



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION**

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

OFFICE USE ONLY

**APPLICATION #: OSP-0785**

**HCAI Special Seismic Certification Preapproval (OSP)**

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: CUSTOM MECHANICAL SYSTEMS, LLC

Manufacturer's Technical Representative: Michael Ball

Mailing Address: 1981 N Broadway Suite 400, Walnut Creek, CA 94596

Telephone: (510) 932-2406

Email: mball@cmscooling.com

**Product Information**

Product Name: Air Conditioning Units

Product Type: Air Conditioning Units - Custom

Product Model Number: CPDXE-23 Custom Air Handling Unit

General Description: Single model custom air handling unit constructed of carbon steel.

Mounting Description: Spring Vibration Isolated, Curb Mounted

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

**Applicant Information**

Applicant Company Name: Manwill Engineering LLC

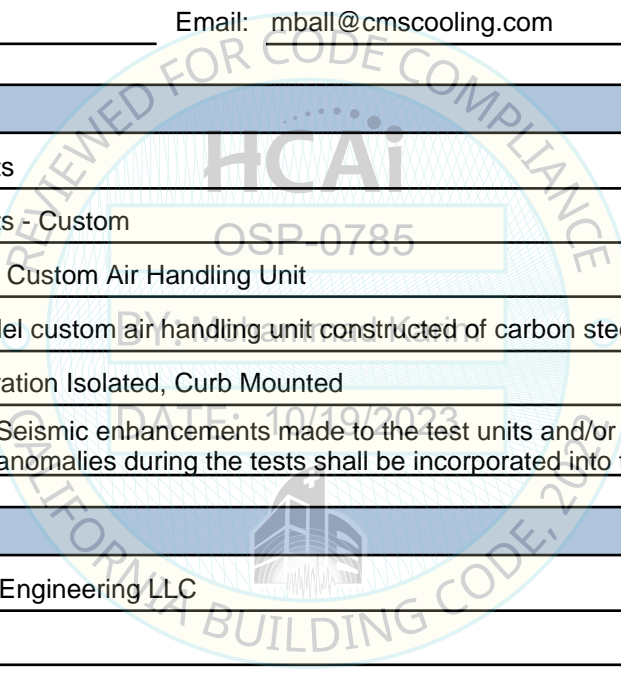
Contact Person: Derek Manwill

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102

Email: derek@manwillse.com

Title: President





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

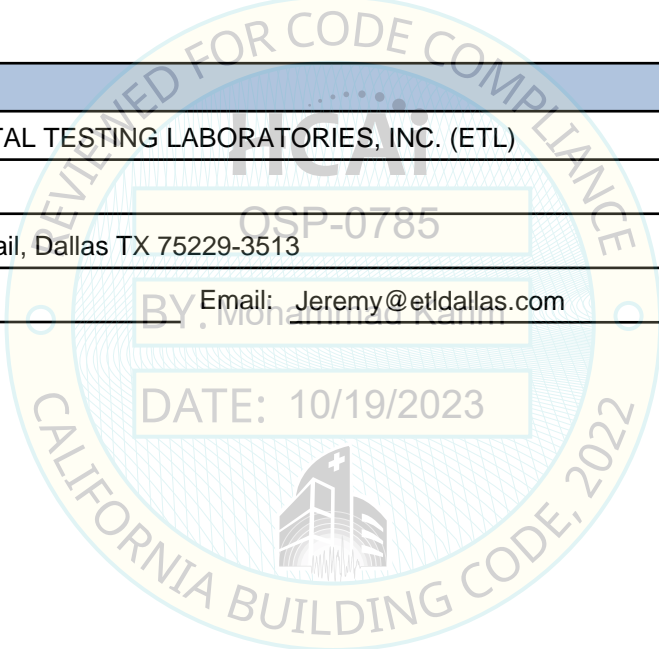
Company Name: MANWILL ENGINEERING LLC  
Name: Derek Manwill California License Number: S6266  
Mailing Address: PO Box 1194, Bend, OR 97709  
Telephone: (541) 241-2102 Email: derek@manwillse.com

**Certification Method**

GR-63-Core       ICC-ES AC156       IEEE 344       IEEE 693       NEBS 3  
 Other (Please Specify): \_\_\_\_\_

**Testing Laboratory**

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)  
Contact Person: Jeremy Lange  
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513  
Telephone: (972) 247-9657 Email: Jeremy@etldallas.com





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**Seismic Parameters**

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.58 (SDS=0.70, z/h=1), 0.84 (SDS=1.12, z/h=0)

SDS (Design spectral response acceleration at short period, g) = 0.70 (z/h=1), 1.12 (z/h=0)

$a_p$  (Amplification factor) = 2.5

$R_p$  (Response modification factor) = 2.0

$\Omega_0$  (System overstrength factor) = 2.0

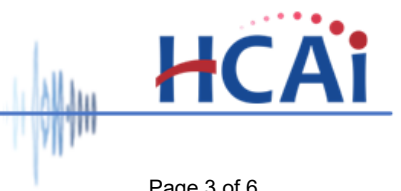
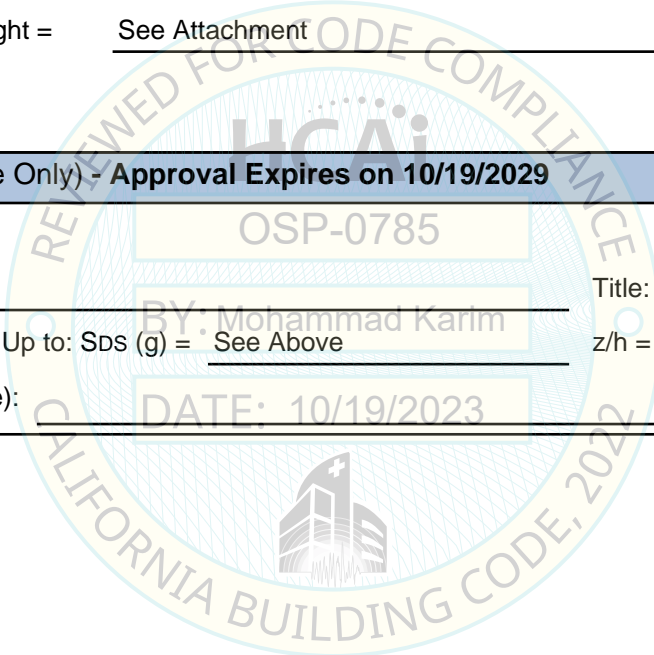
$I_p$  (Importance factor) = 1.5

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

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

<b>HCAI Approval (For Office Use Only) - Approval Expires on 10/19/2029</b>			
Date:	<u>10/19/2023</u>	OSP-0785	
Name:	<u>Mohammad Karim</u>	BY: Mohammad Karim	Title: <u>Supervisor, Health Facilities</u>
Special Seismic Certification Valid Up to:	SDS (g) = <u>See Above</u>		z/h = <u>See Above</u>
Condition of Approval (if applicable):	<u>DATE: 10/19/2023</u>		



**CUSTOM MECHANICAL SYSTEMS, LLC**  
**Custom Air Handling Unit**

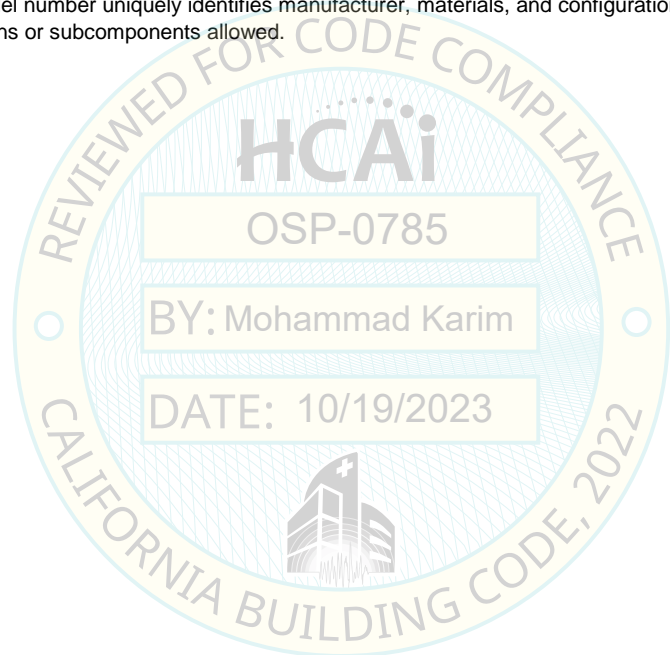
**TABLE 1**

Model Number	Dimensions (in)			Max. Wt. (lb)	Description / Notes	Basis
	Depth	Width	Height			
<b>Custom Air Handling Unit</b> CPDXE-23	144	94	70	5,200	-	<b>UUT 1,2</b>

**Mounting:** Spring Vibration Isolated Curb Mounted. **Seismic Levels:**  $S_{DS} = 0.70g$  for  $z/h = 1$   
 $S_{DS} = 1.12g$  for  $z/h = 0$   $I_p = 1.5$

**Product Construction:** Roof/walls: 2in panels, 16GA carbon steel exterior skin, 20GA carbon steel interior liner, fiberglass insulation. Base: 12GA formed carbon steel base with vertical lip to attach to side of curb.

**Options/Subcomponents:** Model number uniquely identifies manufacturer, materials, and configuration of subcomponents. This is a single model with no variations in options or subcomponents allowed.



## UUT 1

Manufacturer: CUSTOM MECHANICAL SYSTEMS, LLC

Model number: CPDXE-23 (001)

Unit function: AIR HANDLING UNIT

Serial number: 230081-01-001

Dimensions (in)			Weight (lb)	Res. Freq. (Hz)		
Depth	Width	Height		F-B	S-S	V
144.0	94.0	70.0	5,200	2.5	1.9	4.9

Code & criteria: 2022 CBC, ICC-ES AC156

Test laboratory: Environmental Testing Laboratory

Report: 20023TR1.0 (dated 10-11-23), tested on 10-6-23

S <sub>DS</sub> (g)	z/h	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
0.70	1	1.12	0.84	0.75	0.30
1.12	0				

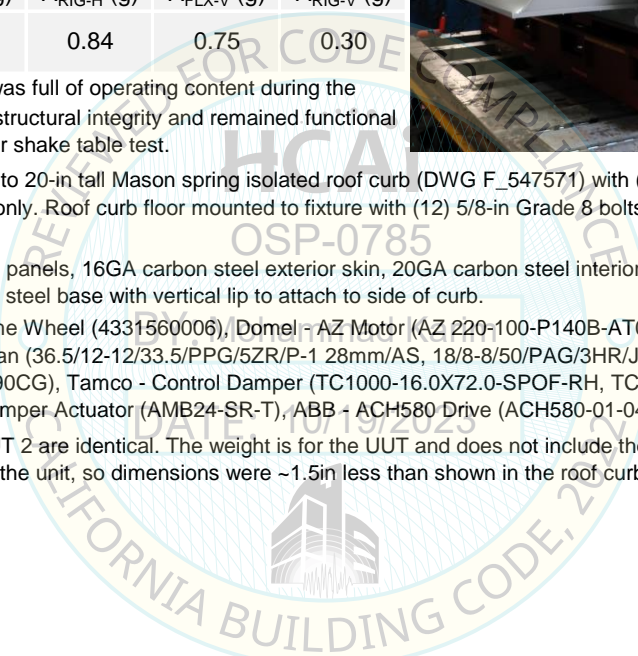
Importance Factor, I<sub>p</sub> = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

**Mounting:** UUT mounted to 20-in tall Mason spring isolated roof curb (DWG F\_547571) with (28) #14 self-tapping screws distributed on long sides only. Roof curb floor mounted to fixture with (12) 5/8-in Grade 8 bolts with square plate washers on long sides only.

**Construction:** Roof/walls: 2in panels, 16GA carbon steel exterior skin, 20GA carbon steel interior liner, fiberglass insulation. Base: 12GA formed carbon steel base with vertical lip to attach to side of curb.

**Subcomponents:** Punker - Dprime Wheel (4331560006), Domel - AZ Motor (AZ 220-100-P140B-AT0G), OJ - Drive (OJ-DV-3055-NGN7), Multi-Wing - Fan (36.5/12-12/33.5/PPG/5ZR/P-1 28mm/AS, 18/8-8/50/PAG/3HR/JA 1.125/BR), Domel - ZZ Motor (ZZ150070S090CG), Tamco - Control Damper (TC1000-16.0X72.0-SPOF-RH, TC1000-20.0X20.0-SPOF-LH), Tamco - Modulating Damper Actuator (AMB24-SR-T), ABB - ACH580 Drive (ACH580-01-044A-4).

**Testing notes:** UUT 1 and UUT 2 are identical. The weight is for the UUT and does not include the curb. The curb required modification to fit the width of the unit, so dimensions were ~1.5in less than shown in the roof curb drawing.



## UUT 2

Manufacturer: CUSTOM MECHANICAL SYSTEMS, LLC

Model number: CPDXE-23 (002)

Unit function: AIR HANDLING UNIT

Serial number: 230081-01-002

Dimensions (in)			Weight (lb)	Res. Freq. (Hz)		
Depth	Width	Height		F-B	S-S	V
144.0	94.0	70.0	5,200	2.9	2.0	5.7

Code & criteria: 2022 CBC, ICC-ES AC156

Test laboratory: Environmental Testing Laboratory

Report: 20023TR1.0 (dated 10-11-23), tested on 10-6-23

S <sub>DS</sub> (g)	z/h	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
0.70	1	1.12	0.84	0.75	0.30
1.12	0				

Importance Factor, I<sub>p</sub> = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

**Mounting:** UUT mounted to 20-in tall Mason spring isolated roof curb (DWG F\_547571) with (28) #14 self-tapping screws distributed on long sides only. Roof curb floor mounted to fixture with (12) 5/8-in Grade 8 bolts with square plate washers on long sides only.

**Construction:** Roof/walls: 2in panels, 16GA carbon steel exterior skin, 20GA carbon steel interior liner, fiberglass insulation. Base: 12GA formed carbon steel base with vertical lip to attach to side of curb.

**Subcomponents:** Punker - Dprime Wheel (4331560006), Domel - AZ Motor (AZ 220-100-P140B-AT0G), OJ - Drive (OJ-DV-3055-NGN7), Multi-Wing - Fan (36.5/12-12/33.5/PPG/5ZR/P-1 28mm/AS, 18/8-8/50/PAG/3HR/JA 1.125/BR), Domel - ZZ Motor (ZZ150070S090CG), Tamco - Control Damper (TC1000-16.0X72.0-SPOF-RH, TC1000-20.0X20.0-SPOF-LH), Tamco - Modulating Damper Actuator (AMB24-SR-T), ABB - ACH580 Drive (ACH580-01-044A-4).

**Testing notes:** UUT 1 and UUT 2 are identical. The weight is for the UUT and does not include the curb. The curb required modification to fit the width of the unit, so dimensions were ~1.5in less than shown in the roof curb drawing.

