

**TOWN OF PLYMOUTH CAPITAL IMPROVEMENT PLAN REQUEST
FY27 SPRING ANNUAL TOWN MEETING**

Department: PPS	Priority #:	1
Project Title and Description: South Middle Chiller Replacement	Total Project Cost:	\$450,000

Department/Division Head: Matt Durkee

Check if project is: New ☒ Resubmitted ☐ Cost estimate was developed: Internally ☐ Externally ☒

For project re-submittals, list prior year(s):

List any funding sources and amounts already granted: _____

Basis of Estimated Costs (attach additional information if available)			If project has impact on 5 Year Plan and future operating budgets, insert estimated amounts.		
Capital:	Cost	Comments	Fiscal Year:	Capital	Operations & Maintenance
<i>Planning and Design</i>			FY28		
<i>Labor and Materials</i>	\$400,000		FY29		
<i>Administration</i>			FY30		
<i>Land Acquisition</i>			FY31		
<i>Equipment</i>			FY32		
<i>Other</i>					
<i>Contingency</i>	\$50,000	12.5%			
Total Capital	\$450,000				

Project Justification and Objective: The District has been making many repairs on this chiller to continue operation. We are now operating on 2 out of 3 circuits as equipment components have broken down and cannot be sourced.

For Capital Project Requests:

Will this project be phased over more than one fiscal year? If yes, enter it on the 5 Year Plan
Can this project be phased over more than one fiscal year?

Yes ☐ No ☒
Yes ☐ No ☒

For Capital Equipment Requests:

☐ Check if equipment requested is replacement and enter the year, make & model, VIN and present condition of existing equipment


What is the expected lifespan of this new/replacement equipment: ASHRAE estimates 20 years for packaged chillers

Attach backup information, estimates, or justification to support this request.

PSMS Chiller Replacement Budget Number External Inbox

 **Seggos, Christina**
to me 

Hi Matt!

 Tue, Sep 16, 11:55 PM (9 hours ago)

At this time I could get the price for the Turnkey Chiller Replacement to be right under 400k.

With the way inflation is, it would be better to carry more as a budget number since I am not sure when you are planning to do this. There are 6-8% equipment price increases worldwide that come out of nowhere as well as Refrigerant changes due to "climate" Policies. So 450k would work as a Budget number. This Price includes the Chiller (see attachment- could change), Labor to Install and Startup, any re-piping, Crane/Rigging, Electrical, Insulation.

Thank you!!

Call or text if you have any questions.

Christina

Christina Seggos

Account Manager

Daikin Applied - New England Branch

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Proposed Unit

Existing vs Proposed

	Model	MOP	Max Capacity	Operating Weight	Length	Width	Height
Existing	ALS225	600 A	237.7 Tons	16180 lbs	355"	83.4"	91.2"
Proposed	AWV016B	600 A	245.6 Tons	15931 lbs	334"	88"	100"

*Tonnage @
AHRI ratings*

Job Information		Item Summary	
Job Name	Plymouth Middle School Chiller Replacement - SN 58F8136901 - 22404756	Date	11/8/2024
Model	AWV016B	Software Version	16.21
Unit Tag	CH-1		

Unit Options		
Code Item	Code Value	Description
1	AWV	UNIT TYPE; AWV
2	016	FAN NUMBER; 16 Fans
3	B	VINTAGE; B Vintage
4	JFN	COMPRESSOR SIZE; JFN
5	AC	TYPE OF COMPRESSORS; AC Compressors
6	KGN	ECONOMIZER; KGN
7	PK	CONSTRUCTION TYPE; Package
8	EV4027A1207	EVAP SIZE/TUBE COUNT; EV4027A1207
9	NCN3	TUBE MATERIAL; Copper
10	L1GS	HEAD CONFIGURATION; Left Hand Grooved
11	4	WATERSIDE PRESSURE; 150 PSIG
12	S	EVAPORATOR INSULATION; Single Insulation
13	0440	LEAVING FLUID TEMP; 0440
14	P40	% OF GLYCOL; P40
15	P	CONDENSER COIL; MicroChannel (Epoxy Coating)
16	0950	AMBIENT TEMP; 0950
17	AF	FAN TYPE; AC Fan Motors / Fantrol
18	460V60H	VOLTAGE; 460V60H
19	VF	STARTER TYPE/FILTER; VFD without Filters
20	0221	COMPR RLA #1; 0221
21	0143	COMPR RLA #2; 0143
22	NNNN	COMPR RLA #3; None
23	0850	OPERATING HERTZ #1; 0850
24	0600	OPERATING HERTZ #2; 0600
25	NNNN	OPERATING HERTZ #3; None
26	DC	POWER CONNECTION; Single Point Disconnect Sw. & Circuit Protection
27	N	SWITCH OPTIONS; None
28	N	SITELINE; None
29	NN	COMMUNICATION; None
30	N	DISPLAY OPTIONS; On Controller Only
31	G	GROUND FAULT; Ground Fault Protection for the Unit
32	C	OUTLET; 115v Outlet
33	A	WATER FLOW; Water Flow Indication
34	N	RESTORE; Standard
35	N	FAN VFD LINE REACTORS; None
36	N	CONTROL BOX HEATER; None
37	S	VALVES; With Suction Shut-off Valves Only
38	N	LIQUID INJECTION; None
39	G	GUARDS; Condenser Coil Wire Grilles Only
40	NN	EXPANSION TANK; None
41	ST	SOUND; Internal Discharge Compressor Muffler
42	NN	SPECIAL CONSTRUCTION; Standard
43	J	BRAND NAME; Daikin
44	E	AGENCY APPROVAL; With ETL Label

Code Item	Code Value	Description
45	A	AHRI APPROVAL; With AHRI Label
46	A	ASHRAE APPROVAL; With ASHRAE Label
47	N	CRN EVAPORATOR; No CRN
48	B	SHIPPING/PACKAGING; Bagged
49	W	WATER PUMP HP; Without Pumps
50	N	PUMP POWER SUPPLY; No Pump Power Supply
51	N	PUMP SPEED; None
52	N	PUMP #; None
53	0586	PUMP FLOW; 0586
54	NNN	PUMP HEAD; Pump Head
55	N	PUMP PACKAGE STARTER; No Pump Package
56	N	PUMP GAUGES; No Pressure Gauges
57	NNNN	PUMP IMPELLER SIZE; No Pumps
	NNNNNNNN	
58	NNNNNNNN	PUMP PART NUMBER; No Pumps
	NN	
59	DSU	UNIT START; Domestic Startup By Daikin SVC or Daikin ASP
60	DPL	STANDARD WARRANTY; Domestic, 1st year std warranty - parts & labor
61	CPE4	EXT COMPRESSOR WARRANTY; Compressor Only - Ext. 4 Year Parts Only
62	NNNN	EXT UNIT WARRANTY; Entire Unit - No extended unit warranty
63	NNN	REFRIGERANT WARRANTY; Refrigerant Warranty - No refrigerant warranty
64	D00	DELAYED WARRANTY START; Additional Months
65	S	UNIT MISC; Standard Unit
66	F0	TESTING; Functional Test
67	161	CIR #1 REFRIGERANT QTY; 161 lb
68	180	CIR #2 REFRIGERANT QTY; 180 lb
69	000	CIR #3 REFRIGERANT QTY; None
70	2360	OUTPUT AMPS COMPR #1; 2360
71	1470	OUTPUT AMPS COMPR #2; 1470
72	NNNN	OUTPUT AMPS COMPR #3; None
73	S	SHIP; Standard Ship
74	0D	UNIT REVISION; Major Unit Change Revision
75	B	OUTPUT AMP RANGE #1; B
76	A	OUTPUT AMP RANGE #2; A
77	N	OUTPUT AMP RANGE #3; N/A
78	223	UNIT TONS; 223
79	0907	UNIT EER; 0907
80	1711	UNIT IPLV; 1711
81	5	REFRIGERANT TYPE; R513A
82	02119	LRA AMPS COMPR #1; 02119
83	00976	LRA AMPS COMPR #2; 00976
84	00000	LRA AMPS COMPR #3; Amps
85	N	MANUFACTURING; Location & Base Type to be determined

Accessories				
Part Number	Description	Qty	Ext Qty	
332946401	Spring Isolator Kit; AWW: (4) 2 SPNG GRAY, (6) 4 SPNG BLACK	1	1	
331758936	Strainer Kit; Grooved; 6", AWW EV40; AWS	1	1	

Job Information		Technical Data Sheet
Job Name	Plymouth Middle School Chiller Replacement - SN 58F8136901 - 22404756	
Date	11/8/2024	
Submitted By	Andrew Williams	
Software Version	16.21	
Unit Tag	CH-1	



Image may not represent ordered unit

Unit Overview					
Model Number	Capacity ton	Voltage	Unit Starter Type	ASHRAE 90.1	LEED Enhanced Refrigerant Management Credit
AWV016B	223.2	460 V / 60 Hz / 3 Ph	VFD	'07, '10, '13, '16 & '19	Pass

Unit								
Unit Type					Platform			Unit Revision
Air-Cooled Screw Compressor Chiller					Packaged			0D
Fan Type					Tubing			
AC Fan Motors / Fantrol (32°F Min.)					With Suction Shut-off Valves Only			
Display								
On Controller only								
Compressor					Refrigerant Economizer			
JFN					KGN			
Refrigerant Type					Refrigerant Weight			
R513A					341 lb (per unit)			
Approval								
ETL/cETL, AHRI & ASHRAE 90.1								
Evaporator								
Evaporator Model:		EV4027A1207						
Fluid Volume:		63.3 gal						
Connection Hand:		Grooved / Left Hand						
Connection Size:		6.0 in						
Insulation:		Single Layer Insulation on Evaporator						
Entering Fluid Temperature	Leaving Fluid Temperature	Fluid Type	Glycol Concentration	Fluid Flow	Fluid Flow (with glycol) Min / Max	Pressure Drop	Pressure Drop (with glycol) Min / Max	Fouling Factor
54.00 °F	44.00 °F	Propylene Glycol	40.0 %	586.3 gpm	188.0 / 748.0 gpm	26.0 ft H ₂ O	0.000 / 43.4 ft H ₂ O	0.000100 °F.ft ² .h/Btu
Note: Evaporator Pressure Drop includes Field Installed Accessory Kit Strainer. Pressure drop without strainer is 23.6. Minimum flow is based on a Variable Flow Pumping System Type and applies to part load conditions only.								

Condenser			
Number of Fans:	16		
Coil Fins:	MicroChannel (Epoxy Coating)		
Guards:	Condenser Coil Wire Grilles only		
Design Ambient Air Temperature	Altitude	Fan Diameter	Minimum Design Ambient Temperature
95.0 °F	0.000 ft	31.5 in	32.0 °F

Unit Performance

Design													
Capacity			Input Power			Efficiency (EER)			IPLV/IP (EER)*				
223.2 ton			295.2 kW			9.074 Btu/W.h			17.11 Btu/W.h				
Performance Points rated at AHRI Ambient Relief - with Glycol													
Point #	% Load	Unit				Refrigerant Economizer Status #1; #2	Compressor RPS #1; #2	Fluid Flow gpm	Evaporator			Condenser	
		Capacity ton	Input Power kW	Efficiency (EER) Btu/W.h	Pressure Drop ft H ₂ O				Entering Fluid °F	Leaving Fluid °F	Ambient Air °F	Altitude ft	
1	100.0	223.2	295.2	9.074	On; On	85; 60	586.3	23.6	54.00	44.00	95.0	0.000	
2	75.0	167.4	147.8	13.59	On; Off	53; 41	586.3	23.6	51.50	44.00	80.0	0.000	
3	50.0	111.6	74.09	18.08	Off; Off	34; 26	586.3	23.5	49.00	44.00	65.0	0.000	
4	25.0	55.80	32.07	20.88	Off; Off	29	586.3	23.5	46.50	44.00	55.0	0.000	

* IPLV reflects AHRI standard rating conditions with water and may change with user defined conditions due to AWV product optimized configurability.
Note: Evaporator Pressure Drop in this table does Not include strainer. For strainer pressure drop data see 'Evaporator' table on page 1.

Sound Data (Internal Discharge Compressor Muffler)

Sound Pressure (at 30 feet)																								
% Load		63 Hz db		125 Hz db		250 Hz db		500 Hz db		1 kHz db		2 kHz db		4 kHz db		8 kHz db		Overall dBA						
100		79		76		72		70		68		62		55		49		72						
75		76		73		70		67		64		56		51		45		69						
50		76		72		67		65		62		54		49		43		67						
25		72		69		64		62		59		51		46		40		64						
Sound Power																								
% Load		63 Hz db		125 Hz db		250 Hz db		500 Hz db		1 kHz db		2 kHz db		4 kHz db		8 kHz db		Overall dBA						
100		106		103		99		97		95		89		82		76		99						
75		103		100		97		94		91		83		78		72		96						
50		103		99		94		92		89		81		76		70		94						
25		99		96		91		89		86		78		73		67		91						
One-third Octave Band Sound Power																								
% Load	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
100	102	102	99	98	98	98	94	95	94	94	93	89	89	91	90	86	83	81	79	77	76	74	68	65
75	100	99	97	95	96	95	91	93	93	90	89	88	86	87	86	80	78	77	74	73	72	71	65	62
50	99	98	96	94	95	94	90	91	88	89	88	84	85	85	83	78	76	74	72	71	70	69	63	60
25	96	95	93	91	92	91	86	87	85	86	85	81	82	82	80	75	73	71	69	67	67	66	60	57

Physical

			Unit	
Length*	Height	Width*	Shipping Weight*	Operating Weight*
334 in	100 in	88 in	15370 lb	15931 lb

* Shipping and operating weights are based on 'worst case' unit configuration variations but do not include the weights of any Options or Accessories. Contact Chiller Applications for additional information.

Electrical

Unit Electrical Data				
Voltage	Starter Type	Fan Motor Quantity	LRA Fan Motor (each)	FLA Fan Motors (each)
460 V / 60 Hz / 3 Ph	VFD	16	10.5 A	3.3 A
Power Connection Type:	Single Point Disconnect Switch with Circuit Protection			
Short Circuit Current Rating:	10 kA			
Box Size Code:	S			
Phase Voltage:	None (PVM included as part of Solid State / VFD)			

Single Point Power Connection	
Minimum Circuit Ampacity (MCA):	481 A
Recommended Overcurrent Protection Size:	600 A
Maximum Overcurrent Protection Size(MOCP):	700 A
Lug Connection Size:	(3) 2/0-400MCM

Compressor Electrical Data			
Compressor Type	Compressor Quantity	Starter Type	
Screw	2	VFD	
	Compressor #	1	2
Rated Load Amps (RLA):		221 A	143 A
Inrush Current:		221 A	143 A

Note: Power wiring connections to the chiller may be done with either copper or aluminum wiring. Wire should be sized per NEC and/or local codes. Wire sizing and wire count must fit in the power connection lug sizing listed above. Please contact your local sales office for more information.

Options

High Stage Relief Valve: Included

Electrical	
Ground Fault:	Unit Ground Fault Protection
Unit Options:	115V Convenience Outlet
Water Flow Indicator:	Thermal Dispersion Type

Warranty

Unit Startup	Domestic
Standard Warranty:	1st Year Entire Unit Parts & Labor
Extended Compressor Warranty:	Compressor Only; extended 4 years parts only (5 Years Total)

AHRI Certification



Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at www.ahridirectory.org. Unit contains freeze protection liquids in the evaporator and is certified when rated per the Standard with water.

Performance at AHRI Standard Condition – with Water										
% Load	Capacity ton	Unit		IPLV/IP* (EER)	Fluid Flow gpm	Evaporator			Condenser	
		Input Power kW	Efficiency (EER) Btu/W.h			Pressure Drop ft H ₂ O	Entering Fluid °F	Leaving Fluid °F	Ambient Air °F	Altitude ft
100	223.2	266.9	10.04	17.11	534.2	15.3	54.00	44.00	95.0	0.000

Note: Performance with water given as reference only to show compliance with AHRI Standard 550/590. Unit will be configured from the factory to support glycol performance as rated. The unit must not operate with water only without consulting the factory.