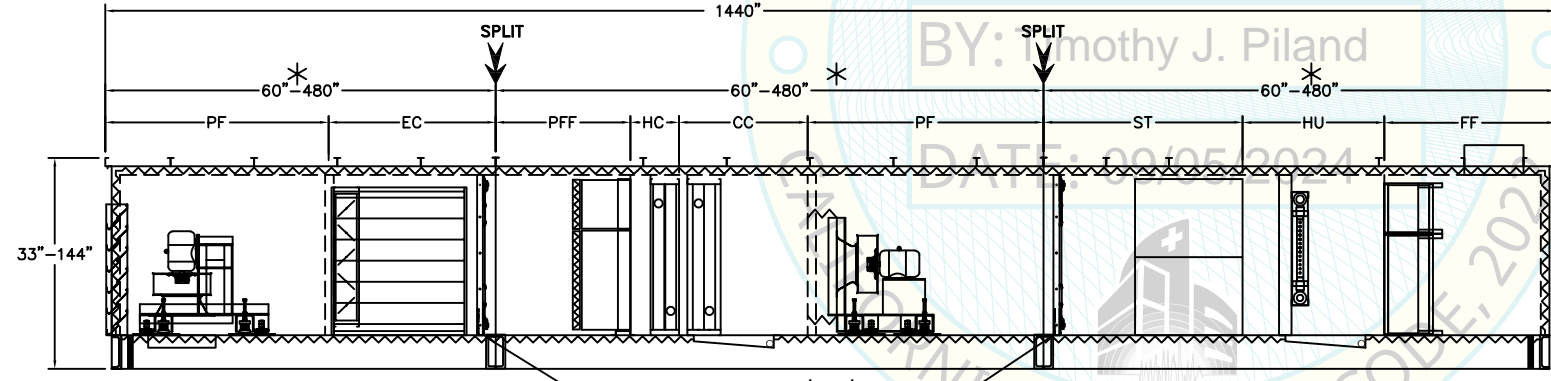
DESCRIPTION: OSHPD Renewal	JOB NAME: HCAI -4 Single Tunnel Unit With Vestibule and Splits	SHEET: 4
DRAWING BY: Jalcaraz	UNIT TAG: AHU-4	
DATE: 08/05/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_4

DOUBLE TUNNEL UNIT WITH SPLITS

- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters



PLAN VIEW



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

- NOTES:**
1. Wall insulation 2" and 4".
 2. Cabinet Material: Galvanized Steel, Stainless Steel.
 3. Stacked coils can be provided with or without coil rack.
 4. Control panel could be in various locations on the unit.
 5. Unit base heights 6"
 6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
 7. Seismic requirements are based on installed condition, not shipped condition.
 8. All shipping splits shall maintain structural continuity between sections.

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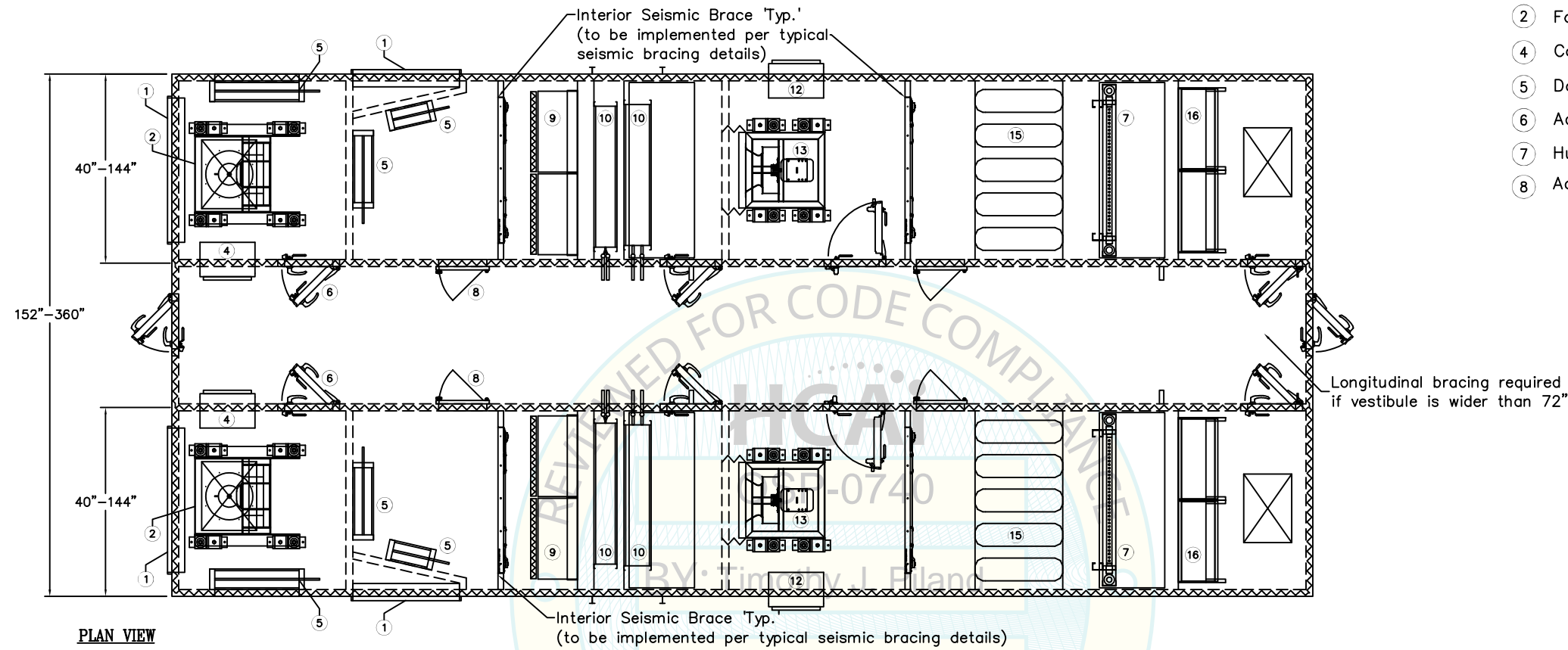
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED INCHES (PRIMARY)		
X	± 1/8	± .125
.X	± 1/16	± .0625
.XX	± 1/16	± .0625
.XXX	± 1/32	± .03125
.XXXX	± 1/32	± .03125
ANGULAR ± 2°		

PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD,
SAN DIEGO
CALIFORNIA 92154

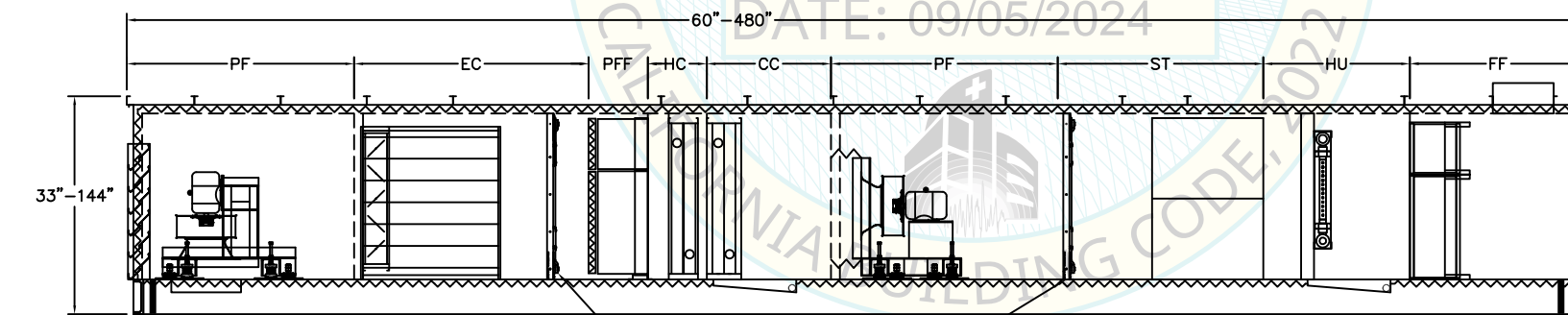


DESCRIPTION: OSHPD Renewal	JOB NAME: HCAI-5 Double Tunnel Unit With Splits	SHEET: 5
DRAWING BY: Jalcaraz	UNIT TAG: AHU-5	
DATE: 08/05/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_5

DOUBLE TUNNEL UNIT WITH VESTIBULE IN THE MIDDLE



PLAN VIEW



SIDE VIEW

- | | |
|-----------------|----------------------|
| ① Louver | ⑨ Pre & Final Filter |
| ② Fan | ⑩ Coils |
| ④ Control Panel | ⑫ Control Panel |
| ⑤ Damper | ⑬ Fan |
| ⑥ Access Door | ⑮ Sound Traps |
| ⑦ Humidifier | ⑯ Hepa Filters |
| ⑧ Access Door | |

Longitudinal bracing required if vestibule is wider than 72"

- 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 | |

- NOTES:**
1. Wall insulation 2" and 4".
 2. Cabinet Material: Galvanized Steel, Stainless Steel.
 3. Stacked coils can be provided with or without coil rack.
 4. Control panel could be in various locations on the unit.
 5. Unit base heights 6"
 6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
 7. Seismic requirements are based on installed condition, not shipped condition.
 8. All shipping splits shall maintain structural continuity between sections.

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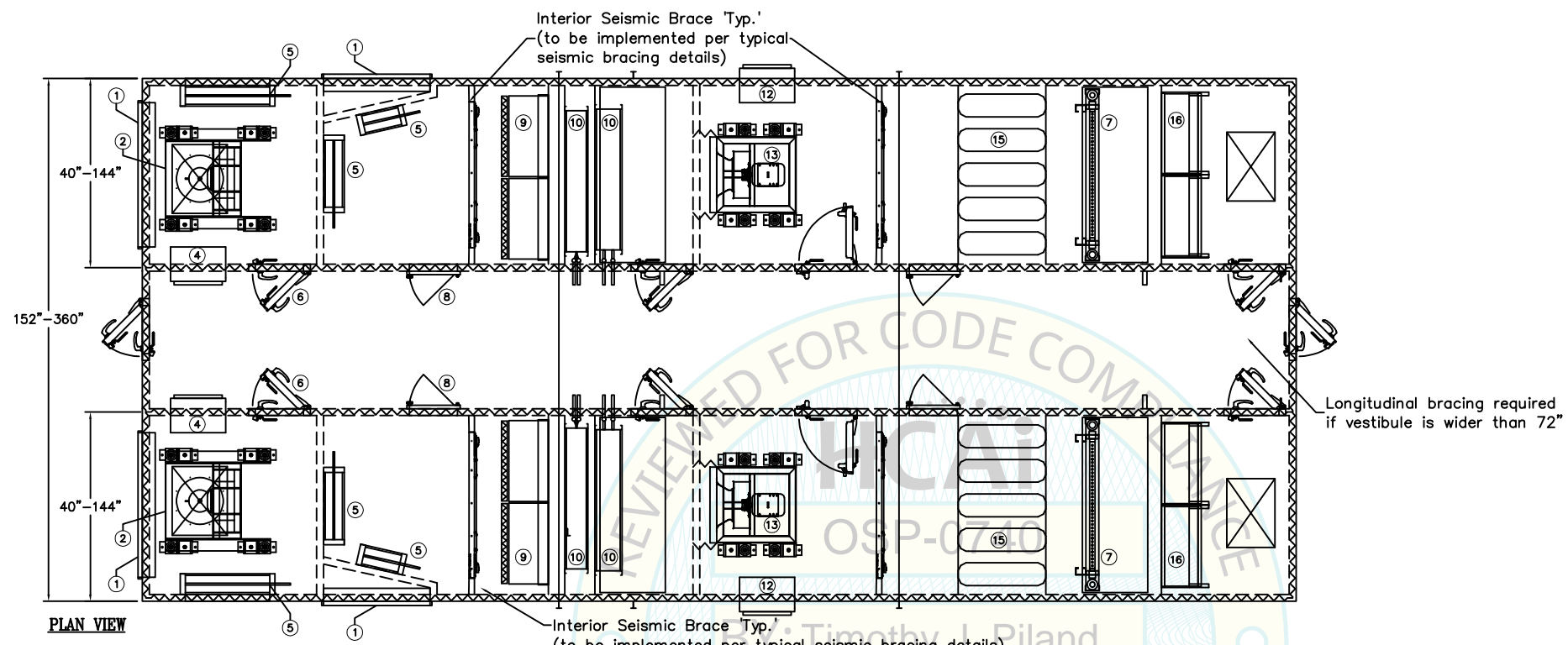
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X	± 1/8 ± .125
.X	± 1/16 ± .0625
.XX	± 1/16 ± .0625
.XXX	± 1/32 ± .03125
.XXXX	± 1/32 ± .03125
ANGULAR	± 2°

PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD,
SAN DIEGO
CALIFORNIA 92154



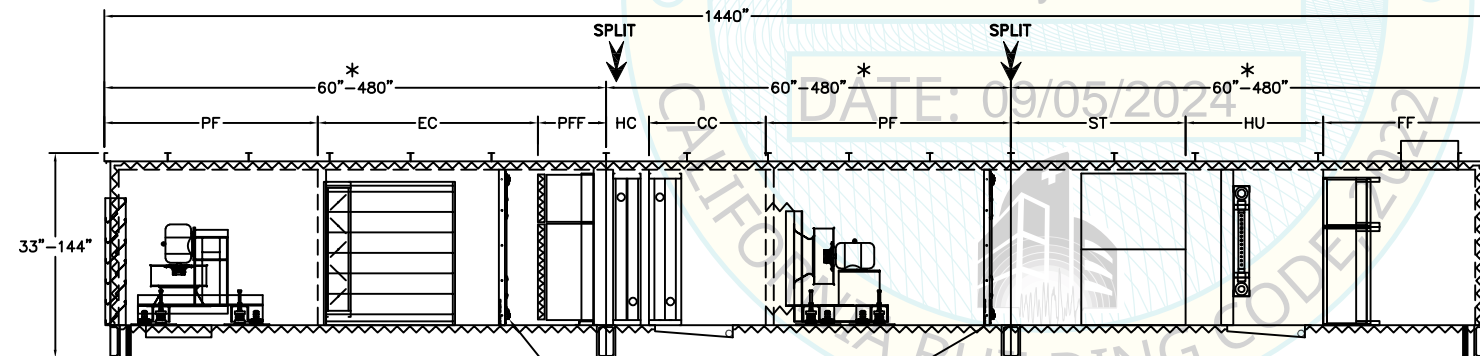
DESCRIPTION: OSHP Renewal	JOB NAME: HCAI -6 Double Tunnel Unit With Vest. in the Middle	
DRAWING BY: Jalcaraz	UNIT TAG: AHU-6	SHEET: 6
DATE: 08/05/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_6

DOUBLE TUNNEL UNIT WITH VESTIBULE IN THE MIDDLE AND SPLITS

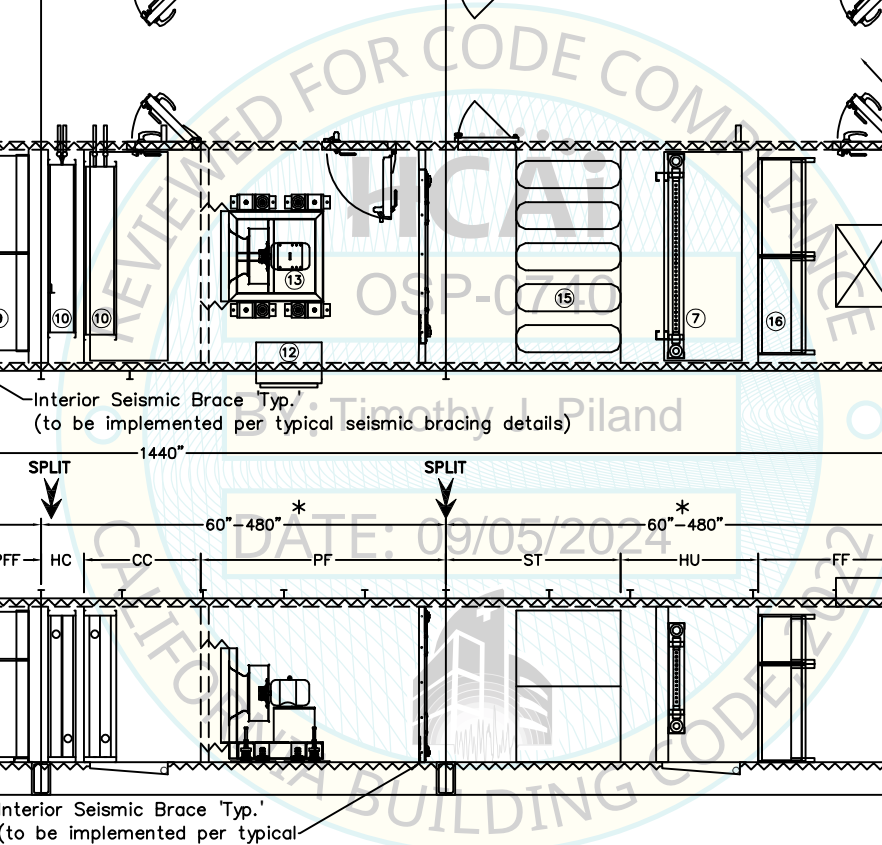


- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters

PLAN VIEW



SIDE VIEW



NOTES:

1. Wall insulation 2" and 4".
2. Cabinet Material: Galvanized Steel, Stainless Steel.
3. Stacked coils can be provided with or without coil rack.
4. Control panel could be in various locations on the unit.
5. Unit base heights 6"
6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
7. Seismic requirements are based on installed condition, not shipped condition.
8. All shipping splits shall maintain structural continuity between sections.

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

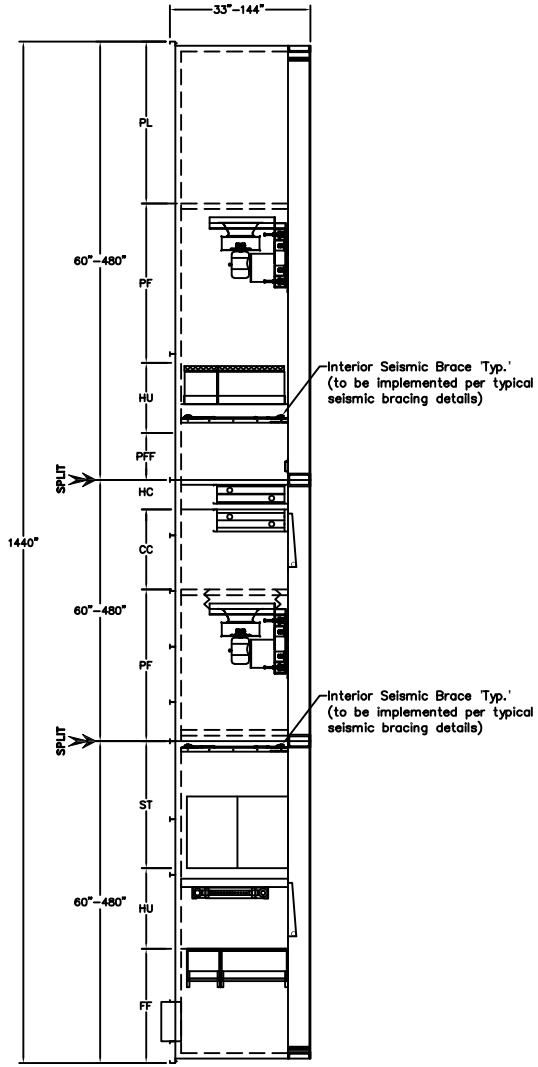
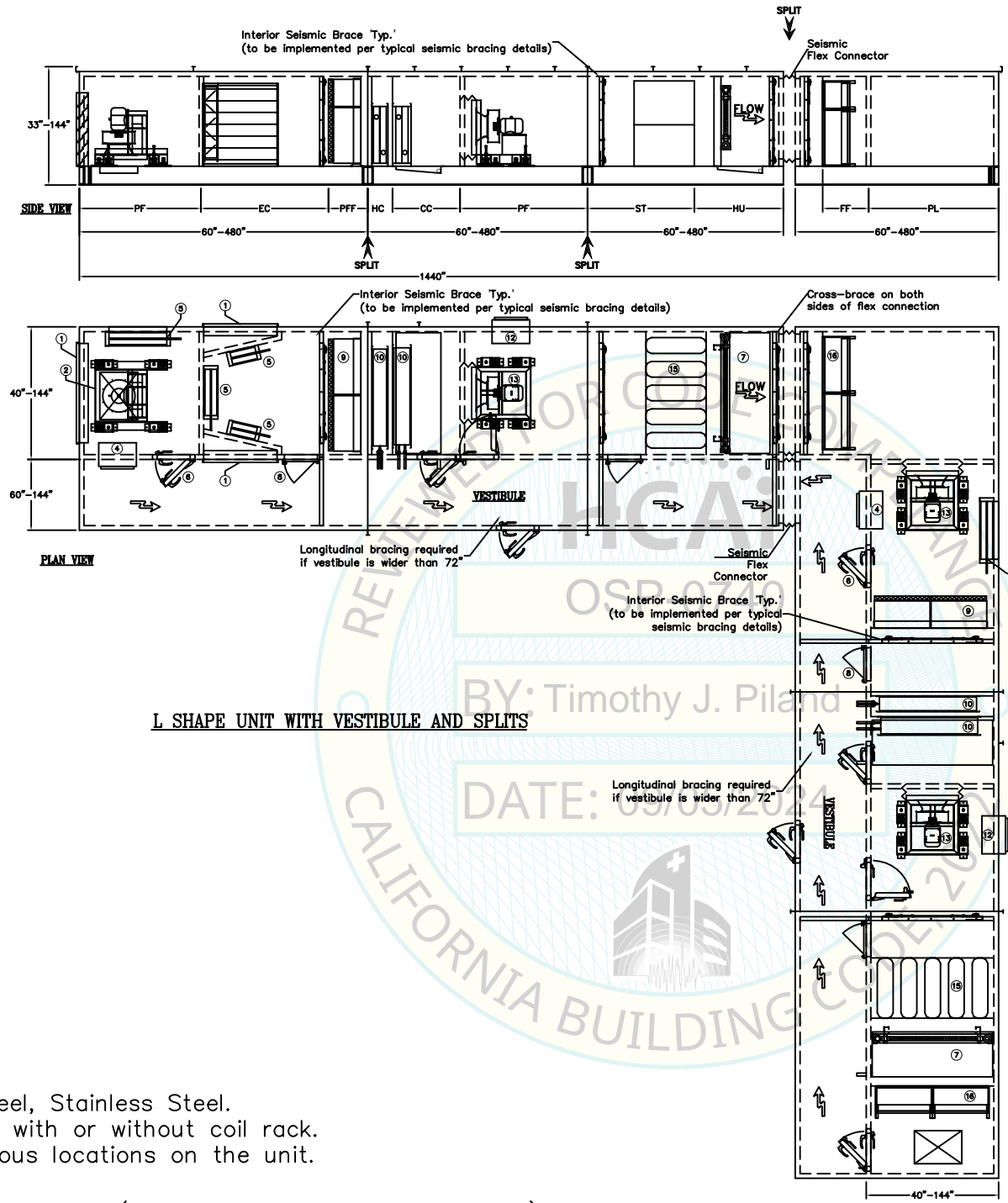
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.XX	± 1/16	± .0625
.XXX	± 1/32	± .03125
.XXXX	± 1/32	± .03125
ANGULAR ± 2°		

PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD, SAN DIEGO CALIFORNIA 92154



DESCRIPTION: OSHP Renewal	JOB NAME: HCAI -7 Double Tunnel Unit With Vest. in the Middle and Splits	SHEET: 7
DRAWING BY: Jalcaraz	UNIT TAG: AHU-7	
DATE: 08/05/2024	JOB NUMBER: OSP-0740	DWG NUMBER: 0740_7



- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters


- 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.
3. Stacked coils can be provided with or without coil rack.
4. Control panel could be in various locations on the unit.
5. Unit base heights 6"
6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
7. Seismic requirements are based on installed condition, not shipped condition.
8. All shipping splits shall maintain structural continuity between sections.

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.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

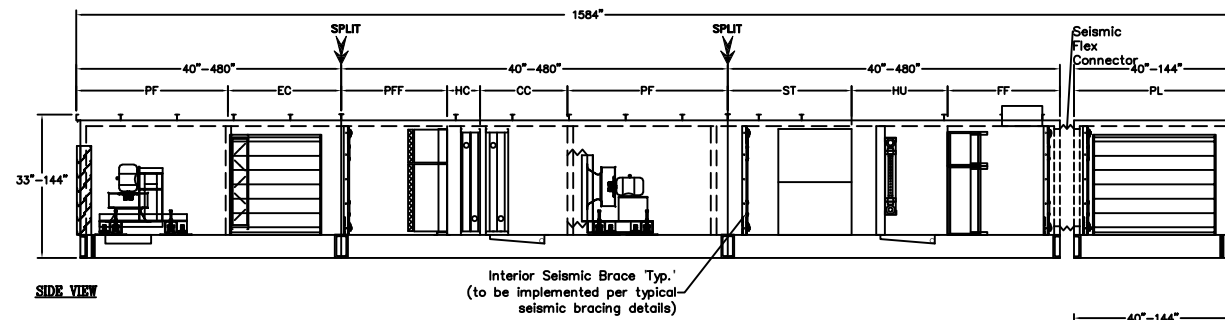
PRIMARY DIMENSIONS ARE IN INCHES

 THIRD ANGLE PROJECTION
 1695 CACTUS ROAD,
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 CALIFORNIA 92154



DESCRIPTION: OSHPD Renewal
 DRAWING BY: Jalcaraz
 DATE: 08/05/2024

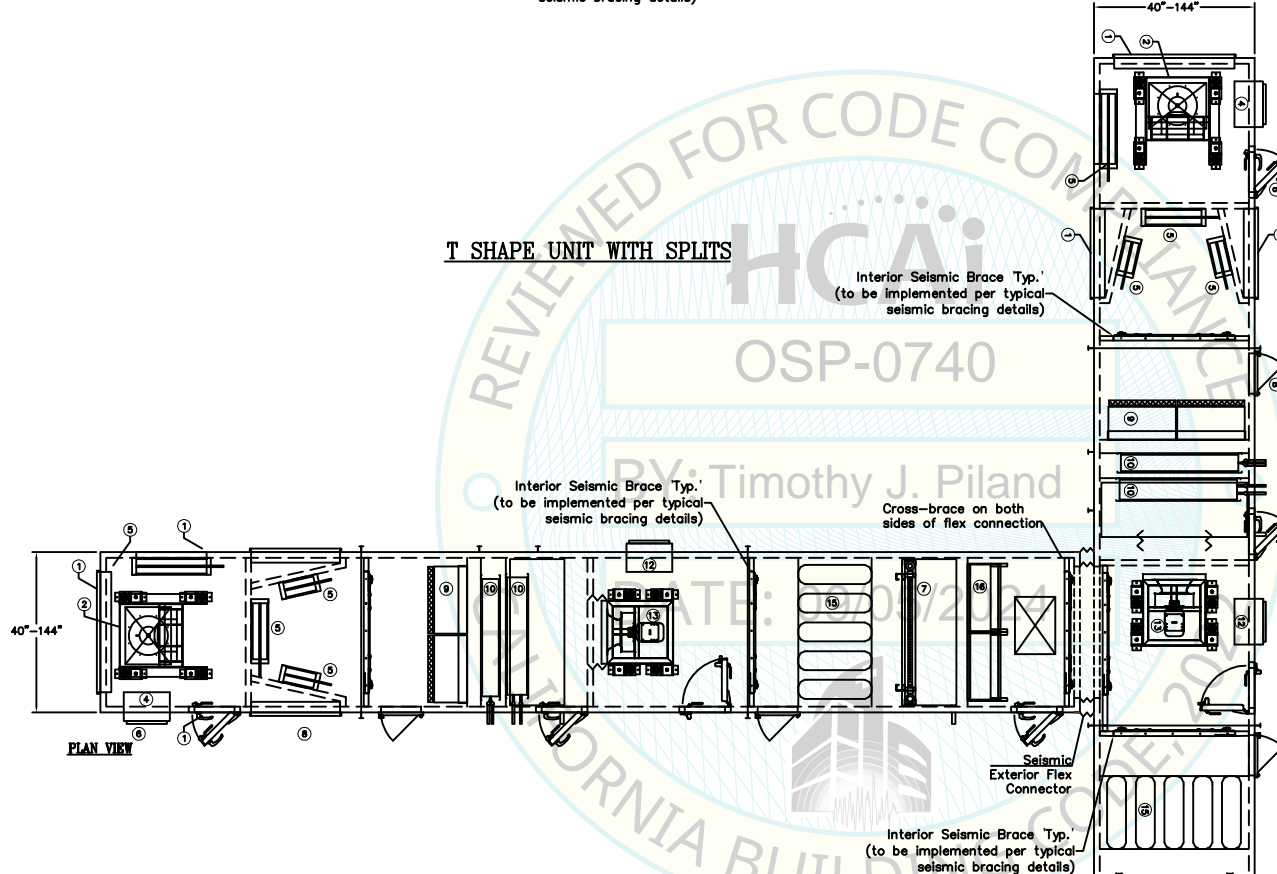
JOB NAME: HCAI-8
 L Shape With Vestibule and Splits
 UNIT TAG: AHU-8
 JOB NUMBER: OSP-0740
 DWG NUMBER: 0740_8

SHEET: 8

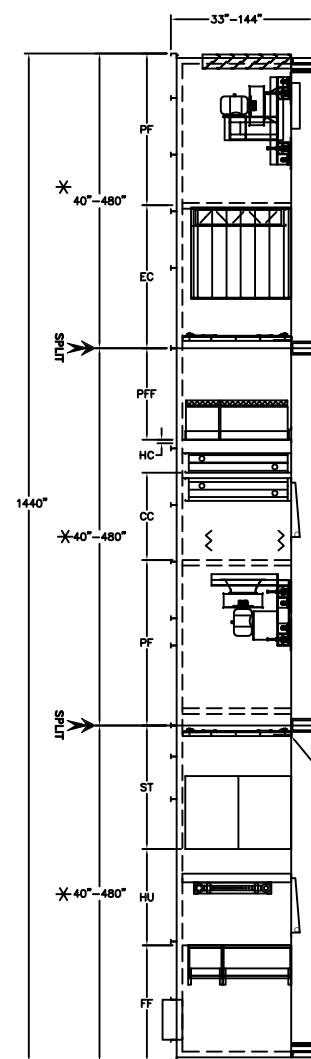


SIDE VIEW

T SHAPE UNIT WITH SPLITS



PLAN VIEW



SIDE VIEW

- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters

SECTIONS:

- AB = Air Blender
- CC = Cooling Coil
- CU = Condensing Unit
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- FU = Furnace
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- 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.
3. Stacked coils can be provided with or without coil rack.
4. Control panel could be in various locations on the unit.
5. Unit base heights 6"
6. Internal seismic braces installation see (CS-081-003 & CS-081-003_1a).
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.XXXX	± 1/32	± .03125
ANGULAR ± 2°		

PRIMARY DIMENSIONS ARE IN INCHES
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1695 CACTUS ROAD,
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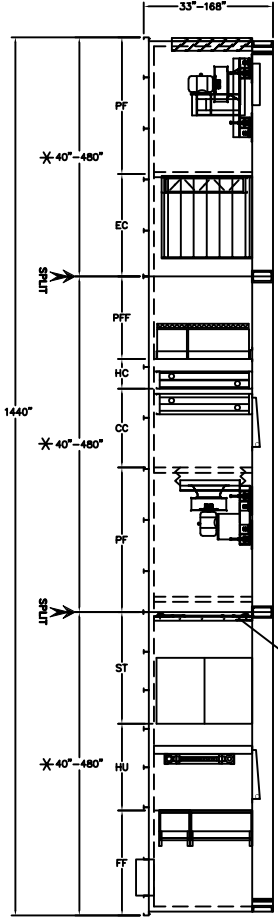
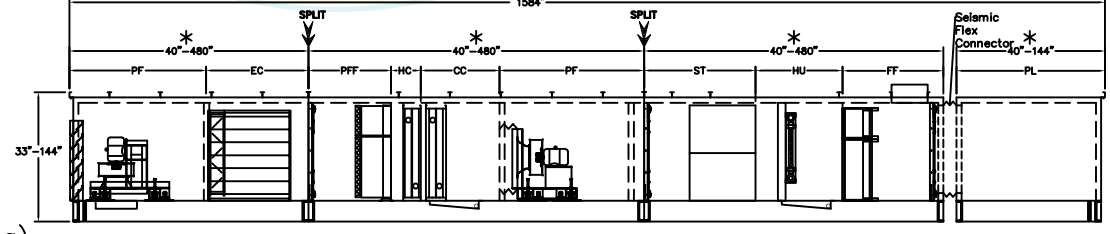
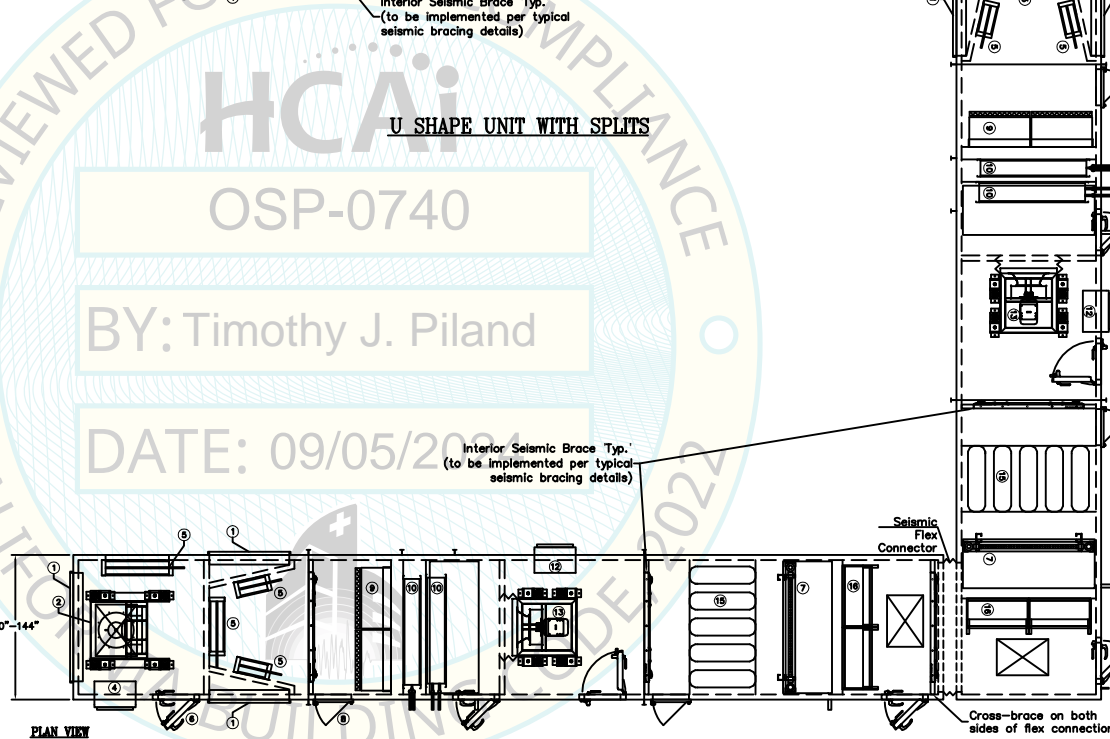
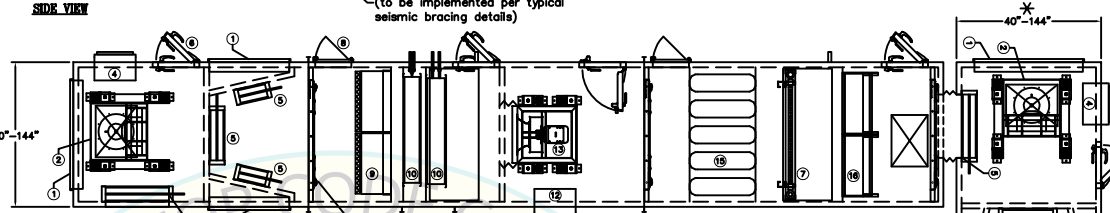
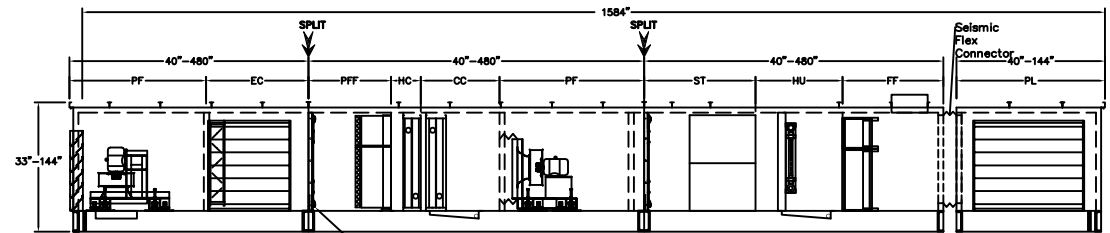


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DESCRIPTION: OSHPD Renewal
DRAWING BY: Jalcaraz
DATE: 08/05/2024

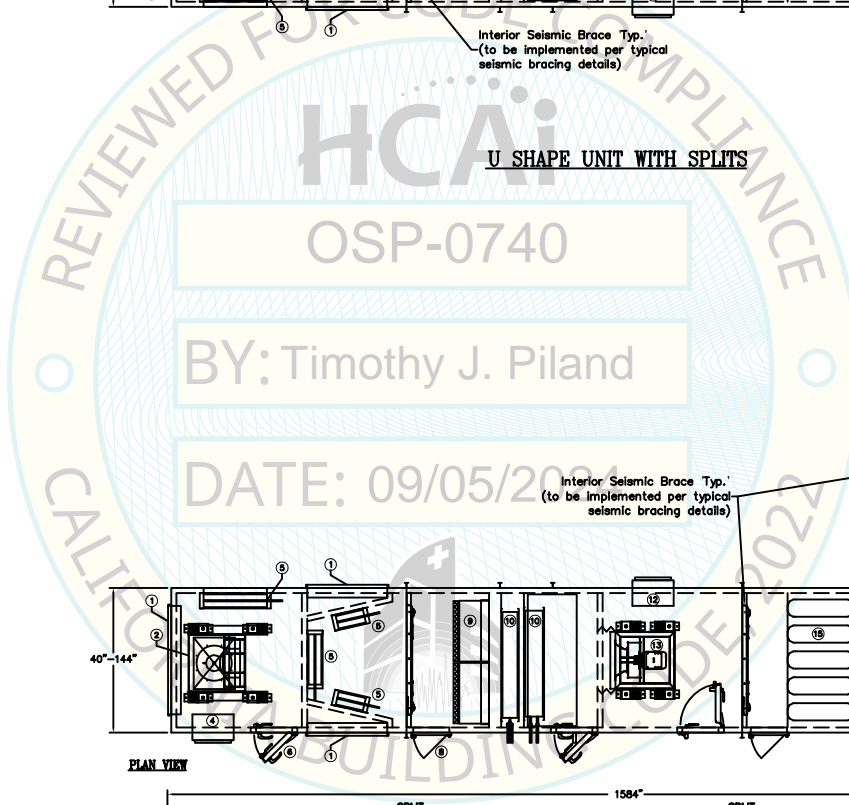
JOB NAME: HCAI-9
T Shape with Splits
UNIT TAG: AHU-9
JOB NUMBER: OSP-0740
DWG NUMBER: 0740_9

SHEET: 9



- ① Louver
- ② Fan
- ④ Control Panel
- ⑤ Damper
- ⑥ Access Door
- ⑦ Humidifier
- ⑧ Access Door
- ⑨ Pre & Final Filter
- ⑩ Coils
- ⑫ Control Panel
- ⑬ Fan
- ⑮ Sound Traps
- ⑯ Hepa Filters

- SECTIONS:**
- AB = Air Blender
 - CC = Cooling Coil
 - CU = Condensing Unit
 - DE = Direct Evaporative
 - DF = DWI Fan
 - DX = DX Coil
 - EC = Economizer
 - FF = Final Filter
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 - SC = Steam Coil
 - ST = Sound Trap
 - VF = Vee Filter



- NOTES:**
1. Wall insulation 2" and 4".
 2. Cabinet Material: Galvanized Steel, Stainless Steel.
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 7. Seismic requirements are based on installed condition, not shipped condition.
 8. All shipping splits shall maintain structural continuity between sections.

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DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED INCHES (PRIMARY)		
X	± 1/8	± .125
.x	± 1/16	± .0625
.xx	± 1/16	± .0625
.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD, SAN DIEGO, CALIFORNIA 92154

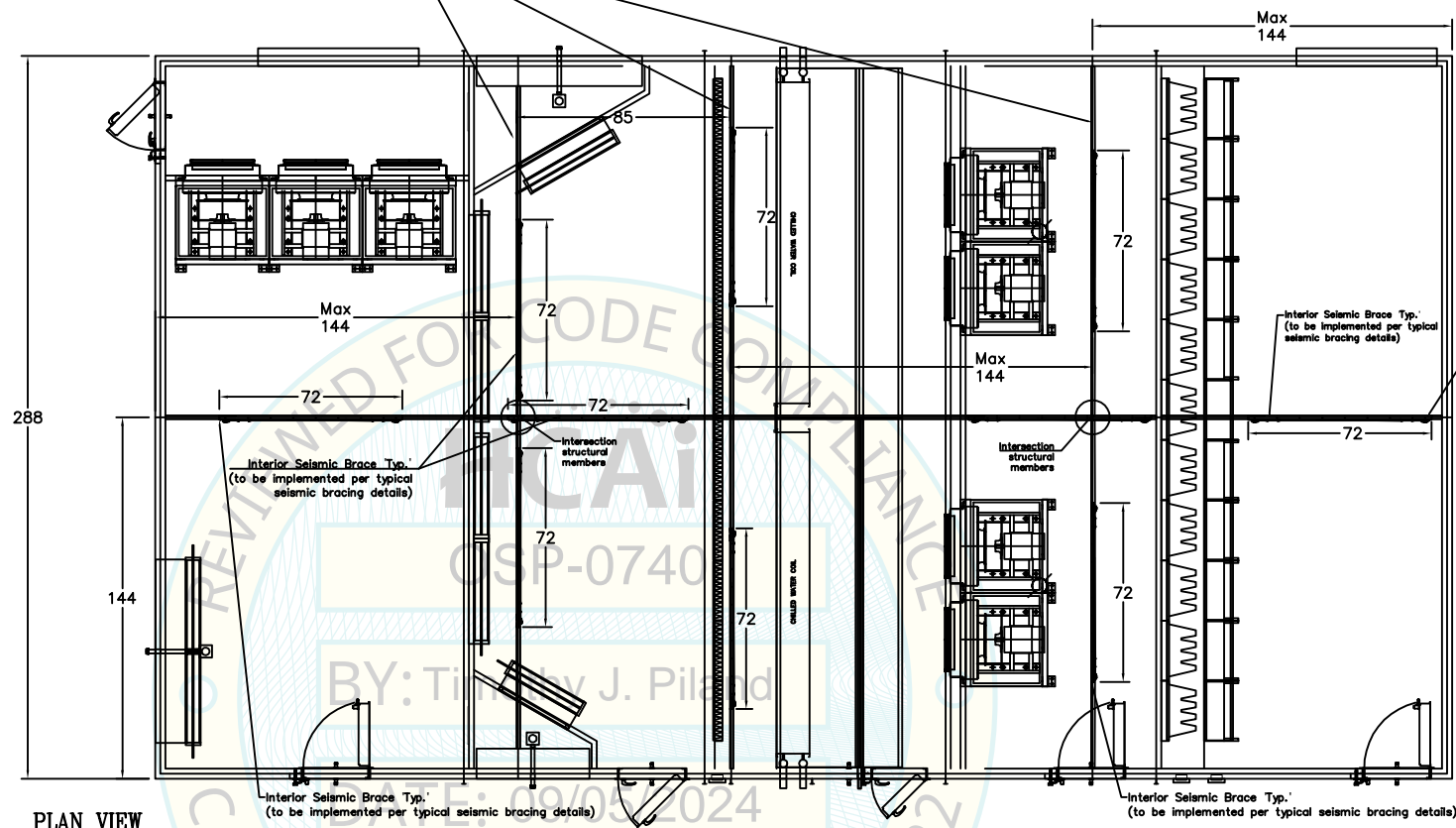


DESCRIPTION: OSHPD Renewal
DRAWING BY: Jalcaraz
DATE: 08/05/2024

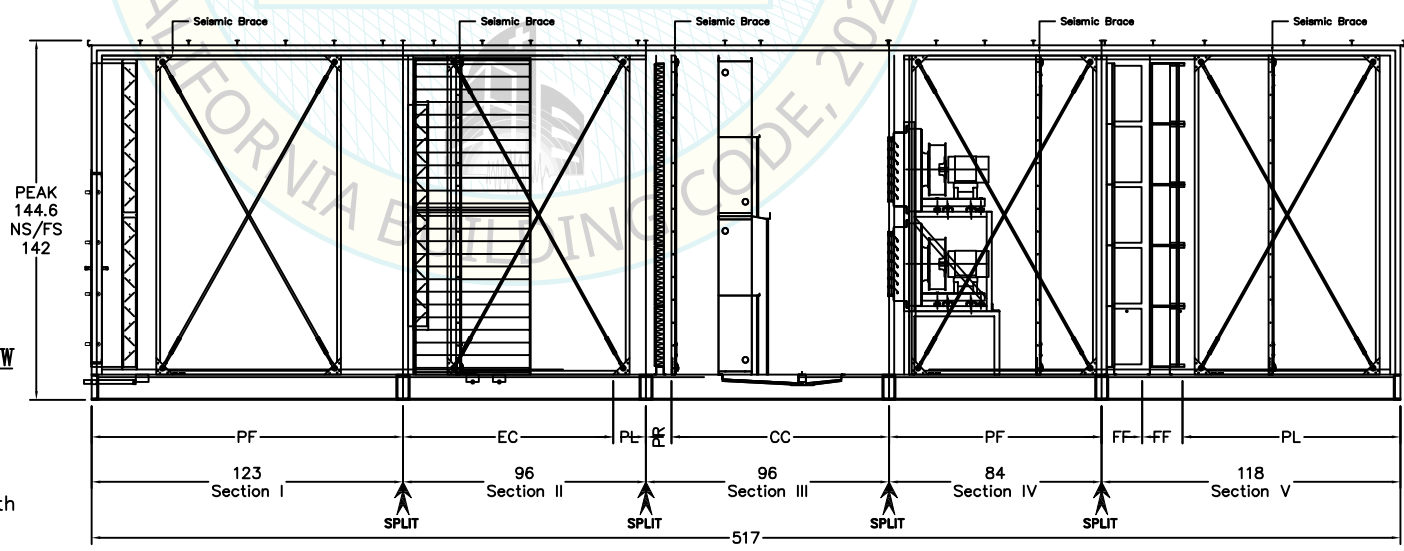
JOB NAME: HCAI-10 U Shape with Splits
UNIT TAG: AHU-10
JOB NUMBER: OSP-0740
DWG NUMBER: 0740_10

SHEET: 10

cross bracing applied as specified in drawings CS-081-003 and CS-081-003_1a



PLAN VIEW



SIDE VIEW

NOTES:

1. Cabinet Material: Galvanized Steel, Stainless Steel.
2. Stacked coils can be provided with or without coil rack using seismic details.
3. Control panel could be in various locations on the unit.
4. Internal seismic braces to be implemented per the restrictions outlined on drawing "OSP-0740_12"
5. Shipping splits shall maintain structural continuity between sections.

For all non-continuous interior braces, brace line must have full section width roof collector members, see Roof collector requirements for all interior non-continuous braces.

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DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED INCHES (PRIMARY)		
X	± 1/8	± .125
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.XX	± 1/16	± .0625
.XXX	± 1/32	± .03125
.XXXX	± 1/32	± .03125
ANGULAR ± 2°		

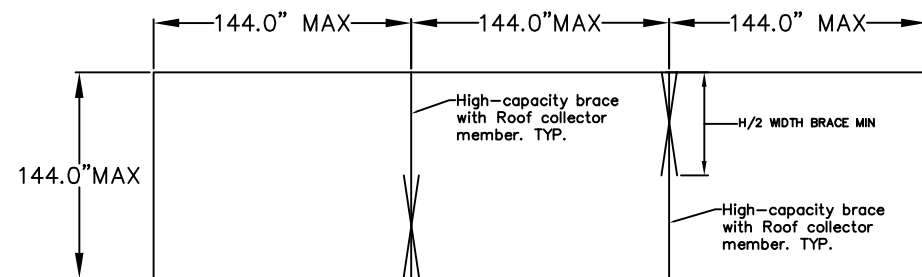
PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD, SAN DIEGO CALIFORNIA 92154



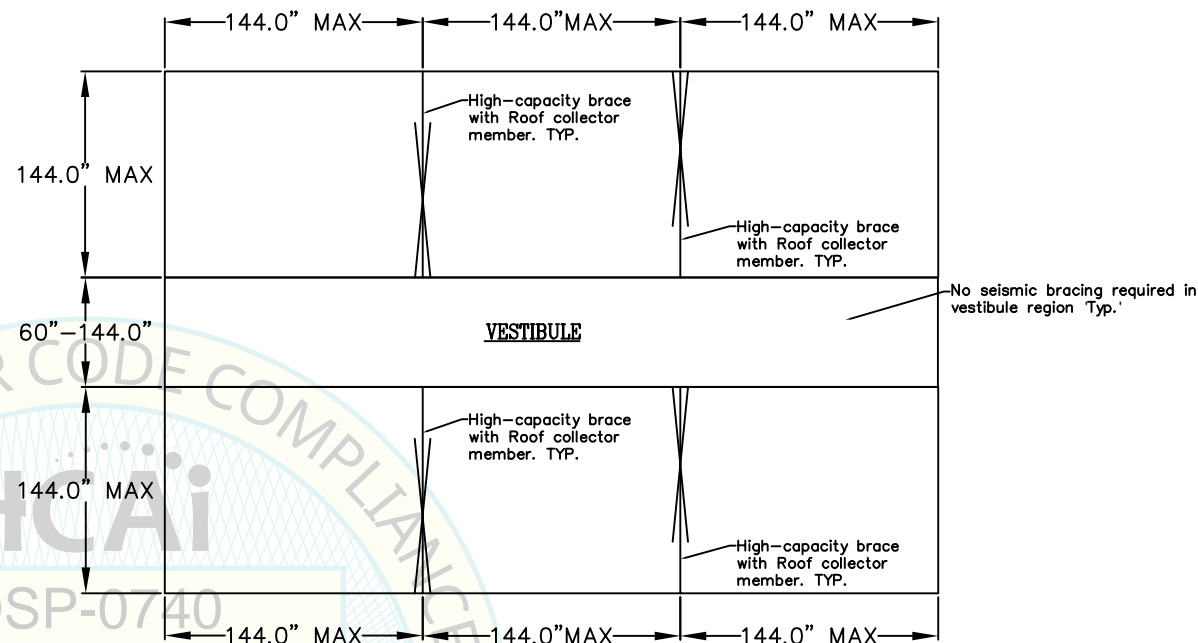
DESCRIPTION: OSHPD Renewal
DRAWING BY: J. Alcaraz
DATE: 08/05/2024

JOB NAME: HCAI-1 Wider Unit		SHEET: 11
UNIT TAG: AHU-H-11	JOB NUMBER: OSP-0740	
DWG NUMBER: 0740_11		

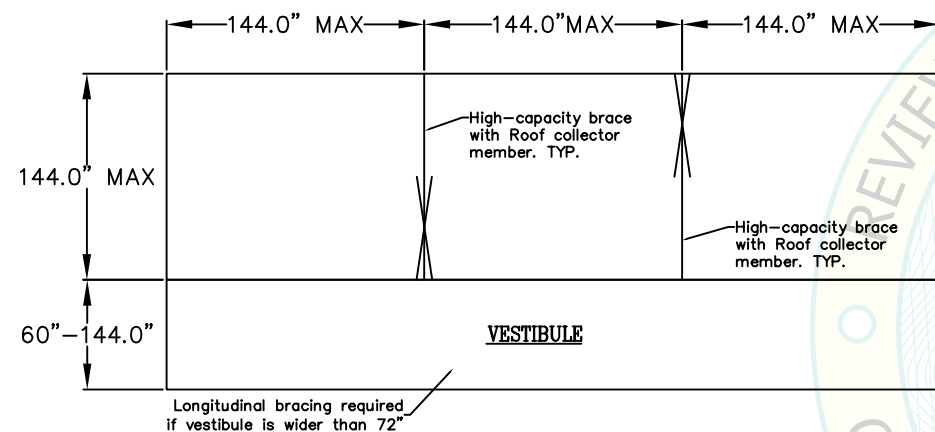
SINGLE TUNNEL UNIT



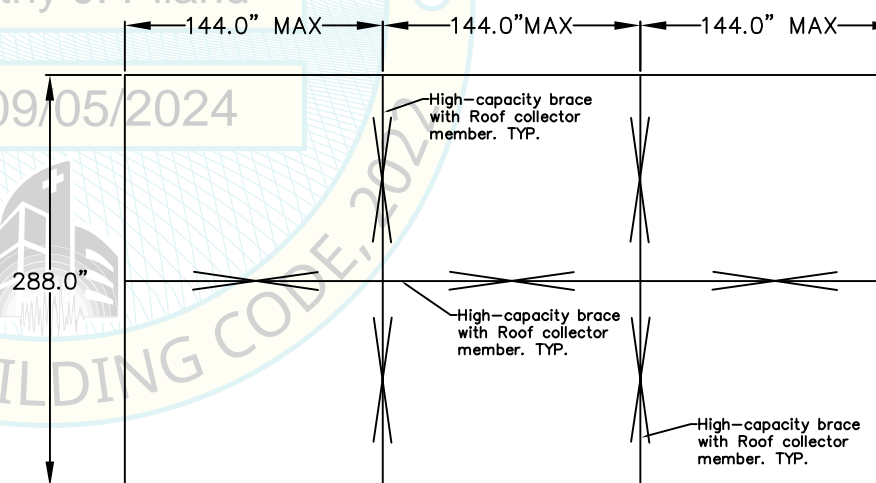
DOUBLE TUNNEL UNIT WITH VESTIBULE



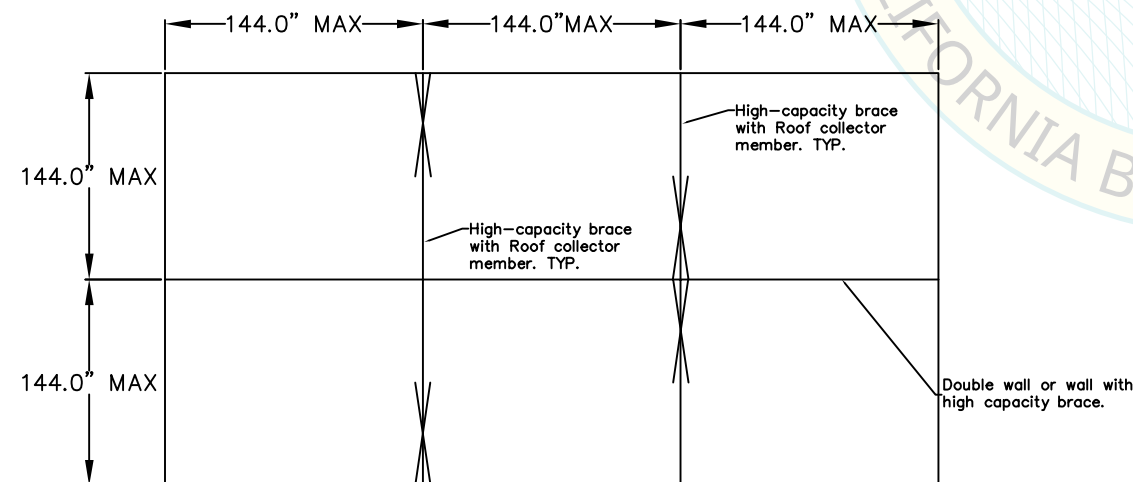
SINGLE TUNNEL UNIT WITH VESTIBULE



SINGLE TUNNEL WIDE UNIT

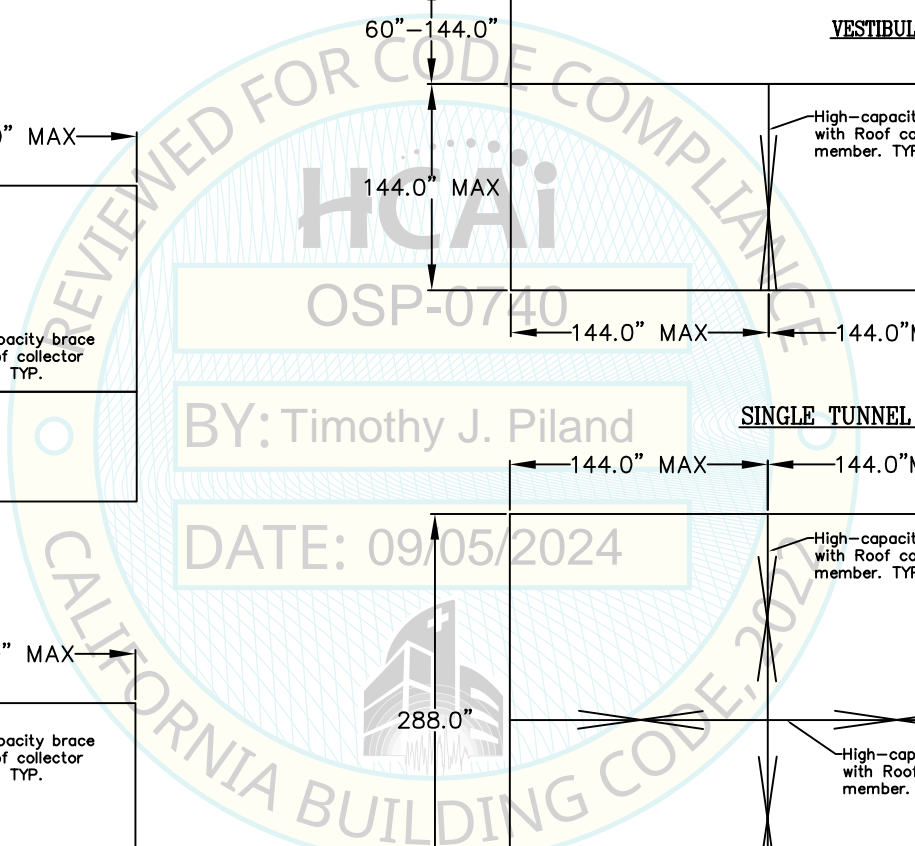


DOUBLE TUNNEL UNIT



NOTES:

1. Brace aren't always in line. spacing and tributary length requierements must be maintained for each brace.
2. High capacity cross brace shown above. Cross braces (standard capacity) or full width walls can be used with reduced tributary lenght of 72"
3. For all non-continuous interior braces, brace line must have roof collector members, see drawings OSP-0740_Collector.



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DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED INCHES (PRIMARY)		
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.xxx	± 1/32	± .03125
.xxxx	± 1/32	± .03125
ANGULAR ± 2°		

PRIMARY DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION
1695 CACTUS ROAD,
SAN DIEGO
CALIFORNIA 92154



DESCRIPTION: OSHPD Renewal
DRAWING BY: Jalcaraz
DATE: 08/05/2024

JOB NAME: SEISMIC BRACING REQUIREMENTS
UNIT TAG:
JOB NUMBER: OSP-0740
DWG NUMBER: 0740_12

SHEET: 12

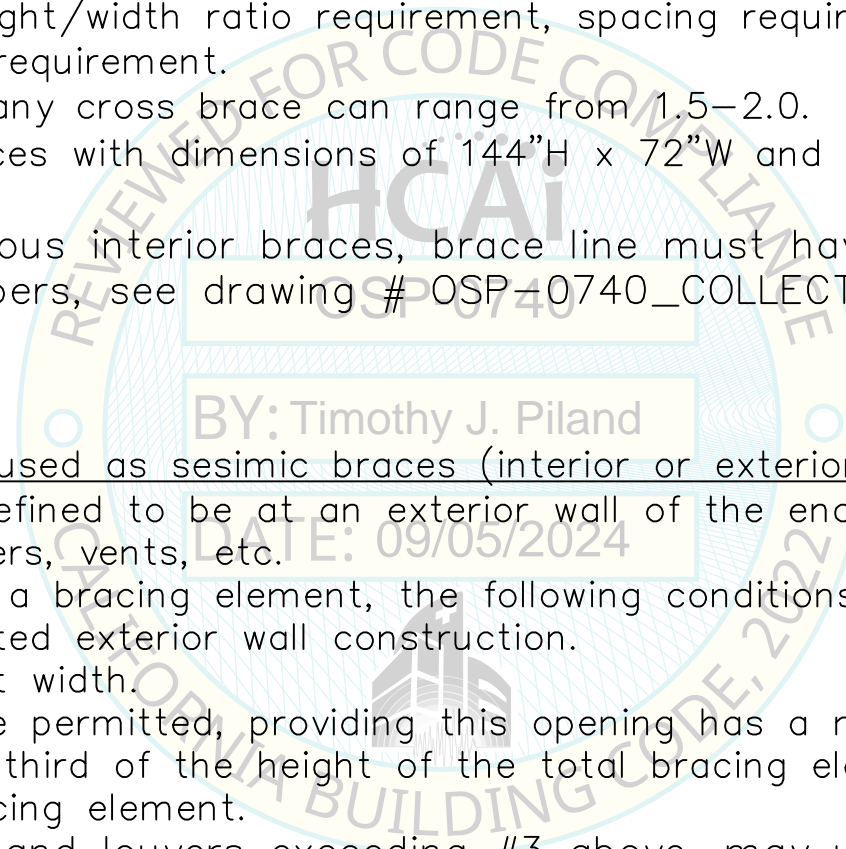
VERTIV: Requirements and Restrictions of Seismic Bracing


A. Interior Bracing Requirements

1. Qualified standard bracing elements:
Cross Brace, Full Width Wall (matching exterior wall construction).
2. Qualified High capacity bracing elements:
High capacity cross brace as detailed in following pages.
3. Bracing requirements must be applied both Transverse and longitudinally in the unit.
4. Maximum brace spacing: 144”.
5. Maximum tributary length for standard brace: 72”.
6. Maximum tributary length for High capacity brace: 144”.
7. Brace height must match air tunnel height.
8. Minimum total cross brace width: 1/2 the overall Unit width; Air Tunnel + Vestibule (or length if brace is parallel to airflow).
 - a. Multiple cross braces may be used to achieve minimum total brace width. Each individual brace must meet height/width ratio requirement, spacing requirement, and tributary length requirement.
9. Height/width ratio of any cross brace can range from 1.5–2.0.
 - a. Based on tested braces with dimensions of 144”H x 72”W and 144”and 96”W.
10. For all non–continuous interior braces, brace line must have Roof collector members, see drawing # OSP-0740_COLLECTOR.

B. Requirements for walls used as seismic braces (interior or exterior)

1. Exterior opening are defined to be at an exterior wall of the enclosure, created by the presence of louvers, vents, etc.
2. If a wall is utilized as a bracing element, the following conditions must be met:
 - a. Wall must match tested exterior wall construction.
 - b. Wall must be full unit width.
3. 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.
4. Walls with dampers and louvers exceeding #3 above, may used a maximum tributary length of 48” based on testing of "UUT2a"



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TITLE/TITULO:
Cross brace Requirements

NO.	DATE/FECHA	REVISION/REVISIÓN	DWN
3	08-07-24	Update notes	JRA
2	07-02-24	Update notes	JRA
1	03-21-24	Add & Update notes	JRA

ENGINEERING CONSTRUCTION STANDARD		
DRAWN BY/DIBUJADO POR:	ISSUED/LIBERADO:	DRAWING NO./NÚMERO DE DIBUJO:
J.R. Alcaraz	12/14/23	CS-081-004

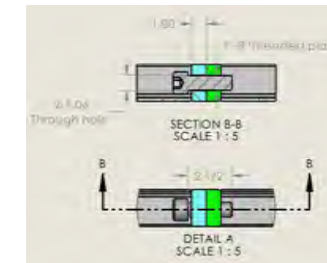
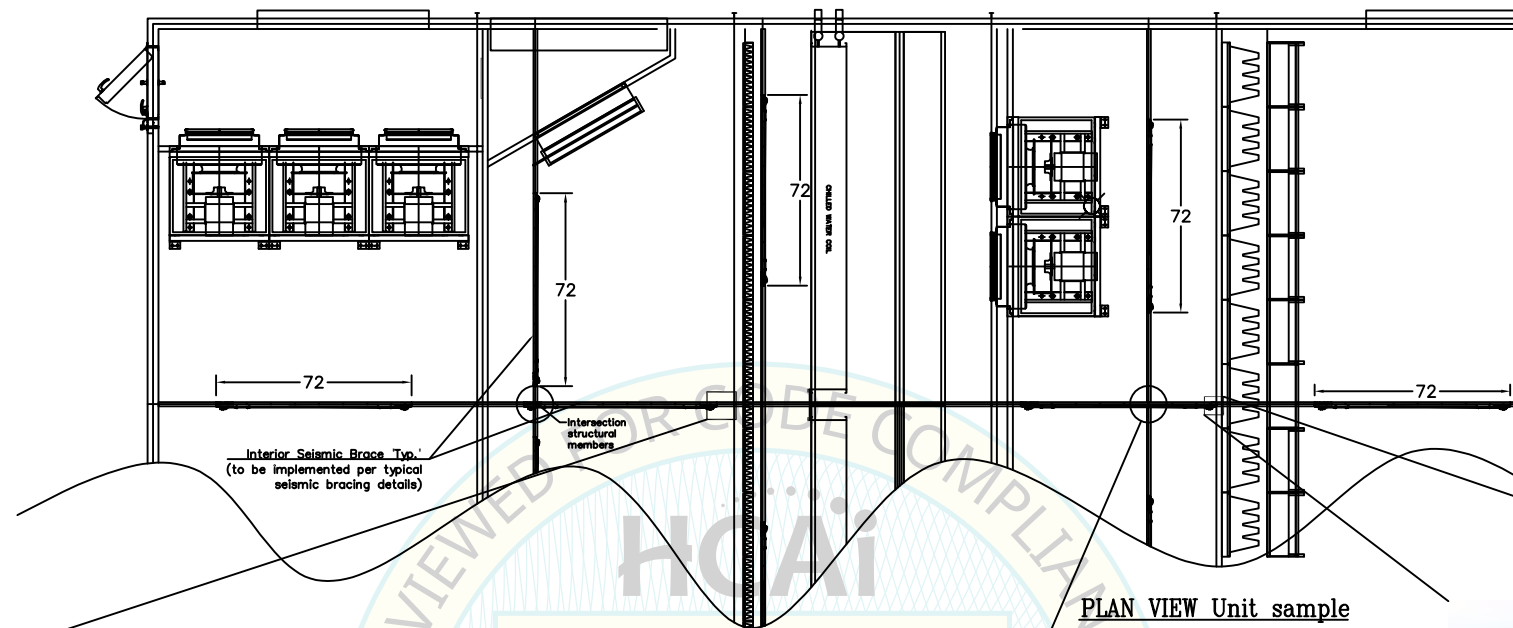
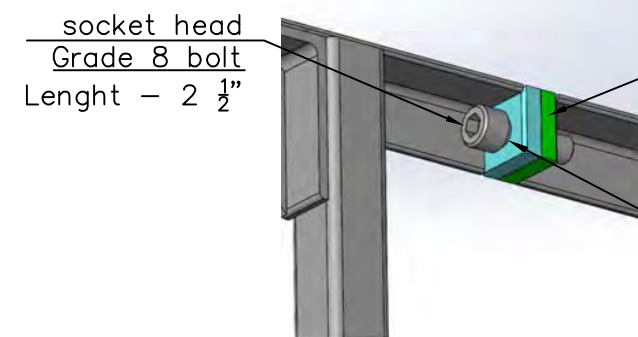


Plate to Plate JOINT COLLECTOR MEMBER
(used on splits or when angle is >20')

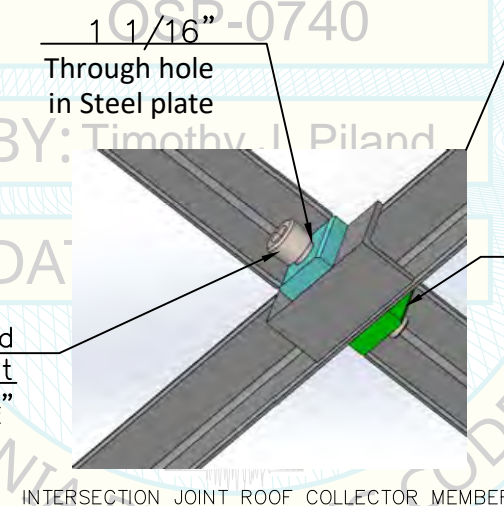


EXTENDED AND SPLIT JOINT ROOF COLLECTOR MEMBER BRACE
(used on splits or when angle is >20')

1"-8 threaded hole
in a 1" steel plate

1 1/16"
Through hole
in Steel plate

socket head
Grade 8 bolt
Length - 5 1/2"

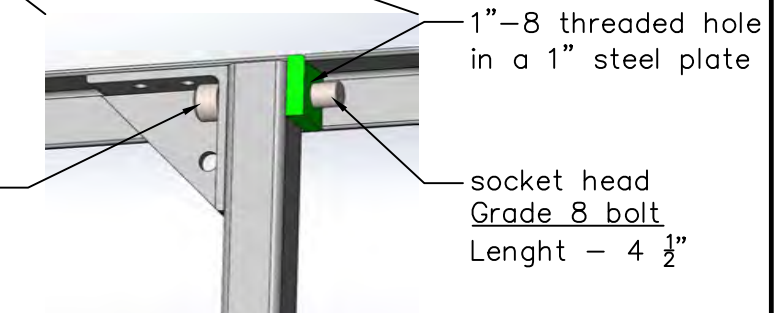


INTERSECTION JOINT ROOF COLLECTOR MEMBER

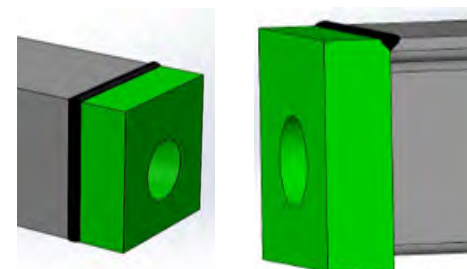
PLAN VIEW Unit sample

socket head
Grade 8 bolt

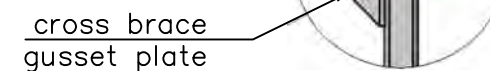
1"-8 threaded hole
in a 1" steel plate



BRACE POST JOINT COLLECTOR MEMBER
(used on splits or when angle is >20')



full penetration weld
in all end angles/plate



cross brace
gusset plate

NOTES:

The roof Collector member need to be one piece up to 20' When a joint or split is needed please see drawings detail of that Joint.

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.XX	± 1/16	± .0625
.XXX	± 1/32	± .03125
.XXXX	± 1/32	± .03125
ANGULAR ± 2°		

PRIMARY DIMENSIONS ARE IN INCHES

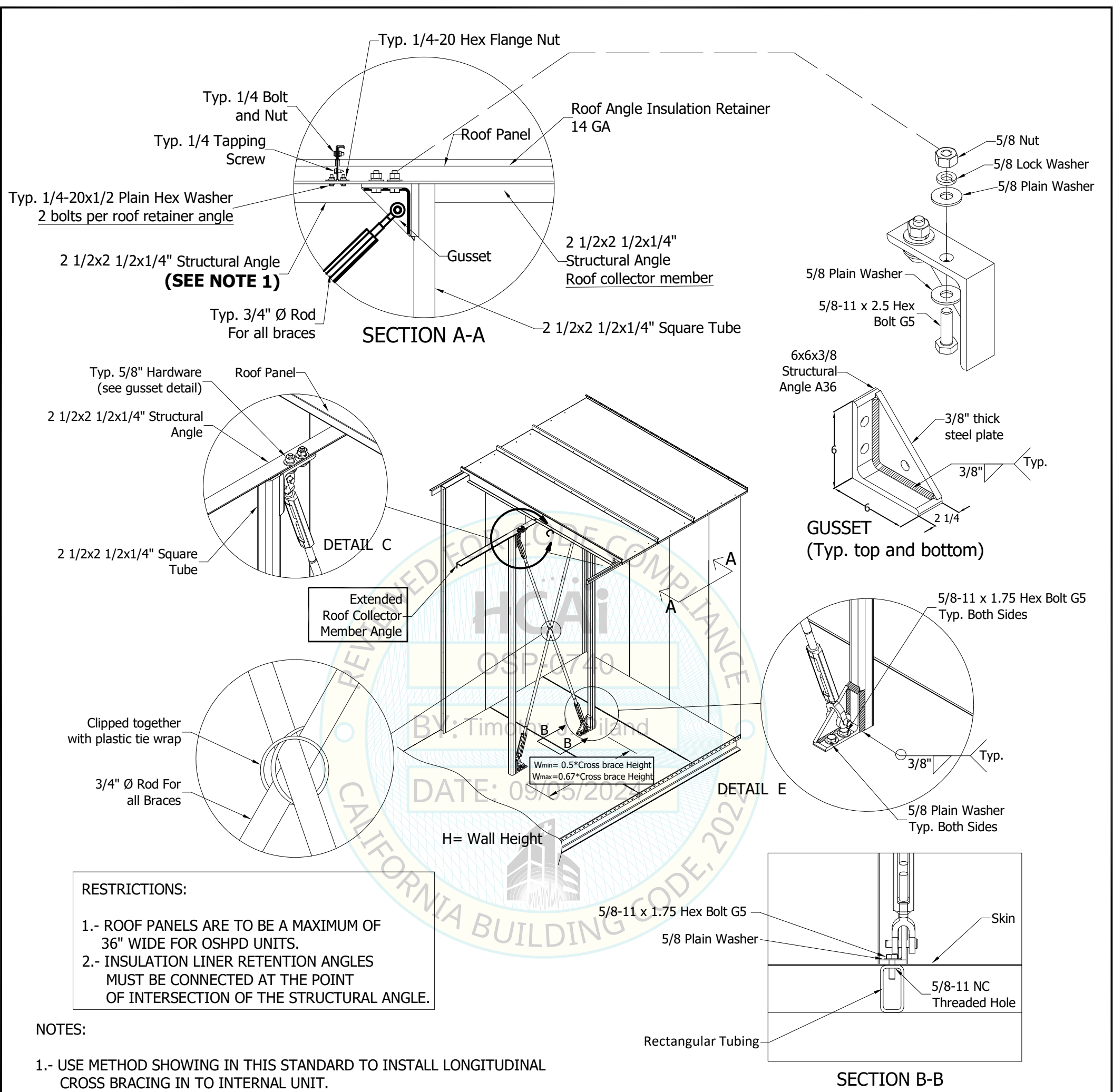
THIRD ANGLE PROJECTION

1695 CACTUS ROAD,
SAN DIEGO
CALIFORNIA 92154



DESCRIPTION: OSHPD Renewal	JOB NAME: Collector Member Joint Detail
DRAWING BY: J.ALCAZAR	UNIT TAG: AHU-H-13
DATE: 08/05/2024	DRAWING NUMBER: OSP-0740_COLLECTOR

SHEET: 13	
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RESTRICTIONS:

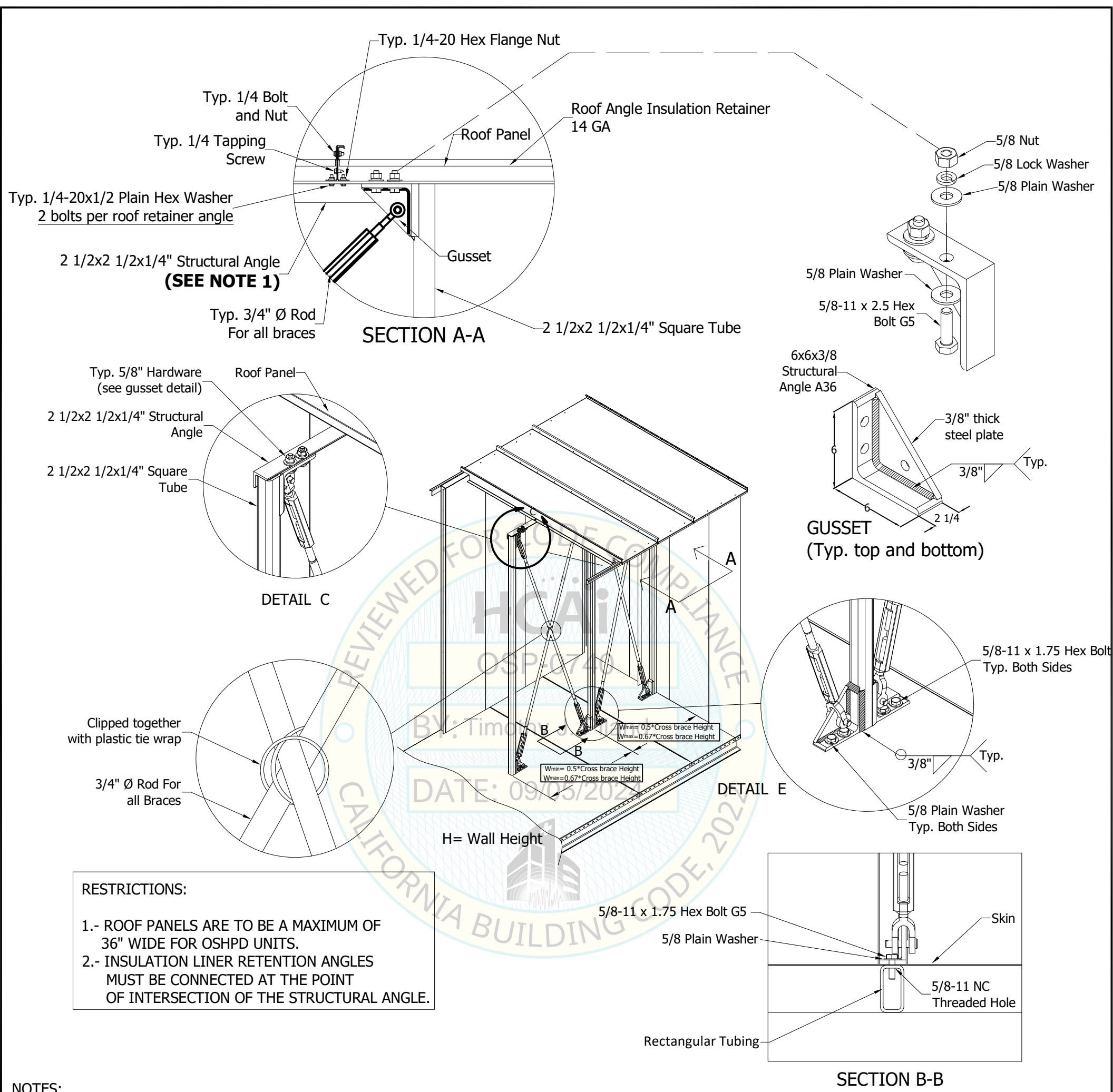
- 1.- ROOF PANELS ARE TO BE A MAXIMUM OF 36" WIDE FOR OSHPD UNITS.
- 2.- INSULATION LINER RETENTION ANGLES MUST BE CONNECTED AT THE POINT OF INTERSECTION OF THE STRUCTURAL ANGLE.

NOTES:

- 1.- USE METHOD SHOWING IN THIS STANDARD TO INSTALL LONGITUDINAL CROSS BRACING IN TO INTERNAL UNIT.
- 2.- PAINT CROSS BRACING BEFORE TO INSTALL. USE STANDARD UNIT COLOR
- 3.- Collector member is required at all non-continuous interior braces.

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5	08-07-24	Max-Min cross brace dimension	JRA
4	08-05-24	Remove vertical post	JRA
3	07-12-24	Show Roof Collector Member	JRA
2	03-20-24	Update View and notes	JRA
1	12-13-23	Update bolt dimension and Title	JRA
NO.	DATE/FECHA	REVISION/REVISIÓN	DWN

<p>TITLE/TITULO: LONGITUDINAL SINGLE CROSS BRACE INSTALLATION High Capacity Longitudinal Case (SEISMIC CERTIFICATION)</p>		
<p>ENGINEERING CONSTRUCTION STANDARD</p>		
DRAWN BY/DIBUJADO POR: J.R.Alcaraz	ISSUED/LIBERADO: 11/29/23	DRAWING NO./NÚMERO DE DIBUJO: CS-081-002_1a



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.

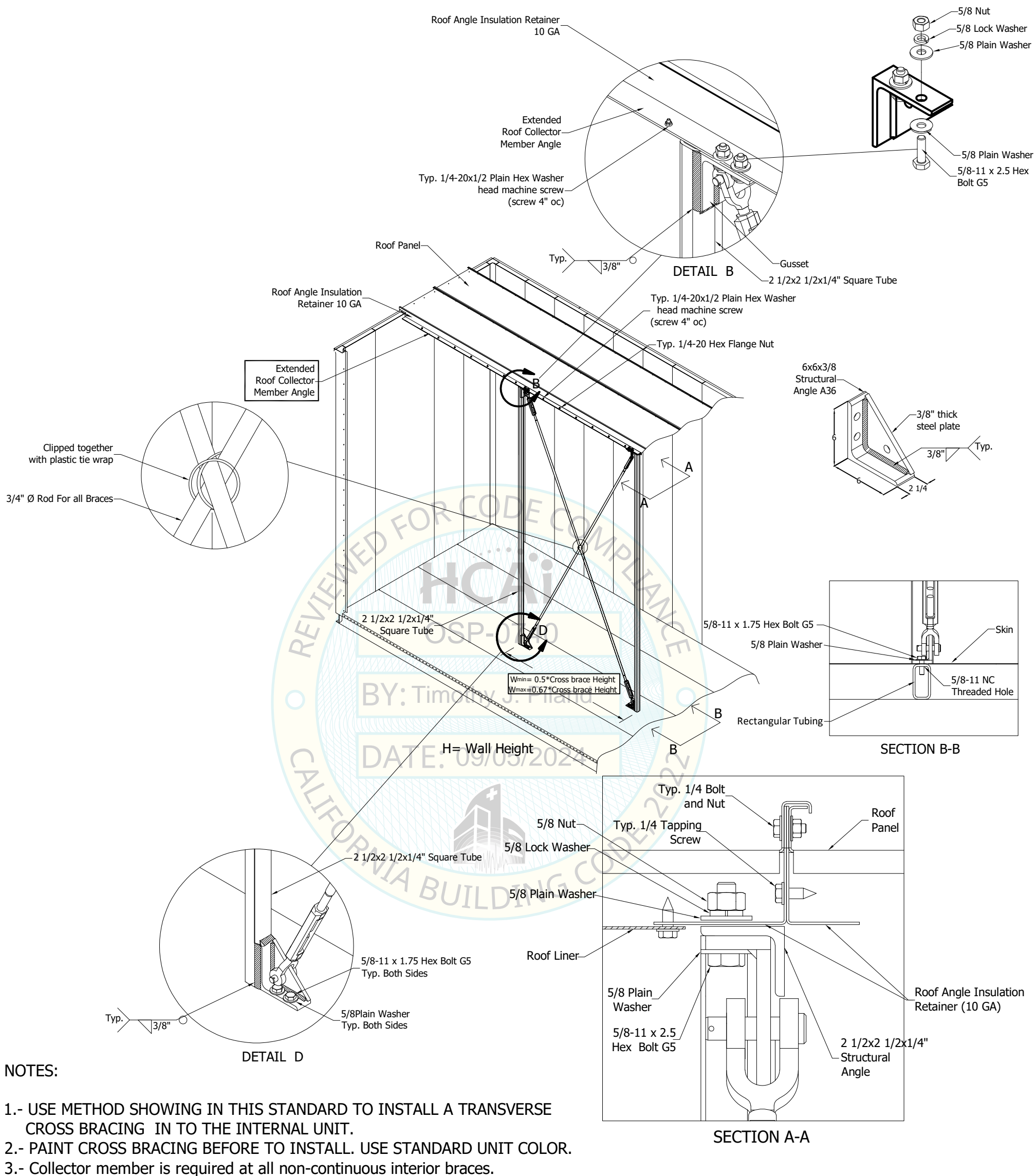
- NOTES:**
- 1.- USE METHOD SHOWING IN THIS STANDARD TO INSTALL LONGITUDINAL CROSS BRACING IN TO INTERNAL UNIT.
 - 2.- PAINT CROSS BRACING BEFORE TO INSTALL. USE STANDARD UNIT COLOR
 - 3.- Collector member is required at all non-continuous interior braces.

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TITLE/TITULO:
LONGITUDINAL DOUBLE BRACE INSTALLATION
 High Capacity Longitudinal Case
 (SEISMIC CERTIFICATION)

NO.	DATE/FECHA	REVISION/REVISIÓN	DWN
4	08-07-24	Max-Min cross brace dimension	JRA
3	07-12-24	Show Roof Collector Member	JRA
2	03-20-24	Update View and notes	JRA
1	12-13-23	Update bolt dimension and Title	JRA

ENGINEERING CONSTRUCTION STANDARD	
DRAWN BY/DIBUJADO POR: J. Alcaraz	ISSUED/LIBERADO: 11/29/23
DRAWING NO./NÚMERO DE DIBUJO: CS-081-002	



NOTES:

- 1.- USE METHOD SHOWING IN THIS STANDARD TO INSTALL A TRANSVERSE CROSS BRACING IN TO THE INTERNAL UNIT.
- 2.- PAINT CROSS BRACING BEFORE TO INSTALL. USE STANDARD UNIT COLOR.
- 3.- Collector member is required at all non-continuous interior braces.



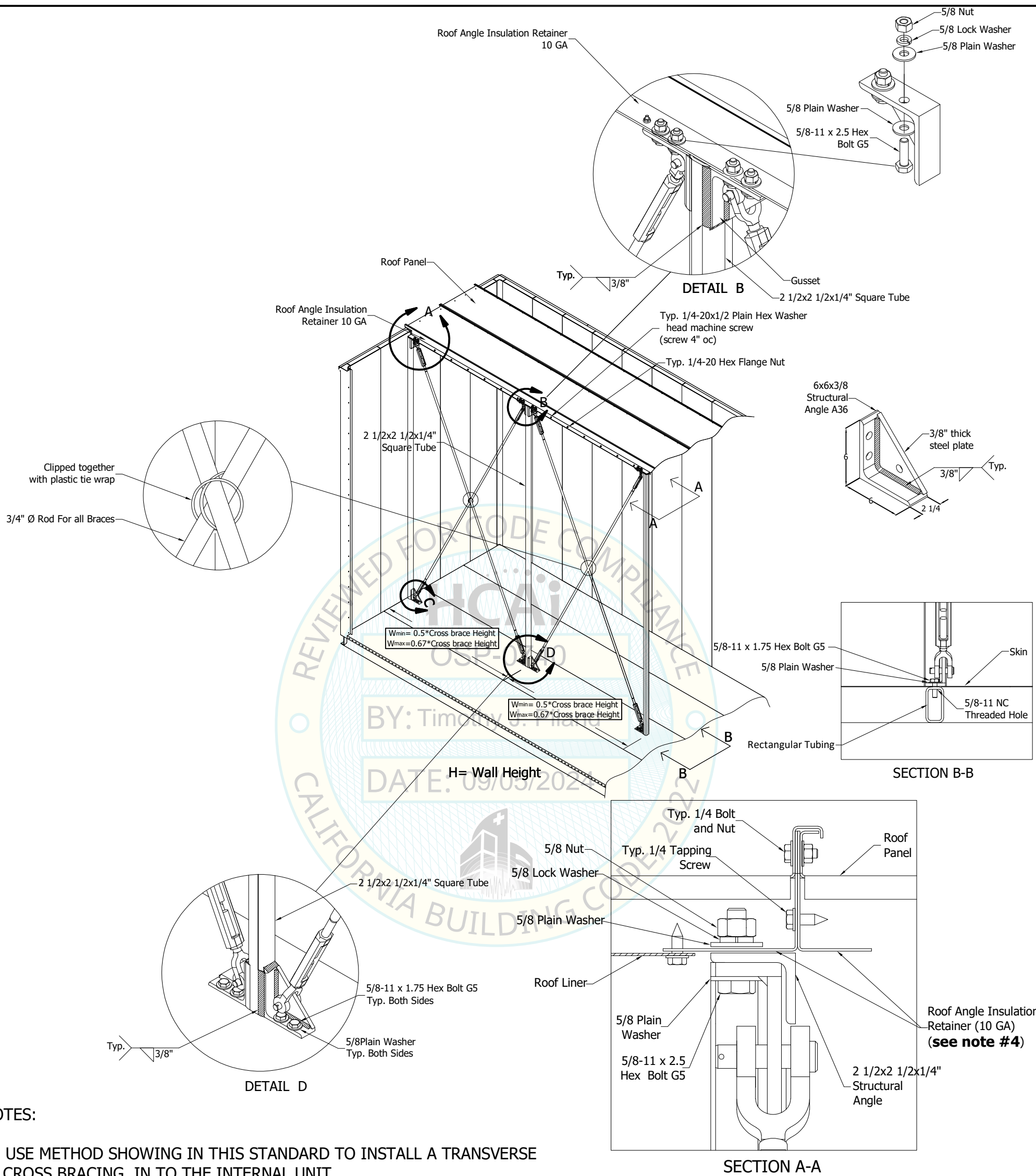
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TITLE/TITULO:
TRANSVERSE SINGLE CROSS BRACE INSTALLATION
High Capacity Transverse Case
(SEISMIC CERTIFICATION)

ENGINEERING CONSTRUCTION STANDARD

NO.	DATE/FECHA	REVISION/REVISIÓN	
4	08-07-24	Max-Min cross brace dimension	JRA
3	08-05-24	Remove vertical post	JRA
2	07-12-24	Show Roof Collector Member	JRA
1	07-04-24	Update Title note	JRA
			DWN

DRAWN BY/DIBUJADO POR: J.R. Alcaraz	ISSUED/LIBERADO: 11/29/23	DRAWING NO./NÚMERO DE DIBUJO: CS-081-003_1a
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NOTES:

- 1.- USE METHOD SHOWING IN THIS STANDARD TO INSTALL A TRANSVERSE CROSS BRACING IN TO THE INTERNAL UNIT.
- 2.- PAINT CROSS BRACING BEFORE TO INSTALL. USE STANDARD UNIT COLOR.
- 3.- Collector member is required at all non-continuous interior braces.



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TITLE/TITULO:

**TRANSVERSE DOUBLE BRACE CONNECTIONS
High Capacity Transverse Case
(SEISMIC CERTIFICATION)**

ENGINEERING CONSTRUCTION STANDARD

NO.	DATE/FECHA	REVISION/REVISIÓN	DWN
4	08-07-24	Max-Min cross brace dimension	JRA
3	08-05-24	Update bolt lenght to the Roof	JRA
2	03-20-24	Update View and notes	JRA
1	12-13-23	Update bolt dimension and Title	JRA

DRAWN BY/DIBUJADO POR: J. Alcaraz	ISSUED/LIBERADO: 03/19/24	DRAWING NO./NÚMERO DE DIBUJO: CS-081-003
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