



Registered Design Professional Preparing the Report

4.0 MAKEITRIGHT, INC.

MAKEITRIGHT, INC.	
<i>Company Name</i>	
JOSEPH L. LA BRIE, SE	S 3566
<i>Contact Name</i>	<i>California License Number</i>
55 E. HUNTINGTON DRIVE, #277, ARCADIA, CA., 91006	
<i>Mailing Address</i>	
626-445-0366	labrie@makeitright.net
<i>Telephone</i>	<i>E-mail Address</i>

California Licensed Structural Engineer Review and Acceptance of the Report

5.0

MAKEITRIGHT, INC.	
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JOSEPH L. LABRIE, SE	S 3566
<i>Contact Name</i>	<i>California License Number</i>
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Anchorage Pre-Approval

6.0

- Anchorage is pre-approved under OPA-
(Separate application for anchorage pre-approval is required)
- Anchorage is not Pre-approved

Certification Method

7.0

- Testing in accordance with:
 - ICC-ES AC-156
 - Other (Please Specify):
- Analysis
- Experience data
- Combination of Testing, Analysis, and/or Experience Data (Please Specify):

Testing Laboratory (if applicable)

8.0

UUT1: Portland State University, iSTAR Lab UUT2: UCSD: SRMD Test Facility	UUT1: Peter Dusicka, PhD UUT2: Gianmario Benzoni Ph.D.
<i>Company Name</i>	<i>Contact Name</i>
UUT1: 1930 SW 4th Ave, Suite 200 Portland, OR 97201 UUT2: 9500 Gilman Drive, La Jolla, Ca., 92093	
<i>Mailing Address</i>	
UUT1: (503) 725-4275 UUT2: (858) 534-1432	UUT1: dusicka@pdx.edu UUT2: benzoni@ucsd.edu
<i>Telephone</i>	<i>E-mail:</i>



Approval Parameters

9.0

Design in accordance with ASCE 7-05 Chapter 13: Yes No

Design Basis of Equipment or Components (F_p/W_p) = 2.88g

S_{DS} (Spectral response acceleration at short period) = 1.60g

a_p (In-structure equipment or component amplification factor) = 2.5

R_p (Equipment or component response modification factor) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

Equipment or Component fundamental period(s) = SEE ATTACHED

Building period limits (if any) = NONE

Overall dimensions and weight (or range thereof) = SEE ATTACHED

Equipment or Components @ grade designed in accordance with ASCE 7-05 Chapter 15: Yes No

Design Basis of Equipment or Components (VW) =

S_{DS} (Spectral response acceleration at short period) =

S_1 (Spectral response acceleration at 1 second period) =

R (Response modification coefficient) = 1.0

Ω_0 (System overstrength factor) = 1.0

C_d (Deflection amplification factor) = 1.0

I_p (Importance factor) = 1.5

Height to Center of Gravity above base =

Equipment or Component fundamental period(s) = Sec

Overall dimensions and weight (or range thereof) =

Tank(s) designed in accordance with ASME BPVC, 2007: Yes No

10.0 List of attachments supporting the special seismic certification of equipment or components:

- Test Report (2 LAB REPORTS) Drawings Manufacturer's Catalog
 Calculations Others (Please Specify):

11.0 OSHPD Approval (For Office Use Only)

 Signature & Date Chris Tokas, SHFR	10/27/10	December 31, 2016 Approval Expiration Date
Name & Title	Special Seismic Certification Valid Up to	
Condition of Approval (if any): Approval is limited to Chillers with components listed in Pages #5 through #7.		



Product Line and Model Numbers:

MODEL	TONNAGE	UUT Number	WEIGHT (Lbs)	WIDTH (in)	HEIGHT (in)	LENGTH (in)	FUND. FREQ. (hz)		
							frt to bck	side to side	vertical
WMC-145S E2209/C2009	145 Ton	UUT-1	5,920	34.5	78.9	128.3	12.3	10.1	NOT DETERMINED
WDC126 E4816/C4816	2000 Ton	UUT-2	78,781	117.72	115.1	230.76	8.5	6.3	21.5



COMPONENT
MANUFACTURER: MCQUAY INTERNATIONAL

PRODUCT LINE	MODEL	LARGEST	SMALLEST	INCLUDED WITH TEST MOUNT CONFIGURATION
EVAPORATOR	E2009		X	• Base Mounted
	E2012			• Base Mounted
	E2209			• UUT-1 Base Mounted
	E2212			• Base Mounted
	E2216			• Base Mounted
	E2412			• Base Mounted
	E2416			• Base Mounted
	E2609			• Base Mounted
	E2612			• Base Mounted
	E2616			• Base Mounted
	E3009			• Base Mounted
	E3012			• Base Mounted
	E3016			• Base Mounted
	E3609			• Base Mounted
	E3612			• Base Mounted
	E3616			• Base Mounted
	E3620			• Base Mounted
	E4212			• Base Mounted
	E4216			• Base Mounted
	E4220			• Base Mounted
E4812			• Base Mounted	
E4816	X		• UUT-2 Base Mounted	

* Interpolated



COMPONENT

MANUFACTURER: MCQUAY INTERNATIONAL

PRODUCT LINE	MODEL	LARGEST	SMALLEST	INCLUDED WITH TEST	MOUNT CONFIGURATION	
CONDENSER	C1809		X	*	Base Mounted	
	C1812			*	Base Mounted	
	C2009			UUT-1	Base Mounted	
	C2012			*	Base Mounted	
	C2209			*	Base Mounted	
	C2212			*	Base Mounted	
	C2216			*	Base Mounted	
	C2416			*	Base Mounted	
	C2609			*	Base Mounted	
	C2612			*	Base Mounted	
	C2616			*	Base Mounted	
	C3009			*	Base Mounted	
	C3012			*	Base Mounted	
	C3016			*	Base Mounted	
	C3612			*	Base Mounted	
	C3616			*	Base Mounted	
	C3620			*	Base Mounted	
	C4212			*	Base Mounted	
	C4216			*	Base Mounted	
	C4220			*	Base Mounted	
	C4812			*	Base Mounted	
	C4816		X		UUT-2	Base Mounted

* Interpolated



COMPONENT MANUFACTURER: MCQUAY INTERNATIONAL

PRODUCT LINE	MODEL NUMBER	ARGES	MALLES	MANUFACTURER	INCLUDED WITH TEST	MOUNT CONFIGURATION
COMPRESSORS	TT300		X	TURBOCOR	UUT-1	Mounted on Unit
	TT400			TURBOCOR	.	Mounted on Unit
	TT500			TURBOCOR	.	Mounted on Unit
	CE063			MCQUAY INT.	.	Mounted on Unit
	CE079			MCQUAY INT.	.	Mounted on Unit
	CE087			MCQUAY INT.	.	Mounted on Unit
	DD092			MCQUAY INT.	.	Mounted on Unit
	CE100			MCQUAY INT.	.	Mounted on Unit
	DD106			MCQUAY INT.	.	Mounted on Unit
	CE113			MCQUAY INT.	.	Mounted on Unit
	CE126	X		MCQUAY INT.	UUT-2	Mounted on Unit
OIL PUMP	**		X	**	UUT-1	**
	16"	X		MCQUAY INT.	UUT-2	Mounted on Unit
UNIT CONTROLLER			X	CAREL	UUT-1	Mounted on Unit
		X		CAREL	UUT-2	Mounted on Unit
COMPRESSOR CONTROLLER			X	CAREL	UUT-1	Mounted on Unit
		X		CAREL	UUT-2	Mounted on Unit
MOTOR			X	TURBOCOR	UUT-1	Mounted on Unit
		X		RAM, YYZ, RELIANCE	UUT-2	Mounted on Unit
VFD			X	TURBOCOR, MCQUAY	UUT-1	Mounted on Unit
		X		ROCKWELL AUTOMATIO	UUT-2	Remote Mounted
OITS (touchscreen interface panel)			X	GVISION	UUT-1	Mounted on Unit
		X		GVISION	UUT-2	Mounted on Unit

* Interpolated
** Not Used

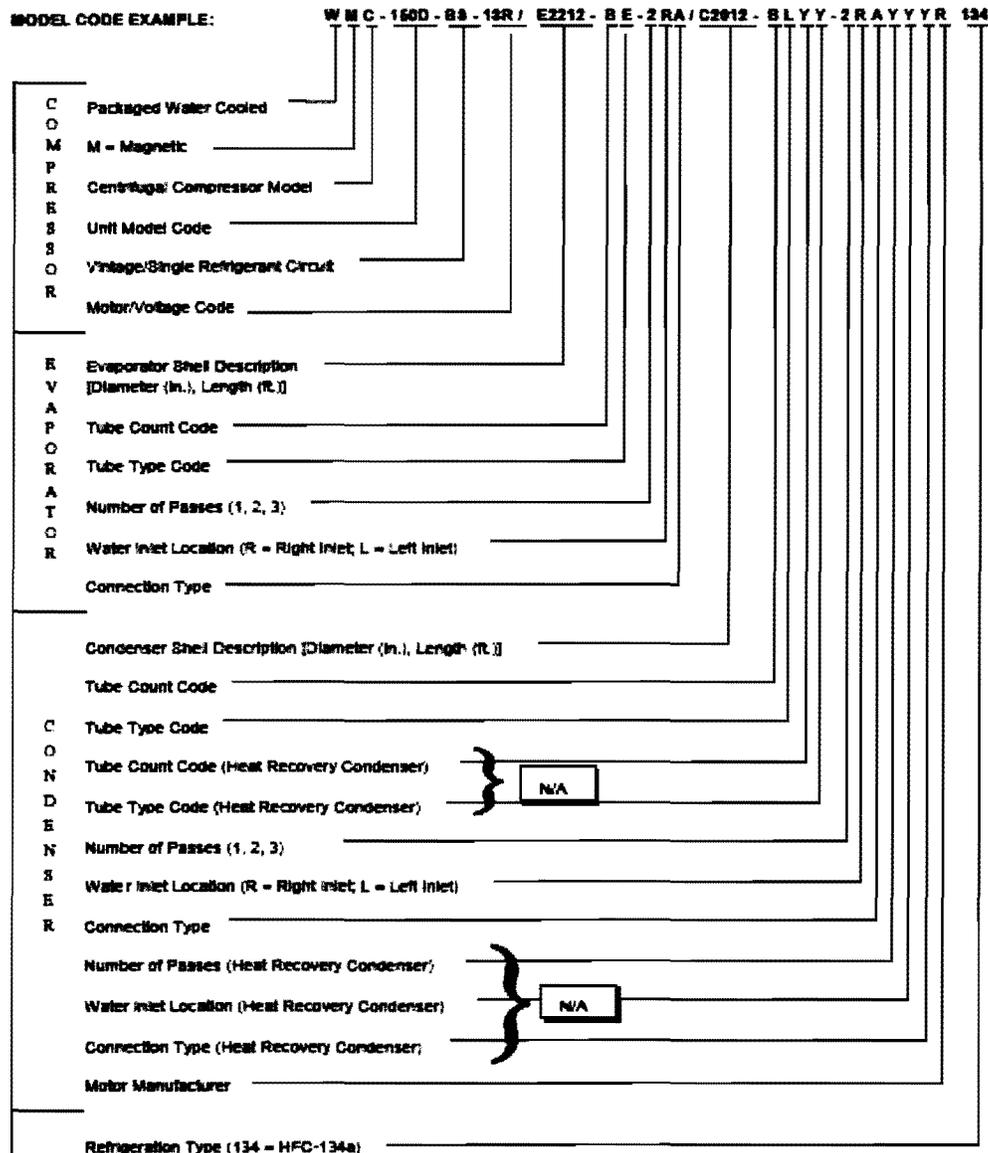


PRODUCT CODE:

Chiller Identification

Magnitude centrifugal chillers are selected by computer and identified by their components on the selection printout as a Model #. The unit model code is as follows:

Figure 6, Chiller Identification

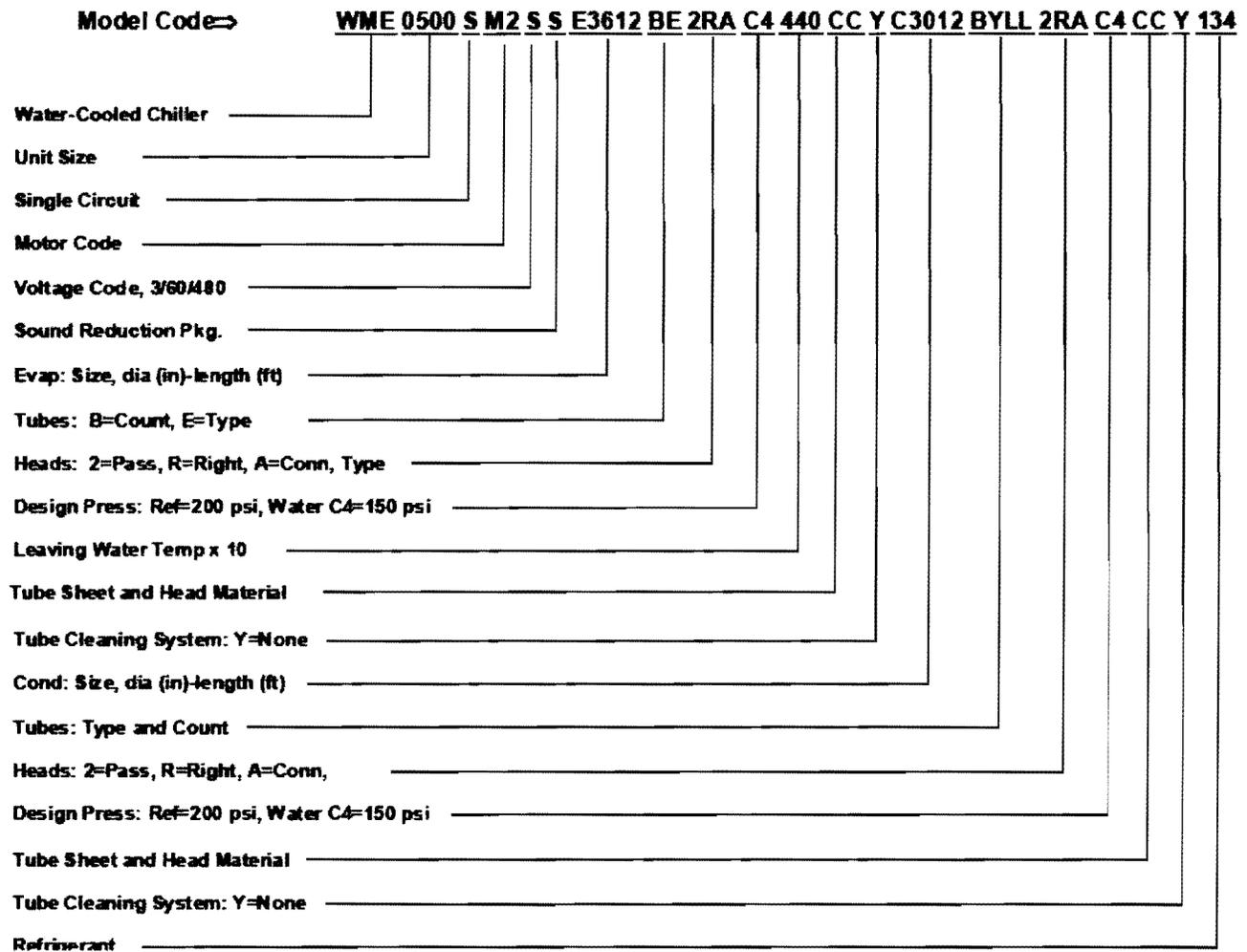




PRODUCT CODE:

Chiller Identification

Figure 2: Magnitude Code String Chiller Identification

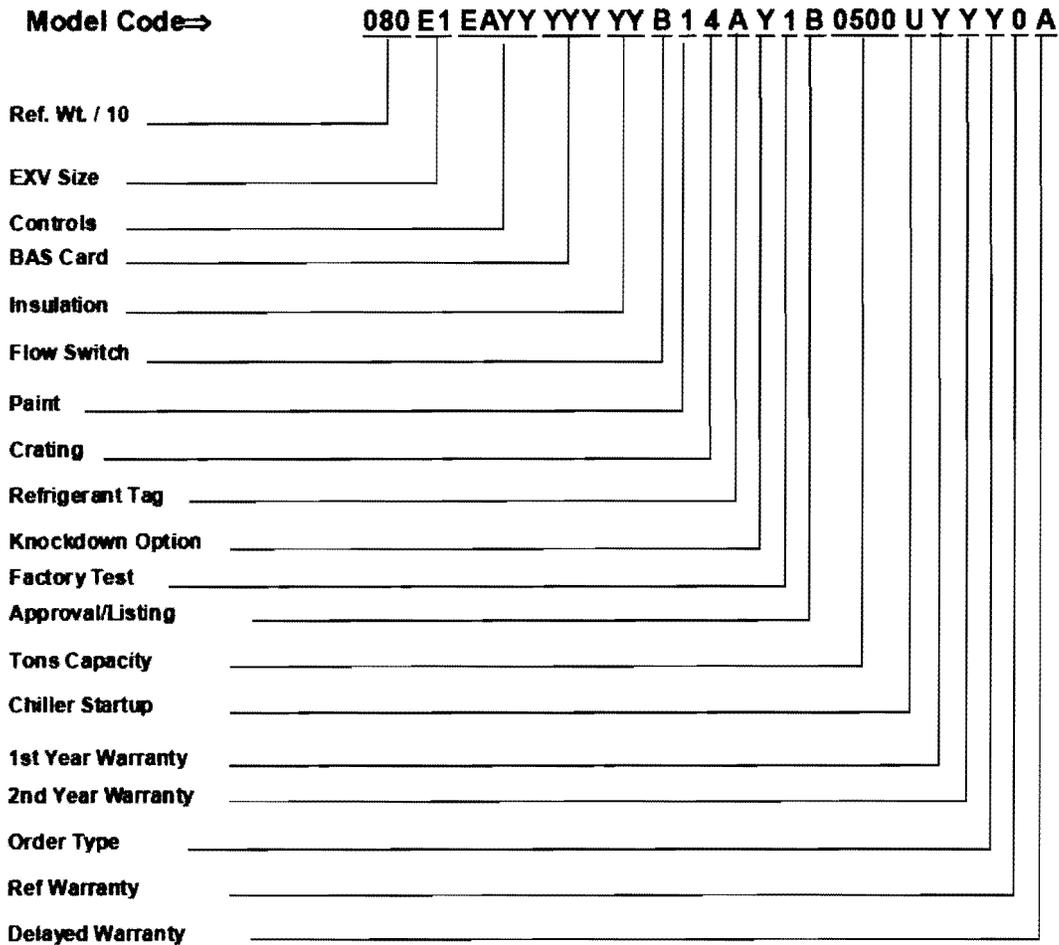




PRODUCT CODE:

Chiller Identification

Figure 3: Magnitude Code String Chiller Identification





PRODUCT CODE: *McQuay Model TSC Templifiers and HSC heat recovery chillers utilize the same components as McQuay model WSC. For the TSC, only the operating entering and leaving water temperatures differ. Model HSC chillers have the same operating characteristics as the WSC, but utilize a split bundle condenser for heat recovery purposes.*

Chiller Identification

To provide a wide range of components to match job requirements of capacity, efficiency and competitive initial cost, McQuay WSC, WDC and WCC centrifugal chillers are selected by computer and identified by their components.

The variations of compressor, impeller, gear ratio, evaporator and condenser tube surface and configuration provide over 1,000,000 combinations of standard components within the range of 200 to 2,700 tons. It is impractical to catalog all of these combinations. Therefore, computer selection for specific application conditions is required. The complete unit model code is then established as follows:

Figure 20, Chiller Identification

