



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

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

OFFICE USE ONLY

APPLICATION #: OSP-0481

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: EVAPCO, INC.

Manufacturer's Technical Representative: Scott Nevins

Mailing Address: 5151 Allendale Ln, Taneytown, MD 21787

Telephone: (410) 756-2600

Email: snevins@evapco.com

Product Information

Product Name: Cooling Towers

Product Type: NA

Product Model Number: AXS ADVANCED CROSSFLOW SERIES COOLING TOWERS

General Description: Crossflow cooling tower constructed of carbon steel or stainless steel with seismic enhancements.

Mounting Description: Rigid or Spring Vibration Isolated, Floor 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

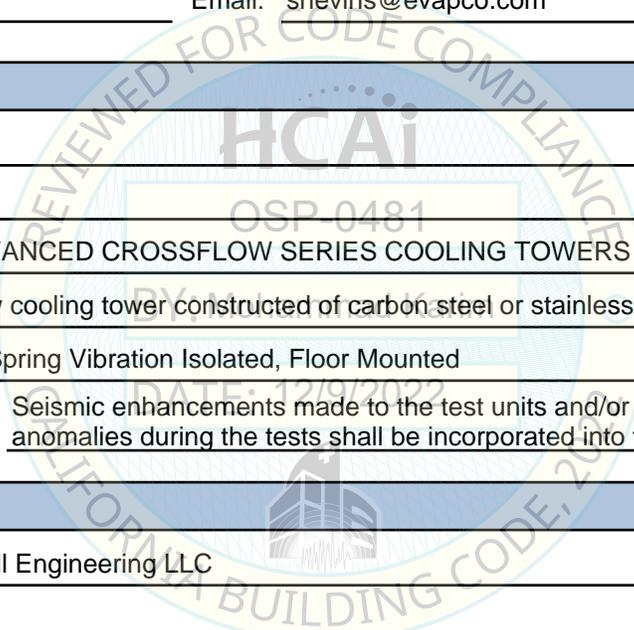
Contact Person: Derek Manwill

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102

Email: derek@manwillse.com

Title: President





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FACILITIES DEVELOPMENT DIVISION

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

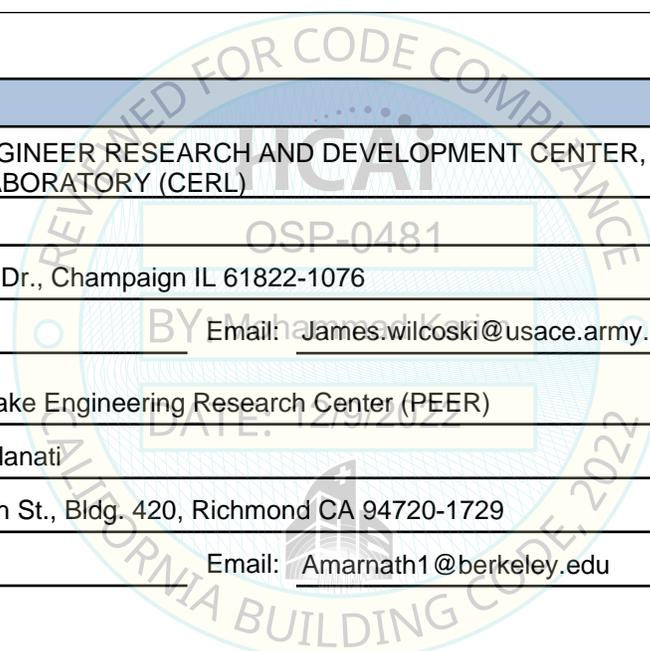
Company Name: MANWILL ENGINEERING LLC
Name: Derek Manwill California License Number: S6266
Mailing Address: PO Box 1194, Bend, OR 97709
Telephone: (541) 241-2102 Email: derek@manwillse.com

Certification Method

GR-63-Core [X] ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
Other (Please Specify):

Testing Laboratory

Company Name: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, CONSTRUCTION ENGINEERING RESEARCH LABORATORY (CERL)
Contact Person: James Wilcoski
Mailing Address: 2902 Newmark Dr., Champaign IL 61822-1076
Telephone: (217) 373-6763 Email: James.wilcoski@usace.army.mil
Company Name: Pacific Earthquake Engineering Research Center (PEER)
Contact Person: Amarnath Kasalanati
Mailing Address: 1301 South 46th St., Bldg. 420, Richmond CA 94720-1729
Telephone: (510) 642-3437 Email: Amarnath1@berkeley.edu





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FACILITIES DEVELOPMENT DIVISION**

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 3.80 (SDS=1.69, z/h=1), 2.03 (SDS=2.70, z/h=0)

SDS (Design spectral response acceleration at short period, g) = 1.69 (z/h=1), 2.70 (z/h=0)

a_p (Amplification factor) = 2.5

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 12/09/2028

Date: 12/9/2022

Name: Mohammad Karim Title: Supervisor, Health Facilities

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

Condition of Approval (if applicable): DATE: 12/9/2022



ATTACHMENT 1: CERTIFIED COMPONENTS

SPECIAL SEISMIC CERTIFICATION

TABLE 1

DOCUMENT NO.: 21071CR1.0

MANUFACTURER: EVAPCO, INC.						
PRODUCT FAMILY: AXS ADVANCED CROSSFLOW SERIES COOLING TOWERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
AXS						
AXS 12-9*22	273	142	137	26,830	Single stack, 12x22, 9' Fill	INTERP
AXS 14-9*24	297	167	137	32,920	Single stack, 14x24, 9' Fill	INTERP
AXS 12-13*22	273	142	188	37,170	Double stack, 12x22, 13' Fill	INTERP
AXS 12-17*22	273	142	235	38,230	Double stack, 12x22, 17' Fill	INTERP
AXS 12-20*22	273	142	271	41,790	Double stack, 12x22, 20' Fill	INTERP
AXS 12-20R22	273	142	271	41,790	Carbon Steel, double, 12x22, 20'	UUT 3
AXS 14-13*24	297	167	188	48,240	Double stack, 14x24, 13' Fill	INTERP
AXS 14-17*24	297	167	235	49,490	Double stack, 14x24, 17' Fill	INTERP
AXS 14-20*24	297	167	271	52,200	Double stack, 14x24, 20' Fill	INTERP
AXS 14-20S24	297	167	271	52,200	Stainless steel, double, 14x24, 20'	UUT 5
AXS FAN MODULE						
AXS 12X Fan Module	157	142	62	6,000	Carbon steel, single stack	UUT 7
AXS 14X Fan Module	181	167	62	6,000	Carbon steel, single stack	UUT 6
AT						
AT 112-4O20	240	142	207	26,360	Stainless steel, double Stack	UUT 8
MOUNTING:	Rigid or spring vibration isolated floor mounted.			SEISMIC LEVELS:	$S_{DS} = 1.69g$ for $z/h = 1$ $S_{DS} = 2.70g$ for $z/h = 0$ $I_p = 1.5$	
NOTES:	<p>Seismic Enhancements: Seismic enhancements made to the test units must be included in the production models.</p> <p>Product Construction: Carbon steel or stainless steel enclosure and basin.</p> <p>Construction Options: Inlet: Top, Side, End, Bottom; Outlet: Side, End, Bottom; Equalizer: Side, Bottom; Bypass: Side, Bottom; Air Intake Screens; Flume Plate and Cover; Internal Piping (SCH 10 carbon or stainless steel or SCH 40 PVC); Sump Sweeper Piping; Cold Water Basin Covers; Remote Sump Trash Screen; Double Drift Eliminators.</p> <p>Fan Options: Velocity Recovery Stack (fiberglass): 11ft diameter X 5ft tall; Cylinder Extension (carbon or stainless steel): 11-13ft diameter X 0-3ft tall w/ 1ft max tall sections; Belt Drive or Gear Drive; Gear Drive Support (carbon or stainless steel); Fan Shaft (carbon or stainless steel); Fan Access Door.</p> <p>Access Options: External Service Platform; Internal Drive Acces Platform; Internal Walkway; Motor Davit Base; Perimeter Handrail; Ladder with Safety Cage; Safety Gate.</p> <p>Subcomponents: Subcomponents are listed in Table 2.</p>					

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SPECIAL SEISMIC CERTIFICATION

TABLE 2 - SUBCOMPONENTS

DOCUMENT NO.: 21071CR1.0

MANUFACTURER: EVAPCO, INC.						
PRODUCT FAMILY: AXS ADVANCED CROSSFLOW SERIES COOLING TOWERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Cofimco - Fan (Aluminum)						
132D-5B-A-165	132	132	4.6	165	24L 5-Blade, B3 Hub	UUT 7
132D-6B-A-190	132	132	4.6	190	24L 6-Blade, B3 Hub	INTERP
132D-7B-A-210	132	132	4.6	210	24L 7-Blade, B3 Hub	UUT 3
132D-6B-A-340	132	132	5.5	340	34N 6-Blade, B6 Hub	INTERP
132D-7B-A-380	132	132	5.5	380	34N 7-Blade, B6 Hub	INTERP
132D-8B-A-415	132	132	5.5	415	34N 8-Blade, B6 Hub	INTERP
156D-5B-A-330	156	156	5.5	330	34N 5-Blade, B6 Hub	INTERP
156D-6B-A-375	156	156	5.5	375	34N 6-Blade, B6 Hub	INTERP
156D-7B-A-415	156	156	5.5	415	34N 7-Blade, B6 Hub	INTERP
156D-8B-A-460	156	156	5.5	460	34N 8-Blade, B6 Hub	UUT 6
Fan TR - Fan (Fiberglass)						
63D-3B-F-125	63	63	26	125	3-Blade	EXTRAP
74D-3B-F-160	74	74	26	160	3-Blade	EXTRAP
84D-3B-F-200	84	84	26	200	3-Blade	EXTRAP
92D-3B-F-195	92	92	26	195	3-Blade	EXTRAP
108D-3B-F-250	108	108	26	250	3-Blade	EXTRAP
132D-4B-F-575	132	132	26	575	4-Blade	UUT 8
132D-5B-F-720	132	132	26	720	5-Blade	INTERP
156D-4B-F-620	156	156	26	620	4-Blade	INTERP
156D-5B-F-775	156	156	26	775	5-Blade	UUT 5
WEG - W22 Motor (NEMA Premium)						
184T	15.9	8.7	9.3	95	5hp, 1800 rpm	EXTRAP
213T/215T	18.0	10.7	10.8	172	5-10hp, 1200-1800rpm	EXTRAP
254T	23.2	13.0	12.6	289	7.5-15hp, 1200-1800rpm	EXTRAP
256T	24.9	13.0	12.6	291	10-20hp, 1200-1800rpm	EXTRAP
284T	26.4	14.2	14.1	388	15-25hp, 1200-1800rpm	UUT 7
286T	27.9	14.2	14.1	437	20-30hp, 1200-1800rpm	INTERP
324T	29.6	15.8	16.0	560	25-40hp, 1200-1800rpm	INTERP
326T	31.1	15.8	16.0	560	30-50hp, 1200-1800rpm	INTERP
364/5T	34.3	17.9	18.0	919	40-75hp, 1200-1800rpm	UUT 6,8
404/5T	39.7	19.1	19.6	1,140	60-100hp, 1200-1800rpm	INTERP
444/5T	45.0	23.6	22.8	1,590	125hp, 1800rpm, heater, ground ring	UUT 5
Nidec - Motor						
405T	37.6	21.1	20.6	1,000	100hp, 1800rpm	UUT 3
NOTES:	Table continues on the next page. Additional notes, information, and seismic parameters are shown at the end of the table.					

ATTACHMENT 1: CERTIFIED SUBCOMPONENTS

SPECIAL SEISMIC CERTIFICATION

TABLE 2 - SUBCOMPONENTS (continued)

DOCUMENT NO.: 21071CR1.0

MANUFACTURER: EVAPCO, INC.						
PRODUCT FAMILY: AXS ADVANCED CROSSFLOW SERIES COOLING TOWERS						
MODEL NUMBER	DIMENSIONS (in)			MAX. WT. (lb)	DESCRIPTION / NOTES	BASIS
	DEPTH	WIDTH	HEIGHT			
Amarillo - Right Angle Gear Drive w/ Low Speed						
65	20.9	10.0	17.8	90		EXTRAP
85	25.3	11.0	23.3	195		EXTRAP
110	31.1	13.5	26.5	325		EXTRAP
135	37.0	16.0	29.6	500	UUT: Zero RPM duty option	UUT 6
155	42.1	19.0	31.7	675		INTERP
175	44.0	20.5	33.4	825	UUT: Zero RPM duty option	UUT 5
Gems Sensors ASCO - Water Level Control						
3 probe						UUT 5
5 probe						UUT 5
Chromalox - Basin Heater						
2kW						UUT 5
...					Interpolated sizes	INTERP
20kW						UUT 5
M-Tech - Float Switch						
017-00207PA						UUT 5
Metrix - Vibration Switch						
5550						UUT 5
Balmac - Vibration Switch						
550						UUT 5
Evapco - Mechanical Makeup Brass Valve						
1"						UUT 5
2"						UUT 5
MOUNTING:	Mounted within unit.			SEISMIC LEVELS:	$S_{DS} = 1.69g$ for $z/h = 1$ $S_{DS} = 2.70g$ for $z/h = 0$	$I_p = 1.5$
NOTES:	Construction/Options: Model number uniquely identifies manufacturer, materials, and configuration of subcomponents.					

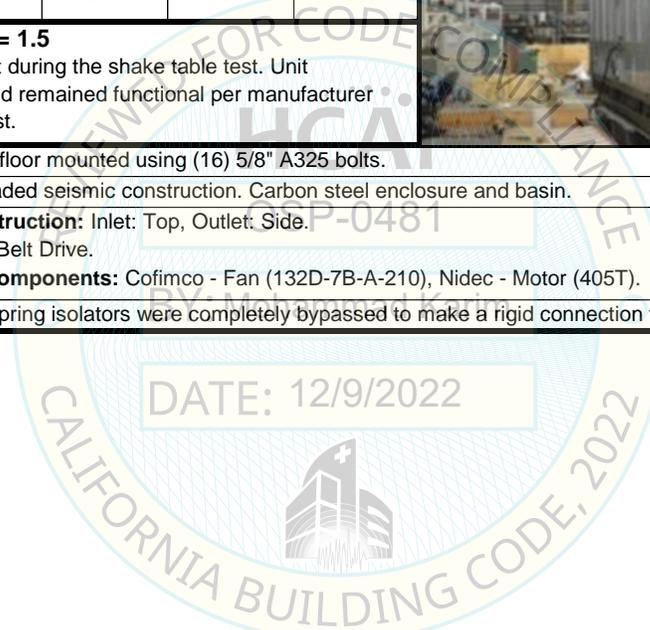
ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SPECIAL SEISMIC CERTIFICATION

UUT 3

DOCUMENT NO.: 21071CR1.0

MANUFACTURER:		EVAPCO, INC.				
MODEL NUMBER:		AXS 12-20R22				
UNIT FUNCTION:		COOLING TOWER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT	(lb)	F-B	S-S	V
273	142	271	41,790	5.9	3.2	8.5
CODE & CRITERIA:		2022 CBC		ICC-ES AC156		
TEST LABORATORY:		ERDC-CERL				
REPORT: 15021-TR-001, Rev. 1 (dated 1/3/17), tested on 6/5/2015						
S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)	
2.0	1	3.20	2.40	2.14	0.86	
3.2	0					
IMPORTANCE FACTOR, I_p = 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:		Rigid floor mounted using (16) 5/8" A325 bolts.				
CONSTRUCTION:		Upgraded seismic construction. Carbon steel enclosure and basin.				
OPTIONS/ SUBCOMPONENTS:		Construction: Inlet: Top, Outlet: Side. Fan: Belt Drive. Subcomponents: Cofimco - Fan (132D-7B-A-210), Nidec - Motor (405T).				
TESTING NOTES:		The spring isolators were completely bypassed to make a rigid connection to the table.				



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SPECIAL SEISMIC CERTIFICATION

UUT 5

DOCUMENT NO.: 21071CR1.0

MANUFACTURER:	EVAPCO, INC.
MODEL NUMBER:	AXS 14-20S24
UNIT FUNCTION:	COOLING TOWER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
297	167	271	52,200	3.3	1.9	3.1

CODE & CRITERIA:	2022 CBC	ICC-ES AC156
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TEST LABORATORY:	PEER-BERKELEY
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REPORT:	15050-TR-001, Rev. 2 (dated 1/3/17), tested on 4/19/2016
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S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
2.0	1	3.20	2.40	2.14	0.86
3.2	0				

IMPORTANCE FACTOR, I_p = 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:	Spring isolated floor mounted. Unit connects to unit fixture with (24) 5/8" Grade 5 bolts. Unit fixture connects to spring isolators with (2) 3/4" Grade 5 bolts per isolator (20 total). (4) Mason SLFADA-600-2-109 and (6) Mason SLFADA-600-2-111 spring isolators connect to the table with (2) 3/4" Grade 8 bolts per isolator (20 total).
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CONSTRUCTION:	Upgraded seismic construction. Stainless steel enclosure and basin.
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OPTIONS/ SUBCOMPONENTS:	<p>Construction: Inlet: Bottom; Outlet: Bottom; Equalizer: Bottom; Bypass: Bottom; Air Intake Screens; Flume Plate and Cover; Internal Piping (SCH 40 PVC); Sump Sweeper Piping; Cold Water Basin Covers; Remote Sump Trash Screen; Double Drift Eliminators.</p> <p>Fan: Cylinder Extension (stainless steel): 13ft diameter X 3ft tall w/ 1ft tall sections; Gear Drive; Gear Drive Support (stainless steel); Fan Access Door.</p> <p>Access: External Service Platform; Internal Drive Acces Platform; Internal Walkway; Motor Davit Base; Perimeter Handrail; Ladder with Safety Cage; Safety Gate.</p> <p>Subcomponents: Fan TR - Fan (156D-5B-F-775), WEG - W22 Motor (444/5T with shaft grounding ring and space heater), Amarillo - Gear Drive (175), Gems Sensors ASCO - Water Level Controls (3 probe, 5 probe), Chromalox - Basin Heaters (2kW, 20kW), M-Tech - Float Switch (017-00207PA), Metrix - Vibration Switch (5550), Balmac - Vibration Switch (550), Evapco - Mechanical Makeup Brass Valve (1", 2").</p>
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TESTING NOTES:	Additional plate washers were required to address an anomaly during testing. At each 2-bolt group connecting the unit to the fixture (12 total), a 6"x1.5"x1/4" thick plate washer was added to spread the forces and strengthen the connection at the base.
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ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SPECIAL SEISMIC CERTIFICATION

UUT 6

DOCUMENT NO.: 21071CR1.0

MANUFACTURER:		EVAPCO, INC.				
MODEL NUMBER:		AXS 14X Fan Module				
UNIT FUNCTION:		COOLING TOWER				
SERIAL NUMBER:		N/A				
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
181	167	62	6,000	6.7	12.2	3.6
CODE & CRITERIA:		2022 CBC		ICC-ES AC156		
TEST LABORATORY:		PEER-BERKELEY				
REPORT: 15050-TR-001, Rev. 2 (dated 1/3/17), tested on 4/25/2016						
S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)	
1.69	1	SEE	SEE	SEE	SEE	
2.70	0	NOTES	NOTES	NOTES	NOTES	
IMPORTANCE FACTOR, I_p = 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:		Spring isolated floor mounted. Unit connects to unit fixture with (36) 3/8" Grade 5 bolts. Unit fixture connects to spring isolators with (2) 3/4" Grade 8 bolts per isoaltor (8 total). (4) Mason SLFADA-600-2-109 spring isolators connect to the table with (2) 3/4" Grade 8 bolts per isolator (8 total).				
CONSTRUCTION:		Upgraded seismic construction. Carbon steel enclosure.				
OPTIONS/		Fan: Gear Drive.				
SUBCOMPONENTS:		Subcomponents: Cofimco - Fan (156D-8B-A-460), WEG - W22 Motor (364/5T), Amarillo - Gear Drive (135).				
TESTING NOTES:		UUT 6 was tested as a subassembly to a custom RRS based on data from UUT 3 and UUT 5. The equivalent target seismic level was S _{DS} =2.0g for z/h=1 and S _{DS} =3.2g for z/h=0. The table only achieved 84.5% of the target level in the X direction, so the certified level has been reduced accordingly.				



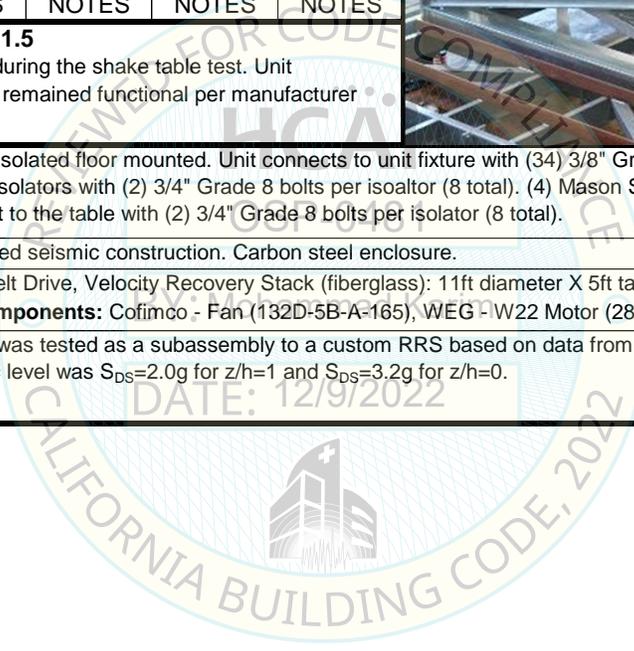
ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SPECIAL SEISMIC CERTIFICATION

UUT 7

DOCUMENT NO.: 21071CR1.0

MANUFACTURER:		EVAPCO, INC.					
MODEL NUMBER:		AXS 12X Fan Module					
UNIT FUNCTION:		COOLING TOWER					
SERIAL NUMBER:		N/A					
DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)			
DEPTH	WIDTH	HEIGHT		F-B	S-S	V	
157	142	62	6,000	10.0	8.1	5.0	
CODE & CRITERIA:		2022 CBC		ICC-ES AC156			
TEST LABORATORY:		PEER-BERKELEY					
REPORT: 15050-TR-001, Rev. 2 (dated 1/3/17), tested on 4/27/2016							
S_{DS} (g)	z/h	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)		
2.0	1	SEE	SEE	SEE	SEE		
3.2	0	NOTES	NOTES	NOTES	NOTES		
IMPORTANCE FACTOR, I_p = 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:		Spring isolated floor mounted. Unit connects to unit fixture with (34) 3/8" Grade 5 bolts. Unit fixture connects to spring isolators with (2) 3/4" Grade 8 bolts per isoaltor (8 total). (4) Mason SLFADA-600-2-109 spring isolators connect to the table with (2) 3/4" Grade 8 bolts per isolator (8 total).					
CONSTRUCTION:		Upgraded seismic construction. Carbon steel enclosure.					
OPTIONS/		Fan: Belt Drive, Velocity Recovery Stack (fiberglass): 11ft diameter X 5ft tall.					
SUBCOMPONENTS:		Subcomponents: Cofimco - Fan (132D-5B-A-165), WEG - W22 Motor (284T).					
TESTING NOTES:		UUT 7 was tested as a subassembly to a custom RRS based on data from UUT 3 and UUT 5. The equivalent target seismic level was S _{DS} =2.0g for z/h=1 and S _{DS} =3.2g for z/h=0.					



ATTACHMENT 2: UNIT UNDER TEST SUMMARIES

SPECIAL SEISMIC CERTIFICATION

UUT 8

DOCUMENT NO.: 21071CR1.0

MANUFACTURER:	EVAPCO, INC.
MODEL NUMBER:	AT 112-4O20
UNIT FUNCTION:	COOLING TOWER
SERIAL NUMBER:	N/A

DIMENSIONS (in)			WEIGHT (lb)	RES. FREQ. (Hz)		
DEPTH	WIDTH	HEIGHT		F-B	S-S	V
240	142	207	26,360	2.8	3.2	3.1

CODE & CRITERIA:	2022 CBC	ICC-ES AC156
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TEST LABORATORY:	PEER-BERKELEY
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REPORT:	15050-TR-001, Rev. 2 (dated 1/3/17), tested on 4/21/2016
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S _{DS} (g)	z/h	A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-V} (g)
1.94	1	3.10	2.33	2.00	0.80
2.98	0				

IMPORTANCE FACTOR, I_p = 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:	Spring isolated floor mounted. Unit connects to unit fixture with (36) 5/8" ASTM A325 bolts. Unit fixture connects to spring isolators with (2) 3/4" Grade 8 bolts per isolator (20 total). (4) Mason SLFADA-600-2-109 and (6) Mason SLFADA-600-2-111 spring isolators connect to the table with (2) 3/4" Grade 8 bolts per isolator (20 total).
CONSTRUCTION:	Upgraded seismic construction. Stainless steel enclosure and basin.
OPTIONS/ SUBCOMPONENTS:	<p>Construction: Inlet: Bottom; Outlet: Bottom/End; Equalizer: Bottom/End; Bypass: Bottom/End; Internal Piping (SCH 40 PVC).</p> <p>Fan: Cylinder Extension (carbon steel): 11ft diameter X 1ft tall; Belt Drive; Fan Shaft (stainless steel); Fan Access Door.</p> <p>Access: External Service Platform; Ladder.</p> <p>Subcomponents: Fan TR - Fan (132D-4B-F-575), WEG - W22 Motor (364/5T with space heater).</p>
TESTING NOTES:	N/A

ATTACHMENT 3: MODEL NOMENCLATURE

SPECIAL SEISMIC CERTIFICATION

AXS COOLING TOWERS

DOCUMENT NO.: 21071CR1.0

DIGIT	DIGIT DESCRIPTION	CODES	DEFINITIONS
1-3	Product Line Name	AXS	AXS Advanced Crossflow Series
5-6	Box Width (ft)	12	12-ft Nominal Box Width
		14	14-ft Nominal Box Width
8-9	Fill Height (old naming convention used Box Height)	9	9-ft Fill Height (old: 11 for 11-ft Nominal Box Height)
		13	13-ft Fill Height (old: 16 for 16-ft Nominal Box Height)
		17	17-ft Fill Height (old: 19 for 19-ft Nominal Box Height)
		20	20-ft Fill Height (old: 22 for 22-ft Nominal Box Height)
10	Motor Designator	G	5-hp
		H	7.5-hp
		I	10-hp
		J	15-hp
		K	20-hp
		L	25-hp
		M	30-hp
		N	40-hp
		O	50-hp
		P	60-hp
11-12	Box Length (ft)	22	22-ft Nominal Box Length
		24	24-ft Nominal Box Length

