



DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR HCAI SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0797

HCAI Special Seismic Certification Preapproval (OSP)

Type: [X] New [] Renewal

Manufacturer Information

Manufacturer: Carrier Corporation

Manufacturer's Technical Representative: Anthony Molavi

Mailing Address: 9701 Old Statesville Road, Charlotte, NC 28269

Telephone: (704) 921-3976

Email: Anthony.Molavi@Carrier.com

Product Information

Product Name: Chillers

Product Type: Chillers - Water Cooled

Product Model Number: AquaEdge 19DV Centrifugal Chillers

General Description: AquaEdge High-Efficiency Semi-Hermetic Centrifugal Liquid Chillers: 350 to 1150 Nominal Tons

Mounting Description: Rigid, 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: Pre Compliance

Contact Person: Katie Braman

Mailing Address: 36 SW Wall St, Bend, OR 97702

Telephone: (541) 241-2310

Email: katie@go-pre.com

Title: Principal & Program Manager





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

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

Company Name: PRE COMPLIANCE

Name: Andrew Coughlin California License Number: S6082

Mailing Address: 36 SW Wall Street, Bend, OR 97702

Telephone: (415) 635-8461 Email: Andy@go-pre.com

Certification Method

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

Other (Please Specify): _____

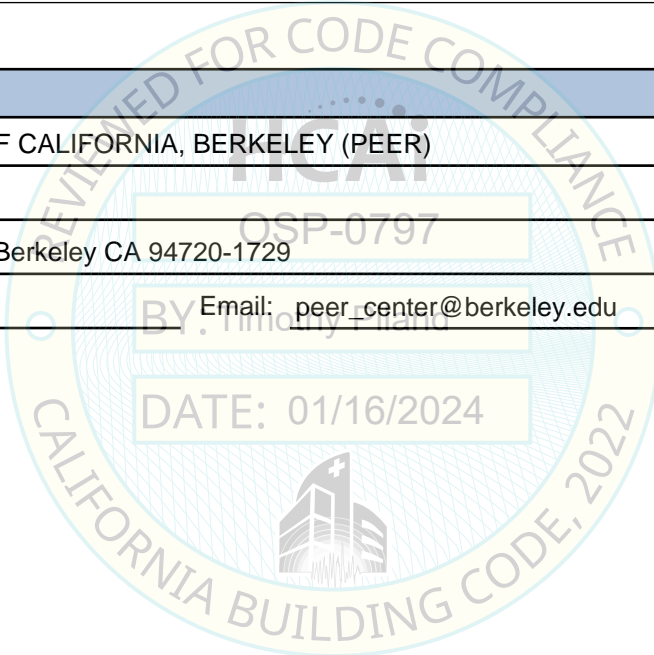
Testing Laboratory

Company Name: UNIVERSITY OF CALIFORNIA, BERKELEY (PEER)

Contact Person: _____

Mailing Address: 325 Davis Hall, Berkeley CA 94720-1729

Telephone: (510) 642-3437 Email: peer_center@berkeley.edu





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

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.44/1.13

SDS (Design spectral response acceleration at short period, g) = 2.0/2.5

a_p (Amplification factor) = 1.0

R_p (Response modification factor) = 2.5

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

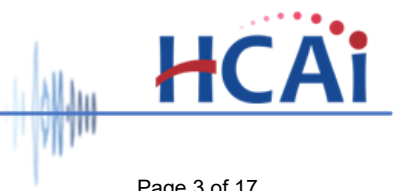
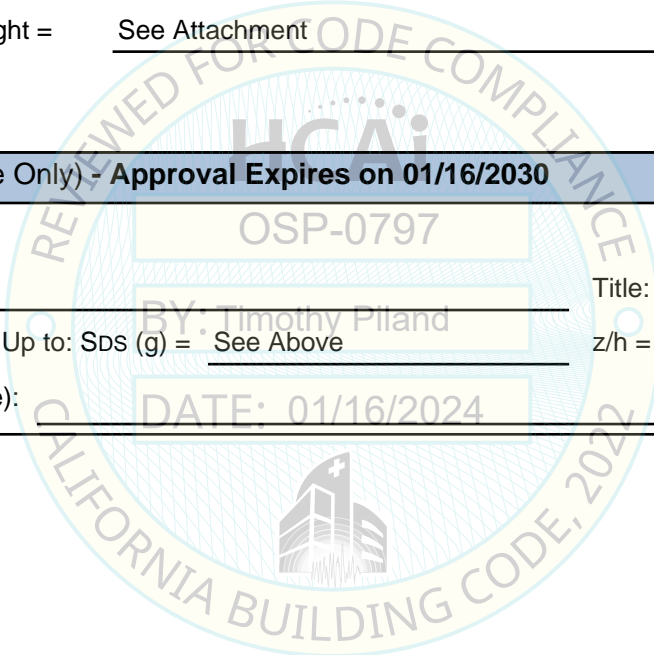
HCAI Approval (For Office Use Only) - Approval Expires on 01/16/2030

Date: 1/16/2024

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: 01/16/2024





SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENTS

Pre No. CC231339-01-R0

Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

Seismic Parameters
 $S_{DS} = 2.0g$ for $z/h=1$
 $S_{DS} = 2.5g$ for $z/h=0$
 $I_p = 1.5$

Building Codes
CBC 2022

TABLE 1

Mounting Configuration: Base Mounted - Rigid

Construction Summary

Shell, Tube Sheet, Flat Covers : Carbon steel;
 Tubes: Copper

Options Summary

Nozzle-In-Head Waterbox (NIH) or
 Marine Waterbox (MWB), Dual-Stage Compressor

Model Line	Model	Max. Dimensions (in)			Max. Weight (lb)	Notes	UUT
		L	W	H			
19DV Frame 3 350-600 Tons	19DV-F2XXXXXXXXXX	144	97	121	32,000		Extrap.
	...	...	...	...	...		Extrap.
	19DV-F4XXXXXXXXXX	199	97	121	33,600		Extrap.
	...	...	...	...	...		Extrap.
	19DV-F44F4434445H5	199	97	121	33,600	Tested with Nozzle-in-Head Waterbox (NIH), dimension includes NIH.	1
19DV Frame 4 500-800 Tons	19DV-G2XXXXXXXXXX	144	108	120	44,000		Interp.
	...	...	...	...	...		Interp.
	19DV-G4XXXXXXXXXX	168	96	120	46,000		Interp.
	19DV-H2XXXXXXXXXX	144	109	132	48,000		Interp.
	...	...	...	...	...		Interp.
	19DV-H4XXXXXXXXXX	168	97	132	50,000		Interp.
19DV Frame 5 800-1150 Tons	19DV-M4XXXXXXXXXX	168	132	145	68,000		Interp.
	...	...	...	...	...		Interp.
	19DV-M6XXXXXXXXXX	264	132	155	72,011		Interp.
	...	...	...	...	...		Interp.
	19DV-M64M645645H5	264	132	155	72,011	Tested with Marine Waterbox(MWB), dimension includes MWB	2

Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

Seismic Parameters

$S_{DS} = 2.0g$ for $z/h=1$
 $S_{DS} = 2.5g$ for $z/h=0$

$I_p = 1.5$

Building Codes

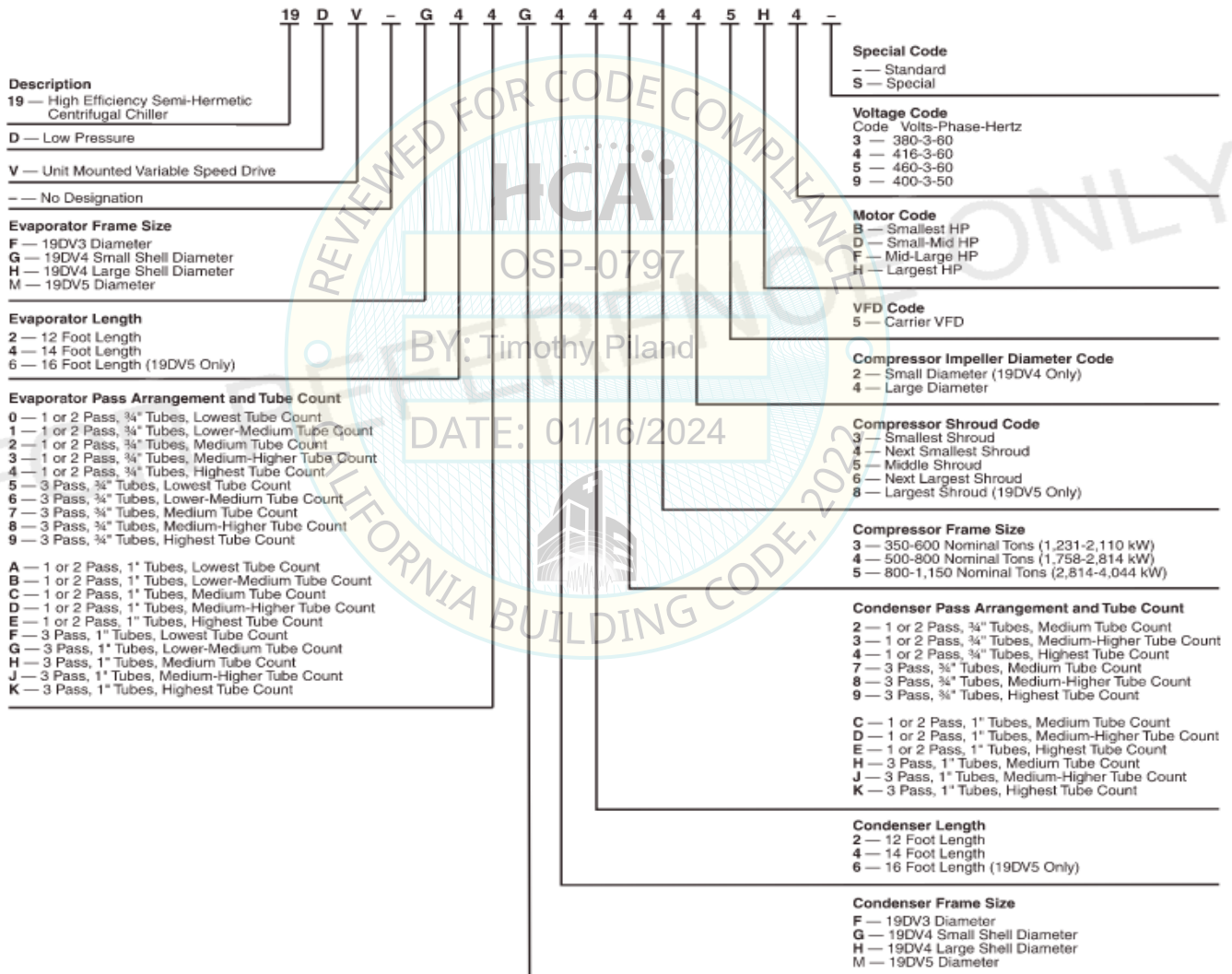
CBC 2022

TABLE 1

Mounting Configuration: Base Mounted - Rigid

For Reference Only

19DV Two-Stage Compressor



Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller


Seismic Parameters

$S_{DS} = 2.0g$ for $z/h=1$ $I_p = 1.5$
 $S_{DS} = 2.5g$ for $z/h=0$

Building Codes

CBC 2022

TABLE 2 Evaporator & Condenser

Component (Manufacturer)	Evaporator	Material	Max. Weight (lbs.)	Notes ¹	UUT
DV3 Evaporator (Carrier)	10DVF4006908LC	 OSP-0797 Copper Tubes and Carbon Steel Shell	8,997	12' Length, w/ 1" OD Tube	Extrap.
	10DVF4006904LC		8,961	12' Length, w/ 1" OD Tube	Extrap.
	10DVF4006902LC		9,398	12' Length, w/ 3/4" OD Tube	Extrap.
	10DVF4006906LC		9,414	12' Length, w/ 3/4" OD Tube	Extrap.
	10DVF4006905LC		9,668	14' Length, w/ 1" OD Tube	Extrap.
	10DVF4006909LC		9,706	14' Length, w/ 1" OD Tube	Extrap.
	10DVF4006903LC		10,166	14' Length, w/ 3/4" OD Tube	Extrap.
	10DVF4006907LC		10,194	14' Length, w/ 3/4" OD Tube	1
DV4 Evaporator (Carrier)	10DVG4006908LC		10,704	12' Length, w/ 1" OD Tube	Interp.
	10DVG4006904LC		10,758	12' Length, w/ 1" OD Tube	Interp.
	10DVG4006906LC		11,068	12' Length, w/ 3/4" OD Tube	Interp.
	10DVG4006902LC		11,393	12' Length, w/ 3/4" OD Tube	Interp.
	10DVG4006905LC		11,556	14' Length, w/ 1" OD Tube	Interp.
	10DVG4006909LC		11,489	14' Length, w/ 1" OD Tube	Interp.
	10DVG4006908LC		12,045	12' Length, w/ 1" OD Tube	Interp.
	10DVG4006904LC		12,137	12' Length, w/ 1" OD Tube	Interp.
	10DVG4006907LC	12,222	14' Length, w/ 3/4" OD Tube	Interp.	
	10DVG4006903LC	12,283	14' Length, w/ 3/4" OD Tube	Interp.	
	10DVG4006906LC	12,853	12' Length, w/ 3/4" OD Tube	Interp.	
	10DVG4006909LC	12,952	14' Length, w/ 1" OD Tube	Interp.	
	10DVG4006902LC	12,974	12' Length, w/ 3/4" OD Tube	Interp.	
	10DVG4006905LC	13,057	14' Length, w/ 1" OD Tube	Interp.	
10DVG4006907LC	13,875	14' Length, w/ 3/4" OD Tube	Interp.		
10DVG4006903LC	13,981	14' Length, w/ 3/4" OD Tube	Interp.		
DV5 Evaporator (Carrier)	10DVM4006901LC	12,983	16' Length, w/ 1" OD Tube	Interp.	
	10DVM4006905LC	14,001	16' Length, w/ 1" OD Tube	Interp.	
	10DVM4006903LC	14,182	16' Length, w/ 1" OD Tube	Interp.	
	10DVM4006902LC	14,848	14' Length, w/ 3/4" OD Tube	Interp.	
	10DVM4006907LC	15,131	16' Length, w/ 1" OD Tube	Interp.	
	10DVM4006906LC	16,088	14' Length, w/ 3/4" OD Tube	Interp.	
	10DVM4006904LC	16,566	16' Length, w/ 3/4" OD Tube	Interp.	
	10DVM4006908LC	18,318	16' Length, w/ 3/4" OD Tube	2	

¹3/4" OD tube creates a heavier evaporator due to the surface area of tubing in the evaporator.

Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

Seismic Parameters

$S_{DS} = 2.0g$ for $z/h=1$ $I_p = 1.5$
 $S_{DS} = 2.5g$ for $z/h=0$

Building Codes

CBC 2022

TABLE 2 Evaporator & Condenser

Component (Manufacturer)	Evaporator	Material	Max. Weight (lbs.)	Notes ¹	UUT
DV3 Condenser (Carrier)	09DVF4003702LC	Copper Tubes and Carbon Steel Shell	7,894	12' Length, w/ 3/4" OD Tube	Extrap.
	09DVF4003706LC		8,181	12' Length, w/ 3/4" OD Tube	Extrap.
	09DVF4003704LC		8,961	12' Length, w/ 1" OD Tube	Extrap.
	09DVF4003708LC		8,987	12' Length, w/ 1" OD Tube	Extrap.
	09DVF4003705LC		9,668	14' Length, w/ 1" OD Tube	Extrap.
	09DVF4003709LC		9,706	14' Length, w/ 1" OD Tube	Extrap.
	09DVF4003703LC		10,166	14' Length, w/ 3/4" OD Tube	Extrap.
	09DVF4003707LC		10,194	14' Length, w/ 3/4" OD Tube	1
DV4 Condenser (Carrier)	09DVG4003704LC	Copper Tubes and Carbon Steel Shell	8,447	12' Length, w/ 1" OD Tube	Interp.
	09DVG4003708LC		8,649	12' Length, w/ 1" OD Tube	Interp.
	09DVG4003706LC		9,140	12' Length, w/ 3/4" OD Tube	Interp.
	09DVG4003705LC		9,203	14' Length, w/ 1" OD Tube	Interp.
	09DVG4003709LC		9,249	14' Length, w/ 1" OD Tube	Interp.
	09DVG4003703LC		9,800	14' Length, w/ 3/4" OD Tube	Interp.
	09DVG4003702LC		8,956	12' Length, w/ 3/4" OD Tube	Interp.
	09DVG4003707LC		10,008	14' Length, w/ 3/4" OD Tube	Interp.
	09DVH4003704LC		10,198	12' Length, w/ 1" OD Tube	Interp.
	09DVH4003708LC		10,382	12' Length, w/ 1" OD Tube	Interp.
	09DVH4003702LC		10,893	12' Length, w/ 3/4" OD Tube	Interp.
	09DVH4003706LC		11,104	12' Length, w/ 3/4" OD Tube	Interp.
	09DVH4003705LC		11,124	14' Length, w/ 1" OD Tube	Interp.
	09DVH4003709LC		11,335	14' Length, w/ 1" OD Tube	Interp.
	09DVH4003703LC		11,922	14' Length, w/ 3/4" OD Tube	Interp.
09DVH4003707LC	12,080	14' Length, w/ 3/4" OD Tube	Interp.		
DV5 Condenser (Carrier)	09DVM4003701LC	Copper Tubes and Carbon Steel Shell	12,317	16' Length, w/ 1" OD Tube	Interp.
	09DVM4003705LC		13,193	16' Length, w/ 1" OD Tube	Interp.
	09DVM4003703LC		13,951	16' Length, w/ 1" OD Tube	Interp.
	09DVM4003707LC		14,484	16' Length, w/ 1" OD Tube	Interp.
	09DVM4003702LC		16,589	14' Length, w/ 3/4" OD Tube	Interp.
	09DVM4003706LC		17,495	14' Length, w/ 3/4" OD Tube	Interp.
	09DVM4003704LC		18,356	16' Length, w/ 3/4" OD Tube	Interp.
	09DVM4003708LC		19,398	16' Length, w/ 3/4" OD Tube	2

¹3/4" OD tube creates a heavier evaporator due to the surface area of tubing in the evaporator.

Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

Seismic Parameters
$S_{DS} = 2.0g$ for $z/h=1$ $S_{DS} = 2.5g$ for $z/h=0$
$I_p = 1.5$

Building Codes
CBC 2022

TABLE 3

Compressor Motor Assembly

Component (Manufacturer)	Model	Description	Notes	UUT
DV3 Compressor Motor Assembly (Carrier)	02DV34000001-LB	Cast Iron, 320-100 hp@380/460V, 6,773 lbs.		Extrap
	02DV34000001-LD	Cast Iron, 400-105 hp@380/460V, 6,773 lbs.		Extrap
	02DV34000001-LF	Cast Iron, 500-105 hp@380/460V, 6,927 lbs.		Extrap
	02DV34000001-LH	Cast Iron, 600-110 hp@380/460V, 7,000 lbs.		1
DV4 Compressor Motor Assembly (Carrier)	02DV44000001-NB	Cast Iron, 520-90 hp@380/460V, 7,615 lbs.		Interp.
	02DV44000001-ND	Cast Iron, 600-90 hp@380/460V, 7,685 lbs.		Interp.
	02DV44000001-NF	Cast Iron, 700-95 hp@380/460V, 7,775 lbs.		Interp.
	02DV44000001-NH	Cast Iron, 805-98 hp@380/460V, 7,865 lbs.		Interp.
DV5 Compressor Motor Assembly (Carrier)	02DV54000001-QB	Cast Iron, 750-77 hp@380/460V, 13,217 lbs.		Interp.
	02DV54000001-QD	Cast Iron, 850-77 hp@380/460V, 13,252 lbs.		Interp.
	02DV54000001-QF	Cast Iron, 925-79 hp@380/460V, 13,305 lbs.		Interp.
	02DV54000001-QH	Cast Iron, 925-81 hp@ 380/460V, 13,393 lbs.		2



Pre No. CC231339-01-R0

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENTS

Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

Seismic Parameters

S_{DS} = 2.0g for z/h=1
S_{DS} = 2.5g for z/h=0
I_p = 1.5

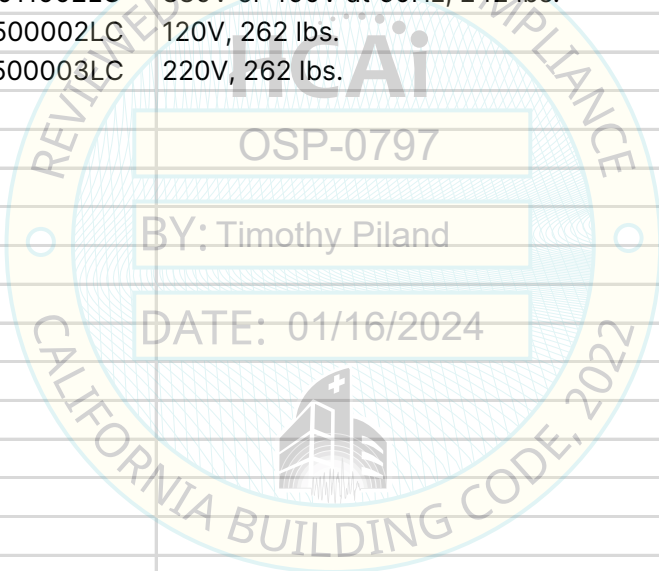
Building Codes

CBC 2022

TABLE 4

Pump & Purge Assembly

Component (Manufacturer)	Model	Description	Notes	UUT
Pump Assembly Lubrication System (Carrier)	19DV44011902LC	416V,460V,or 480V at 60Hz, 136 lbs.	Voltage output based on wiring, no physical difference.	1
	19DV44011903LC	380V or 400V at 60Hz, 136 lbs.		Interp.
	19DV54011901LC	416V, 460V, or 480V at 60Hz, 242 lbs.		Interp.
	19DV54011902LC	380V or 400V at 60Hz, 242 lbs.		2
Purge Assembly (Carrier)	11DV04500002LC	120V, 262 lbs.		1
	11DV04500003LC	220V, 262 lbs.		2



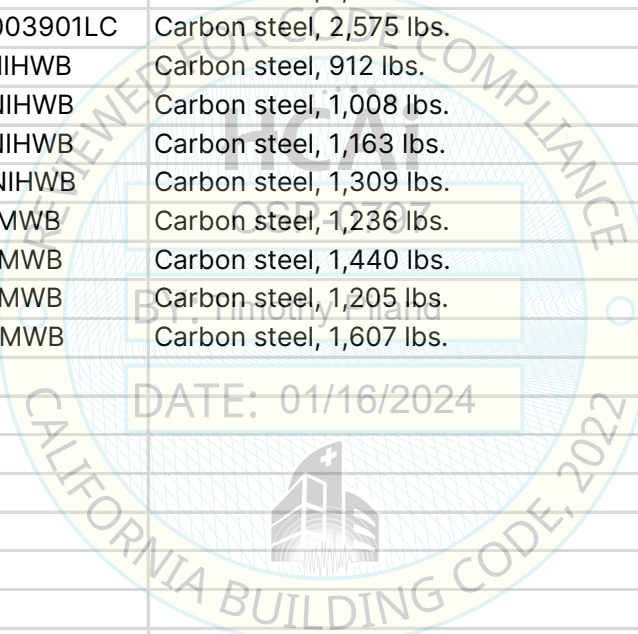
Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

Seismic Parameters	
$S_{DS} = 2.0g$ for $z/h=1$	$I_p = 1.5$
$S_{DS} = 2.5g$ for $z/h=0$	

Building Codes
CBC 2022

TABLE 5 Economizer & Waterboxes

Component (Manufacturer)	Model	Description	Notes	UUT
Economizer (Macor)	08DV34004001LC	Carbon steel, 1,259 lbs.		1
	08DV44004001LC	Carbon steel, 1,607 lbs.		Interp.
	08DV54003901LC	Carbon steel, 2,575 lbs.		2
Waterboxes- Nozzel In Head (Macor)	DVFNIHWB	Carbon steel, 912 lbs.		1
	DVGNIHWB	Carbon steel, 1,008 lbs.		Interp.
	DVHNIHWB	Carbon steel, 1,163 lbs.		Interp.
	DVMNIHWB	Carbon steel, 1,309 lbs.		Interp.
Waterboxes- Marine (Macor)	DVFMWB	Carbon steel, 1,236 lbs.		Interp.
	DVGMWB	Carbon steel, 1,440 lbs.		Interp.
	DVHMWB	Carbon steel, 1,205 lbs.		Interp.
	DVMMWB	Carbon steel, 1,607 lbs.		2





SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENTS

Pre No. CC231339-01-R0

Manufacturer: Carrier Corporation
Product Type: Chillers - Water Cooled
Model Line: AquaEdge® 19DV Centrifugal Chiller

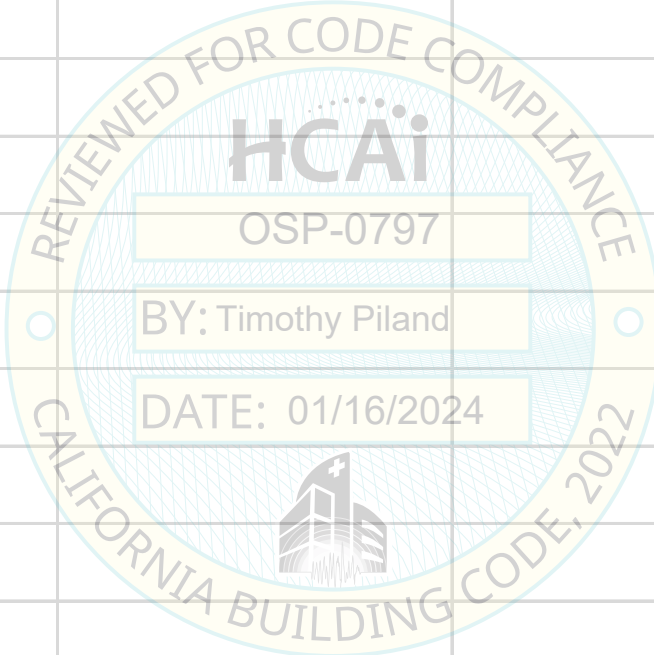
Seismic Parameters
 $S_{DS} = 2.0g$ for $z/h=1$ $I_p = 1.5$
 $S_{DS} = 2.5g$ for $z/h=0$

Building Codes
CBC 2022

TABLE 6 Miscellaneous Electrical

Component (Manufacturer)	Model	Description	Notes	UUT
HMI Panel (UTEC)	19XF14011401	Carbon steel sheet metal, 168 lbs.		1,2
VFD Active Harmonic Filter (Gatson)	32VSC06805002	Steel & copper, 1,199 lbs.		1
VFD Active Harmonic Filter (Nancal)	HR46ZZ433	Steel & copper, 500 lbs.		1
VFD (Gaston)	32VSS06805002	Steel & copper, 1,199 lbs.		1
	32VSS09005002	Steel & copper, 1,321 lbs.		Interp.
	32VSS10605002	Steel & copper, 1,322 lbs.		Interp.
	32VSS12005002	Steel & copper, 1,615 lbs.		2
Purge Assembly (TBD)	DV3	Frame F, 263 lbs.		1
	DV4	Frame G, 263 lbs.		Interp.
	DV4	Frame H, 263 lbs.		Interp.
	DV5	Frame M, 270 lbs.		2
Power Panel (UTEC)	03DV04000101LC	Carbon steel sheet metal, 168 lbs.		1,2

UUT	Model	Test Report	Test Laboratory	S _{DS}	z/h	I _p
1	19DV-F44F443445H5	TP231339-01-R0	Pacific Earthquake Engineering Research Center (PEER)	2.0 2.5	1.0	1.5
2	19DV-M64M645645H5	TP231339-01-R0	Pacific Earthquake Engineering Research Center (PEER)	2.0 2.5	1.0	1.5



Notes:

UUT 1

Test Report# TR231339-01-R0

Manufacturer: Carrier Corporation
Model Line: AquaEdge® 19DV Centrifugal Chiller
Model Number: 19DV-F44F443445H5
Serial Number: N/A

Highest Passed Test Level						
S _{DS}	z/h	I _p	A _{flx-h}	A _{rig-h}	A _{flx-v}	A _{rig-v}
2.0	1	1.5	3.2	2.4	1.67	0.67
2.5	0					

Dimensions/Weights			
Depth (in)	Width (in)	Height (in)	Weight (lbs.)
199	97	121	33,600

Lowest Natural Frequency (Hz)		
Front-Back	Side-Side	Vertical
9.2	7.3	18.4

Building Codes
CBC 2022

Test Criteria
ICC-ES AC156

Construction/Option Summary
Carbon Steel & Copper (Condenser and Evaporator Assemblies) and Cast Iron (Compressor Assembly)

UUT Mounting Details:



UUT was mounted to the shake table with twelve (12) 1" Grade 5 bolts with washers. See the following page for bolt locations.
 Unit maintained structural integrity and remained operational per manufacturer requirement following shake table test. All contents were included in the unit per operating conditions.

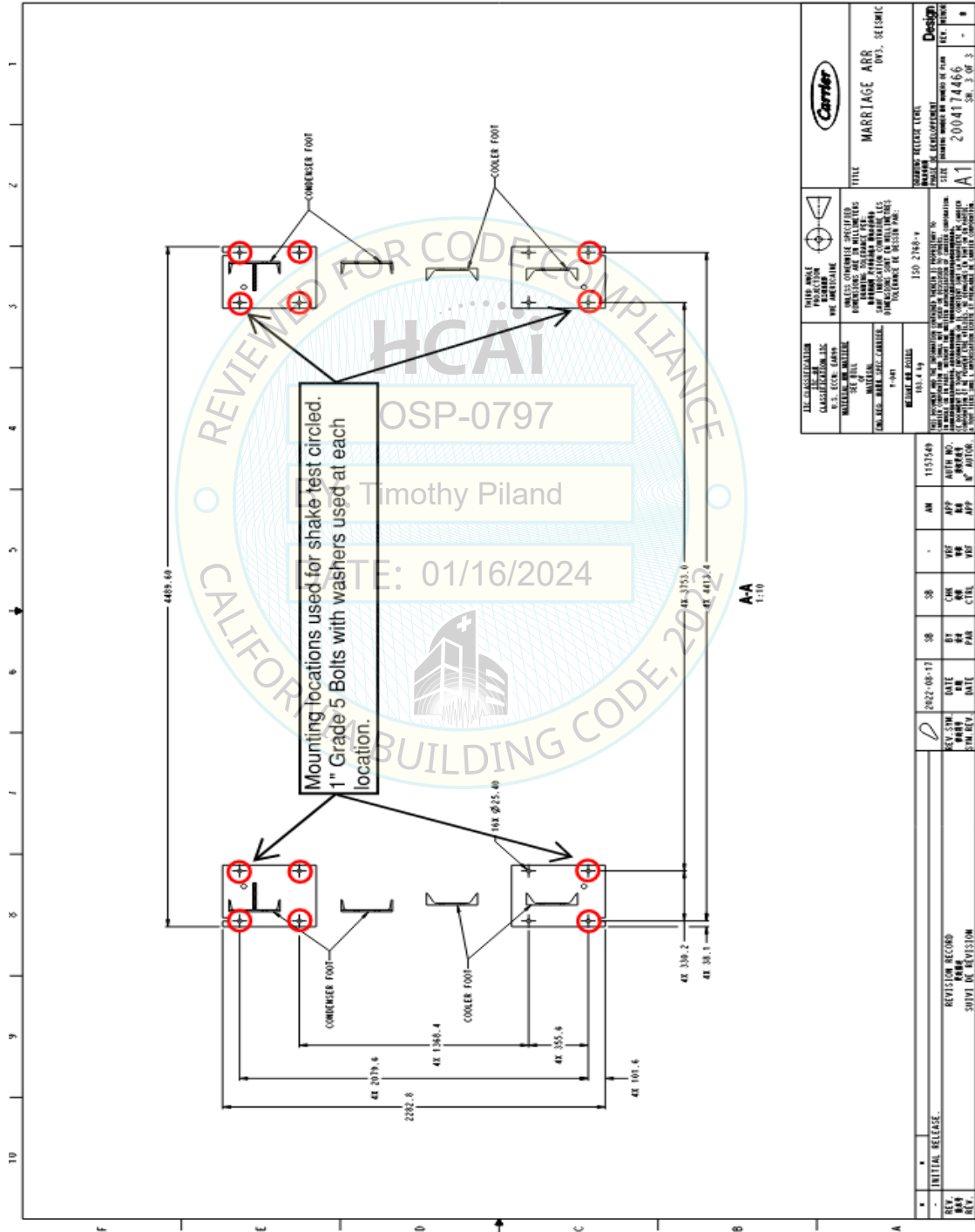
List of Included Subcomponents

Description	Model Number	Manufacturer
Condenser Assembly	09DVF4003707LC	Carrier
Evaporator Assembly	10DVF4006907LC	Carrier
Condenser Water Box	09DVF5001002LC/ 09DVF5002002LC	Macor
Evaporator Water Box	10DVF5000102LC/10DVF5000102LC	Macor
Economizer	08DV34004001LC	Macor
Purge Assembly	11DV04500002LC	Carrier
Refrigerant Pump Assembly	19DV44011902LC	Carrier
VFD	32VSC06805002	Gaston
VFD with AHF	HR46ZZ433	Gaston
Power Panel	03DV04000101LC	UTEC
Control Panel HMI	19XF14011401	UTEC
Compressor - Motor Assembly	02DV34000001	Carrier

UUT 1

Test Report# TR231339-01-R0

Mounting Bolt Locations



TITLE MARRIAGE APP. SEISMIC	
DESIGNER DVS, SEISMIC	
DATE 2004174466	
SCALE A1	
REVISIONS 1. 150 2788-y 2. 150 2788-y 3. 150 2788-y	

REVISION 1. 150 2788-y 2. 150 2788-y 3. 150 2788-y	DATE 01/16/2024 01/16/2024 01/16/2024	BY TP TP TP	CHK TP TP TP	APP TP TP TP
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INITIAL RELEASE _____	
REVISION RECORD _____	
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UUT 2

Test Report# TR231339-01-R0

Manufacturer: Carrier Corporation
Model Line: AquaEdge® 19DV Centrifugal Chiller
Model Number: 19DV-M64M645645H5
Serial Number: N/A

Highest Passed Test Level						
S _{DS}	z/h	I _p	A _{flx-h}	A _{rig-h}	A _{flx-v}	A _{rig-v}
2.0	1		3.2	2.4	1.67	0.67
2.5	0	1.5				

Dimensions/Weights			
Depth (in)	Width (in)	Height (in)	Weight (lbs.)
264	132	155	72,011

Lowest Natural Frequency (Hz)		
Front-Back	Side-Side	Vertical
9.0	7.4	29.2

Building Codes
CBC 2022

Test Criteria
ICC-ES AC156

Construction/Option Summary
Carbon Steel & Copper (Condenser and Evaporator Assemblies) and Cast Iron (Compressor Assembly)

UUT Mounting Details:



UUT was mounted to the shake table with eight (8) 1" Grade 5 bolts with washers on condenser side's mounting feet. Evaporator side's mounting feet were attached to the shake table with 1/2" fillet welds. See the following pages for bolt and weld locations.

Unit maintained structural integrity and remained operational per manufacturer requirement following shake table test. All contents were included in the unit per operating conditions.

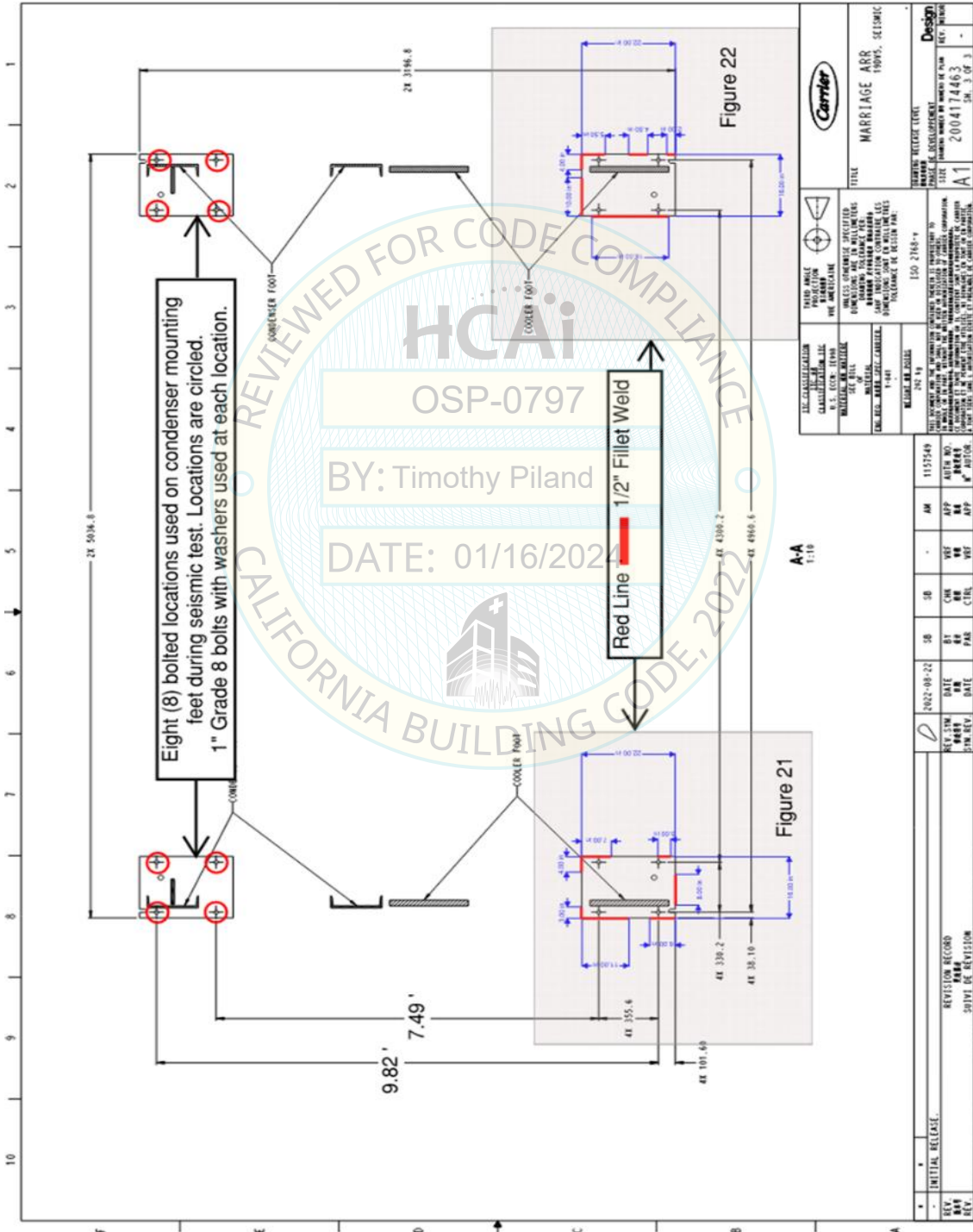
List of Included Subcomponents

Description	Model Number	Manufacturer
Condenser Assembly	09DVM4003708LC	Carrier
Evaporator Assembly	10DVM4006908LC	Carrier
Condenser Water Box (Marine)	09DVM5500301LC/09DVM5500401LC	Macor
Evaporator Water Box (Marine)	10DVM4000301LC/10DVM4000301LC	Macor
Economizer	08DV54003901LC	Macor
Purge Assembly	11DV04500002LC	Carrier
Refrigerant Pump Assembly	19DV54011901LC	Carrier
VFD	32VSS12005002	Gaston
Power Panel	03DV04000101LC	UTEC
Control Panel HMI	19XF14011401	UTEC
Compressor - Motor Assembly	02DV54000001	Carrier

UUT 2

Test Report# TR231339-01-R0

Mounting Bolt and Weld Locations



UUT 2

Test Report# TR231339-01-R0

Mounting Weld Details

