



FRESNO COUNTY ZOO AUTHORITY

MEETING AGENDA

9:00 AM, Wednesday, June 29, 2022

Fresno County Employees' Retirement Association

7772 N. Palm Ave. Fresno, CA 93711

(559) 457-0681

1. Call to Order
2. Roll Call
3. Approve Agenda
4. Public Comments
This portion of the meeting is reserved for persons desiring to address the board on matters within the Board's jurisdiction that are not on the agenda. Attention is called to the fact that the Board is prohibited from taking any action on matters that are not on the agenda. Members of the public are limited to three minutes to speak during Public Comments as well as for each item on the agenda. Before beginning comments, please state for the record your name and affiliation, if any
5. Approve Consent Agenda Items
These matters are routine in nature and are usually approved by a single vote. Prior to action by the Board, the public will be given the opportunity to remove any item from the Consent Calendar. Items removed from the Consent Calendar may be heard immediately following approval of the Consent Calendar
 - a. Review and approve minutes of May 25, 2022
 - b. Review and approve payment of County of Fresno invoice for Professional and Specialized Services in the amount of \$17,037.87 for services through June 2022.
 - c. Receive Treasurer's Reports for May 2022
6. Receive Fresno Chaffee Zoo Director's report
7. Receive Fresno Chaffee Zoo Corporation's April 2022 Year-to-Date Financial Report and May 2022 Early Insights

8. Approve Fresno Chaffee Zoo Corporation's request for Measure Z Capital funds totaling \$53,790 to complete the demolition phase of the Kingdoms of Asia Mixed Species Exhibit
9. Approve Fresno Chaffee Zoo Corporation's request of Measure Z Capital funds totaling \$1,409,982.40 for the construction and replacement work on the Sea Lion Cove's biotank filtration tower walls and installation of the chiller addition
10. Approve Fresno Chaffee Zoo Corporation's request of Measure Z Capital funds totaling \$1,383,565 for the implementation of the energy efficiency upgrades proposal from Alliance Building Solutions, Inc.
11. Approve and authorize release of retention withheld on design work provided by CLR Design related to Kingdoms of Asia (\$2,765)
12. Approve and authorize the estimated administrative appropriations and revenues for the 2022-2023 budget year
13. Review next meeting date and revise if necessary:

Wednesday, July 27, 2022

Wednesday, September 28, 2022

Note: August 31, 2022 meeting cancelled during the May 25, 2022 meeting.

14. Receive staff reports
15. Chair's comments
16. Board Member comments
17. Adjourn

All supporting documentation is available for public review in the office of the Fresno County Zoo Authority, 2281 Tulare Street, Room 304, Fresno, 93721, during regular business hours.

For further information, please contact Ronald Alexander, Zoo Authority Coordinator, at 600-1710, email zooauthority@co.fresno.ca.us, or visit www.zooauthority.org. Requests for disability-related modification or accommodation needed in order to participate in the meeting must be made to the Zoo Authority Coordinator no later than 9:00 a.m. on the day prior to the meeting.



FRESNO COUNTY ZOO AUTHORITY

ACTION SUMMARY MINUTES

9:00 AM, Wednesday, May 25, 2022

**Fresno Chaffee Zoo
Simba Room
894 West Belmont Avenue
Fresno, CA 93728
(559) 498-5910**

1. Call to Order
CHAIRMAN ROMAN CALLED THE MEETING TO ORDER AT 9:10AM.
2. Roll Call
A QUORUM WAS PRESENT WITH MEMBERS ROMAN, GARABEDIAN, WATERHOUSE AND ARIAS PRESENT
3. Approve Agenda
MEMBER ARIAS MOVED TO ADOPT THE AGENDA, SECONDED BY MEMBER WATERHOUSE. THE MOTION PASSED UNANIMOUSLY.
4. Public Comments
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HELD. NONE RECEIVED.
5. Approve Consent Agenda Items
These matters are routine in nature and are usually approved by a single vote. Prior to action by the Board, the public will be given the opportunity to remove any item from the Consent Calendar. Items removed from the Consent Calendar may be heard immediately following approval of the Consent Calendar
 - a. Review and approve minutes of February 25, 2022
 - b. Review and approve minutes of March 16, 2022
 - c. Review and approve payment of County of Fresno invoice for Professional and Specialized Services in the amount of \$32,244.45 for services through April 2022.

- d. Receive Treasurer's Reports for February, March (including Quarter Ended March) and April 2022

MEMBER ARIAS MOVED TO APPROVE THE CONSENT ITEMS, SECONDED BY MEMBER WATERHOUSE. THE MOTION PASSED UNANIMOUSLY.

6. Receive Fresno Chaffee Zoo Director's report
RECEIVED. CEO JON DOHLIN PROVIDED A BRIEF CONSTRUCTION UPDATE: CLOSING IN ON RIBBON CUTTING FOR ZOOPLEX AROUND MID JUNE. KINGDOMS OF ASIA CONTINUES TO PROGRESS. ANTICIPATES CONSTRUCTION ASPECTS COMPLETED AROUND THE END OF THIS YEAR'S THIRD QUARTER WITH GRAND OPENING FEBRUARY 2023. STATED THAT HE ANTICIPATES REPORTING ON PURPOSE PLANNING DURING THE JUNE OR JULY MEETING. REPORTED ON GIVEAWAY OF 18,000 TICKETS. REPORTED ON LAWSUIT REGARDING FREEING ELEPHANTS.
7. Receive Fresno Chaffee Zoo Corporation's March 2022 Year-to-Date Financial Report and April 2022 Early Insights
RECEIVED. CFO NORA CROW REPORTED ON ATTENDANCE BEING ABOVE BUDGET EACH MONTH OF THE FIRST QUARTER, MARCH YEAR-TO-DATE VARIANCE ANALYSIS VS THE BUDGET, TICKET PRICES REMAINING AS IS FOR THE YEAR, AND THE APRIL BALANCE SHEET. ITEMS OF NOTE ARE THE PPP2 FORGIVENESS APPLICATION HAS BEEN SUBMITTED, THEY RECEIVED ACCREDITATION RENEWAL, AND THIS WAS THE MOST WELL ATTENDED APRIL SINCE THE CORPORATION TOOK OVER OPERATIONS.
8. Review next meeting date and revise if necessary:

Wednesday, June 29, 2022
Wednesday, July 27, 2022
Wednesday, August 31, 2022
MEMBER ARIAS MOVED TO CANCEL THE AUGUST 31, 2022 MEETING. SECONDED BY MEMBER WATERHOUSE. THE MOTION PASSED UNANIMOUSLY.
9. Receive staff reports
NO ADDITIONAL STAFF REPORTS RECEIVED.
10. Chair's comments
ROMAN THANKED EVERYONE FOR ALL OF THE HARD WORK. VOTE IN JUNE.
11. Board Member comments
MEMBER GARABEDIAN STATED THAT THE RECENT EVENT WAS FABULOUS AND THAT THE DINASAUR EXHIBIT IS THE BEST SHE HAS SEEN. MEMBER ARIAS REPORTED ON THE PARKING SITUATION AND MOBILE VENDOR.
12. Adjourn
THERE BEING NO FURTHER BUSINESS BEFORE THE BOARD, CHAIRMAN ROMAN ADJOURNED THE MEETING AT 9:47AM

All supporting documentation is available for public review in the office of the Fresno County Zoo Authority, 2281 Tulare Street, Room 304, Fresno, 93721, during regular business hours.

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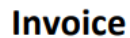
Invoice for Professional Services in Support of the Zoo Authority
Billing Hours and Expenses through June 2022

Invoice Number
06-ZOO-062922

June 29, 2022

TO: Zoo Authority Board
c/o County of Fresno
2281 Tulare St. Room 304
Fresno, CA 93721

Department / Title	Hours	Rates	Cost
ACTTC FR&A			
Accounting & Finance Div Chief	0.75	\$92.49	\$69.37
Accounting & Finance Manager	18.79	\$91.80	\$1,724.92
Accountant I	21.24	\$62.78	\$1,333.47
Account Clerk II	37.48	\$56.16	\$2,104.88
County Counsel			
Deputy County Counsel	3.00	\$150.00	\$450.00
CAO			
Board Coordinator	87.00	\$130.52	\$11,355.24
Professional Services Total	168.26		\$17,037.87
Office Expense Total			
Invoice Total			\$17,037.87



BILL TO:

PO BOX 1247
FRESNO, CA 93715-1247

[illegible]

INVOICE

DATE: June 1, 2022
INVOICE # 1012
FOR: *Zoo Authority
Administration*

DESCRIPTION	AMOUNT
Zoo Authority Board Coordinator Services April, May, June 2022	\$ 11,355.24
TOTAL	\$ 11,355.24

Statement

Date: June 10, 2022

Invoice # 22-12

FRESNO COUNTY COUNSEL
2220 Tulare Street, Suite 500
Fresno, CA 93721

Bill to: Zoo Authority
VIA Email to Ron Alexander

Comments:[illegible]

Remittance	
Invoice #	22-12
Date	
Amount Due	\$450.00
Amount Enclosed	

Make all checks payable to Fresno County Counsel
2220 Tulare Street, Suite 500, Fresno, CA 93721 Ph# 559/600-3479

AGENDA ITEM 5c



Fresno County Zoo Authority Treasurer's Report Unaudited Cash Basis For the Month Ended May 31, 2022

Summary of Measure Z Proceeds			
Tax Proceeds Received:			
-	Measure Z - Sales Tax Proceeds	\$	1,972,402.59
	Total Proceeds Received:	\$	1,972,402.59
Tax Proceeds Allocated:			
-	Allocation to Zoo Authority Fund (2%)	\$	39,448.05
-	Allocation to Trust Fund for Operations and Capital Projects (98%)		1,932,954.54
	Total Proceed Allocations	\$	1,972,402.59
Cash Balance by Fund			
Zoo Authority Fund >> Administrative Fund 2%			
	Beginning Cash Balance	\$	2,636,791.48
Receipts:	- Measure Z Sales Tax Proceeds		39,448.05
	- Interest Received		51.39
Disbursements:	ZA Staff Invoice Reimbursement for Professional Services		(32,244.45)
	- PeopleSoft Financial Charges		(95.99)
	Net Increase/(Decrease) to Cash		7,159.00
	Ending Cash Balance - Zoo Authority Administrative Fund	\$	2,643,950.48
Trust Fund for FCZC Operations and Capital Projects 98%			
	Beginning Cash Balance	\$	35,356,547.65
>>> Operations Fund			
	Beginning Cash Balance		7,640,573.96
Receipts:	- Measure Z Sales Tax Proceeds		644,318.18
	- Interest Received		167.46
Disbursements:	- FCZC Operations Claim #2022-03		(650,635.28)
	- Wire Fees		(20.00)
	Net Increase/(Decrease) to Cash		(6,169.64)
	Ending Cash Balance - Available for Operations	\$	7,634,404.32
>>> Capital Facilities Project Fund			
	Beginning Cash Balance	\$	27,715,973.69
Receipts:	- Measure Z Sales Tax Proceeds		1,288,636.36
	- Interest Received		596.78
Disbursements:	FCZC Capital Claim #2022-03C		(1,371,294.89)
	Net Increase/(Decrease) to Cash		(82,061.75)
	Ending Cash Balance - Available for Capital Projects		27,633,911.94
	Ending Balance Available for Operations and Capital Projects	\$	35,268,316.26
	Total Interest Received During the Month		815.63

By Staff _____

Date _____

Accepted _____

Date _____

* Interest receipts are recorded in the month received rather than in the month earned and were calculated on an annual percentage rate of 1.312 as of March 31, 2022.



Fresno County Zoo Authority

SUMMARY OF MEASURE Z SALES TAX PROCEEDS

	PRIOR FISCAL YEARS			CURRENT FISCAL YEAR			
	2018-2019	2019-2020	2020-21	2021-22			
	ACTUAL TAX RECEIPTS	ACTUAL TAX RECEIPTS	ACTUAL TAX RECEIPTS	BUDGETED TAX RECEIPTS	ACTUAL TAX RECEIPTS	BUDGET TO ACTUAL VARIANCE	
July	\$ 1,227,435	\$ 1,436,673	1,493,025	\$ 1,537,816	\$ 2,124,574	\$ 586,758	38.16%
August	928,052	1,123,640	1,669,386	1,619,304	1,637,692	18,388	1.14%
September	1,171,132	1,367,439	1,417,789	1,403,611	1,638,799	235,188	16.76%
October	1,619,199	1,571,111	1,609,453	1,657,737	1,919,542	261,805	15.79%
November	1,531,072	1,073,344	1,437,716	1,480,847	1,649,471	168,624	11.39%
December	1,392,262	1,194,027	1,302,722	1,289,695	1,573,898	284,203	22.04%
January	1,345,542	1,263,406	1,388,858	1,430,524	1,555,927	125,403	8.77%
February	1,118,789	1,707,967	1,728,158	1,710,876	2,256,736	545,860	31.91%
March	1,327,543	1,063,584	1,292,553	1,279,627	1,529,499	249,872	19.53%
April	1,318,821	1,031,402	1,513,199	1,558,595	1,542,639	(15,956)	-1.02%
May	868,850	989,444	1,632,214	1,049,701	1,972,403	922,702	87.90%
June	1,263,124	1,105,857	1,682,042	1,128,085			
Total	<u>\$ 15,111,821</u>	<u>\$ 14,927,894</u>	<u>18,167,115</u>	<u>\$ 17,146,418</u>	<u>\$ 19,401,180</u>	<u>\$ 3,382,847</u>	<u>19.73%</u>

TOTAL MEASURE Z PROCEEDS FROM INCEPTION \$ 220,932,320



**Fresno County Zoo Authority
Treasurer's Report
Unaudited Cash Basis
For the Month Ended May 31, 2022**

Summary of Quarterly Interest Receipts										
Fund Subclass Description	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Total	
	1st Alloc.	2nd Alloc.	1st Alloc.	2nd Alloc.	1st Alloc.	2nd Alloc.	1st Alloc.	2nd Alloc.	Interest	
Date Received	7/20/2021	9/3/2021	10/20/2021	1/3/2022	1/21/2022	3/25/2022	4/20/2022	5/31/2022		
4845 10000 Zoo Authority	705.85	7,224.03	717.57	7,813.73	698.47	7,257.77	674.30	51.39	\$	25,143.11
4850 10000 FCZC - Operations	1,951.27	19,970.22	2,337.26	25,450.85	2,285.43	23,747.68	2,197.48	167.46	\$	78,107.65
4850 42700 FCZC - CP	12,681.48	129,788.10	11,193.97	121,893.41	9,317.98	96,822.06	7,831.11	596.78	\$	390,124.89
Total	\$ 15,338.60	\$ 156,982.35	\$ 14,248.80	\$155,157.99	\$ 12,301.88	\$127,827.51	\$ 10,702.89	\$ 815.63	\$	493,375.65
For Fiscal Year Ending June 30, 2022										



**Fresno County Zoo Authority
Capital Projects Fund Cash Flow
For the Month Ended May 31, 2022**

Cash Balance as of 05/31/2022 **\$ 27,633,912**

DEDUCTIONS (earmarked projects, FY21-22 expenditures paid through claim 2022-03C):

Zooplex Construction - June 2020	1,429,090
Ambassador Animal Building Construction - June 2020	102,736
Asia Construction - July 2020	8,897,692
South Corridor Infrastructure - February 2018	153,170
Asia Design - December 2017	801,200
Zooplex Design- August 2017	195,541
Ambassador Animal Building Design - August 2017	25,878
African River - June 2016	2,830,350
Mixed Species Exhibit Design - June 2021	103,282
SLC Biotank Design	66,481

Total Deductions:	<u><u>\$ (14,605,420)</u></u>
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TOTAL:	<u><u>\$ 13,028,492</u></u>
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**Fresno County Zoo Authority
Operations Fund Cash Flow
For the Month Ended May 31, 2022**

Cash Balance as of 05/31/2022 **\$ 7,634,404**

DEDUCTIONS (Remaining budgets, paid through claim 2022-03):

Marketing	440
Animal	3,108,115
Veterinary	434,846
Utilities	722,185
Animal Feed	310,856
Interest/Bank Charges	(220)
Maintenance-General Equipment	31,838
Maint.-Water/Water Standby	77,053
Visitor Services	55,054
Commissary	151,956
Maintenance	465,602
Medical, Dental & Lab Supplies	45,146
Total Deductions:	<u><u>\$ (5,402,871)</u></u>
TOTAL:	<u><u>\$ 2,231,533</u></u>



**Fresno County Zoo Authority
Administration Fund Cash Flow
For the Month Ended May 31, 2022**

Cash Balance as of 05/31/2022 \$ 2,643,950

DEDUCTIONS

(FY 21-22 Remaining budgets, paid through ZA Claim October 2021 to May 2022):

Telephone Charges	250
Memberships	500
Office Expense	6,000
Postage	1,000
PeopleSoft Financials Charges	282
Professional & Specialized Ser	66,717
Data Processing Services	1,500
Publications & Legal Notices	500
Trans, Travel & Education	2,500

Total Deductions:	<u>\$ (79,249)</u>
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TOTAL:	<u><u>\$ 2,564,701</u></u>
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AGENDA ITEM 6

DATE: June 29, 2022

TO: Fresno County Zoo Authority Board

FROM: Jon Forrest Dohlin, Chief Executive Officer
Fresno Chaffee Zoo Corporation

SUBJECT: Zoo Director's Report

RECOMMENDED ACTION:

Receive Fresno Chaffee Zoo Director's report.



AGENDA ITEM 7

DATE: June 29, 2022

TO: Fresno County Zoo Authority Board

FROM: Nora Crow, Chief Financial Officer
Fresno Chaffee Zoo Corporation

SUBJECT: April 2022 Year-to-Date Financial Report

RECOMMENDED ACTION:

Receive Fresno Chaffee Zoo Corporation's April 2022 Year-to-Date Financial Report and May 2022 Early Insights.

ATTACHMENTS:

April 2022 Financial Report



Financial Report

April 2022 YTD

May 2022 Early Insights

Summary

April 2022

Key Takeaway: Attendance has been above budget each month, April most well attended since the Corporation took over operations; received accreditation renewal at the mid year AZA conference

- \$5,694,493 self-generated revenue YTD (26% above budget)
- \$6,341,533 total expenses (15% below budget)
- \$647,040 operating deficit (less than budgeted deficit of \$2,972,913)
- \$1,755,428 operating surplus with Measure Z support (budgeted deficit of \$179,990)
- \$4,622,187 net surplus – MZ Capital Funds, Depreciation, Investment Income/Interest

May 2022 Key Notes:

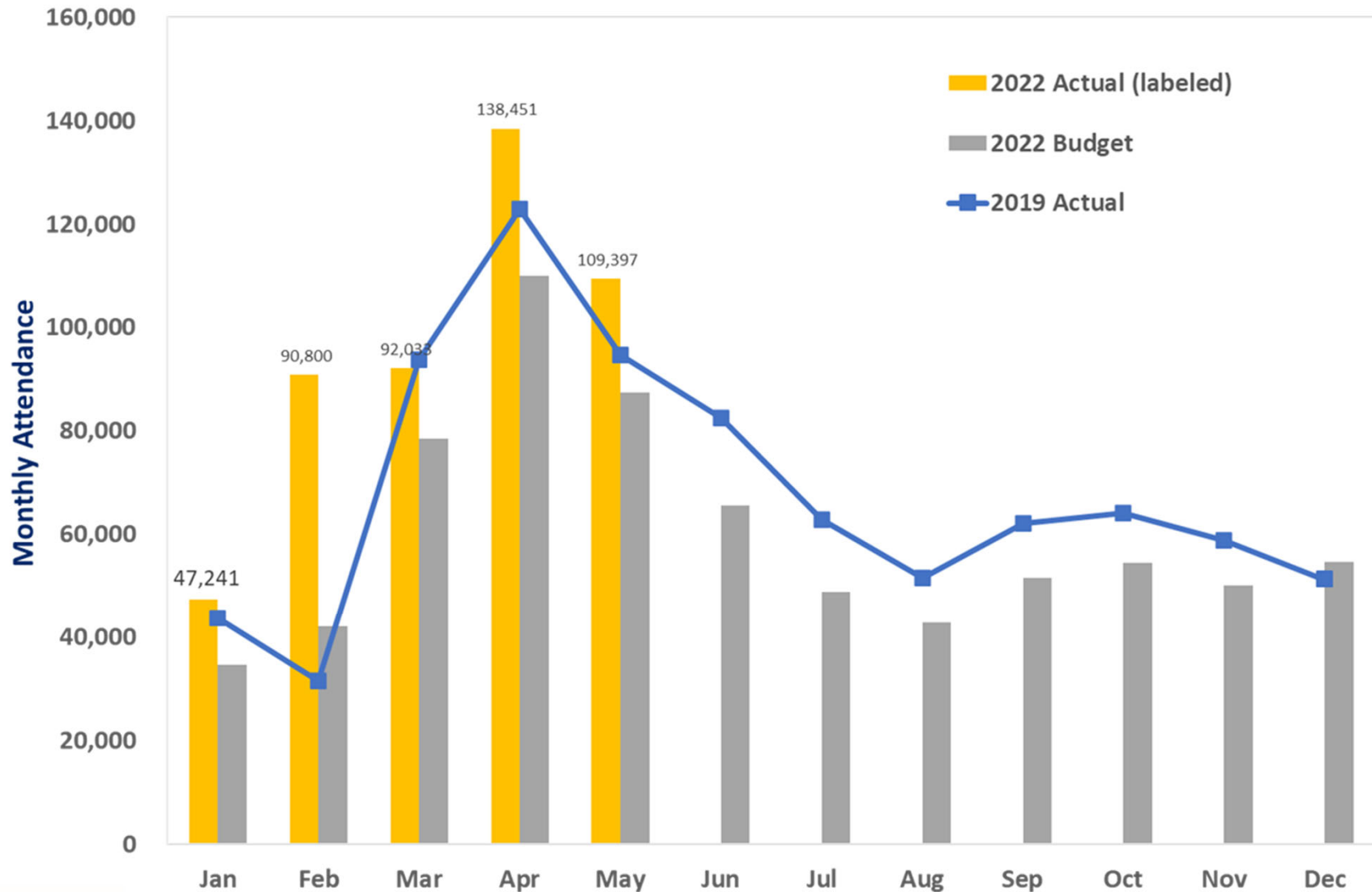
- PPP2 forgiveness application submitted – waiting for response
- Very early preliminary self-generated year to date revenue is \$7.2m compared to budget of \$6m (not including interfund operational support)
- Second best attendance numbers for May on record
- Welcomed 50,711 field trip visitors back through our doors YTD

2022 – Attendance

April 2022 = 138,451 (113% of 2019, 126% of budget)

April 2022 YTD attendance = 368,525 (126% of 2019, 139% of budget)

May 2022 YTD attendance = 477,922 (124% of 2019, 136% of budget)



Apr. '22 YTD – Variance Analysis vs. Budget

Summary	FY 22 Actual	FY 22 Budgeted	FY 22 Diff.	% Diff.	FY 21 Actual	FY 21 Diff.	% Diff.
Attendance	138,451	110,000	28,451	26%	90,067	48,384	54%
Revenue	\$5,694,493	\$4,528,499	\$1,165,994	26%	\$5,561,152	\$133,341	2%
Personnel Expenses	\$3,714,907	\$4,267,101	(\$552,194)	(13%)	\$3,063,852	\$651,055	21%
Other Expenses	\$2,626,626	\$3,234,311	(\$607,685)	(19%)	\$1,952,078	\$674,548	35%
Operations Surplus (Deficit)	(\$647,040)	(\$2,972,913)	\$2,325,873	78%	\$545,222	(\$1,192,262)	nm
Measure Z Operating	\$2,402,468	\$2,792,923	(\$390,455)	(14%)	\$964,029	\$1,438,439	149%
Operations + MZ Surplus (Deficit)	\$1,755,428	(\$179,990)	\$1,935,418	nm	\$1,509,250	\$246,178	16%
Other Non-Operating	\$2,866,759	\$309,294	\$2,557,465	nm	\$10,540,774	(\$7,674,016)	(73%)
Net Surplus (Deficit)	\$4,622,187	\$129,304	\$4,492,883	3475%	\$12,050,025	(\$7,427,838)	(62%)

Revenue - Selected Detail	FY 22 Actual	FY 22 Budgeted	FY 22 Diff.	% Diff.	FY 21 Actual	FY 21 Diff.	% Diff.
Admissions	\$2,316,276	\$1,906,069	\$410,207	22%	\$2,296,878	\$19,397	1%
Membership	\$1,049,738	\$726,000	\$323,738	45%	\$1,213,627	(\$163,888)	(14%)
Food Services/Gift Shop	\$633,347	\$535,502	\$97,845	18%	\$619,195	\$14,152	2%
Dinosaur Exhibit	\$673,063	\$607,128	\$65,935	11%	\$723,330	(\$50,267)	(7%)
Grants/Fundraising, ex-bequest	\$57,472	\$175,000	(\$117,528)	(67%)	\$38,151	\$19,321	51%
Bequest - unrestricted	-	nm	nm	nm	nm	nm	nm
Other	\$964,597	\$578,800	\$385,797	67%	\$669,971	\$294,626	44%
Revenue	\$5,694,493	\$4,528,499	\$1,165,994	26%	\$5,561,152	\$133,341	2%

Expenses - Selected Detail	FY 22 Actual	FY 22 Budgeted	FY 22 Diff.	% Diff.	FY 21 Actual	FY 21 Diff.	% Diff.
Personnel - Animal/Vet.	\$1,438,631	\$1,637,682	(\$199,051)	(12%)	\$1,306,854	\$131,776	10%
Personnel - Education	\$474,992	\$438,136	\$36,856	8%	\$387,598	\$87,395	23%
Personnel - Maint./Hort.	\$371,828	\$536,214	(\$164,386)	(31%)	\$274,801	\$97,027	35%
Personnel - Other	\$1,429,456	\$1,655,069	(\$225,613)	(14%)	\$1,094,599	\$334,857	31%
Animal Services	\$187,196	\$264,381	(\$77,185)	(29%)	\$132,091	\$55,105	42%
Dinosaur Exhibit	\$270,146	\$283,246	(\$13,100)	(5%)	\$189,432	\$80,713	43%
Utilities	\$252,770	\$309,000	(\$56,230)	(18%)	\$207,495	\$45,275	22%
Repairs & Replacements	\$151,311	\$301,560	(\$150,249)	(50%)	\$217,276	(\$65,965)	(30%)
Contracted/Prof. Services	\$516,488	\$448,053	\$68,435	15%	\$289,620	\$226,868	78%
Conservation	\$15,115	\$88,300	(\$73,185)	(83%)	\$4,255	\$10,860	255%
Accumulated Op Ex - Other	\$1,233,602	\$1,539,771	(\$306,169)	(20%)	\$911,909	\$321,693	35%
Operating Expenses	\$6,341,533	\$7,501,412	(\$1,159,879)	(15%)	\$5,015,930	\$1,325,603	26%

Per Capita Spending on Grounds (1 of 3)

Price Reference

Selected Ticket Prices	Non-Member				Member			
	2022	2021	2020	2019	2022	2021	2020	2019
Adult Ticket	\$14.95	\$14.95	\$14.95	\$12.95	-	-	-	-
Child Ticket	\$8.95	\$8.95	\$8.95	\$7.95	-	-	-	-
Giraffe Feeding	\$5.00	\$5.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
Stingray Bay Admission	\$4.00	\$4.00	\$2.00	\$2.00	-	-	-	-
Stingray Bay Feeding	\$2.00	\$2.00	\$2.00	\$1.00	\$2.00	\$2.00	\$2.00	\$1.00
Adult Zoorassic Park	\$6.00	\$6.00	\$5.00	\$4.00	\$5.00	\$5.00	\$5.00	\$4.00
Child Zoorassic Park	\$5.00	\$5.00	\$4.00	\$3.00	\$4.00	\$4.00	\$4.00	\$3.00

Note: Additional prices/discounts offered for seniors, groups, total experience ticketholders, etc. Free attendance includes babies, complimentary ticketholders, etc. Members can purchase Zoorassic Park season passes.

Per Capita Spending on Grounds (2 of 3)

Capture Rates & Average Revenue for Experiences

	April 2022	March 2022	February 2022	April 2021
Attendance	138,451	91,691	90,800	90,067
General Admission	80,545	51,641	52,362	58,983
Total Experience GA	27,230	17,533	18,470	14,659
Members	37,371	28,824	35,971	30,663
Programs & Events (P&E)	20,535	11,226	2,467	421
Giraffe Feeding				
Attendance	41,704	26,461	22,239	29,607
Total Experience	27,230	17,533	18,470	14,659
Revenue	\$138,341	\$99,154	\$87,570	\$140,167
Capture Rate	30%	29%	24%	33%
Capture Rate, ex. P&E	29%	27%	21%	28%
Average Revenue	\$3.32	\$3.75	\$3.94	\$4.73
Stingray Bay				
Attendance	42,016	28,865	21,752	29,980
Total Experience	27,230	17,533	18,470	14,659
Revenue	\$92,564	\$63,178	\$49,670	\$76,591
Capture Rate	30%	31%	24%	33%
Capture Rate, ex. P&E	36%	36%	25%	33%
Average Revenue	\$2.20	\$2.19	\$2.28	\$2.55
Zoorassic Park				
Attendance	49,062	34,055	32,506	51,593
Total Experience	27,230	17,533	18,470	14,659
Revenue	\$253,602	\$189,632	\$215,186	\$332,501
Capture Rate	35%	37%	36%	57%
Capture Rate, ex. P&E	42%	42%	37%	58%
Average Revenue	\$5.17	\$5.57	\$6.62	\$6.44

Per Capita Spending on Grounds (3 of 3)

	April 2022	March 2022	February 2022	April 2021
General Admission	80,545	51,641	52,362	58,983
Total Experience GA	27,230	17,533	18,470	14,659
	34%	34%	35%	25%
Members	37,371	28,824	35,971	30,663
Attendance ex P&E	117,916	80,465	88,333	89,646
Giraffe	41,704	26,461	22,239	29,607
Stingray	42,016	28,865	21,752	29,980
Zoorassic	49,062	34,055	32,506	51,593
P&E attendance	20,535	11,226	2,467	421
Total attendance	138,451	91,691	90,800	90,067
Admissions	\$860,180	\$586,505	\$553,108	\$856,755
Food	\$169,460	\$94,861	\$72,542	\$143,224
Gift Shop	\$97,078	\$69,784	\$51,058	\$101,564
Giraffe	\$138,341	\$99,154	\$87,570	\$140,167
Stingray	\$92,564	\$63,178	\$49,670	\$76,591
Zoorassic	\$253,602	\$189,632	\$215,186	\$332,501
Revenue sub-total	\$1,611,224	\$1,103,113	\$1,029,134	\$1,650,801
Admissions	\$7.29	\$7.29	\$6.26	\$9.56
Food	\$1.44	\$1.18	\$0.82	\$1.60
Gift	\$0.82	\$0.87	\$0.58	\$1.13
Giraffe	\$1.17	\$1.23	\$0.99	\$1.56
Stingray	\$0.78	\$0.79	\$0.56	\$0.85
Zoorassic	\$2.15	\$2.36	\$2.44	\$3.71
Per capita (GA & members)	\$13.66	\$13.71	\$11.65	\$18.41
Admissions	\$6.21	\$6.40	\$6.09	\$9.51
Food	\$1.22	\$1.03	\$0.80	\$1.59
Gift	\$0.70	\$0.76	\$0.56	\$1.13
Giraffe	\$1.00	\$1.08	\$0.96	\$1.56
Stingray	\$0.67	\$0.69	\$0.55	\$0.85
Zoorassic	\$1.83	\$2.07	\$2.37	\$3.69
Per capita (all attendance)	\$11.64	\$12.03	\$11.33	\$18.33

FCZC Balance Sheet – April 2022

	April 2022	April 2021
ASSETS		
Current Assets		
Cash	\$3,132,660	\$6,984,047
Short Term Investments-Retention	\$2,357,345	\$827,913
Accounts Receivable	\$6,530,810	\$7,352,826
Prepaid Expenses	\$297,862	\$168,304
Deferred Maintenance	\$1,561	\$1,561
Total Current Assets	\$12,320,238	\$15,334,649
Other Assets		
Long Term Investments	\$17,843,341	\$14,662,435
Buildings, Equipment, Vehicles, and Furniture (net)	\$3,851,950	\$3,960,466
Exhibits	\$57,293,227	\$58,130,525
Construction in Progress	\$44,831,576	\$22,969,883
Goodwill	\$76,910	\$88,447
Total Other Assets	\$123,897,005	\$99,811,755
TOTAL ASSETS	\$136,217,242	\$115,146,404
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts Payable and Accrued Liabilities	\$3,962,217	\$7,345,362
Deferred Revenue	\$1,396,048	\$1,262,630
Loan Account PPP	\$1,647,424	\$1,853,770
Retention Payable	\$2,421,352	\$1,217,442
Long-Term Liabilities	\$91,376	\$243,779
Total Liabilities	\$9,518,418	\$11,922,984
Net Assets		
Fund Balance-Without donor restriction	\$115,420,075	\$102,185,683
Fund Balance-With donor restriction	\$966,282	\$950,769
Fund Balance-Permanently Restricted	\$79,411	\$86,968
Fund Balance-Board Designated	\$10,233,057	\$0
Total Net Assets	\$126,698,824	\$103,223,420
TOTAL LIABILITIES AND NET ASSETS	\$136,217,242	\$115,146,404

FCZC Balance Sheet – May 2022

	May 2022	May 2021
ASSETS		
Current Assets		
Cash	\$4,081,522	\$7,453,186
Short Term Investments-Retention	\$2,419,481	\$985,556
Accounts Receivable	\$5,058,481	\$7,600,770
Prepaid Expenses	\$231,080	\$135,670
Deferred Maintenance	\$0	\$1,561
Total Current Assets	\$11,790,563	\$16,176,742
Other Assets		
Long Term Investments	\$17,742,266	\$14,700,705
Buildings, Equipment, Vehicles, and Furniture (net)	\$3,853,120	\$3,928,994
Exhibits	\$56,938,783	\$57,790,197
Construction in Progress	\$45,082,153	\$25,504,211
Goodwill	\$75,949	\$87,485
Total Other Assets	\$123,692,271	\$102,011,592
TOTAL ASSETS	\$135,482,834	\$118,188,334
LIABILITIES AND NET ASSETS		
Liabilities		
Accounts Payable and Accrued Liabilities	\$3,021,672	\$7,571,544
Deferred Revenue	\$1,431,940	\$1,224,494
Loan Account PPP	\$1,647,424	\$1,853,770
Retention Payable	\$2,422,834	\$1,375,092
Long-Term Liabilities	\$91,376	\$243,779
Total Liabilities	\$8,615,247	\$12,268,679
Net Assets		
Fund Balance-Without donor restriction	\$115,629,767	\$104,876,572
Fund Balance-With donor restriction	\$967,493	\$955,899
Fund Balance-Permanently Restricted	\$79,005	\$87,184
Fund Balance-Board Designated	\$10,191,322	\$0
Total Net Assets	\$126,867,587	\$105,919,655
TOTAL LIABILITIES AND NET ASSETS	\$135,482,834	\$118,188,334

DRAFT – subject to
final month-end
adjustments



AGENDA ITEM 8

DATE: June 29, 2022

TO: Fresno County Zoo Authority Board

FROM: Nora Crow, Chief Financial Officer
Fresno's Chaffee Zoo Corporation

SUBJECT: Measure Z Capital Funds Request for Kingdoms of Asia Mixed Species Exhibit

RECOMMENDED ACTION:

Approve Fresno Chaffee Zoo Corporation's request for Measure Z Capital funds totaling \$53,790 to complete the demolition phase of the Kingdoms of Asia Mixed Species Exhibit.

DISCUSSION:

ZooCorp is requesting the approval of additional funding of \$53,790.00 to complete the demolition phase of the project while the design phase is in its final stages. This will provide for a more contiguous transition from design into construction. The proposal includes fees for HD Matthews Demolition, Inc., to provide demolition services and a ten percent contingency.

The Kingdoms of Asia Project significantly expands the Zoo's exhibit infrastructure. The project includes:

- 1) A dedicated Asia section of the Zoo, including enhanced orangutan, tiger, sloth bear and Komodo dragon exhibits.
- 2) New space for educational programming that directly connects participants with Asian species, e.g., through an indoor viewing window.
- 3) Cultural elements, including an Asian-themed café.

The Zoo Authority Board has previously approved the following funding for the Kingdoms of Asia project:

- Design totaling \$4,101,931. This includes approvals between November 29, 2017 and November 28, 2018.
- Design for the Orangutan Exhibit enhancements totaling \$110,066 on April 26, 2017.
- Construction totaling \$38,365,323 on July 29, 2020.
- Design for the Mixed Species Exhibit totaling \$248,347, on July 28, 2021. (NOTE: When the design budget was approved, the project was called Greater One Horned Rhino.)

ATTACHMENTS:

Mixed Species Bid Results
Mixed Species Budget Overview



Mixed Species Demolition Project Bid Results
Overall Projected Cost

May 31, 2022

Fresno County Zoo Authority

RE: Mixed Species Demolition Project Bid Results and Overall Projected Cost

Bids for the Mixed Species project were received May 31, 2022, from two qualified demolition contractors. The results were as follows:

- HD Matthews Demolition and Excavation - \$48,900.00
- CENCAL Services, Inc. - \$65,000.00

After review of the bid results, the best value bidder, HD Matthews Demolition and Excavation has been selected for this project.

The project costs also include a ten percent (10%) construction contingency that is integral to completing the project.

The total request is \$53,790.00. An overall project cost sheet has been attached.

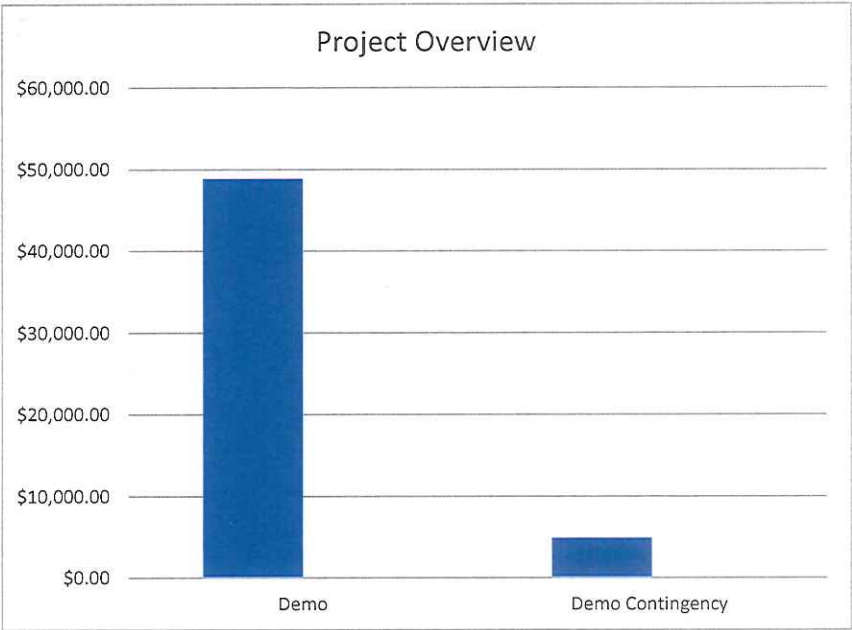
Please contact me if you have any questions.

Respectfully,

Jesse Santiago
Construction Project Manager
JSantiago@fresnochaffeezoo.org

Mixed Species Demolition - Project Overview

	Budget:	Expenses:	Balance:
Demo	\$48,900.00	\$0.00	\$48,900.00
Demo Contingency	\$4,890.00	\$0.00	\$4,890.00
Total:	\$53,790.00	\$0.00	\$53,790.00



PROPOSAL



PO BOX 12483 - FRESNO, CA 93778
OFFICE 559-275-DEMO (3366) FAX 559-275-5456

DATE: 5-31-22

JSantiago@fresnochaffeezoo.org:

SUBMITTED TO:

Fresno Chaffee Zoo

Jesse Santiago: 559/903-5920

JOB NAME/LOCATION:

Existing Rhino exhibit

OFF:

FAX:

ARCHITECT

CLR design

DATE OF PLANS

3-18-22

We hereby propose to furnish all material, labor, and equipment in accordance with the below specification:

Removal and disposal of the follow listed items: bid per sheet ST102

1. 20' cmu wall at truck loading area, saw cut break and remove 1300sf of concrete flatwork along pool edge, break and remove 80' of the top portion of the cmu wall along mortar joint. Removal and disposal of wood post's and trellis along view area, concrete cap, salvage boulders, steel shade structure, roof from tower structure, misc brush and debris within animal viewing area.	\$48,900.00
--	-------------

NOTE: All debris as a result of demolition will be dispose of leaving site rough graded and/or broom swept upon completion.

All Demolition work to be completed within (1) mobilization. This Proposal is based on Prevailing Wage.

Bid Proposal and Exclusions list are to be attached to the contract, as scope section.

Exclusions: Hazardous material handling of any kind, APCD permits, Air board notifications, Asbestos surveys, monitoring, or Haz Mat supervision.

Cutting and capping of any/all utilities including but not limited to electrical and gas.

Removal of Wells and dry Wells. Removal of underground tanks, (NOTE: Not responsible for damage to existing underground facilities not clearly marked).

Traffic control, access, safety barricades, swppp, erosion control, back fill or compaction, and/or testing. Shoring/bracing. All saw cutting layouts.

Totals: \$48,900.00

Payment to be made as follows:

PER BID DOCUMENT

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control.

Authorized Signature

Note: This proposal
may be withdrawn by
us if not accepted within Thirty (30) days

Acceptance of Proposal

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above

Signature _____ Date _____

Signature _____

Date _____

HD Matthews Demolition, Inc.



JRS
5/31/22



May 23, 2022

Fresno Chaffee Zoo
Attn. Mr. Jesse Santiago

RE. FCZ - Former Rhino Exhibit – Mixed Species Habitat

CENCAL Services, Inc. to provide All scopes as listed below as per job walk today onsite.

Tree Protection.

- Install barricades and protected fencing around all trees to remain.

Site Demolition.

- Provide crane & Boom lifts to demo green metal shade structure & related concrete footings.
- Provide saw cutting selective demolition of retaining wall as noted on detail sheet ST102
- Provide selective demolition of concrete slab above wall.
- Provide excavation of excess materials to new grade for new visitor's deck.
- Removal of wood pole wall and related footings. Provide backfill and compaction of void created during demo.
- Concrete saw & demo pool deck as shown.
- Selective demo of Thatched roof and framing of visitor's tower.
- Concrete saw & demo Concrete wall in back of house area.

Pricing.

Total this Quote. \$ 65,000.00

Exclusions: Traffic control, Haz testing, bonds, permits, temp. fencing, damage to unforeseen utilities, testing.

Thank you,

M. Gonzales

President/CEO
CENCAL Services, Inc.
Cell 559.994.2234



AGENDA ITEM 9

DATE: June 29, 2022

TO: Fresno County Zoo Authority Board

FROM: Nora Crow, Chief Financial Officer
Fresno's Chaffee Zoo Corporation

SUBJECT: Measure Z Capital Funds Request for Sea Lion Cove's Biotank Filtration Tower Walls and Chiller Addition

RECOMMENDED ACTION:

Approve Fresno Chaffee Zoo Corporation's request of Measure Z Capital funds totaling \$1,409,982.40 for the construction and replacement work on the Sea Lion Cove's biotank filtration tower walls and installation of the chiller addition.

DISCUSSION:

ZooCorp is requesting the approval of \$1,409,982.40 to move forward with the construction and replacement work on the biotank filtration tower walls. This funding request also encompasses the construction and installation of the chiller addition.

During an onsite inspection of Sea Lion Cove (SLC) in early Spring 2021 by the original contractors (Matt Construction) to evaluate corrosion issues identified in certain portions of SLC, it was determined that the biotank filtration tower walls were experiencing substantial corrosion issues that may compromise the longterm integrity of the structure. It was recommended by Matt Construction that the best course of action is to conduct a major demolition and replacement operation to large sections of the tower walls to restore its long-term service life.

As the mobilization and work of this project creates the optimal time to complete the necessary work for electrical components and chillers to provide sufficient chilling capacity for our pool, as described below.

SLC was originally completed without the chilling capacity necessary to keep the water temperatures within husbandry standards set forth by the Alliance of Marine Mammal Parks and Aquariums and USDA. In 2015, the Zoo invested in a swamp cooler mechanism to facilitate the cooling of the waters, but this has not proved sufficient to maintain the water temperatures at the ideal parameters for this species.

The Fresno Chaffee Zoo Corporation Board of Directors approved this request on June 16, 2022.

The Fresno County Zoo Authority previously approved requests for total funding of \$84,000 for the design phase and structural engineering of the trickling tower renovation and replacement superstructure along with the chiller addition at their meetings on September 29, 2021 and January 19, 2022.

ATTACHMENTS:

SLC Biotanks /Chiller Bid Results
SLC Biotanks/Chiller Budget Overview
SLC Biotanks/Chiller Other Projection Costs



Sea Lion Cove Chillers Project Bid Results
Overall Projected Cost

May 31, 2022

Fresno County Zoo Authority

RE: Sea Lion Cove Chillers Project Bid Results and Overall Projected Cost

Bids for the Sea Lion Cove Chillers project were received May 19, 2022, from two qualified contractors. The results were as follows:

- New England Sheet Metal and Mechanical Co. - \$889,000.00
- Strategic Mechanical, Inc. - \$890,000.00

After review of the bid results, the best value bidder, New England Sheet Metal and Mechanical Co. (NESM) has been selected for this project.

The project costs also include a ten percent (10%) construction contingency and other project costs that are integral to completing, stocking, and staffing the project.

The total request including construction, project costs and project management is \$1,409,982.40. An overall project cost sheet has been attached.

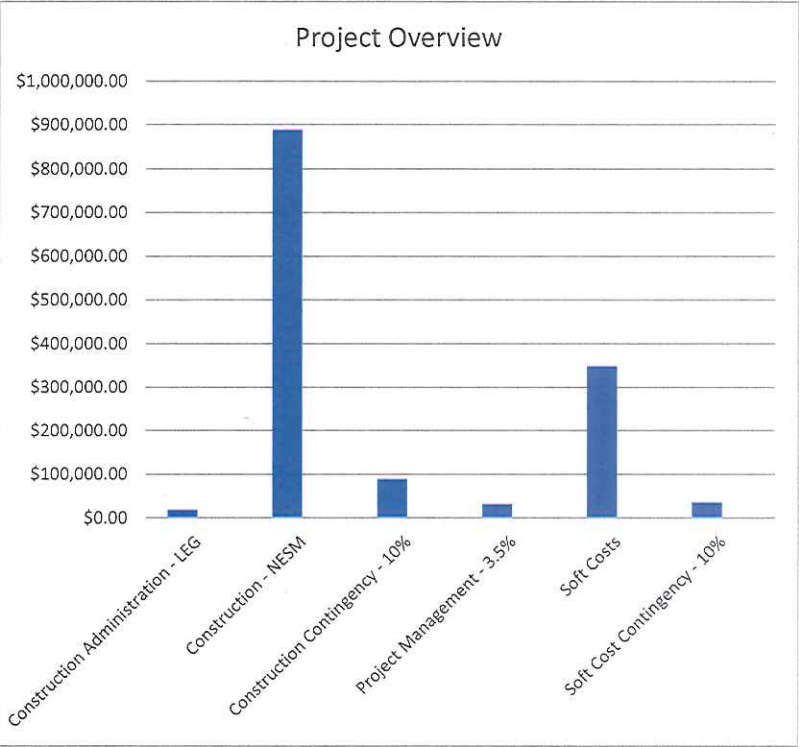
Please contact me if you have any questions.

Respectfully,

Jesse Santiago
Construction Project Manager
JSantiago@fresnochaffeezoo.org

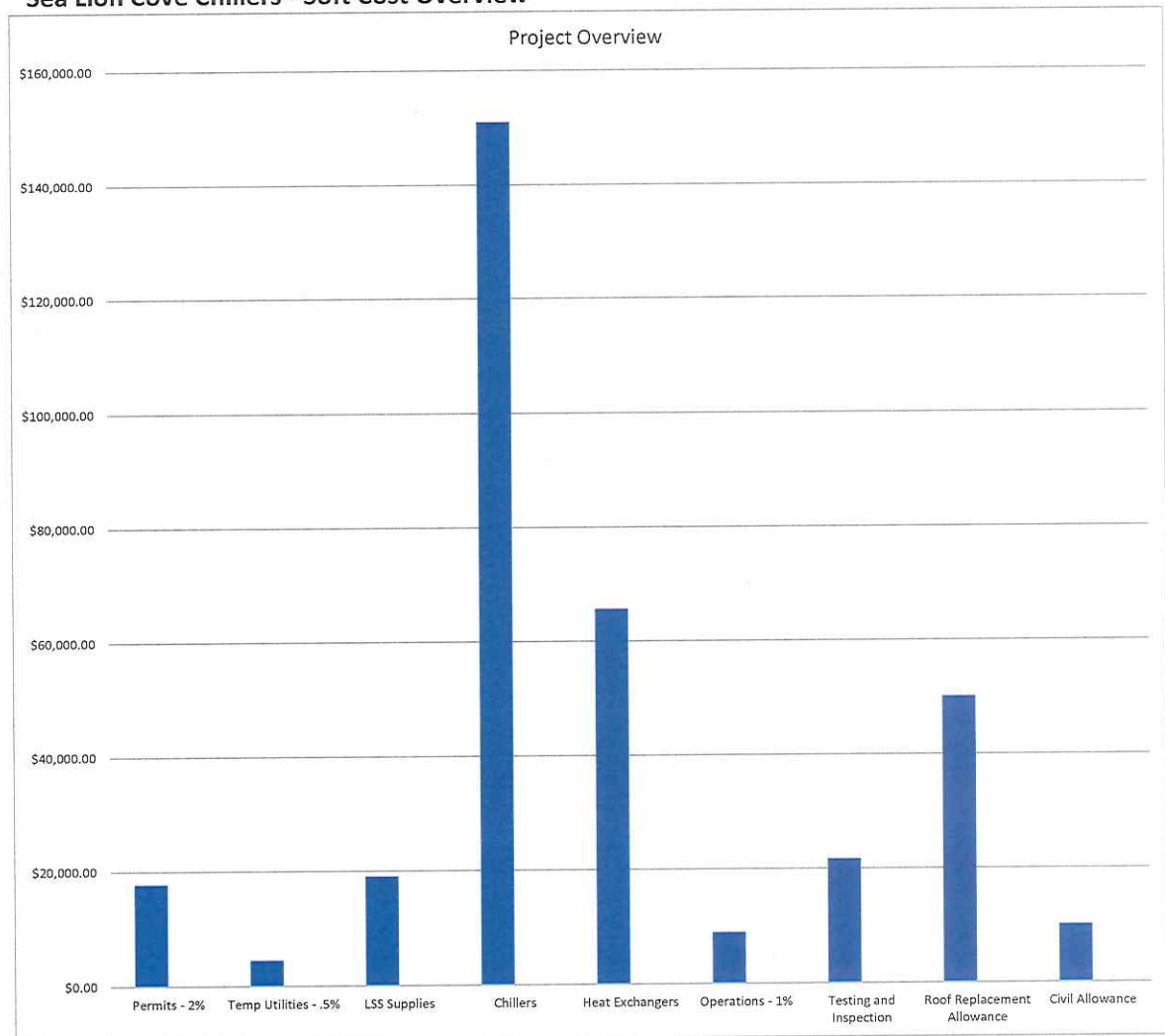
Sea Lion Cove Chillers Construction - Project Overview

	Budget:	Expenses:	Balance:
Construction Administration - LEG	\$17,800.00	\$0.00	\$17,800.00
Construction - NESM	\$889,000.00		\$889,000.00
Construction Contingency - 10%	\$88,900.00	\$0.00	\$88,900.00
Project Management - 3.5%	\$31,115.00	\$0.00	\$31,115.00
Soft Costs	\$348,334.00	\$0.00	\$348,334.00
Soft Cost Contingency - 10%	\$34,833.40	\$0.00	\$34,833.40
	\$1,409,982.40	\$0.00	\$1,409,982.40



	Budget:	Expenses:	Balance:
Permits - 2%	\$17,780.00	\$0.00	\$17,780.00
Temp Utilities - .5%	\$4,445.00	\$0.00	\$4,445.00
LSS Supplies	\$19,000.00	\$0.00	\$19,000.00
Chillers	\$150,975.00	\$0.00	\$150,975.00
Heat Exchangers	\$65,608.00	\$0.00	\$65,608.00
Operations - 1%	\$8,890.00	\$0.00	\$8,890.00
Testing and Inspection	\$21,636.00	\$0.00	\$21,636.00
Roof Replacement Allowance	\$50,000.00	\$0.00	\$50,000.00
Civil Allowance	\$10,000.00	\$0.00	\$10,000.00
Total:	\$348,334.00	\$0.00	\$348,334.00

Sea Lion Cove Chillers - Soft Cost Overview





August 24, 2021, *Revised*

Renee Tindall
Curator of Life Support and Commissary
894 W Belmont ave.
Fresno CA 93728

Subject: Fresno Chaffee Zoo
Sea Lion Cove Chiller Addition
Mechanical and Associated Plumbing, Electrical, LSS, and Civil Design Services

Dear Ms. Tindall,

The project consists of adding an air cooled chiller (with 100% redundant second air cooled chiller) with associated pumps, heat exchangers and connection to existing piping. In addition, LEG shall coordinate LSS and Structural plans for the Trickling Tower renovation and Replacement of Superstructure. (Structural to contract directly with FCZ).

We propose to provide normal Mechanical, Plumbing, Electrical, Civil, and LSS engineering required (Structural to contract directly with the FCZ as per Structural Engineer) including design, CAD produced design plans (2D), specifications prepared for plan check and bidding, plan check response, and construction administration, including site visits. This also includes management of the project through the City of Fresno plan check submission and closeout process as the Prime consultant.

For this work, we ask for the following fees:

Part 1: Chiller Addition with associates infrastructure improvements and new mechanical yard

Design thru Plan Check Approval:	\$64,000
Bidding and Construction Administration:	\$17,000

Part 2: Trickling Tower Renovation and Replacement of Superstructure


(These fees are in addition to the Part 1 fees above and are a pass thru from LSS.)

Design thru Plan Check Approval:	\$1,500
Bidding and Construction Administration:	\$800

Thank you for asking us to prepare this proposal. If you have any questions or need additional information, please feel free to contact me.

Sincerely,

LAWRENCE ENGINEERING GROUP


Ryan W. Carlson, P.E.
Principal



May 27, 2022

New England Sheet Metal and Mechanical Co.
Joshua R. Wilkinson
525 W. Alluvial Ave.
Fresno, CA 93711

RE: Notice of Intent for the Sea Lion Cove Chiller Addition at Fresno Chaffee Zoo

Dear Mr. Wilkinson:

The Fresno Chaffee Zoo Corporation proposes to accept from New England Sheet Metal and Mechanical Co. the bid submitted in the amount of \$889,000.00 to construct the Sea Lion Cove Chiller Addition. The purpose of this Letter of Intent is to set forth the intention of the parties to execute a Construction Agreement acceptable to both parties after approval from the Fresno Chaffee Zoo Corporation Board on June 16, 2022.

Please contact me if you have any questions.

Respectfully,

A handwritten signature in blue ink, appearing to read "J. Santiago".

Jesse Santiago
Construction Project Manager
JSantiago@fresnochaffeezoo.org

New England Sheet Metal and Mechanical Co.	525 W. Alluvial Ave.
Name of Company	Address

Fresno	CA	93711
City	State	Zip

Joshua R. Wilkinson

Print Name

Fax Number

(559) 441-1900

Phone Number

Vice President
Title

jwilkinson@nesm.com
Email Address

DOCUMENT 00300

BID FORM

NAME OF BIDDER: New England Sheet Metal and Mechanical Co.

The undersigned, hereby declare that we have carefully examined the location of the proposed Work, and have read and examined the Contract Documents, including all plans, specifications, and all addenda, if any, for the following Project:

Sea Lion Cove Chiller Addition

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project in a good and workmanlike manner within the time stipulated for the following TOTAL BID PRICE:

889,000

BASE BID	BID PRICE (IN WRITTEN FORM)	BID PRICE (IN NUMBERS)
TOTAL BID PRICE	eight hundred eighty-nine thousand dollars.	889,000

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

If the Contract Documents specify alternate bid items, the following Alternate Bid amounts shall be added to or deducted from the Total Bid Price entered above (please check the appropriate box), at the Owner's sole option. The Owner can choose to include one or more of the Alternate Bids in the Project. If any of the Alternate Bids are selected by the Owner, the resulting amount shall be added to or deducted from Total Bid Price for the Project. The Owner may select one or more of the Alternate Bids at the below stated Bid Price up to sixty (60) days following award of the Contract. The Owner can award/select Alternate Bid items at any time(s).

ALTERNATE BIDS	BID PRICE (IN WRITTEN FORM)	BID PRICE (IN NUMBERS)
ALTERNATE #1 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	
ALTERNATE #2 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	
ALTERNATE #3 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	
ALTERNATE #4 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	
ALTERNATE #5 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	
ALTERNATE #6 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	

The undersigned agrees that this Bid Form constitutes a firm offer to the Owner which cannot be withdrawn for the number of calendar days indicated in the Notice Inviting Bids from and after the bid opening, or until a Contract for the Work is fully executed by the Owner and a third party, whichever is earlier.

The Contract duration shall commence on the date stated in the Owner's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents. In no case shall the Contractor commence construction prior to the date stated in the Owner's Notice to Proceed.

Bidder certifies that it is licensed in accordance with the law providing for the registration of Contractors, License No. 433674, Expiration Date 12/31/23, class of license A,C,C-4,c20,C36. If the bidder is a joint venture, each member of the joint venture must include C38, C43 the above information.

Notice of acceptance or requests for additional information provided by the Owner should be addressed to the undersigned at the address stated below:

New England Sheet Metal and Mechanical Co.

Attn: Mr. Joshua Wilkinson, Vice President

525 W. Alluvial Ave.

Fresno, CA 93711

The names of all persons interested in the foregoing proposal as principals are as follows:

New England Sheet Metal and Mechanical Co., a California corporation

John D. Sloan, President, CEO / Treasurer / Manager

Joshua R. Wilkinson, Vice President / Secretary

(IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual copartners comprising the firm; if bidder or other interested person is an individual, state first and last names in full.)

The undersigned acknowledges receipt, understanding and full consideration of the following addenda to the Contract Documents.

Addenda No. W2X (5/13/22 - Mech & Electrical Drawings)
Addenda No. JW3 (5/10/22 - Structural & Civil Drawings)
Addenda No. 1 (4/20/22 - Civil Spec)

1. Attached is the completed Prime Point of Contact Form
2. Attached is the completed Contractor's Certificate Regarding Workers' Compensation form.
3. Attached is the required bid security in the amount of not less than 10% of the Total Bid Price.
4. Attached is the completed Designation of Subcontractors form.
5. Attached is the completed Project Listings
6. Attached is the completed Asbestos-Free Materials Certification form, if required.
7. Attached is the completed Recycled Content Certification form.
8. Attached is the completed Contractor and Subcontractor Fingerprint Certification forms, if required.
9. Attached is the completed Drug-Free Workplace Certification form.
10. Attached is the completed Alcoholic Beverage and Tobacco Free Workplace Policy form.
11. Attached is the completed Public Works Contractor Registration Certification form.

12. Attached is the fully executed Non-Collusion Declaration form.

Pursuant to Section 7103.5 of the Public Contract Code submitting a bid to the Owner, the bidder offers and agrees that if the bid is accepted, it will assign to Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

I hereby certify under penalty of perjury under the laws of the State of California, that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder New England Sheet Metal and Mechanical Co.

Signature



Name and Title Joshua R. Wilkinson, Vice President

Dated May 19, 2022

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signatures of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his or her signature shall be placed above.

Business Address: 525 W. Alluvial Ave., Fresno, CA 93711

Place of Residence: 525 W. Alluvial Ave., Fresno, CA 93711

Telephone: (559) 441-1900

DOCUMENT 00400
CONTRACTOR'S CERTIFICATE REGARDING
WORKERS' COMPENSATION

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

Name of Bidder New England Sheet Metal and Mechanical Co.

Signature 

Name Joshua R. Wilkinson

Title Vice President

Dated May 19, 2022

DOCUMENT 00410

BID BOND

KNOW ALL MEN BY THESE PRESENTS: THAT we, _____,
New England Sheet Metal and Mechanical Co., as Principal, and _____
Liberty Mutual Insurance Company, as Surety, are held and firmly bound
unto the Chaffee Zoo, hereinafter called the Owner, in the penal sum of Ten percent of bid amount
_____ PERCENT (10 %) OF THE TOTAL AMOUNT OF THE BID of the
Principal submitted to the said OWNER for the work described below for the payment of
which sum in lawful money of the United States, well and truly to be made, we bind
ourselves, our heirs, executors, administrators, successors and assigns, jointly and
severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has
submitted the accompanying bid dated May 19 2022 for Sea Lion Cove
Chiller Addition.

NOW, THEREFORE. The Principal shall not withdraw said bid within the period
specified therein after the opening of the same, or, if no period be specified, within sixty
(60) days after said opening; and, if the Principal be awarded the contract, and shall
within the period specified therefor, or if no period be specified, within ten (10)
consecutive calendar days after the Award of Contract (which date shall be the day
following the governing board approval of the award) complete the prescribed forms are
presented to him for signature enter into a written contract with the Owner in
accordance with the bid as accepted and give bond with good and sufficient surety or
sureties, as may be required, for the faithful performance and proper fulfillment of such
contract and for the payment for labor and materials used for the performance of the
contract, or in the event of the withdrawal of said bid within the period specified or the
failure to enter into such contract and give such bonds within the time specified. If the
Principal shall pay the Owner the difference between the amount specified in said bid
and the amount for which the Owner may procure the required work and/or supplies, if
the latter amount be in excess of the former, together with all costs incurred by the
Owner in again calling for bids, then the above obligation shall be void and of no effect,
otherwise to remain In full force and virtue.

Surety, for value received, hereby stipulates and agrees that no change, extension of
time, alteration or addition to the terms of the contract on the call for bids, or to the work
to be performed thereunder, or the specifications accompanying the same, shall in
anywise affect its obligation under this bond, and It does hereby waive notice of any
such change, extension of time, alteration or addition to the terms of said contract or the
call for bids, or to the work, or to the specifications.

SAMPLE: BID BOND

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this 13 day of May, 2022, the name and corporate seal of each corporate party being hereto affixed and these presents duly assigned by its undersigned representative, pursuant to authority of its governing body.

(Corporate Seal)

New England Sheet Metal and Mechanical Co.

Principal

By

Title

Joshua R. Wilkinson
Joshua R. Wilkinson, Vice President

(Corporate Seal)

Liberty Mutual Insurance Company

Surety

By

Bonnie Gonzalez
Attorney-in-Fact
Bonnie Gonzalez, Attorney in Fact

(Attach Attorney-in-Fact Certificate)

SAMPLE: BID BOND

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

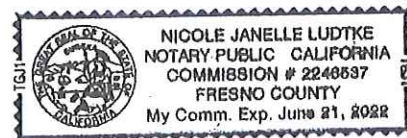
State of California
County of Fresno

On May 19, 2022 before me, Nicole Janelle Ludtke, Notary Public
(insert name and title of the officer)

personally appeared Joshua R. Wilkinson,
who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is/~~are~~
subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in
his/~~her/their~~ authorized capacity~~(ies)~~, and that by his/~~her/their~~ signature~~(s)~~ on the instrument the
person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature Nicole Janelle Ludtke (Seal)
Nicole Janelle Ludtke, Notary Public

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

Civil Code § 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
) ss
County of Fresno)

On May 13, 2022, before me, Kimberly Wilson, Notary Public, personally appeared Bonnie Gonzalez, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



(Seal)

Signature: _____

Kimberly Wilson
Kimberly Wilson, Notary Public



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: 8207509-984971

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana, herein collectively called the "Companies", pursuant to and by authority herein set forth, does hereby name, constitute and appoint, _____

all of the city of Fresno state of CA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 17th day of March, 2022.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By:

David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss
County of MONTGOMERY

On this 17th day of March, 2022 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1126044
Member, Pennsylvania Association of Notaries

By:
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 13 day of May, 2022



By:
Renee C. Llewellyn, Assistant Secretary

DOCUMENT 00420

DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act of the Public Contract Code of the State of California, each bidder shall set forth below: (a) the name and the location of the place of business, (b) the California contractor license number, (c) DIR registration number, and (d) the portion of the work which will be done by each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work in an amount in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price. If requested by the Owner, Bidders are required to submit the phone number, license expiration date and any other requested information for each subcontractor listed in its bid with in twenty-four (24) hours of bid opening. No time extension will be allowed for submission of information required by this document.

If no subcontractor is specified, for a portion of the work, or if more than one subcontractor is specified for the same portion of Work, to be performed under the Contract in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price, then the Contractor shall be deemed to have agreed that it is fully qualified to perform that Work, and that it shall perform that portion itself.

Note: If alternate bids are called for and Contractor intends to use different or additional subcontractors on the alternates, a separate list of subcontractors must be provided for each such alternate. Identify any such additional subcontractors by alternate bid number.

Company Name: <u>Performance Contracting (PCI)</u>		
Address: <u>3030 Orange Grove</u>	Type of work: <u>Insulation</u>	
Phone: <u>N. Highlands, Ca 95660</u> <u>916-485-4891</u>	CSLB No.: <u>474795</u>	Exp. <u>6/30/23</u>
Fax: <u>916-974-7077</u>	DIR No.: <u>1000004922</u>	Exp. <u>6/30/22</u>
Company Name: <u>GenCal Services, Inc.</u>		
Address: <u>3299 S. Cedar Ave.</u> <u>Fresno, Ca 93725</u>	Type of work: <u>Demo, earthwork & concrete</u>	
Phone: <u>559-291-3360</u>	CSLB No.: <u>976935</u>	Exp. <u>2/28/23</u>
Fax: <u>559-291-3369</u>	DIR No.: <u>1000002906</u>	Exp. <u>6/30/22</u>

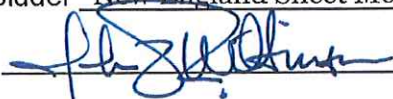
DESIGNATION OF SUBCONTRACTORS

Company Name: Bedard Controls, Inc		
Address: 1521 Tollhouse Rd, Ste. D CLAMS, Ca 93611		Type of work: Controls
Phone: 559-271-8990	CSLB No.: 735986	Exp. 5/31/23
Fax: 559-271-2661	DIR No.: 1000005950	Exp. 6/30/22
Company Name: Valley Fence Co.		
Address: 3505 Lind Ave. CLAMS, Ca 93612		Type of work: Fence
Phone: 559-294-0451	CSLB No.: 237348	Exp. 12/31/22
Fax: 559-294-0455	DIR No.: 1000000118	Exp. 6/30/22
Company Name: Industrial Electrical Company		
Address: 2510 N. Sunnyside Fresno, Ca 93727		Type of work: Electrical
Phone: 559-292-4714	CSLB No.: 135470	Exp. 2/28/23
Fax: 559-292-5939	DIR No.: 1000008134	Exp. 6/30/25
Company Name: RO's Precise Painting		
Address: 1816 Industrial Way Sanger Ca, 93657		Type of work: Painting
Phone: 559-875-6861	CSLB No.: 757058	Exp. 12/31/23
Fax: 559-875-4749	DIR No.: 1000000284	Exp. 6/30/24
Company Name:		
Address:		Type of work:
Phone:	CSLB No.:	Exp.
Fax:	DIR No.:	Exp.

DESIGNATION OF SUBCONTRACTORS

Company Name:		
Address:	Type of work:	
Phone:	CSLB No.:	Exp.
Fax:	DIR No.:	Exp.
Company Name:		
Address:	Type of work:	
Phone:	CSLB No.:	Exp.
Fax:	DIR No.:	Exp.
Company Name:		
Address:	Type of work:	
Phone:	CSLB No.:	Exp.
Fax:	DIR No.:	Exp.

Name of Bidder New England Sheet Metal and Mechanical Co.

Signature 

Name and Title Joshua R. Wilkinson, Vice President

Dated May 19, 2022

DESIGNATION OF SUBCONTRACTORS

**DOCUMENT 00440
PROJECT LISTINGS**

A. LIST OF CURRENT PROJECTS

[**Duplicate Page if needed for listing additional current projects.**]

Project/Client: Applied Technology Phase 1	Contact Person: Nick Seals (Seals Construction, Inc.)
Email: nick.seals@sealsconstruction.com	Phone: (559) 651-4040
Scope of work: Mechanical/Plumbing	
Value of Contract: \$8,790,450.00	Projected Completion Date: 8/30/2023

Project/Client: FCC, First Responders	Contact Person: Richard Jacobs (Bush Construction, Inc.)
Email: richard@bushconstruction.net	Phone: (559) 584-1575
Scope of work: HVAC/ ASM	
Value of Contract: \$1,434,700.00	Projected Completion Date: 1/1/2023

Project/Client: Hoover HS Gym, Locker, Music RM HVAC Upgrades	Contact Person: Danny Anderson (Fresno Unified School District)
Email: william.anderson@fresnounified.org	Phone: (559) 457-3064
Scope of work: Mechanical/Plumbing	
Value of Contract: \$2,299,000.00	Projected Completion Date: 8/8/2022

Project/Client: Radiology Department Remodel	Contact Person: Mark Foote (Madera Community Hospital)
Email: mfoote@maderahospital.com	Phone: (559) 675-5555
Scope of work: Mechanical/Plumbing	
Value of Contract: \$2,581,700.00	Projected Completion Date:

B. LIST OF COMPLETED PROJECTS - LAST THREE YEARS

[**Duplicate Page if needed for listing additional completed projects.**]

Please include only those projects which are similar enough to demonstrate Bidder's ability to perform the required Work.

Project/Client: MCH, AHU#2 Replacment	Contact Person: Nick Nolan (Madera Community Hospital)
Email: nnolan@maderahospital.org	Phone: (559) 675-5521
Scope of work: Mechanical/Sheet Metal/Piping	
Value of Contract: \$2,828,491.00	Completion Date: 11/20/2020

Project/Client: CA Health Sciences University- Osteopathic Medicine	Contact Person: Rich Rathbone (Zumwalt Construction, Inc.)
Email: rrathbone@zumwaltconst.com	Phone: (559) 252-1000
Scope of work: HVAC/Engineering-Design	
Value of Contract: \$3,223,763.00	Completion Date: 3/1/2020

Project/Client: Fresno County DSS Building 1	Contact Person: Gabe Escalera (Quiring General, LLC)
Email: gescalera@quiring.com	Phone: (559) 432-2800
Scope of work: HVAC/Plumbing	
Value of Contract: \$7,408,000.00	Completion Date: 5/30/2020

Project/Client: CCMC, Phase C	Contact Person: Jesse Doty (Clark Construction, Inc.)
Email: jesse.doty@clarkconstruction.com	Phone: (805) 652-5802
Scope of work: HVAC/Plumbing/Med Gas/Design	
Value of Contract: \$66,675,000.00	Completion Date: 2/25/22

PROJECT LISTINGS

DOCUMENT 00450

ASBESTOS-FREE MATERIALS CERTIFICATION

The undersigned declares that he or she is the person who executed the bid for the Sea Lion Cove Chiller Addition (hereinafter referred to as the "Project"), and submitted it to the Chaffee Zoo (hereinafter referred to as the "Owner") on behalf of New England Sheet Metal and Mechanical Co. (hereinafter referred to as the "Contractor").

To the best of my knowledge, information and belief, in completing the Contractor's Work for the Project, no material furnished, installed or incorporated into the Project will contain, or in itself be composed of, any materials listed by the federal or state EPA or federal or state health agencies as a hazardous material.

Any disputes involving the question of whether or not material installed with asbestos-containing equipment is settled by electron microscopy; the cost of any such tests shall be paid by the Contractor.

All work or materials installed by the Contractor which is found to contain asbestos, or work or material installed with asbestos-containing equipment, will be immediately rejected and this work shall be removed and replaced by the Contractor at no additional cost to the Owner.

Decontamination and removal of work found to contain asbestos or work installed with asbestos-containing equipment shall be done only under supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency.

The ASBESTOS REMOVAL CONTRACTOR shall be an EPA accredited contractor qualified in the removal of asbestos and shall be chosen and approved by the Asbestos Consultant who shall have sole discretion and final determination in this matter.

The asbestos consultant shall be chosen and approved by the Construction Manager/Architect or the Owner who shall have sole discretion and final determination in this matter.

The work will be not accepted until asbestos contamination is reduced to levels deemed acceptable by the Asbestos Consultant.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

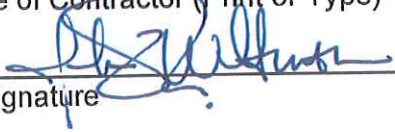
ASBESTOS-FREE MATERIALS CERTIFICATION

Executed on this 19th day of May, 2022 at
Fresno, California

Name of Contractor (Print or Type)

By

Signature



Joshua R. Wilkinson, Vice President

Print Name

ASBESTOS-FREE MATERIALS CERTIFICATION

DOCUMENT 00460

RECYCLED CONTENT CERTIFICATION

The undersigned declares that he or she is the person who executed the bid for the Sea Lion Cove Chiller Addition (hereinafter referred to as the "Project"), and submitted it to the Chaffee Zoo (hereinafter referred to as the "Owner") on behalf of New England Sheet Metal and Mechanical Co. hereinafter referred to as the "Contractor").

Pursuant to Public Contract Code Sections 12205 and 22152, all contractors are required to certify in writing under penalty of perjury the minimum (if not exact) percentage of recycled content in materials, goods, or supplies offered or products used in the performance of their contract, regardless of whether the product meets the required recycled product percentage as defined in Public Contract Code Section 12209. The recycled content shall include both post-consumer material and secondary material as defined in Public Contract Code Section 12200 shall apply.

I declare under penalty of perjury under the laws of the State of California that the following percentages of Post-consumer Material and Secondary Material is in the materials, goods or supplies offered for, or products used in, the performance of the Contract for the Project:

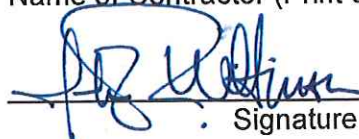
0 (zero) % Post consumer Material 0 (zero) % Secondary Material.

Executed on this 19th day of May, 20²² at Fresno, CA

New England Sheet Metal and Mechanical Co.

Name of Contractor (Print or Type)

By


Signature

Joshua R. Wilkinson

Print Name

Vice President

Title

RECYCLED CONTENT CERTIFICATION

DOCUMENT 00480

DRUG-FREE WORKPLACE CERTIFICATION

This Drug-Free Workplace Certification form is part of the Contract made by and between the Chaffee Zoo (hereinafter referred to as the "Owner") and New England Sheet Metal and Mechanical Co.

_____ (hereinafter referred to as the "Contractor") for the Sea Lion Cove Chiller Addition Project (hereinafter referred to as the "Project"). This form is required from all successful bidders pursuant to the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for procurement of any property or service from any State agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a State agency may be subject to suspension of payments or termination, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

Pursuant to Government Code Section 8355, every person or organization awarded a contract or grant from a State agency shall certify that it will provide a drug-free workplace by doing all of the following:

A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in their workplace and specifying actions which will be taken against employees for violations of the prohibition;

B. Establishing a drug-free awareness program to inform employees about all of the following:

1. The dangers of drug abuse in the workplace;
2. The person's or organization's policy of maintaining a drug-free workplace;
3. The availability of drug counseling, rehabilitation and employee-assistance programs; and
4. The penalties that may be imposed upon employees for drug abuse violations.

C. Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by subdivision "A," and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

DRUG-FREE WORKPLACE CERTIFICATION

I, the undersigned, agree to fulfill the terms and requirements of the Drug-Free Workplace Act as it now exists or may hereinafter be amended. Particularly, I shall abide by Government Code Section 8355 when performing the Contract for the Project by:

- A. Publishing a statement notifying employees concerning the prohibition of controlled substance at my workplace;
- B. Establishing a drug-free awareness program; and
- C. Requiring that each employee engaged in the performance of the contract be given a copy of the statement required by Section 8355(a) and agree to abide by the terms of that statement.

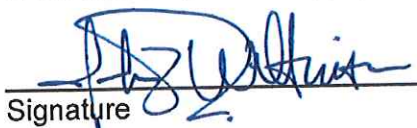
I also understand that if the Owner determines that I have either: (a) made a false certification herein; or (b) violated this certification by failing to carry out the requirements of Section 8355, the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that if I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the Act.

I acknowledge that I am aware of the provisions of Government Code Section 8350 et seq., and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Executed on this 19th day of May, 20 22
at Fresno, CA

New England Sheet Metal and Mechanical Co.
Name of Contractor (Print or Type)

By


Signature

Joshua R. Wilkinson
Print Name

Vice President
Title

DRUG-FREE WORKPLACE CERTIFICATION

DOCUMENT 00482

CONTRACTOR'S CERTIFICATE REGARDING ALCOHOLIC BEVERAGE and
TOBACCO-FREE POLICY

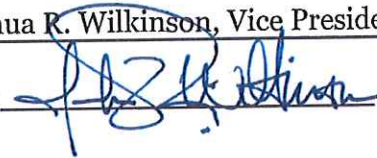
The Contractor agrees that it will abide by and implement the Owner's Alcoholic Beverage and Tobacco-Free Policy, which prohibits the use of alcoholic beverages and tobacco products, at any time, on Owner-owned or leased buildings, on Owner property and in Owner vehicles. The Contractor shall procure signs stating "ALCOHOLIC BEVERAGE AND TOBACCO USE IS PROHIBITED" and shall ensure that these signs are prominently displayed in all entrances to Owner property at all times.

DATE: May 19, 2022

New England Sheet Metal and Mechanical Co.
CONTRACTOR

By: Joshua R. Wilkinson, Vice President

Signature

A handwritten signature in blue ink, appearing to read "Joshua R. Wilkinson", is written over a horizontal line.

DOCUMENT 00485

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

If this bid is due on or after March 1, 2015, then pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See <http://www.dir.ca.gov/PublicWorks/PublicWorks.html> for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder: New England Sheet Metal and Mechanical Co.

DIR Registration Number: 1000001449

Bidder further acknowledges:

- (1) Bidder shall maintain a current DIR registration for the duration of the project.
- (2) Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.
- (3) Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Name of Bidder New England Sheet Metal and Mechanical Co.

Signature 

Name and Title Joshua R. Wilkinson, Vice President

Dated May 19, 2022

DOCUMENT 00490

NON-COLLUSION DECLARATION

The undersigned declares:

I am the Vice President (Title) of New England Sheet Metal and Mechanical Co. (Firm), the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on May 19, 2022 (Date), at Fresno (City), California (State).

By: 

Printed Name: Joshua R. Wilkinson, Vice President

Date: May 19, 2022

NON-COLLUSION DECLARATION

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Fresno)

On May 19, 2022 before me, Nicole Janelle Ludtke, Notary Public
(insert name and title of the officer)

personally appeared Joshua R. Wilkinson,
who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ is/~~are~~
subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in
his/~~her/their~~ authorized capacity~~(ies)~~, and that by his/~~her/their~~ signature~~(s)~~ on the instrument the
person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Nicole Janelle Ludtke

(Seal)

Nicole Janelle Ludtke, Notary Public



DOCUMENT 00200
PRIME POINT OF CONTACT

Each proponent's proposal must contain a statement indicating the name of their prime point of contact for the resolution of difficulties with the vendor's proposed offerings.

Strategic Mechanical Inc
Name of Company


Signature
Code

4661 E Commerce Ave
Address

Fresno CA 93725
City State Zip

Chad Petty (559) 291-1805
Print Name
Fax Number

(559) 291-1952
Phone Number

Corporate Secretary
Title

cpetty@strategicmech.com
Email Address

DOCUMENT 00200
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Fax Number

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Phone Number

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Title

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Email Address

DOCUMENT 00300

BID FORM

NAME OF BIDDER: Strategic Mechanical Inc

The undersigned, hereby declare that we have carefully examined the location of the proposed Work, and have read and examined the Contract Documents, including all plans, specifications, and all addenda, if any, for the following Project:

FCZ Sea Lion Cove Chiller Addition

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project in a good and workmanlike manner within the time stipulated for the following TOTAL BID PRICE:

BASE BID	BID PRICE (IN WRITTEN FORM)	BID PRICE (IN NUMBERS)
TOTAL BID PRICE	Eight hundred and ninety thousand	890,000 ⁰⁰ /100

In case of discrepancy between the written price and the numerical price, the written price shall prevail.

If the Contract Documents specify alternate bid items, the following Alternate Bid amounts shall be added to or deducted from the Total Bid Price entered above (please check the appropriate box), at the Owner's sole option. The Owner can choose to include one or more of the Alternate Bids in the Project. If any of the Alternate Bids are selected by the Owner, the resulting amount shall be added to or deducted from Total Bid Price for the Project. The Owner may select one or more of the Alternate Bids at the below stated Bid Price up to sixty (60) days following award of the Contract. The Owner can award/select Alternate Bid items at any time(s).

ALTERNATE BIDS	BID PRICE (IN WRITTEN FORM)	BID PRICE (IN NUMBERS)
ALTERNATE #1 <input type="checkbox"/> Add <input type="checkbox"/> Deduct	N/A	
ALTERNATE #2 <input type="checkbox"/> Add <input type="checkbox"/> Deduct		
ALTERNATE #3 <input type="checkbox"/> Add <input type="checkbox"/> Deduct		
ALTERNATE #4 <input type="checkbox"/> Add <input type="checkbox"/> Deduct		
ALTERNATE #5 <input type="checkbox"/> Add <input type="checkbox"/> Deduct		
ALTERNATE #6 <input type="checkbox"/> Add <input type="checkbox"/> Deduct		

The undersigned agrees that this Bid Form constitutes a firm offer to the Owner which cannot be withdrawn for the number of calendar days indicated in the Notice Inviting Bids from and after the bid opening, or until a Contract for the Work is fully executed by the Owner and a third party, whichever is earlier.

The Contract duration shall commence on the date stated in the Owner's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents. In no case shall the Contractor commence construction prior to the date stated in the Owner's Notice to Proceed.

Bidder certifies that it is licensed in accordance with the law providing for the registration of Contractors, License No. 834679, Expiration Date 3/31/24, class of license B, C2, C4, C10, C15, C20, C23, C35, C38, C42, C43, HAZ. If the bidder is a joint venture, each member of the joint venture must include the above information.

Notice of acceptance or requests for additional information provided by the Owner should be addressed to the undersigned at the address stated below:

Chad Petty estimating@strategicmech.com

The names of all persons interested in the foregoing proposal as principals are as follows:

Lonnie F Petty, President; Chad Petty, Secretary; Ken McNeal, Treasurer

(IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual copartners comprising the firm; if bidder or other interested person is an individual, state first and last names in full.)

The undersigned acknowledges receipt, understanding and full consideration of the following addenda to the Contract Documents.

Addenda No. 1

Addenda No. _____

Addenda No. _____

1. Attached is the completed Prime Point of Contact Form
2. Attached is the completed Contractor's Certificate Regarding Workers' Compensation form.
3. Attached is the required bid security in the amount of not less than 10% of the Total Bid Price.
4. Attached is the completed Designation of Subcontractors form.
5. Attached is the completed Project Listings
6. Attached is the completed Asbestos-Free Materials Certification form, if required.
7. Attached is the completed Recycled Content Certification form.
8. Attached is the completed Contractor and Subcontractor Fingerprint Certification forms, if required.
9. Attached is the completed Drug-Free Workplace Certification form.
10. Attached is the completed Alcoholic Beverage and Tobacco Free Workplace Policy form.
11. Attached is the completed Public Works Contractor Registration Certification form.

12. Attached is the fully executed Non-Collusion Declaration form.

Pursuant to Section 7103.5 of the Public Contract Code submitting a bid to the Owner, the bidder offers and agrees that if the bid is accepted, it will assign to Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

I hereby certify under penalty of perjury under the laws of the State of California, that all of the information submitted in connection with this Bid and all of the representations made herein are true and correct.

Name of Bidder Strategic Mechanical Inc

Signature 

Name and Title Chad Petty, Corporate Secretary

Dated 5/19/22

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signatures of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his or her signature shall be placed above.

Business Address: 4661 E Commerce Ave, Fresno, CA 93725

Place of Residence: Fresno

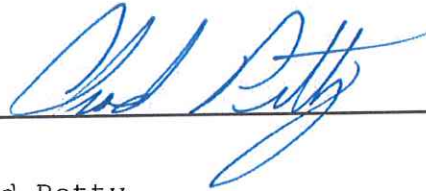
Telephone: (559) 291-1952

DOCUMENT 00400
**CONTRACTOR'S CERTIFICATE REGARDING
WORKERS' COMPENSATION**

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

Name of Bidder Strategic Mechanical Inc

Signature



Name Chad Petty

Title Corporate Secretary

Dated 5/19/22

DOCUMENT 00420

DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act of the Public Contract Code of the State of California, each bidder shall set forth below: (a) the name and the location of the place of business, (b) the California contractor license number, (c) DIR registration number, and (d) the portion of the work which will be done by each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work in an amount in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price. If requested by the Owner, Bidders are required to submit the phone number, license expiration date and any other requested information for each subcontractor listed in its bid with in twenty-four (24) hours of bid opening. No time extension will be allowed for submission of information required by this document.

If no subcontractor is specified, for a portion of the work, or if more than one subcontractor is specified for the same portion of Work, to be performed under the Contract in excess of one-half of one percent (1/2%) of the Contractor's Total Bid Price, then the Contractor shall be deemed to have agreed that it is fully qualified to perform that Work, and that it shall perform that portion itself.

Note: If alternate bids are called for and Contractor intends to use different or additional subcontractors on the alternates, a separate list of subcontractors must be provided for each such alternate. Identify any such additional subcontractors by alternate bid number.

Company Name: Bedard Controls Inc		
Address: 1521 Tollhouse Road, Suite D Clovis, CA, 93611		Type of work: Energy Management System
Phone: (559) 271-8990	CSLB No.: 735986	Exp. 5/31/2023
Fax: (559) 271-2661	DIR No.: 1000005950	Exp. 6/30/2022
Company Name: AIR CONTROL BALANCING INC		
Address: 2140 N Winery Suite 103 Fresno, CA, 93703		Type of work: Balancing
Phone: (559) 454-8000	CSLB No.: 687168	Exp. 4/30/2024
Fax: (559) 454-8589	DIR No.: 1000008875	Exp. 6/30/2022

DESIGNATION OF SUBCONTRACTORS

Company Name: Performance Contracting, Inc		
Address: 3030 Orange Grove Avenue North Highlands, CA, 95560	Type of work: Insulation	
Phone: (916) 576-3915	CSLB No.: 474795	Exp. 6/30/2023
Fax: (916) 484-1875	DIR No.: 1000004922	Exp. 6/30/2022
Company Name: Cencal Services Inc		
Address: 3299 S. Cedar Ave Fresno, CA, 93725	Type of work: Concrete/Demolition	
Phone: (559) 291-3366	CSLB No.: 976935	Exp. 2/28/2023
Fax: (559) 291-3369	DIR No.: 1000002906	Exp. 6/30/2022
Company Name: Valley Fence		
Address: 3505 Lind Ave Clovis, CA, 93612	Type of work: Fencing	
Phone: (559) 294-0451	CSLB No.: 237348	Exp. 12/31/2022
Fax: (559) 299-5513	DIR No.: 1000000118	Exp. 6/30/2022
Company Name: Ro's Precise Painting and Powder Coating Inc		
Address: 1816 Industrial Way Sanger, CA 93657	Type of work: Painting	
Phone: (559) 875-6861	CSLB No.: 757058	Exp. 12/31/2022
Fax: (559) 875-4749	DIR No.: 1000000284	Exp. 6/30/2024
Company Name:		
Address:	Type of work:	
Phone:	CSLB No.:	Exp.
Fax:	DIR No.:	Exp.

DESIGNATION OF SUBCONTRACTORS

Company Name:		
Address:		Type of work:
Phone:		CSLB No.: Exp.
Fax:		DIR No.: Exp.
Company Name:		
Address:		Type of work:
Phone:		CSLB No.: Exp.
Fax:		DIR No.: Exp.
Company Name:		
Address:		Type of work:
Phone:		CSLB No.: Exp.
Fax:		DIR No.: Exp.

Name of Bidder Strategic Mechanical Inc

Signature 

Name and Title Chad Petty, Corporate Secretary

Dated 5/19/22

DESIGNATION OF SUBCONTRACTORS

**DOCUMENT 00440
PROJECT LISTINGS**

A. LIST OF CURRENT PROJECTS

[**Duplicate Page if needed for listing additional current projects.**]

Project/Client: Chaffee Zoo KOA/Bernard Bros Inc	Contact Person: Tonya Bojorquez
Email: tbojorquez@bernards.com	Phone: 5624128077
Scope of work: HVAC; Plumbing, Life Support systems, Sheet Metal, General Exclusions	
Value of Contract: \$928,174.00	Projected Completion Date: June 2022

Project/Client: PDC Chiller & VFD Upgrade/Dept. of General Services	Contact Person: Wayne Hawkins
Email: wayne.hawkins@dgs.ca.gov	Phone: 9169560887
Scope of work: Install temporary air-cooled chillers. Replace existing chillers and cooling towers and install new VFD's	
Value of Contract: \$5,678,000.00	Projected Completion Date: May 2023

Project/Client: FM City Center Chiller Replacement/ Fresno Rescue Mission	Contact Person: Nathan Freeland
Email:	Phone: 5592680839
Scope of work: Chiller replacement at Fresno Mission City Center	
Value of Contract: \$454,624.00	Projected Completion Date: June 2023

Project/Client: Replace HVAC FAX Admin Bldg/City of Fresno	Contact Person: Karl Lenhof
Email: karl.lenhof@fresno.gov	Phone: 5596515604
Scope of work: Replace rooftop AH units and exhaust fans, replace boiler and related piping, replace VAV boxes, replace all controls, clean existing duct.	
Value of Contract: \$552,195.00	Projected Completion Date: Sept 2022

B. LIST OF COMPLETED PROJECTS - LAST THREE YEARS

[**Duplicate Page if needed for listing additional completed projects.**]

Please include only those projects which are similar enough to demonstrate Bidder's ability to perform the required Work.

Project/Client: Hoover HS MPR HVAC/ FUSD	Contact Person: Danny Anderson
Email: William.Anderson@fresnounified.org	Phone: 5594573064
Scope of work: Demo/install of central plant and HVAC equipment.	
Value of Contract: \$1,128,000.00	Completion Date: 04/05/2022

Project/Client: MPR HVAC Gibson Holland/FUSD	Contact Person: Ronika Barnes
Email: Ronika.Barnes@fresnounified.org	Phone: 5594573120
Scope of work: Multipurpose Room HVAC upgrades at various schools	
Value of Contract: \$1,818,175.52	Completion Date: 10/28/2020

Project/Client: Madera County Public Health/Harris Co	Contact Person: Courtney Miller
Email: cmiller@harrisconstruction.com	Phone: 5592510301
Scope of work: HVAC design/assist install of 160k SF office complex (4 bldgs)	
Value of Contract: \$3,999,944.24	Completion Date: 03/18/2020

Project/Client: Unit Replacement Project/ CUSD	Contact Person: Henry Garza
Email: HenryGarza@clovisusd.k12.ca.us	Phone: 5593279241
Scope of work: HVAC unit replacement at multiple schools	
Value of Contract: \$635,577.00	Completion Date: 02/15/2022

PROJECT LISTINGS

DOCUMENT 00450

ASBESTOS-FREE MATERIALS CERTIFICATION

The undersigned declares that he or she is the person who executed the bid for the Sea Lion Cove Chiller Addition (hereinafter referred to as the "Project"), and submitted it to the Chaffee Zoo (hereinafter referred to as the "Owner") on behalf of Strategic Mechanical Inc (hereinafter referred to as the "Contractor").

To the best of my knowledge, information and belief, in completing the Contractor's Work for the Project, no material furnished, installed or incorporated into the Project will contain, or in itself be composed of, any materials listed by the federal or state EPA or federal or state health agencies as a hazardous material.

Any disputes involving the question of whether or not material installed with asbestos-containing equipment is settled by electron microscopy; the cost of any such tests shall be paid by the Contractor.

All work or materials installed by the Contractor which is found to contain asbestos, or work or material installed with asbestos-containing equipment, will be immediately rejected and this work shall be removed and replaced by the Contractor at no additional cost to the Owner.

Decontamination and removal of work found to contain asbestos or work installed with asbestos-containing equipment shall be done only under supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency.

The ASBESTOS REMOVAL CONTRACTOR shall be an EPA accredited contractor qualified in the removal of asbestos and shall be chosen and approved by the Asbestos Consultant who shall have sole discretion and final determination in this matter.

The asbestos consultant shall be chosen and approved by the Construction Manager/Architect or the Owner who shall have sole discretion and final determination in this matter.

The work will be not accepted until asbestos contamination is reduced to levels deemed acceptable by the Asbestos Consultant.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

ASBESTOS-FREE MATERIALS CERTIFICATION

Executed on this 19th day of May, 2022 at
Fresno CA

Name of Contractor (Print or Type)

By 
Signature

Chad Petty, Corporate Secretary

Print Name

ASBESTOS-FREE MATERIALS CERTIFICATION

DOCUMENT 00460

RECYCLED CONTENT CERTIFICATION

The undersigned declares that he or she is the person who executed the bid for the Sea Lion Cove Chiller Addition (hereinafter referred to as the "Project"), and submitted it to the Chaffee Zoo (hereinafter referred to as the "Owner") on behalf of Strategic Mechanical Inc hereinafter referred to as the "Contractor").

Pursuant to Public Contract Code Sections 12205 and 22152, all contractors are required to certify in writing under penalty of perjury the minimum (if not exact) percentage of recycled content in materials, goods, or supplies offered or products used in the performance of their contract, regardless of whether the product meets the required recycled product percentage as defined in Public Contract Code Section 12209. The recycled content shall include both post-consumer material and secondary material as defined in Public Contract Code Section 12200 shall apply.

I declare under penalty of perjury under the laws of the State of California that the following percentages of Post-consumer Material and Secondary Material is in the materials, goods or supplies offered for, or products used in, the performance of the Contract for the Project:

_____ % Post consumer Material _____ % Secondary Material.

Executed on this 19th day of May 2022, 20 at Fresno CA

Strategic Mechanical Inc

Name of Contractor (Print or Type)

By


Signature

Chad Petty

Print Name

Corporate Secretary

Title

RECYCLED CONTENT CERTIFICATION

DRUG-FREE WORKPLACE CERTIFICATION

referred to as the "Contractor") for the Sea Lion Cove Chiller Addition Project (hereinafter referred to as the "Project"). This form is required from all successful bidders pursuant to the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for procurement of any property or service from any State agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a State agency may be subject to suspension of payments or termination, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in their workplace and specifying actions which will be taken against employees for violations of the prohibition;

1. The dangers of drug abuse in the workplace;
2. The person's or organization's policy of maintaining a drug-free workplace;
3. The availability of drug counseling, rehabilitation and employee-assistance programs; and
4. The penalties that may be imposed upon employees for drug abuse violations.

DRUG-FREE WORKPLACE CERTIFICATION

I, the undersigned, agree to fulfill the terms and requirements of the Drug-Free Workplace Act as it now exists or may hereinafter be amended. Particularly, I shall abide by Government Code Section 8355 when performing the Contract for the Project by:

A. Publishing a statement notifying employees concerning the prohibition of controlled substance at my workplace;

B. Establishing a drug-free awareness program; and

C. Requiring that each employee engaged in the performance of the contract be given a copy of the statement required by Section 8355(a) and agree to abide by the terms of that statement.

I also understand that if the Owner determines that I have either: (a) made a false certification herein; or (b) violated this certification by failing to carry out the requirements of Section 8355, the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that if I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the Act.

I acknowledge that I am aware of the provisions of Government Code Section 8350 et seq., and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Executed on this 19th day of May, 2022
Fresno CA

Strategic Mechanical Inc

Name of Contractor (Print or Type)

By

Signature

Chad Petty

Print Name

Corporate Secretary

Title

DRUG-FREE WORKPLACE CERTIFICATION

DOCUMENT 00482

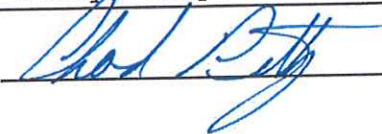
**CONTRACTOR'S CERTIFICATE REGARDING ALCOHOLIC BEVERAGE and
TOBACCO-FREE POLICY**

The Contractor agrees that it will abide by and implement the Owner's Alcoholic Beverage and Tobacco-Free Policy, which prohibits the use of alcoholic beverages and tobacco products, at any time, on Owner-owned or leased buildings, on Owner property and in Owner vehicles. The Contractor shall procure signs stating "ALCOHOLIC BEVERAGE AND TOBACCO USE IS PROHIBITED" and shall ensure that these signs are prominently displayed in all entrances to Owner property at all times.

DATE: 5/19/2022

Strategic Mechanical
CONTRACTOR

By: Chad Petty, Corporate Secretary

Signature 

DOCUMENT 00485

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION

If this bid is due on or after March 1, 2015, then pursuant to Labor Code sections 1725.5 and 1771.1, all contractors and subcontractors that wish to bid on, be listed in a bid proposal, or enter into a contract to perform public work must be registered with the Department of Industrial Relations. See <http://www.dir.ca.gov/Public-Works/PublicWorks.html> for additional information.

No bid will be accepted nor any contract entered into without proof of the contractor's and subcontractors' current registration with the Department of Industrial Relations to perform public work.

Bidder hereby certifies that it is aware of the registration requirements set forth in Labor Code sections 1725.5 and 1771.1 and is currently registered as a contractor with the Department of Industrial Relations.

Name of Bidder:

Strategic Mechanical Inc

DIR Registration Number:

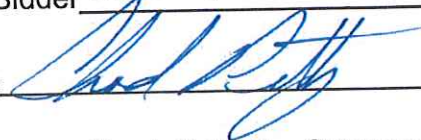
1000001726

Bidder further acknowledges:

- (1) Bidder shall maintain a current DIR registration for the duration of the project.
- (2) Bidder shall include the requirements of Labor Code sections 1725.5 and 1771.1 in its contract with subcontractors and ensure that all subcontractors are registered at the time of bid opening and maintain registration status for the duration of the project.
- (3) Failure to submit this form or comply with any of the above requirements may result in a finding that the bid is non-responsive.

Name of Bidder Strategic Mechanical Inc

Signature



Name and Title Chad Petty, Corporate Secretary

Dated 5/19/2022

DOCUMENT 00490

NON-COLLUSION DECLARATION

The undersigned declares:

I am the Corporate Secretary (Title) of Strategic Mechanical Inc (Firm), the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on 5/18/22 (Date), at Fresno (City), California (State).

By:  _____

Printed Name: Chad Petty

Date: 5/18/22

NON-COLLUSION DECLARATION

DOCUMENT 00499
Notary Acknowledgment
(sample form)

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF Fresno

On May 18, 2022, before me, Sandra M. Katen, Notary Public, personally appeared Chad Petty, who proved to me on the basis of satisfactory

evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.



Signature of Notary Public

WITNESS my hand and official seal.

Sandra M. Katen

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

CAPACITY CLAIMED BY SIGNER

- ☐ Individual
☒ Corporate Officer

Corporate Secretary
Title(s)

- ☐ Partner(s) ☐ Limited
☐ General
☐ Attorney-In-Fact
☐ Trustee(s)
☐ Guardian/Conservator
☐ Other:

Signer is representing:
Name Of Person(s) Or Entity(ies)

DESCRIPTION OF ATTACHED DOCUMENT

Non Collusion Declaration
Title or Type of Document

1
Number of Pages

05/18/22
Date of Document

Signer(s) Other Than Named Above

DOCUMENT 00410

BID BOND

KNOW ALL MEN BY THESE PRESENTS: THAT we, Strategic Mechanical, Inc.
Western Surety Company, as Principal, and Western Surety Company, as Surety, are held and firmly bound unto the Chaffee Zoo, hereinafter called the Owner, in the penal sum of ten percent of amount bid PERCENT (Ten %) OF THE TOTAL AMOUNT OF THE BID of the Principal submitted to the said OWNER for the work described below for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted the accompanying bid dated May 19 2022, for Sea Lion Cove Chiller Addition.

NOW, THEREFORE. The Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within sixty (60) days after said opening; and, if the Principal be awarded the contract, and shall within the period specified therefor, or if no period be specified, within ten (10) consecutive calendar days after the Award of Contract (which date shall be the day following the governing board approval of the award) complete the prescribed forms are presented to him for signature enter into a written contract with the Owner in accordance with the bid as accepted and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract and for the payment for labor and materials used for the performance of the contract, or in the event of the withdrawal of said bid within the period specified or the failure to enter into such contract and give such bonds within the time specified. If the Principal shall pay the Owner the difference between the amount specified in said bid and the amount for which the Owner may procure the required work and/or supplies, if the latter amount be in excess of the former, together with all costs incurred by the Owner in again calling for bids, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract on the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in anywise affect its obligation under this bond, and It does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said contract or the call for bids, or to the work, or to the specifications.

SAMPLE: BID BOND

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this 11th day of May, 2022, the name and corporate seal of each corporate party being hereto affixed and these presents duly assigned by its undersigned representative, pursuant to authority of its governing body.

(Corporate Seal)

Strategic Mechanical, Inc.

Principal

By

Title EVP

(Corporate Seal)

Western Surety Company

Surety

By

Attorney-in-Fact

Title Attorney-In-Fact: Justin Smit

(Attach Attorney-in-Fact Certificate)

SAMPLE: BID BOND

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

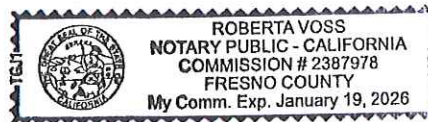
State of California
County of Fresno

On 5/11/22 before me, Roberta Voss, Notary Public
(insert name and title of the officer)

personally appeared Justin Smit
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~
subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in
his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(~~s~~) on the instrument the
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature Roberta Voss (Seal)

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

Roberta Voss, Justin Smit, Individually

of Fresno, CA, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 18th day of October, 2021.



WESTERN SURETY COMPANY

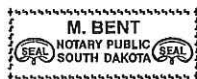
Paul T. Bruflat, Vice President

State of South Dakota }
County of Minnehaha } ss

On this 23rd day of June, 2021, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

March 2, 2026



M. Bent, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 11th day of May, 2022.



WESTERN SURETY COMPANY

L. Nelson, Assistant Secretary

Authorizing By-Law

ADOPTED BY THE SHAREHOLDERS OF WESTERN SURETY COMPANY

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the shareholders of the Company.

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, and Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

JodiAnn Farias

From: Renee Tindall
Sent: Tuesday, May 31, 2022 11:19 AM
To: JodiAnn Farias; Jennifer Basl McIntyre; Lyn Myers
Subject: soft cost for SLC bio tower chiller

Hi JodiAnn

The following are the only soft cost request for LSS for the SLC bio tower and chiller project
14,000 new bio media (this is the cost to replace all the media)
3,000 new all terrain laptop
2,000 misc. unforeseen
19,000 total

Renee Tindall (She/ Her) | Curator of Life Support

Email: rtindall@fresnochaffeezoo.org
Address: 894 W Belmont Ave, Fresno, CA, 93728
Main: 559.498.5910 Cell: 602.999.6538



**Fresno Chaffee Zoo inspires wonder of our natural world,
provides an engaging learning environment,
and creates a passion for conservation.**

This e-mail and any files or document(s) transmitted with it are the property of Fresno Chaffee Zoo, are confidential and privileged, and are intended solely for the use of the individual or entity to whom this e-mail is addressed. If you are not one of the named recipient(s) or otherwise have reason to believe that you have received this message in error, please notify the sender at 559-498-5920 and delete this message immediately from your computer. Any other use, retention, dissemination, forwarding, printing, or copying of this e-mail is strictly prohibited. Thank you for your cooperation.



NORMAN S. WRIGHT
DUCKWORTH
Mechanical Equipment Company, LLC

7595 N. Del Mar Avenue, Fresno, CA 93711-5871 • tel 559.449.8701 • fax 559.449.8734

Heating
Ventilation
Air Conditioning
Hydronic Systems

www.nsw-duckworth.com

QUOTATION

TO : Fresno Chaffee Zoo
ATTN: Jesse Santiago

DATE: January 28, 2022

TERMS: NET 30 FOB: Factory FFA APPROX. SHIP TIME: 21-23 Weeks FRT. ALLOW: YES

This Quotation Subject To Acceptance Within 30 Days.

To the prices and terms quoted, add any manufacturers' gross receipts, sales or use tax, either Federal, State or City, payable on the transaction under any affecting statute. Orders will be invoiced at price in effect at time of shipping, unless otherwise specified. Ship times are estimates only and not guaranteed. All orders subject to factory acceptance. No material will be accepted for return without permission. Orders may not be canceled without written permission from the manufacturers. Cancellation charges may apply. No warranty is offered or implied, other than the standard warranty of the manufacturer. Written copies available on request. Unless otherwise stated, we do not include: seismic calculations, disconnect switches, starters, controls, thermostats, damper motors, internal wiring, drives, belt guards, filters, gauges, vibration isolators, and start-up service or supervision. Programming of DDC controls is not included in this quotation. Subject to attached terms and conditions.

PROJECT : Sea Lion Cove
ENGINEER: Lawrence Engineering Group

Daikin Applied model AGZ101E packaged air cooled chiller with:

- Single point 460/3 electrical service with circuit protection
- Phase under/over voltage protection with LED
- 3/4" closed cell insulation on brazed plate and frame evaporator
- R410a scroll compressors
- All aluminum micro-channel condenser coil
- Condenser coil louvers & base frame wire grilles
- VFDs with line reactors
- High ambient with exhaust fans
- Replaceable filter dryer with liquid, discharge and suction shut-off valves
- MicroTechIII unit DDC controller with BACnet MS/TP communication card
- Intelligent equipment with Power monitoring
- 1st year unit parts, labor and refrigerant warranty
- 4 additional years extended warranty on compressor only
- Factory Start-up
- Water flow indication and strainer

DOES NOT INCLUDE: Hot gas bypass, control or electrical wiring, special tools or labels, expansion tanks, field system test, or factory performance tests, mounting/hanging hardware, external vibration isolation, crane fees, interlocking system, glycol management, rigging/unloading, and any additional accessories not specifically listed above.

BASE BID TOTAL COST: \$ 150,975.00
EXCLUDES SALES TAX

CHC

CALIFORNIA HYDRONICS- HAYWARD
 3 Tripaldi Way
 Hayward, CA 94545
 WWW.CHCHYDRO.COM

QUOTE
 Q-00133411

Job Site
 FRESNO CHAFFEE ZOO CORP.
 1250 W. OLIVE AVE
 FRESNO CA 93728

Jesse Santiago

Quote Date	Quote Expiration	Attention
Jan 18, 2022	Feb 17, 2022	Jesse Santiago

Requested Ship Date	Shipping Carrier	Job Name
	Best Way	Sea Lion Cove Chiller Addition

This quotation is offered pursuant to the Terms and Conditions at end of this document – CHC does not agree to accept other terms and conditions unless noted within this quotation.

Tag	QNTY	Part Number	Description	Net Each	Ext. Total
	2	804070BJM	B&G In-Line Pump Series e-80, Model 4 x 4 x 7B, SS, 5 HP, 1800 RPM, with 6.875" Impeller, STD-Buna/Carbon/Ceramic/SS/Bronze Seal, e-80, 4 x 4 x 7B, SS, 5 HP, 1800 , Baldor, TEFC, Nema Premium Efficient, 208-230/460/3/60 Motor, 378 gpm, 30 ft	\$7,115.00	\$14,230.00
	2	P2003873	VFD, 5HP, 460 VOLT, 3PH, IP55 NEMA 12 w BACKPL, DISC, ADV	\$2,455.00	\$4,910.00
	1	GPX PLATE & FRAME HX	B&G Model - P42 Plate Heat Exchanger - Consisting of 0mm frame with 0.5 mm AISITitanium TK heat transfer plates and NITRILE HT gaskets, STL header plates, SS carry bar, SS guide bar, OSHA approved ALUMINUM splash guard, " 6" Titanium lined studded port for 150# ansi flange (Hot side). " 6" 316SS lined studded port for 150# ansi flange (Cold side). ASME construction with U1 stamp for 150 design pressure.	\$46,468.00	\$46,468.00
SubTotal					\$65,608.00
Est. Taxes					\$0.00
Total					\$65,608.00

If you have any questions or require additional information, please feel free to give us a call.

Thank you for the opportunity to provide this quotation.

Sincerely – Kurt Eckroth

Email: keckroth@chchydro.com

Direct: (916) 315-2001
 Line



GEOTECHNICAL & ENVIRONMENTAL ENGINEERING — CONSTRUCTION TESTING & INSPECTION

May 25, 2022

TES No. MP22-108

Mr. Jessie Santiago
Construction Project Manager
Fresno Chaffee Zoo
894 W. Belmont Avenue
Fresno, CA 93728
Phone: 559-498-5910
Email: JSantiago@fresnochaffeezoo.org

PROJECT: Fresno Chaffee Zoo Sea Lion Cove Chiller Addition
894 W. Belmont Avenue
Fresno, CA

SUBJECT: Cost Estimate for Materials Testing and Inspections Services

Mr. Santiago:

In accordance with your request, **TECHNICON Engineering Services, Inc. (TECHNICON)** is pleased to provide you with this cost estimate for testing for the above referenced project. We will do our best to keep the testing cost to a minimum. This estimate is based on the preliminary construction schedule, which is subject to change.

Fresno Chaffee Zoo Sean Lion Cove Chiller Addition 894 W. Belmont Avenue Fresno, CA	Unit	Unit Cost	Total Unit Cost
Earthwork			
Compaction Testing Soils	4/Hour	\$112/Hour	\$448
Compaction Testing Trenches	12/Hour	\$112/Hour	\$1,344
Compaction Testing Building Pad	4/Hour	\$112/Hour	\$448
Compaction Testing Subgrade	4/Hour	\$112/Hour	\$448
Compaction Testing Aggregate Base	4/Hour	\$112/Hour	\$448
Fill Placement Observation	4/Hour	\$112/Hour	\$448
Sample Pickup	4/Hour	\$96/Hour	\$384
MD/OM Curves ASTM D1557	4/Each	\$225/Each	\$900
MD/OM Curves CAL 216	1/Each	\$230/Each	\$230
Fill Suitability	1/Each	\$625/Each	\$625
Subtotal for Earthwork			\$5,753

CORPORATE OFFICE — 4539 N. Brawley Avenue #108, Fresno, CA 93722 — P 559.276.9311 — F 559.276.9344

MERCED OFFICE — 2345 Jetway Drive, Atwater, CA 95301 — P 209.384.9300 — F 209.384.0891

www.technicon.net

Structural Concrete			
Sample Concrete	16/Hour	\$112/Hour	\$1,792
Mix Design Review	1/Each	\$284/Each	\$284
Concrete Sample Pickup	8/Hour	\$96/Hour	\$768
Concrete Compression Strength Tests (Set of 4)	8/Set	\$115/Set	\$920
Reinforced Concrete Inspection	16/Hour	\$120/Hour	\$1,920
Subtotal for Structural Concrete			\$5,684
Structural Steel			
Epoxy Anchor Bolt Installation	4/Hour	\$120/Hour	\$480
Reinforcing Steel Inspection	16/Hour	\$120/Hour	\$1,920
Reinforcing Steel Sample & Tagging	4/Hour	\$113/Hour	\$452
Tension Test Steel #2-#8	2/Each	\$90/Each	\$180
Bend Test Reinforcing Steel #2-#8	2/Each	\$80/Each	\$160
Subtotal for Structural Steel			\$3,192
Report Preparation			
Registered Civil Engineer	8/Hour	\$210/Hour	\$1,680
Project Management	12/Hour	\$141/Hour	\$1,692
Administrative Staff	12/Hour	\$90/Hour	\$1,080
Drafting	8/Hour	\$90/Hour	\$540
Subtotal for Report Preparation			\$4,992
Travel			
Fuel Surcharge	30/Trips	\$35/Per Trip	\$1,050
Mileage (greater than 40 miles one way)	300/Miles	\$0.85/Mile	\$255
Subtotal for Travel			\$1,305
Final Reports			
Final Soils	1/LS	\$370/LS	\$370
Final Structural	1/LS	\$370/LS	\$370
Subtotal for Final Reports			\$740
ESTIMATED TOTAL OF CONSTRUCTION TESTING AND INSPECTION			\$21,636

Rates (additional charges)	
Overtime @ 1.5 x \$120.00 (If required after 8 hours and Saturdays)	\$180.00/Hour
Overtime @ 1.5 x \$112.00 (If required after 8 hours and Saturdays)	\$168.00/Hour
Double time @ 2 x \$120.00 (If required after 12 hours, Sundays and Holidays)	\$240.00/Hour
Double time @ 2 x \$112.00 (If required after 12 hours, Sundays and Holidays)	\$224.00/Hour
Mileage (\$0.85 per mile charged outside of a 10 mile radius)	\$0.85

CONDITIONS

The fees and conditions of this proposal will remain in effect for a period of 90 days. Our technicians and inspectors will attempt, wherever possible, to combine observation and testing during site visits, in order to keep the final bill as low as possible. However, as the presence of our personnel at the site will depend upon the contractor's schedule and the progress of the work, the fees presented above are to be considered as estimates only, and shall not be construed as guaranteed maximum fees. The invoices will reflect the time spent and service performed, and may be greater or less than the estimated amounts.

Fees are predicated upon our understanding that this project **is subject to California Prevailing Wage Law (i.e. certified payroll)**, and are based upon straight-time rates. Work performed on weekends, holidays, and when work starts outside of regular business hours is subject to a 4-hour minimum charge. Saturdays, night work, and premium hours (before 7 a.m., after 3 p.m. or in excess of 8 hours in one day) for personnel are at time and one-half; Sundays and holidays are at double time. **TECHNICON** will notify the DSA project inspector for authorization to perform our service on overtime. Field services for regular work days are subject to a 2-hour minimum charge for inspections, consultations, sampling, or show up time and 2-hour increments, M-F 7 a.m. to 3 p.m. with a minimum of 48 hour schedule notice and a 4 hour cancellation notice. Time is accumulated on a portal to portal basis.

Routine project supervision by an engineer has been included in the above quotation. However, please note that the above quotation does not include charges for weekly site meetings, plan reviews, site visits to address unforeseen problem areas, or other such services. Fees for such services will be charged at the fee schedule rates in effect at the time of the services request.

Charges for reinspection due to failing results, or when testing or inspection is requested but the contractor is not ready and does not cancel scheduled work are also not included in the estimate and will be billed at the hourly rates listed previously. This firm shall not be responsible for backcharging contractors.

Client agrees to pay for the described services in accordance with the compensation provisions in the cost estimate. Unless otherwise specified in the cost estimate, payment to Consultant will be made within 30 days of the date of billing. Our unit cost was based on work being conducted locally. Should portions of the work be subcontracted to out-of town subcontractors, additional incurred costs will be charged accordingly.

*Rates are subject to change due to changes in Prevailing Wage Law or its application. In the event that it is determined or alleged that Prevailing Wage Law applies to any additional aspect of the project, the Client agrees to pay **TECHNICON Engineering Services, Inc.** (Consultant) any and all additional compensation necessary to adjust Consultant's Wage, to pay any penalties that may be levied against Consultant due to alleged compliance with the Prevailing Wage Law, and to pay for apprentices, supervision, certified payrolls, and other administrative costs as necessary to comply with Prevailing Wage Law. In the event that work thought to be subject to Prevailing Wage is determined not to be subject to prevailing Wage, no refund of fees will be given.

Respectfully

TECHNICON Engineering Services, Inc.

Darren G. Williams, RCE
Principal

Accepted by:

Signature

Title

Date

CONSULTING CONTRACT TERMS AND CONDITIONS (REV 1/2022)

Page 1 of 2

I SCOPE

Consultant (*TECHNICON*) agrees to perform the services described in the proposal which incorporates these terms and conditions. Unless modified in writing by the parties hereto, the duties of Consultant shall not be construed to exceed those services specifically set forth in the proposal. The proposal and these terms and conditions, when executed by Client, shall constitute a binding agreement on both parties.

II COMPENSATION

Client agrees to pay for the described services in accordance with the compensation provisions in the proposal. Unless otherwise specified in the proposal, payment to Consultant will be made within 30 days of the date of billing; interest on the unpaid balance will accrue beginning on the 31st day at that rate of 2 percent per month or the maximum interest rate permitted by law, whichever is less. Such interest is due and payable when the overdue payment is made. Client agrees that periodic billings from Consultant to client are correct, conclusive, and binding on client unless Client, within ten (10) calendar days from the receipt of such billing, notifies Consultant in writing of alleged inaccuracies, discrepancies, or errors in the billing. Client agrees that if Client requests services not specified pursuant to the scope of services description within this agreement, Client agrees to pay for all such additional services as extra work in accordance with the project fee schedule.

III RESPONSIBILITY

Consultant is employed to render a professional service only, and any payments made by Client are compensation solely for such services rendered and recommendations made in carrying out the work. Consultant shall follow the practice of the engineering profession to make findings, provide opinions, make factual presentations, and provide professional advice and recommendations. Consultant shall only act as an advisor in all governmental relations. In performing the services under this contract, Consultant shall act as agent of Client. Consultant's review or supervision of work prepared or performed by other individuals or firms employed by Client shall not relieve those individuals or firms of complete responsibility for the adequacy of their work.

It is understood that any resident engineering or inspection provided by Consultant is for the purpose of determining compliance with the technical provisions of the project specifications and does not constitute any form of guarantee or insurance with respect to the performance of a contractor. Consultant does not assume responsibility for methods or appliance used by a contractor, for safety of construction work, or for compliance by contractors with laws and regulations.

IV SCOPE OF CLIENT SERVICES

Client agrees to cooperate with Consultant in every way on the project, including but not limited to:

1. Coordinate with tenants for access to sampling locations.
2. Provide all available information on past history and operations at the site.
3. Provide all available information on the location of all underground tanks, piping, and utilities at the site.

Client agrees not to use or permit any other person to use plans, drawings, or other work products prepared by Consultant, which plans, drawings, or other work products are not final and which are not signed and stamped or sealed by Consultant. Client agrees to be liable and responsible for any such use of not final plans, drawings, and other work products not signed and stamped or sealed by Consultants and waives liability against Consultant for their use. Client further agrees that final plans, drawings, or other work product are for the exclusive use of Client and may be used by Client only for the project described on the face hereof. Such final plans, drawings or other work products may not be changed nor used on a different project without the written authorization or approval Consultant.

V INDEMNIFICATION

Consultant agrees to indemnify, and hold Client harmless from liability arising out of the sole negligent errors or sole negligent omissions of Consultant, its agents, employees, officers, directors, or representatives in the performance of Consultant's duties under this Agreement. Consultant's liability shall be limited to the actual loss sustained, but in no event shall it exceed the limits of Consultant's insurance policies in force at the time of this work. Such negligence shall be measured by standards in effect at that time services are rendered, not by later standards. Client may not assert any claim against Consultant after the shorter of: (1) 3 years from substantial completion of services giving rise to the claim; or (2) the statute of limitation provided by law. Client acknowledges Consultant will perform part of the work at facilities that may contain hazardous materials or conditions, and that Consultant had no prior role in the generation, treatment, storage, or disposition of any hazardous materials or conditions that may be encountered at the site. In consideration of the associated risks that may give rise to claims by third parties or employees of Client, Client agrees to indemnify, defend and hold Consultant harmless (including attorney's fees) from any and all losses, damages, claims, or actions brought by any third party or employee of Client against Consultant or Consultant's employees, agents, officers, or directors, in any way arising out of the presence of hazardous materials at the site, except for claims shown by final judgment to arise out of the sole negligence of Consultant.

CONSULTING
CONTRACT TERMS AND CONDITIONS (REV 1/2022)

Page 2 of 2

VI SUBCONTRACTS

Consultants shall be entitled, to the extent determined appropriate by Consultant to subcontract any portion of the work to be performed under this project.

VII ASSIGNMENT

This agreement is binding on the heirs, successors, and assigns of the parties hereto. The Agreement is not to be assigned by either Client or Consultant without the prior written consent of the other.

VIII INTEGRATION

These terms and conditions and the letter agreement to which they are attached represent the entire understanding of Client and Consultant as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. The Agreement may not be modified or altered except in writing signed by both parties.

IX JURISDICTION

This agreement shall be administered and interpreted under the laws of the state of California. Jurisdiction of litigation arising from the agreement shall be in that state. If any part of the agreement is found to be in conflict with applicable laws, such part shall be inoperative, null and void insofar as it is in conflict with said laws, but the remainder of the Agreement shall be in full force and effect.

X PROJECT DELAY

Client agrees that Consultant is not responsible for delays caused by activities or factors beyond Consultant's reasonable control, including but not limited to, delays by reason of strikes, lockouts, work slowdowns or stoppages, accidents, acts of God, failure of Client to furnish timely information or approve or disapprove Consultant's work promptly, faulty performance by Client or other contractors or governmental agencies. When such delays beyond Consultant's reasonable control occur, Client agrees consultant is not responsible for damages nor shall Consultant be deemed to be in fault of this agreement.

Client also agrees that Consultant shall not be liable for damages resulting from the actions or inactions of governmental agencies including, but not limited to, permit processing, environmental impact reports, general plans and amendments thereto, zoning matters, annexations or consolidation, use or conditional use permits, project or plan approvals, and building permits.

XI SUSPENSION OF WORK

Client may suspend, in writing, all or a portion of the work under the Agreement in the event unforeseen circumstances beyond the control of the Client make normal progress in the performance of the work impossible. Consultant may request that the work be suspended by notifying Client, in writing, of circumstances that are interfering with normal progress of the work. Consultant may suspend work on the project in the event Client does not pay invoices within 30 days of the date of billing. If Client fails to pay Consultant within 30 days after invoices are rendered, Client agrees Consultant shall have the right to consider such default in payment a material breach of this entire agreement, and, upon written notice, the duties, obligations, and responsibilities of Consultant under this agreement are terminated. The time for completion of the work shall be extended by the number of days the work is suspended. In the event that the period of suspension exceeds 90 days, the terms of the agreement are subject to renegotiation and both parties are granted the option to terminate work on the suspended portion of the project, in accordance with Article XII.

XII TERMINATION OF WORK

Client or Consultant may terminate all or a portion of the work covered by the Agreement for its convenience. Either party may terminate work in the event the other party fails to perform in accordance with the provisions of the Agreement by giving 15 days prior written notice from the party initiating termination to the other. Notice of termination shall be by certified mail with return receipt to sender. In such event, Client shall promptly pay consultant for all fees, charges, and services provided by Consultant.

XIII ARBITRATION

All claims, disputes, and other matters in question between the parties to this Agreement arising out of or relating to this Agreement or the breach thereof, which are not disposed by mutual agreement of the parties, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association (AAA). No arbitration arising out of or relating to this Agreement shall include, by consolidation, joinder, or in any other manner, any additional person not a party to this Agreement except by written consent containing a specific reference to this Agreement and signed by the parties hereto and such persons to be joined. This agreement to arbitrate and any agreement to arbitrate with an additional person or persons shall be specifically enforceable under prevailing arbitration law. Notice of demand for arbitration shall be filed in writing with the parties to this Agreement and with the AAA within a reasonable time after the claim, dispute or other matter in question has arisen. In no event shall the demand for arbitration be made after the date when the institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations. The award rendered by the arbitrators shall be final, and judgment may be entered in accordance with applicable law in any court having jurisdiction thereof.



AGENDA ITEM 10

DATE: June 29, 2022

TO: Fresno County Zoo Authority Board

FROM: Nora Crow, Chief Financial Officer
Fresno's Chaffee Zoo Corporation

SUBJECT: Measure Z Capital Funds Request for Energy Efficiency Upgrades Project

RECOMMENDED ACTION:

Approve Fresno Chaffee Zoo Corporation's request of Measure Z Capital funds totaling \$1,383,565 for the implementation of the energy efficiency upgrades proposal from Alliance Building Solutions, Inc.

DISCUSSION:

ZooCorp is requesting the approval of funding of \$1,383,565 to move forward with implementation of the energy efficiency upgrades proposal from Alliance Building Solutions, Inc. The Fresno's Chaffee Zoo Corporation Board of Directors approved this request on January 13, 2022.

As a conservation organization, green practices are core to the values of the Fresno Chaffee Zoo Corporation. This project presents us with the opportunity to push forward with energy conservation that works twofold: it contributes to our goal to move towards a carbon-neutral footprint, while also offering substantial cost savings. Over the last year, the Fresno Chaffee Zoo Corporation has solicited proposals from companies to review our current energy usage and provide recommendations to reduce our consumption.

This project would include the replacement of lighting to energy efficient LED bulbs and fixtures, replacement of old and/or inefficient HVAC systems, installation of programmable HVAC control systems, and replacement of old and/or inefficient transformers. All work would be done campus-wide.

The project is estimated to provide cost savings of approximately \$3 million over the next 30 years. It is projected to reach a net positive cash flow by the end of the 10th year.

ATTACHMENTS:

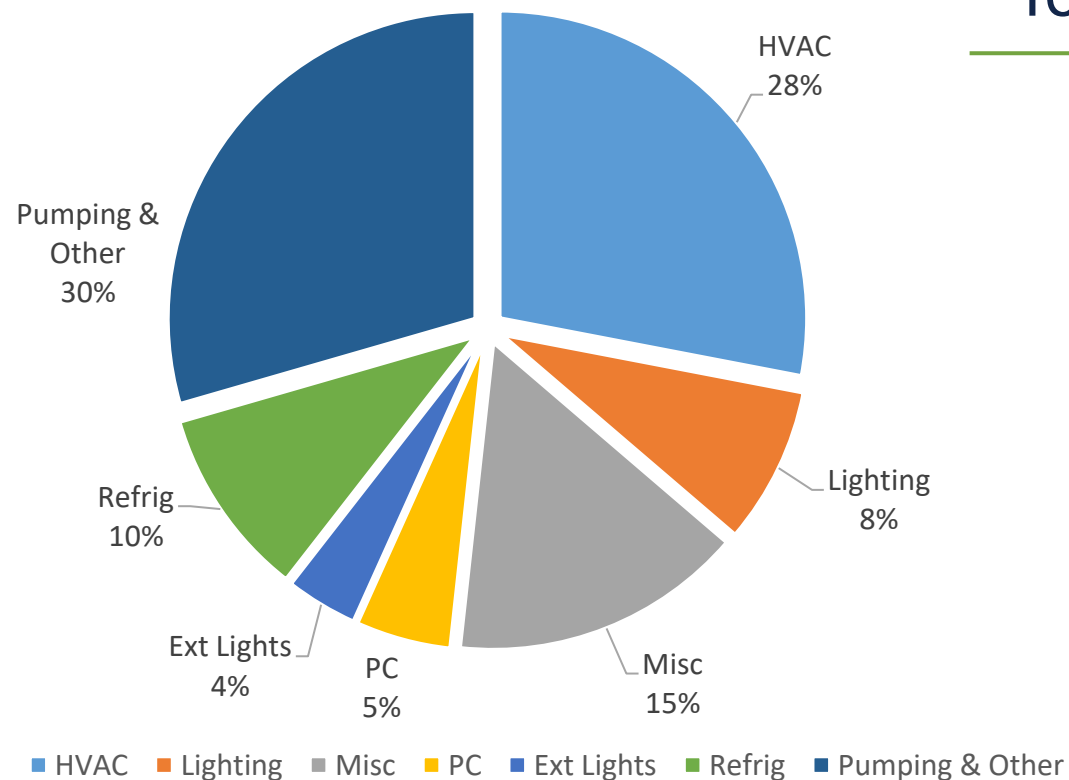
Energy Efficiency ABS Proposal
Energy Efficiency Cash Flow



Fresno Chaffee Zoo

Energy
Efficiency Project

Current Energy Costs



Total Annual Cost

\$565,072

Total kW Usage

2,961,396

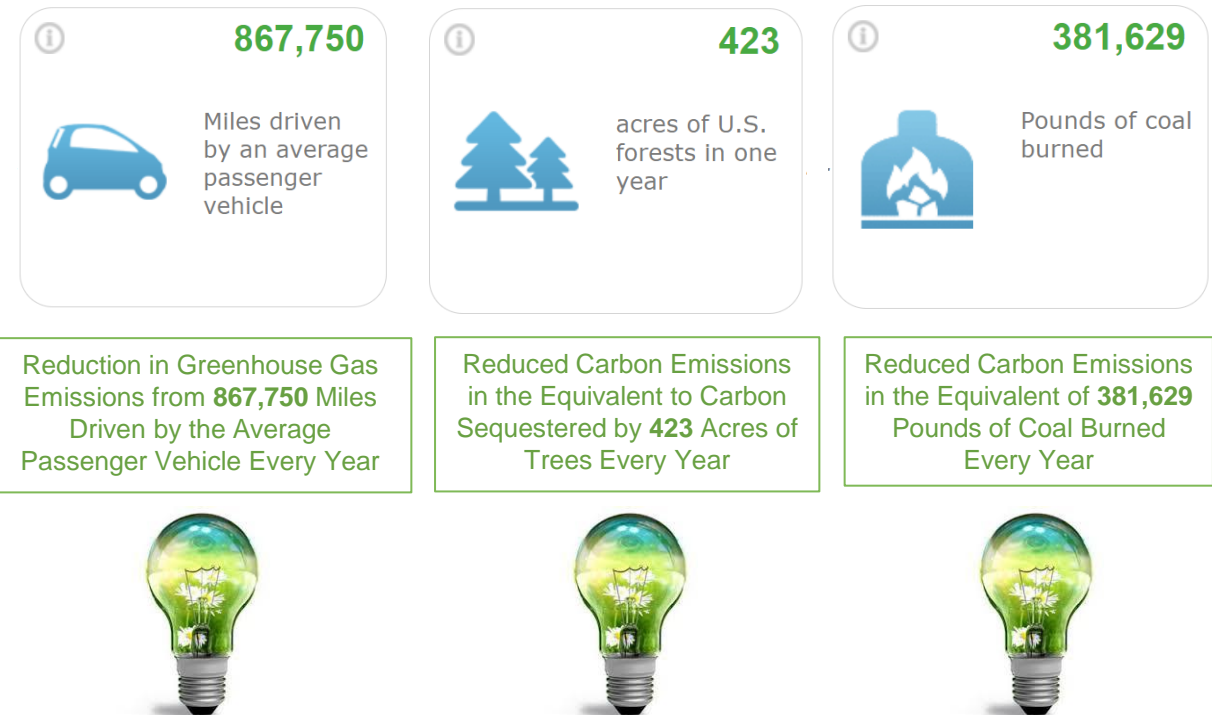
Category	kW Usage
HVAC	829,761 kW
Lighting	244,555 kW
Misc.	457,742 kW
PC	148,070 kW
Ext Lights	112,324 kW
Refrigeration	296,140 kW

Project Benefits/Environmental Attributes

Project Benefits

- Significant reduction in utility & operational and maintenance costs.
- Total project realizes over \$3M throughout the life of the project.
- Addresses facility and deferred maintenance needs through leveraging energy savings
- Available rebates and incentives through project installation in partnership with PG&E
- Allows the Zoo to take strides towards reaching climate action goals through investments into clean energy and sustainability.

Environmental Attributes



Lighting



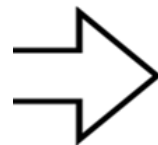
Interior Lighting

- Interior LED Upgrades
 - Campus Wide



Exterior Lighting

- Exterior LED Upgrades
 - Campus Wide



Approach

Campus Wide interior and exterior lighting inventories have been completed providing staff with full lamp and fixture specification data for all existing infrastructure, along with breakouts on proposed lighting scope. Staff has already begun lighting retrofits at various sites as lights burn out; however, our team is retrofitting all remaining lamps campus wide to LED. The existing interior and exterior lighting systems included a variety of fluorescent and HID lamps throughout the campus.

LED retrofits are considered a great source of savings to increase energy efficiency and are required to achieve a net zero dynamic. In addition to a reduction in energy consumption, LED lamps will also reduce maintenance/labor costs due to a longer useful life when compared to anything outside of the LED spectrum.

HVAC / Mechanical Scope

HVAC Unit Replacements

- (17) Units
 - Campus Wide



Average Age

Average age of HVAC units being replaced is over 20+ years

Approach

Through the HVAC/mechanical portion of our audit, we have inventoried roughly **88** units campus wide . Out of these units, we have identified **17 units** that are past their useful life, failing, and are eligible for replacement. These are units that the Zoo is going to have to replace within the next 2-3 years and are currently over 20+ years old. The existing HVAC infrastructure includes a wide range of different manufacturers, the most prominent being Daikin, Bryant, Carrier, and Trane.

For this project, the primary approach to replacements is replacing the oldest and most dilapidated units that are significantly decreasing in functionality. The replacements of these units will also greatly reduce maintenance and repair costs that staff will not have to incur with newer units.



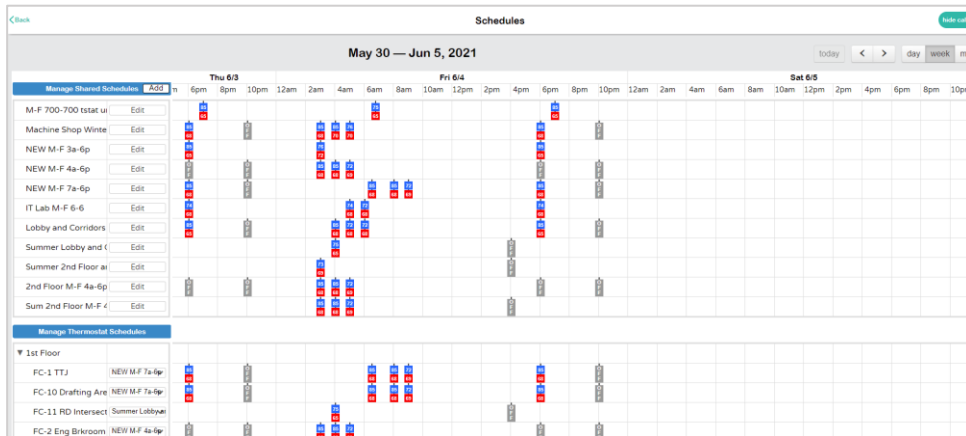
HVAC Inventory

ABS ID	Existing Tag	Location Served	Equipment Type	Manufacturer	Model Number	Serial Number	Size / Capacity	Voltage	Year
1		Hospital Unit 1	Packaged Unit (Gas/DX)	Bryant	580DPV048074AAAB	3998G20994	4.0 ton	208/230 PH3	1998
2		Hospital Unit 2	Packaged Unit (Gas/DX)	Bryant	580DPV036074ABAB	4698G20717	3.0 ton	208/230 PH3	1998
3		Hospital Unit 3	Packaged Unit (Gas/DX)	Bryant	580DPV060074AAAA	4198G20716	5.0 ton	208/230 PH3	1998
4		Hospital Unit 4	Packaged Unit (Gas/DX)	Bryant	580DPV048074AAAB	998G20996	4.0 ton	208/230 PH1	1998
5		Hospital Unit 5	Packaged Unit (Gas/DX)	Bryant	580DPV036074ABAB	4698G20718	3.0 ton	480/277 PH3	1998
6		Orang Unit 1	Packaged Unit (Gas/DX)	Carrier	48HJE006	4699G20388	5.0 ton	208/230 PH3	1999
7		Orang Unit 2	Ductless Split System	Fujitsu	A0U18RLQ	GWN00176	1.5 ton	208/230 PH3	
8		Sea Lion Cove Unit	Heat Pump	Daikin	RXYMQ36PVJU	E001216	3.0 ton		
9		Security / VSO Unit	Packaged Unit (Gas/DX)	York	D1NA036N03606C	NCJM028539	3.0 ton	208/230 PH3	2000
10		Gift Shop Unit 1	Split System (Ht Pmp)	Carrier	38YRA060300	0898E04039	5.0 ton		1998
11		Gift Shop Unit 2	Split System (Ht Pmp)	Carrier	38YRA060300	0898E04036	5.0 ton		1998
12		Ops Trailer Unit	WMHP	Bard	est 3-ton	125D0419****	3.0 ton	208/230 PH1	2004
13		Annex Unit 1	WMHP	Bard	WH361-A0SVP4XXX	125K082546299-02	3.0 ton	208/230 PH1	2008
14		Annex Unit 2	WMHP	Bard	WH361-A0SVP4XXX		3.0 ton	208/230 PH1	
15	Ed Unit #1	Education Unit 1	Cond. Unit	Ruud	UAFD024JAS	4077F37883471	2.0 ton	208/230 PH1	1988
16	AC-4	Reptile House Unit 4	Packaged Unit (Gas/DX)	Carrier	UAFD024JAS	50DK506992C	5.0 ton		2001
17		Stingray Pool	Split System (CU)	Trane	TWA180		15.0 ton		

Controls

HVAC Controls System

- Install New Pelican Controls
- Wireless Globally Programmable T-Stat
 - (42) Units



Approach

Within the controls scope of our audit, our team had identified a majority of the sites District-wide to be running on stand alone thermostats, with the large holding facilities will have their own existing controls systems.

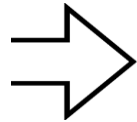
Typically, in a project of this nature the main function for a controls retrofit would be to implemented a more sophisticated and efficient platform to realize energy savings. However, due to the dynamic of housing animals that need to have specified temperature level environmental preferences, energy savings isn't as vital as occupant comfort.

In order to keep this dynamic, this project includes installing Wi-Fi programmable smart thermostats for the stand-alone controls, which will now allow staff to monitor, manage, and fully controls these systems to be consolidated on one front end. Staff will now be able to edit set points, scheduling, and change existing temperature via laptop, tablet, or smartphone.

Other - Transformers

Transformer Retrofit

- Install New High Efficiency Transformers
 - (14) Units
 - Campus Wide



Approach

Throughout the process of developing an energy efficiency project, there is a constant balance between the dynamic of cost and savings. Transformer retrofits have become a great source of additional savings to fund other infrastructure items that might have a lower payback, such as an HVAC unit replacement. Through this portion of the audit, there had been roughly 27 units inventoried Campus Wide, and 14 identified to be past their useful life with opportunity for energy savings following a retrofit. It is always recommended to proactively replace transformers, due to the significant power complications that can occur if a transformer were to fail.

These retrofits will not only reduce energy consumption, but also increase power quality and consistency throughout the campus.



Transformer Inventory

#	ID TAG #	Bldg.	Make: Model #	kVA	Location	E-Star Rated (Y/N)
1	40T-ZH	Hospital	Square D: 150T3H	150.0	Hospital	N
2		Rhino Barn	GE: 9723 L 1572	30.0	Rhino Barn	N
3		Tropical Treasure Shack	GE: 9T2383072	30.0	Tropical Treasure Shack	N
4	49T-OU	Orangutan		75.0	Orangutan	N
5	17T-CS	Safari Café	Square D: 112T3H	112.5	Safari Café	N
6		Stingray	MGM: HT150A3B2SH	112.5	Stingray	N
7	41T-RU	Rainforest Restroom	GE	75.0	Rainforest Restroom	N
8	3T-MS	Maintenance	Siemens	50.0	Maintenance	N
9	TA	Lodge	GE	225.0	Lodge	N
10		Admin	GE	112.5	Admin	N
11		Bird Show	Siemens:1D1Y075	75.0	Bird Show	N
12	ZM5TH-BS	Bird Show	Squaare D: 75T3H	75.0	Bird Show	N
13	20TH-RH	Reptile Hjouse	Sorgel	225.0	Reptile House	N
14		Front Restrooms	Square D:	75.0	Front Restrooms	N

Project Overview – Phase 1

Fiscal Overview

Estimated Project Amount
\$1,383,565

Estimated Project Net Savings
\$ 3,038,450

Estimated 1st Year Net Savings
\$137,128

Scope Overview

- LED Lighting Upgrades — Campus Wide
- HVAC Upgrades — Campus Wide
- Controls Upgrades — Campus Wide
- Transformer Upgrades — Campus Wide

*Project cost and savings values are estimations and will be finalized and presented to staff following the approval of the scope specifications



www.absenergy.com



Cash Flow - Cash Purchase Option
 Fresno Zoo

	Year 0 2022	Year 1 2023	Year 2 2024	Year 3 2025	Year 4 2026	Year 5 2027	Year 6 2028	Year 7 2029	Year 8 2030	Year 9 2031	Year 10 2032	Year 11 2033	Year 12 2034	Year 13 2035	Year 14 2036	Year 15 2037	Years 16 to 20 2038 to 2042	Years 21 to 25 2043 to 2047	Years 26 to 30 2048 to 2052	Totals
Energy Efficiency Savings	\$16,343	\$81,713	\$84,982	\$88,381	\$91,916	\$95,593	\$99,416	\$103,393	\$107,529	\$111,830	\$116,303	\$120,955	\$125,793	\$130,825	\$136,058	\$141,500	\$206,140	\$250,801	\$305,137	\$2,414,608
O&M Savings		\$41,507	\$42,337	\$43,184	\$44,048	\$44,928	\$35,943	\$28,754	\$23,003	\$18,403	\$14,722	\$10,306	\$7,214	\$5,050	\$3,535	\$2,474	\$0	\$0	\$0	\$365,407
Capital Offset		\$13,908	\$13,908	\$13,908	\$13,908	\$13,908	\$12,094	\$12,094	\$12,094	\$12,094	\$12,094	\$11,382	\$11,382	\$11,382	\$11,382	\$11,382	\$56,910	\$14,605	\$0	\$258,435
Total Program Savings	\$16,343	\$137,128	\$141,227	\$145,473	\$149,872	\$154,429	\$147,453	\$144,241	\$142,626	\$142,327	\$143,119	\$142,643	\$144,389	\$147,257	\$150,975	\$155,357	\$263,050	\$265,406	\$305,137	\$3,038,450
Energy Efficiency Project Amount -																				
Total Program Payments	\$1,383,565	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,383,565
Net Annual Cash Flow	(\$1,367,222)	\$137,128	\$141,227	\$145,473	\$149,872	\$154,429	\$147,453	\$144,241	\$142,626	\$142,327	\$143,119	\$142,643	\$144,389	\$147,257	\$150,975	\$155,357	\$263,050	\$265,406	\$305,137	\$1,654,885
Net Cumulative Cash Flow	(\$1,367,222)	(\$1,230,094)	(\$1,088,868)	(\$943,395)	(\$793,524)	(\$639,095)	(\$491,641)	(\$347,400)	(\$204,774)	(\$62,448)	\$80,672	\$223,314	\$367,704	\$514,960	\$665,935	\$821,292	\$1,084,342	\$1,349,748	\$1,654,885	

*INSTALLATION AGREEMENT
FOR
FRESNO'S CHAFFEE ZOO CORPORATION*

TERMS AND CONDITIONS

ATTACHMENTS:

- Attachment A – Scope of Work
- Attachment B – Lighting Systems
- Attachment C – HVAC Systems
- Attachment D – Control Systems
- Attachment E – Electrical Systems

ALLIANCE INSTALLATION AGREEMENT

This Installation Agreement ("Agreement") dated ____/____/____ ("Effective Date") is made by and between:

Fresno's Chaffee Zoo Corporation ("Purchaser") with its principal place of business at:

Fresno's Chaffee Zoo Corporation
("Purchaser") with its principal place of business at
894 West Belmont Avenue, Fresno, CA 93728

and

Alliance Building Solutions, Inc.
("ABS") with its principal place of business at
12520 High Bluff Drive, Ste 345, San Diego, CA 92130

"Purchaser" and "ABS" agree as follows:

- 1. SCOPE OF WORK.** "ABS" shall provide "Purchaser" with and Energy Efficiency and/or Renewable Program, as identified in the following Attachment's and incorporated herein by reference (hereinafter referred to as the "Work") at the total fixed price of **\$1,383,565.00** including required taxes and Performance Bond (the "Contract Amount").

"ABS" is responsible for the design, engineering, permits, fees, approvals, project management, installation, startup, training, checkout, warranty, and insurance specifically associated with the Work to be performed. "ABS" is not responsible for any balancing, duct cleaning, equipment, systems, controls, comfort problems, etc. not specifically included in the Agreement. "ABS" will provide submittals and engineering drawings (if required), for "Purchaser's" technical review and written approval, prior to initiating construction. All construction and associated cleanup shall be performed and scheduled so as to minimize any disruption with any ongoing "Purchaser" activities. "ABS" requires all underground conduits between building to be clear of obstruction, of sufficient size to accommodate new wire and cable, and easily accessible. The "Purchaser" is responsible for Ethernet drops and WiFi access at each location for Energy Management Systems communication. The proposal offer is valid for 90 days from the date of this agreement.

Beyond the proposal validity date, "ABS" reserves the right to revise any or all portions of the agreement. This agreement is based upon the use of straight time labor only unless stated otherwise in this agreement. "Purchaser" agrees to provide "ABS" with required field utilities (electricity, toilets, drinking water, etc.) without charge. "ABS" agrees to keep the jobsite clean of debris arising out of its own operations. "Purchaser" shall not back charge "ABS" for any cost or expenses without written consent from "ABS". Unless specifically noted in the statement of the scope of the work or services undertaken by "ABS" under this agreement, "ABS" obligations under this agreement expressly exclude any work or service of any nature associated or connected with the identification, abatement, cleanup, control, removal or disposal of environment hazards or dangerous substances, to include not to be limited to asbestos, PCBs, or mold discovered in or on the premises. Any language or provision of the agreement elsewhere contained which may authorize or empower the "Purchaser" to change, modify or alter the scope of work or services to be performed by "ABS" shall not operate to compel "ABS" to perform any work related to hazards without "ABS" express written consent.

2. **INVOICING AND PAYMENTS.** "ABS" will invoice the "Purchaser" for mobilization, predevelopment, engineering, bonding and insurance upon signing the contract for \$345,891 due within 15 days. "ABS" will submit an SOV for review and approval within 45 days of contract signing for remaining scheduled payments. "Purchaser" agrees to pay "ABS" amounts invoiced 30 days after invoice received per agreed schedule of values (SOV). Waivers of lien will be furnished upon request, as the work progresses; to the extent payments are received. If "ABS" invoices are not paid within 30 days of its issuance, it is considered delinquent and "ABS" may add 1% interest per month, onto delinquent amounts.

The "Purchaser" shall retain an amount equal to 2.5% of each progress payment. All accrued retention shall be payable upon 50% of completion of work. The remainder of retention shall be payable upon completion of the work. For custom orders "ABS" can bill the "Purchaser" up to 50% of the price of the order upon placing the order.

3. **INDEPENDENT CONTRACT.** It is agreed between "Purchaser" and "ABS" that "ABS" shall perform the work as an independent contractor. "ABS" may use subcontractors to perform work hereunder, provided "ABS" shall fully pay said subcontractors and in all instances remain fully responsible for (a) the proper completion of this agreement and (b) supervising such subcontractor's work and for the quality of the work they produce.
4. **MATERIALS.** All materials shall be new, in compliance with all applicable laws and codes, and shall be covered by a manufacturer's warranty, if appropriate. If the materials or equipment included in this agreement become temporarily or permanently unavailable, the time for performance of the work shall be extended to the extent thereof, and case of permanent unavailability, "ABS" shall (a) be excused from furnishing said materials or equipment, and (b) be reimbursed for the difference between the cost of the materials or equipment permanently unavailable and the cost of a reasonable substitute therefore. Final equipment selections shall be coordinated with Purchaser personnel and meet or exceed the performance than the equipment shown in the Attachments.
5. **COMPLETION.** The work specified in Section 1 shall be considered completed upon approval by the "Purchaser", provided that the "Purchaser's" approval shall not be unreasonably withheld.
6. **WARRANTY.** "ABS" warrants that the equipment manufactured by it shall be free from defects in material and workmanship arising from normal usage for a minimum period of one (1) year from delivery of said equipment. "ABS" warrants that for equipment furnished and/or install but NOT manufactured by "ABS", "ABS" will extend the same warranty and terms and conditions, which "ABS" received from manufacturer of said equipment. Within the warranty period, for equipment installed by "ABS", if Purchaser provides written notice to "ABS" of any such defects within thirty (30) days after the appearance or discovery of such defect, "ABS" shall, at its option, repair or replace the defective equipment to "Purchaser". All transportation charges incurred in connection with the warranty for equipment not installed by "ABS" shall be borne by "Purchaser". These warranties do not extend to any equipment which has been repaid by others, abused, altered or misused, or which has not been properly and reasonable maintained. These warranties are in lieu of all other warranties, expressed or implied, including but not limited to those of merchantability and fitness for a specific purpose.
7. **LIABILITY.** "ABS" shall not be liable for any special, indirect, or consequential damages arising in any manner from the equipment or material furnished or the work performed pursuant to this agreement.
8. **TAXES.** The price of this agreement does include duties, sale, use, excise or other similar taxes required by federal, state or local laws in effect at the time of agreement execution.
9. **DELAYS.** "ABS" shall not be liable for any delay in the performance of the work resulting from or attributed to acts of circumstances beyond "ABS" control, including but not limited to acts of God, riots, labor disputes, conditions of the premises, acts or omissions of the "Purchaser", or other contractors or delays caused by suppliers, or subcontractors of "ABS", etc. If "Purchaser" delays project for greater than 60 days, "ABS" can recover any cost inflation on unbilled materials that were either stored or yet to be purchased.

- 10. REBATES, UTILITY INCENTIVES, AND GRANTS.** Unless otherwise stated in the project scope-of-work, or cash flow analysis, any and all rebates, incentives, grants that are earned through the course of this project from public or private utilities, municipalities, development districts or state funding are 100% the property of "ABS" or their designee. The paperwork, inspections and verification required to collect these monies are the sole responsibility of "ABS". The customer agrees to assist "ABS" where required by the jurisdiction in the form of data required for the application and authorizing signatures. In the event the Customer incurs expenses related to the processing of the applications, "ABS" shall reimburse these direct costs.
- 11. CHANGE ORDER (Mid-Performance Amendments).** "ABS" and the "Purchaser" recognize that:
- "Purchaser" may desire a mid-job change in the specifications or scope that would add time and cost to the specified work or inconvenience "ABS".
 - "Purchaser" agrees to any price increases due to Covid-19 related supply chain and inflation issues. "ABS" will provide "Purchaser" with the necessary documentation demonstrating the price increases. Any price increases to this agreement shall be put in writing, signed by both parties and added to this agreement.
 - Other provisions of the agreement may be difficult to carry out because of unforeseen events, such as material shortage or labor strikes. If these are other events beyond the control of the parties reasonably required adjustments to this agreement, the parties shall make a good faith attempt to agree on all necessary particulars. Such agreements shall be put in writing, signed by the parties and added to this agreement. Failure to reach agreement shall be deemed a dispute to be resolved as agreed in section 17 of this agreement.
- 12. TAX DEDUCTIONS.** Unless otherwise stated in the contract, all eligible tax deductions associated with the work, that "Purchaser" is not eligible for, are agreed to be 100% the property of "ABS" or their designee. The paperwork, inspections and verification required to collect these incentives are the sole responsibility of "ABS". In the event the customer incurs expenses related to the processing of the applications, "ABS" shall reimburse these direct costs.
- 13. COMPLIANCE WITH LAWS.** "ABS" shall comply with all applicable Federal, State and local laws and regulations. All licenses and permits required for the prosecution of the work shall be obtained and paid for by "ABS".
- 14. INSURANCE.** "ABS" will maintain comprehensive liability and other insurance in the amount not less than those set forth below.
- General Liability Insurance. A policy of commercial general liability insurance, written on an "occurrence" basis, providing coverage with not less than \$1,000,000 per occurrence for bodily injury, personal injury & property damage and must include a separate endorsement naming the "Purchaser", its elected officials, its officers, agents and employees as additional insurance ("General Liability Policy"). The General Liability Policy shall include coverage for the contractual liability assumed by the ABS pursuant to this Agreement.
 - Vehicle Liability Insurance. A policy of business vehicle liability insurance, written on an "occurrence" basis, with a combined single limit of not less than \$1,000,000 per accident for bodily injury and property damage ("vehicle Liability Policy"). The vehicle Liability Policy shall include coverage for owned, hired, and non-owned automobiles.
 - Worker's Compensation Insurance. Worker's compensation insurance as required by State law and employer's liability insurance with coverage in an amount not less than \$1,000,000. Notwithstanding the insurer rating standards set forth in this Agreement, coverage provided by the State Compensation Insurance Fund shall be deemed, with respect to the workers' compensation insurance, to satisfy such insurer rating standards.

- d. Professional Liability Insurance. Professional liability insurance with coverage in an amount of not less than \$1,000,000 (Professional Liability Policy”), which the “Purchaser” acknowledges shall be written on a “claims made” basis.
- e. Duration of Insurance. Except as provided in this Agreement with respect to insurance written on a “claims made” basis, the ABS shall maintain the insurance required pursuant to this Agreement in effect at least until the date that is one year following final payment to the ABS pursuant to this Agreement.
- f. Professional Liability Insurance. The Professional Liability Policy shall provide coverage for claims arising out of the performance of the Scope of Services pursuant to this Agreement. If an aggregate limit applies, such aggregate limit in the Professional Liability Policy shall not be less than \$2,000,000. Prior to commencing the Scope of Services, and, if applicable, upon replacing the original Professional Liability Policy, the ABS shall provide the “Purchaser” a copy of any and all applicable claims-reporting requirements. Notwithstanding anything to the contrary; (i) the ABS shall have the Professional Liability Policy, as described herein, in full force and effect prior to commencing the Scope of Services; (ii) each renewal or replacement of the Professional Liability Policy shall have a retroactive date that is prior to the date the ABS commenced the Scope of Services; and (iii) as a condition to final payment to the ABS pursuant to this Agreement. If the claims reporting period applicable to the scope of Services, as specified in or determined pursuant to the Professional Liability Policy for the Scope of Services, will Terminate prior to the end of the two-year period following final payment to the ABS pursuant to this Agreement, then the ABS, as its cost, shall obtain and provide satisfactory evidence to the “Purchaser’s” of: (i) an endorsement to extend the claims reporting period to include whatever will remain of such two-year period; or (ii) a supplemental extended reporting period (tail) applicable to the Professional Liability Policy as required to provide coverage until the end of such two-year period. Such tail coverage shall be required, for example; (i) if the ABS intends to switch insurance carriers and the prospective new carrier will not agree to cover claims arising from the Scope of Services submitted at any time prior to the end of the two-year period following final payment to the ABS pursuant to this Agreement; (ii) if the ABSs business is to be wound-up or otherwise terminated, whether voluntarily or Involuntarily; or (iii) when necessary for any other reason to ensure that professional liability insurance applicable to the Scope of Services is in effect at all times required by this Agreement.
- g. Additional Insured’s. The “Purchaser”, its elected officials, officers, employees, and agents shall all be named as additional insured, to the extent of the ABSs’ acts and omissions in connection with this Agreement, on all insurance that the consultant is to have in effect pursuant to this agreement, excepting the workers’ compensation insurance and the Professional Liability Policy. For purposes of this Section, The “Purchaser” architect shall not be deemed or construed to be an agent of the “Purchaser”
- h. Waiver of Subrogation. ABS hereby waives, on behalf of its insurers, any and all rights to subrogation that any such insurer may acquire by virtue of the payment of any loss. Each of the General Liability Policy and The Vehicle Liability Policy shall be endorsed with a cross-liability endorsement and a waiver of the insurer’s rights of subrogation against the “Purchaser”. The policy of worker’s compensation insurance shall be endorsed with a waiver of the insurer’s rights of subrogation.
- i. ABSs Insurance is Primary. To the extent permitted by law, insurance policies required by this Agreement to be maintained by the consultant shall be primary and non-contributing with respect to any insurance or self-insurance programs covering the “Purchaser” or “Purchaser’s” Council members thereof, or the “Purchaser’s” other officers, employees or agents. The General Liability Policy and the Vehicle Liability Policy shall be endorsed to provide that they are so primary and non-contributory.
- j. Evidence of Coverage. Prior to commencing the Scope of Services, the ABS shall provide to the “Purchaser” or “Purchaser” such duly-authorized and executed certificates of insurance evidencing that the insurance

policies to be maintained by the ABS pursuant to this Agreement are in effect (each a “certificate of Insurance”), together with a copy of each endorsement to such insurance as is required pursuant to this Agreement. The delivery of such Certificates of Insurance and endorsements shall be a condition precedent to the ABS commencing any of the Scope of Services. As applicable, the Certificate of Insurance shall identify those who are additional insured’s in accordance with this Agreement. Not less than Thirty days prior to the expiration of any insurance policy that the ABS is required to maintain pursuant to this Agreement, the ABS shall provide updated Certificates of Insurance to the “Purchaser” evidencing the renewal of such policy.

- k. Notice of Changes in Policies. Each certificate of Insurance and corresponding policy of insurance required pursuant to this Agreement shall expressly require, or be endorsed to require, that the insurer notify the “Purchaser” not less than thirty days prior to any cancellation, termination, reduction in coverage, or expiration without renewal of any such insurance policy, except for cancellation due to non-payment of premium, in which case the insurer shall provide such notice not less than ten days prior to cancellation. Language in any Certificate of Insurance or policy of insurance to the effect that the insurer shall “endeavor” to provide such notice shall not be acceptable.

- 15. BONDING.** Bonds are subject to the procurement and installation portion of the contract. Payment and Performance Bonds are required 10 days prior to start of procurement or installation.
- 16. INDEMNITY.** The Parties hereto agree to defend, indemnify, and hold harmless the other Party, its employees, agents, officials, officers and directors from any and all liabilities, claims, expenses, losses or damages, including attorney’s fees which may arise in connection with the work herein specified and which are caused in whole or in part by the negligent act or omission of the indemnifying Party. To the extent it may lawfully do so, the Parties hereby indemnify, defend (with counsel of its choosing), and hold harmless the other party and its affiliates, directors, representatives, agents, officers, employees and volunteers from and against any and all liability or claim of liability, loss or expense, including defense costs and legal fees and claims for damages of whatsoever character, nature and kind, whether directly or indirectly arising from any third party actions from injury to or death of persons, and damage to or loss of property to the extent caused by or arising out of the connected with an act or omission of the indemnifying party, or an agent, invitee, guest, employee, or anyone in, on or about the “Purchaser” sites, including, but not limited to, liability, expense, and claims for: bodily injury, death, personal injury, or property damage caused by negligence, creation or maintenance of a dangerous condition of property, breach of express or implied warranty of product, defectiveness of product, or intentional infliction of harm, including any workers’ compensation suits, liability, or expense, arising from or connected with services performed by, or on behalf of the indemnifying party, by any person pursuant to this Agreement; nonpayment for labor materials, appliances, teams or power, performed on, or furnished or contributed to the “Purchaser” sites. Notwithstanding the above, neither party shall be required to defend, indemnify and hold harmless the other for its own negligent acts and omissions or willful misconduct. It is the intent of the Parties that where negligence is determined to have been joint or contributory, principles of comparative negligence will be followed, and each Party shall bear the proportionate cost of any loss damage, expense or liability attributable to that Party’s negligence.
- 17. DISPUTES.** Written notice of any dispute must be provided to the other party, describing specific details of the dispute relating to changes in work or claim for additional compensation, within seven (7) days of the occurrence of the conditions. This notice must be provided via certified mail. For a reasonable period commencing on the day written notice of dispute was provided, but not to exceed thirty (30) days, the parties shall in good faith attempt to resolve the dispute. If the parties are unable to resolve the dispute during this period, the parties shall proceed to binding arbitration. The arbitrator shall be neutral and mutually acceptable; the arbitrator shall determine all rights and obligations under this agreement and the award of the arbitrator shall be final, binding and enforceable. Any award issued pursuant to this provision may be enforced in a court of competent jurisdiction, and each party hereby consents to that jurisdiction. All venues for arbitration shall be in the locality in which the project is located.
- 18. OCCUPATIONAL SAFETY AND HEALTH.** The parties hereto agree to notify each other immediately upon becoming aware of any alleged violation of, the Occupational Safety and Health Act (OSHA) relating in any way to the project or project site.

- 19. ENTIRE AGREEMENT.** This agreement, upon acceptance, shall constitute the entire agreement between the parties and supersedes any prior representations or understandings.
- 20. CHANGES.** No change or modification of any of the terms and conditions stated herein shall be binding upon “ABS” unless accepted by “ABS” in writing.
- 21. SEVERABILITY.** If one or more of the provisions of this agreement are held to be unenforceable under laws, such provision(s) shall be excluded from these terms and conditions and the remaining terms and conditions shall be interpreted as if such provisions were so excluded and shall be enforced in accordance to their terms and conditions.
- 22. COUNTERPARTS.** This agreement may be executed in multiple counterparts, each of which shall be deemed an original and all of which together shall constitute one and the same instrument. A signature on a copy of this agreement received by either party by facsimile or portable document format (PDF) is binding upon the other party as an original. The parties shall treat a photocopy of such facsimile as a duplicate original.
- 23. ASSIGNMENT.** “ABS” retains the right to assign its rights and obligations of this agreement with written consent of “Purchaser”.
- 24. ACKNOWLEDGMENT.** Both “ABS” and the “Purchaser” acknowledge having read this agreement and all contract documents incorporated herein and have executed this agreement on the date written above.
- 25. APPROVAL.** Each party represents that the person that has executed this agreement on its behalf is authorized to do so.

IN WITNESS WHEREOF, the parties have caused their duly authorized officers to execute this Agreement effective as of the date first above written.

Fresno’s Chaffee Zoo Corporation

Signature

Title

Date

Alliance Building Solutions, Inc.

Signature

Title



Date

Attachment A – Scope of Work




Fresno's Chaffee Zoo Corporation

Fresno's Chaffee Zoo Corporation


Lighting Systems


-  Replace identified existing interior fluorescent and/or incandescent lighting systems with high efficiency light emitting diode (LED) systems. Installation includes disposal of existing lighting systems and installation of new equipment. Refer to the Lighting Systems Attachment for identified fixtures, specific quantities, and locations.
-  Replace identified existing exterior high intensity discharge (HID) and/or fluorescent lighting systems with high efficiency light emitting diode (LED) systems. Installation includes disposal of existing lighting systems and installation of new equipment. Refer to the Lighting Systems Attachment for identified fixtures, specific quantities, and locations.

HVAC Systems


-  Replace select HVAC units with new high efficiency units of similar size, type and capacity. Replacement will include demolition of existing equipment and turn-key installation of new equipment with start-up / testing of the new installation. Refer to the HVAC Systems Attachment for specific equipment information, locations, and capacities.
-  The new like-sized condensing unit providing cooling for the Stingray Exhibit will be moved a short distance from the existing unit location to reduce the exposure from the saltwater spray from the exhibit. The new unit will be located on a new pad with electrical and the refrigeration line set being run to the new location.
-  The new HVAC unit serving the Sea Lion Exhibit will be increased from a 3-ton to a 4-ton capacity to allow for the areas to be properly cooled.

Control Systems

-  Install new wi-fi programmable smart networked thermostats (Pelican Thermostats) to control the HVAC equipment. The new system will be a networked system with a single point of access to adjust equipment schedules and space temperature setpoints. Heating and cooling setpoints will be adjustable by the user within a preprogrammed amount during occupied times. The system will follow a revised, efficient sequence of operations to ensure optimal equipment performance, efficient energy use, and occupant comfort. Refer to the Control Systems Attachment for specific equipment information, locations, and schedule of operations. This measure does not affect the HVAC controls serving the animal enclosure areas of the park.

-  Program the radiant heaters sequence of operation for identified enclosures to operate efficiently. Refer to the Control Systems Attachment for specific equipment information.

Electrical Systems

-  Replace select dry-type electrical transformers with new ultra-efficient K-rated units of similar size and capacity. Replacement will include demolition of existing equipment and turn-key installation of new equipment with start-up and testing of the new installation. Refer to the Electrical Systems Attachment for specific equipment information and sizes.

Scope of Work Exclusions:

1. Includes the recovery and disposal of removed units as per EPA guidelines.
2. Excludes temporary HVAC (cooling or heating) during construction.
3. Excludes air balancing of the existing ductwork.
4. Excludes identification and removal of any hazardous material (such as lead, mold and asbestos).
5. Excludes any specialty smoke detectors, fire alarm work or testing.
6. Excludes any existing electrical issues of power wiring.
7. Excludes any structural penetrations or reinforcement or engineering.
8. Excludes permit, plan check and utility fees.
9. Excludes concrete work of any kind.
10. Excludes modifications and upgrading of existing systems to current codes.
11. Excludes LEED Design, evaluation, calculations or consulting on LEED documentation.
12. Excludes structural engineering, calculations or modifications of any kind.
13. Assumes everything is up to code.
14. Excludes any unforeseen conditions.



Attachment B

Lighting Systems

Detailed Lighting Inventory - Fresno Chaffee Zoo

General Information			Existing Fixture Data						Proposed Fixture Data				
Line	Measure Type	Space Description	Qty	Control	Fixture Description	Lamp Description	Lamp Type	Fixture Watts	Qty	Item Number	Description	Lamp Type	Fixture Watts
1	Warehouse	Maintenance: Supply	2	M	Rec. Can 6" Open	(1) 7W LED [LED 7W]	LED	7		-- No Change --	-- No Change --		
2	Office - Open	Cheetah: Office	1	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
3	Office - Open	Giraffe: Office	1	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
4	Office - Open	Giraffe: Food	2	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
5	Office - Open	Ungulate: Kitchen	1	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
6	Office - Open	Elephant: Holding	2	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
7	Office - Open	Lion: Office	2	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
8	Dining	The Lodge: Main Indoor Cafeteria	51	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
9	Office - Open	The Lodge: Office	1	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
10	Classroom	Education Center: Classroom	18	M	Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
11	Restroom	Hospital: RR	2	M	Recessed 1'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
12	Dining	Café: Kitchen	2	M	Recessed Troffer 2'x2'	(1) 20W LED [LED 20W]	LED	20		-- No Change --	-- No Change --		
13	Office - Open	Hospital: Halls	9	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
14	Low-Use (Storage, etc.)	Hospital: Lab/Test	2	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
15	Low-Use (Storage, etc.)	Hospital: Pharmacy	1	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
16	Hospital Room	Hospital: Quarantine	2	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
17	Hospital Room	Hospital: Quarantine 1	3	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
18	Hospital Room	Hospital: X Ray	4	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
19	Hospital Room	Hospital: OR	6	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
20	Hospital Room	Hospital: Vet Office	6	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
21	Dining	Café: Kitchen	6	M	Recessed Troffer 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
22	Classroom	The Lodge: Simba Classroom	4	M	Rec. Can	(1) 15W LED [LED 15W]	LED	15		-- No Change --	-- No Change --		
23	Dining	Ungulate: Kitchen	1	M	SM	(1) 10W LED [LED 10W]	LED	10		-- No Change --	-- No Change --		
24	Office - Open	Elephant: Holding	4	M	SM	(1) 10W LED [LED 10W]	LED	10		-- No Change --	-- No Change --		
25	All Day (24/7)	Twiga Terrace: Stairs	1	M	SM	(1) 10W LED [LED 10W]	LED	10		-- No Change --	-- No Change --		
26	Dining	The Lodge: Outdoor Canopy Eating	8	M	SM	(1) 10W LED [LED 10W]	LED	10		-- No Change --	-- No Change --		
27	Office - Open	Rhino Barn: Holding	8	M	SM	(1) 10W LED [LED 10W]	LED	10		-- No Change --	-- No Change --		
28	Hospital Room	Hospital: Holding Area	8	M	SM 1'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
29	Hospital Room	Hospital: Quarantine area	1	M	SM 1'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
30	Hospital Room	Hospital: Quarantine	5	M	SM 1'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
31	Office - Open	Rhino Barn: Holding	3	M	SM 1'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
32	Dining	Café:	2	M	SM 1'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
33	Office - Open	Security: Office	4	M	SM 2'x4'	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
34	All Day (24/7)	Sea Lion Cove: Pump Room	8	M	SM Wallpacks	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
35	All Day (24/7)	Wilderness Falls: Pump Room	6	M	Strip	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
36	Office - Open	Orangutan Building:	9	M	Strip	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
37	Office - Open	Cheetah: Office	1	M	Strip Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
38	Office - Open	Rhino: Halls	3	M	Strip Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
39	Office - Open	Warthog: Holding	9	M	Strip Pendant	(1) 30W LED [LED 30W]	LED	30		-- No Change --	-- No Change --		
40	Restroom	Maintenance: Restroom	4	M	Surface Mount	(1) 13W CFL [Spiral-sm, E26] - a	CFL	13	4		(1) 5-Watt LED A Lamp	LED	5
41	Low-Use (Storage, etc.)	Giraffe: Electric	1	M	Surface Mount	(1) 13W CFL [Spiral-sm, E26] - a	CFL	13	1		(1) 5-Watt LED A Lamp	LED	5
42	Dining	The Lodge: Walk-in Freezer	1	M	Surface Mount	(1) 13W CFL [Spiral-sm, E26] - a	CFL	13	1		(1) 5-Watt LED A Lamp	LED	5
43	Dining	The Lodge: Walkin Fridge	2	M	Surface Mount	(1) 13W CFL [Spiral-sm, E26] - a	CFL	13	2		(1) 5-Watt LED A Lamp	LED	5
44	Restroom	Security: Restroom	1	M	Surface Mount	(1) 13W CFL [Spiral-sm, E26] - a	CFL	13	1		(1) 5-Watt LED A Lamp	LED	5
45	Office - Open	Maintenance: Supply	4	M	Can Recessed 6"	(1) 23W CFL [Spiral-med, E26] - d	CFL	23	4		(1) 7-Watt LED A Lamp	LED	7

Detailed Lighting Inventory - Fresno Chaffee Zoo (continued)

General Information			Existing Fixture Data						Proposed Fixture Data				
Line	Measure Type	Space Description	Qty	Control	Fixture Description	Lamp Description	Lamp Type	Fixture Watts	Qty	Item Number	Description	Lamp Type	Fixture Watts
46	Office - Open	Marketing Trailer: Hallway	5	M	Can Recessed 6"	(1) 23W CFL [Spiral-med, E26] - d	CFL	23	5		(1) 7-Watt LED A Lamp	LED	7
47	Retail	Gift Shop: Main Store	8	M	Pendant	(1) 23W CFL [Spiral-med, E26] - b	CFL	23	8		(1) 7-Watt LED A Lamp	LED	7
48	Hospital Room	Hospital: Dark Room	2	M	Surface Mount	(1) 23W CFL [Spiral-med, E26] - f	CFL	23	2		(1) 7-Watt LED A Lamp	LED	7
49	Hospital Room	Hospital: Holding Area	3	M	Surface Mount	(1) 23W CFL [Spiral-med, E26] - f	CFL	23	3		(1) 7-Watt LED A Lamp	LED	7
50	Hospital Room	Hospital: Quarantine	3	M	Surface Mount	(1) 23W CFL [Spiral-med, E26] - f	CFL	23	3		(1) 7-Watt LED A Lamp	LED	7
51	Retail	Gift Shop: Main Store	3	M	Pendant	(1) 48.3W CFL [3U (PLT), 4-Pin (2x2)] - a	CFL	48.3	3		(1) 12-Watt LED 4-Pin Lamp	LED	12
52	Low-Use (Storage, etc.)	Twiga Restroom: Utility	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
53	All Day (24/7)	Twiga Terrace: Tunnel	3	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	3		(1) 9-Watt LED 4-Pin Lamp	LED	9
54	Low-Use (Storage, etc.)	Twiga Terrace: Transformer	2	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	2		(1) 9-Watt LED 4-Pin Lamp	LED	9
55	Restroom	Temba Restroom: Restroom	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
56	Low-Use (Storage, etc.)	Jambu Hut: Hut	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
57	Dining	The Lodge: WH Room	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
58	Restroom	The Lodge: RR Kitchen	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
59	Dining	The Lodge: Dry Storage	2	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	2		(1) 9-Watt LED 4-Pin Lamp	LED	9
60	Dining	The Lodge: Dishes	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
61	Low-Use (Storage, etc.)	The Lodge: Roof Access	2	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	2		(1) 9-Watt LED 4-Pin Lamp	LED	9
62	Low-Use (Storage, etc.)	The Lodge: Server Rm	1	M	Surface Mount	(1) 24W CFL [3U (PLT), 4-Pin (2x2)]	CFL	24	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
63	Office - Open	Elephant: Fridge Room	2	M	Surface Mount	(1) 33W CFL [3U (PLT), 4-Pin (2x2)]	CFL	33	2		(1) 12-Watt LED 4-Pin Lamp	LED	12
64	Office - Open	Elephant: Tools	2	M	Surface Mount	(1) 33W CFL [3U (PLT), 4-Pin (2x2)]	CFL	33	2		(1) 12-Watt LED 4-Pin Lamp	LED	12
65	Office - Open	Giraffe: Locker	1	M	Surface Mount	(1) 27W CFL [2U (PLC), 4-Pin (2x2)]	CFL	27	1		(1) 9-Watt LED 4-Pin Lamp	LED	9
66	Restroom	Rainforest Restroom: Mens	3	M	Vanity	(1) 31W T8 [4 ft] - a	T8	31	3	Espen- L48T8/840/12G-EB	(1) 4ft LED Tube	LED	12
67	Restroom	Rainforest Restroom: Womens	3	M	Vanity	(1) 31W T8 [4 ft] - a	T8	31	3	Espen- L48T8/840/12G-EB	(1) 4ft LED Tube	LED	12
68	Low-Use (Storage, etc.)	Education Center: Hallway Uplights	2	M	Surface Mount 1'x4'	(1) 31W T8 [4 ft] - b	T8	31	2	Espen- L48T8/840/12G-EB	(1) 4ft LED Tube	LED	12
69	Low-Use (Storage, etc.)	SSA: Warehouse	21	M	Pendant 2'x4'	(2) 31W T8 [4 ft] - a	T8	62	21	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
70	Office - Open	Sea Lion Cove: Kitchen	4	M	Pendant & Surface Wrap	(2) 31W T8 [4 ft] - b	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
71	Office - Open	Maintenance: Locker Room	10	M	Recessed Troffer 1'x4'	(2) 31W T8 [4 ft] - c	T8	62	10	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
72	Dining	The Lodge: Exhaust Hood	2	M	Recessed Troffer 1'x4'	(2) 31W T8 [4 ft] - c	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
73	Retail	Gift Shop: Under Display	15	M	Recessed Troffer 1'x4'	(2) 31W T8 [4 ft] - c	T8	62	15	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
74	Hospital Room	Hospital: Treatment Room	2	M	Recessed Troffer 1'x4'	(2) 31W T8 [4 ft] - c	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
75	Office - Open	Sea Lion Cove: Kitchen	2	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
76	Office - Private	Marketing Trailer: Liz Office	2	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
77	Office - Private	Marketing Trailer: Ian Office	3	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
78	Office - Private	Marketing Trailer: Jennifer	2	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
79	Office - Private	Marketing Trailer: Heather	3	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
80	Office - Private	Marketing Trailer: Luis	3	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
81	Office - Private	Marketing Trailer: Assistant	4	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
82	Office - Private	Marketing Trailer: Katryn	3	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
83	Office - Private	Marketing Trailer: Front Office	2	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
84	Classroom	Annex Class Room: Classroom	11	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	11	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
85	Classroom	Annex Class Room: Class 2	13	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	13	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
86	Office - Open	Bird Show Trailer: Holding	4	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
87	Office - Open	Bird Show Trailer: Birdgs Cages	8	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	8	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
88	Restroom	Bird Show Trailer: RR	1	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
89	Office - Open	Bird Show Trailer: Office 2	1	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
90	Office - Open	Gift Shop: Employee Office	2	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24

Detailed Lighting Inventory - Fresno Chaffee Zoo (continued)

General Information			Existing Fixture Data						Proposed Fixture Data				
Line	Measure Type	Space Description	Qty	Control	Fixture Description	Lamp Description	Lamp Type	Fixture Watts	Qty	Item Number	Description	Lamp Type	Fixture Watts
91	Office - Open	Gift Shop: Store Ticket Booth	1	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
92	Hospital Room	Hospital: Treatment Room	11	M	Recessed Troffer 2'x4'	(2) 31W T8 [4 ft] - d	T8	62	11	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
93	Low-Use (Storage, etc.)	Rainforest Restroom: Electric	4	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
94	Office - Open	Cheetah: Holding	3	C	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
95	Low-Use (Storage, etc.)	Cheetah: Electrical	3	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
96	Office - Open	Mahali LSS: Mahali LSS	3	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
97	Low-Use (Storage, etc.)	Elephant LSS: Electric	1	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
98	Office - Open	Elephant LSS: Pump Room	10	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	10	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
99	Low-Use (Storage, etc.)	Lion Viewing: Server	1	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
100	Retail	The Lodge: Lodge Gift Shop	2	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
101	Low-Use (Storage, etc.)	The Lodge: Lodge Gift Shop IT	2	C	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
102	Restroom	Education Center: Mens RR	2	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
103	Restroom	Education Center: Womens RR	2	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
104	Office - Private	Education Center: Office 2	9	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	9	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
105	Office - Open	Ticketing: Ticketing	4	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
106	Office - Open	Gift Shop: Employee	8	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	8	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
107	Restroom	Wilderness Falls Restroom: Mens	7	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	7	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
108	Restroom	Wilderness Falls Restroom: Womens	7	M	Surface Mount	(2) 31W T8 [4 ft] - e	T8	62	7	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
109	Low-Use (Storage, etc.)	SSA: Warehouse	3	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
110	Low-Use (Storage, etc.)	Ungulate: Electric	1	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
111	Classroom	Education Center: Room 1	6	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	6	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
112	Classroom	Education Center: Room 2	3	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
113	Office - Private	Education Center: Office	2	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
114	Office - Open	Education Center: Main Office	23	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	23	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
115	Office - Open	Education Center: Library	10	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	10	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
116	Office - Private	Education Center: Dean's Office	2	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
117	Classroom	Education Center: Program Animals	12	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	12	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
118	Office - Open	Marketing Trailer: Copy Rm	2	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
119	Restroom	Marketing Trailer: RR	3	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
120	Restroom	Annex Class Room: RR	1	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
121	Restroom	Annex Class Room: RR 2	1	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
122	Low-Use (Storage, etc.)	Restroom by Entrance: Closet	1	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
123	Restroom	Restroom by Entrance: Mens	4	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
124	Restroom	Restroom by Entrance: Womens	5	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	5	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
125	Office - Open	Babaroosa Building:	3	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
126	Office - Open	Rhino Barn: Entry room	7	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	7	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
127	Low-Use (Storage, etc.)	Rhino Barn: Pump Room	2	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
128	Low-Use (Storage, etc.)	Tropical Treasure: Pump Room	2	M	Surface Mount 1'x4'	(2) 31W T8 [4 ft] - f	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
129	Low-Use (Storage, etc.)	Security: Vault Room	2	M	Surface Mount 2'x4'	(2) 31W T8 [4 ft] - g	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
130	Office - Open	Events Warehouse: Warehouse	40	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	40	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
131	Low-Use (Storage, etc.)	SSA: Custodial Supply	6	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	6	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
132	Low-Use (Storage, etc.)	SSA: City Yard	22	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	22	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
133	Classroom	The Lodge: Simba Classroom	20	C	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	20	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
134	Low-Use (Storage, etc.)	The Lodge: Simba Mech Closet	1	C	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
135	Low-Use (Storage, etc.)	The Lodge: Simba Storage	1	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26

Detailed Lighting Inventory - Fresno Chaffee Zoo (continued)

General Information			Existing Fixture Data						Proposed Fixture Data				
Line	Measure Type	Space Description	Qty	Control	Fixture Description	Lamp Description	Lamp Type	Fixture Watts	Qty	Item Number	Description	Lamp Type	Fixture Watts
136	Classroom	Education Center: Under Cabinet	6	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	6	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
137	Office - Open	Education Center: Hallway	2	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
138	Office - Open	Reptile House: Halls Around Exhibit	58	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	58	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
139	Low-Use (Storage, etc.)	Orangutan Building: Electric Room	2	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
140	Low-Use (Storage, etc.)	Orangutan Building: Hydraulic Room	1	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	1	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
141	Office - Open	Café: Office	2	M	Strip 4'	(2) 31W T8 [4 ft] - h	T8	62	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	26
142	Classroom	Annex Class Room: Classroom	1	M	Recessed Troffer 2'x2'	(2) 31W T8 [U-lamp]	T8	59	1	Espen- LB48T8U6/840/13P-AB	(2) 2ft LED U-Bend Tubes	LED	24
143	Classroom	Annex Class Room: Class 2	1	M	Recessed Troffer 2'x2'	(2) 31W T8 [U-lamp]	T8	59	1	Espen- LB48T8U6/840/13P-AB	(2) 2ft LED U-Bend Tubes	LED	24
144	Low-Use (Storage, etc.)	Hospital: Necropsy Room	6	M	Recessed Troffer 2'x4'	(3) 31W T8 [4 ft]	T8	93	6	Espen- L48T8/840/12G-EB	(3) 4ft LED Tubes	LED	36
145	Restroom	Rainforest Restroom: Mens	2	M	Surface Mount 2'x4'	(4) 31W T8 [4 ft] - b	T8	124	2	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
146	Restroom	Rainforest Restroom: Womens	2	M	Surface Mount 2'x4'	(4) 31W T8 [4 ft] - b	T8	124	2	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
147	Dining	The Lodge: Kitchen	9	M	Recessed Troffer 2'x4'	(4) 31W T8 [4 ft] - a	T8	124	9	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
148	Office - Open	Bird Show Trailer: Office	8	M	Recessed Troffer 2'x4'	(4) 31W T8 [4 ft] - a	T8	124	8	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
149	Low-Use (Storage, etc.)	Bird Show Trailer: Storage	2	M	Recessed Troffer 2'x4'	(4) 31W T8 [4 ft] - a	T8	124	2	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
150	Office - Private	Ops Trailer: Office	4	M	Recessed Troffer 2'x4'	(4) 31W T8 [4 ft] - a	T8	124	4	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
151	Office - Private	Ops Trailer: Office 2	2	M	Recessed Troffer 2'x4'	(4) 31W T8 [4 ft] - a	T8	124	2	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
152	Office - Private	Ops Trailer: Office 3	2	M	Recessed Troffer 2'x4'	(4) 31W T8 [4 ft] - a	T8	124	2	Espen- L48T8/840/12G-EB	(4) 4ft LED Tubes	LED	48
153	Office - Open	Admin: Open Office	16	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	16	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
154	Office - Private	Admin: Amos	3	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
155	Office - Private	Admin: Jon Office	3	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
156	Office - Private	Admin: Steven Office	2	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
157	Office - Private	Admin: Conference Room	4	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
158	Office - Private	Admin: Lilly Office	2	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
159	Break Room	Admin: Break Rm	2	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
160	Office - Private	Admin: Office	2	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
161	Office - Private	Admin: Lyn Office	2	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	2	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
162	Office - Private	Admin: Assorted Offices x 3	6	M	Recessed Troffer 2'x4'	(2) 40W T12 [4 ft]	T12	72	6	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
163	Low-Use (Storage, etc.)	Admin: Server Room	1	M	Recessed Troffer 2'x4'	(3) 40W T12 [4 ft]	T12	115	1	Espen- L48T8/840/12G-EB	(3) 4ft LED Tubes	LED	36
164	Low-Use (Storage, etc.)	SSA: Warehouse	5	M	Strip 8'	(2) 75W T12 [8 ft]	T12	150	5	Espen- L96T8/840/24G-EB	(2) 8ft LED Tubes	LED	48
165	Low-Use (Storage, etc.)	SSA: City Yard	1	M	Strip 8'	(2) 75W T12 [8 ft]	T12	150	1	Espen- L96T8/840/24G-EB	(2) 8ft LED Tubes	LED	48
166	All Day (24/7)	Maintenance: Halls	6	M	Rec. 1'x1'	(1) 40W INC [Halogen 40W]	INC	40	6		(1) 5-Watt LED Lamp	LED	10
167	Dining	The Lodge: Concessions	6	M	Pendant	(1) 60W INC [Halogen 50W MR16] - a	INC	60	6		(1) 7-Watt LED MR16 Lamp	LED	7
168	Retail	Gift Shop: Main Store	16	M	Pendant	(1) 60W INC [Halogen 50W MR16] - a	INC	60	16		(1) 7-Watt LED MR16 Lamp	LED	7
169	Dining	The Lodge: Main Indoor Cafeteria	46	M	Recessed Can 3"	(1) 60W INC [Halogen 50W MR16] - b	INC	60	46		(1) 7-Watt LED MR16 Lamp	LED	7
170	Classroom	The Lodge: Simba Classroom	8	M	Recessed Can 3"	(1) 60W INC [Halogen 50W MR16] - b	INC	60	8		(1) 7-Watt LED MR16 Lamp	LED	7
171	Dining	The Lodge: Kitchen Halls	10	M	Recessed Can 3"	(1) 60W INC [Halogen 50W MR16] - b	INC	60	10		(1) 7-Watt LED MR16 Lamp	LED	7
172	Dining	The Lodge: Kitchen	3	M	Recessed Can 3"	(1) 60W INC [Halogen 50W MR16] - b	INC	60	3		(1) 7-Watt LED MR16 Lamp	LED	7
173	Retail	Gift Shop: Main Store	2	M	Recessed Can 3"	(1) 60W INC [Halogen 50W MR16] - b	INC	60	2		(1) 7-Watt LED MR16 Lamp	LED	7
174	Other / Misc	Stork Holding:	8	M	SM	(1) 70W INC [Halogen 70W]	INC	70	8		(1) 7-Watt LED Lamp	LED	12
175	Other / Misc	Cheetah: Holding	8	M	SM	(1) 70W INC [Halogen 70W]	INC	70	8		(1) 7-Watt LED Lamp	LED	12
176	Other / Misc	Rhino: Holding	20	M	SM	(1) 70W INC [Halogen 70W]	INC	70	20		(1) 7-Watt LED Lamp	LED	12
177	Other / Misc	Rhino: Storage	2	M	SM	(1) 70W INC [Halogen 70W]	INC	70	2		(1) 7-Watt LED Lamp	LED	12
178	Other / Misc	Giraffe: Commissary	2	M	SM	(1) 70W INC [Halogen 70W]	INC	70	2		(1) 7-Watt LED Lamp	LED	12
179	Other / Misc	Giraffe: Holding	26	M	SM	(1) 70W INC [Halogen 70W]	INC	70	26		(1) 7-Watt LED Lamp	LED	12
180	Other / Misc	Giraffe: Locker	2	M	SM	(1) 70W INC [Halogen 70W]	INC	70	2		(1) 7-Watt LED Lamp	LED	12

Detailed Lighting Inventory - Fresno Chaffee Zoo (continued)

General Information			Existing Fixture Data						Proposed Fixture Data				
Line	Measure Type	Space Description	Qty	Control	Fixture Description	Lamp Description	Lamp Type	Fixture Watts	Qty	Item Number	Description	Lamp Type	Fixture Watts
181	Other / Misc	Ungulate: Holding	12	M	SM	(1) 70W INC [Halogen 70W]	INC	70	12		(1) 7-Watt LED Lamp	LED	12
182	Other / Misc	Ungulate: Holding 2	8	M	SM	(1) 70W INC [Halogen 70W]	INC	70	8		(1) 7-Watt LED Lamp	LED	12
183	Other / Misc	Elephant: Holding	84	M	SM	(1) 70W INC [Halogen 70W]	INC	70	84		(1) 7-Watt LED Lamp	LED	12
184	Other / Misc	Lion: Holding	20	M	SM	(1) 70W INC [Halogen 70W]	INC	70	20		(1) 7-Watt LED Lamp	LED	12
185	Other / Misc	Meer Cat: Holding	12	M	SM	(1) 70W INC [Halogen 70W]	INC	70	12		(1) 7-Watt LED Lamp	LED	12
186	Restroom	Admin: RR x 2	1	M	SM	(1) 60W INC [A19, E26]	INC	60	1		(1) 7-Watt LED A Lamp	LED	9
187	Classroom	Education Center: Classroom	3	M	SM	(1) 60W INC [A19, E26]	INC	60	3		(1) 7-Watt LED A Lamp	LED	9
188	Low-Use (Storage, etc.)	Education Center: Furnace	1	M	SM	(1) 60W INC [A19, E26]	INC	60	1		(1) 7-Watt LED A Lamp	LED	9
189	Restroom	Ops Trailer: RR	1	M	SM	(1) 60W INC [A19, E26]	INC	60	1		(1) 7-Watt LED A Lamp	LED	9
190	Low-Use (Storage, etc.)	Education Center: Hallway Uplights	2	M	Recessed Can 6"	(1) 65W INC [INC 65W]	INC	65	2	VEKR6D/9T/21W-10V	(1) 7-Watt LED Lamp	LED	10
191	Other / Misc	Rhino Barn: Holding	10	M	Wallpack	(1) 190W MH [MH 150W] - a	MH	190	10	FXTWP28/50K/BZ-PHO	28-Watt LED Wallpack	LED	28
192	Exterior (Dusk-Dawn)	way from Babirusa Past Rainforest to Ho	7		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
193	Exterior (Dusk-Dawn)	Petting Zoo	2		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
194	Exterior (Dusk-Dawn)	walkway from Hospital through Petting Z	7		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
195	Exterior (Dusk-Dawn)	Walkway from Hospital around Kangaroo	5		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
196	Exterior (Dusk-Dawn)	Walkway Flamingos to Maintenance	2		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
197	Exterior (Dusk-Dawn)	Open Area by Marketing	7		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
198	Exterior (Dusk-Dawn)	Walkway Café around Lemur Circle	3		Pole Top w/ LED Retro Lamp	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
199	Exterior (Dusk-12am)	Zoo Parking Bathrooms	1		Mini Wallpack	(1) 15W LED [LED 15W]	LED	15		-- No Change --	-- No Change --		
200	Exterior (Dusk-Dawn)	Ticketing	5		Downlights	(1) 10W LED [LED 10W]	LED	10		-- No Change --	-- No Change --		
201	Exterior (Dusk-Dawn)	Walkway from Hospital around Kangaroo	6		Decorative LED Lamp Fixture	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
202	Exterior (Dusk-Dawn)	Walkway Flamingos to Maintenance	2		Decorative LED Lamp Fixture	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
203	Exterior (Dusk-Dawn)	Walkway from Lodge to Zoo Café	9		Decorative LED Lamp Fixture	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
204	Exterior (Dusk-Dawn)	Wilderness Falls	12		Decorative LED Lamp Fixture	(1) 50W LED [LED 50W]	LED	50		-- No Change --	-- No Change --		
205	Exterior (Dusk-Dawn)	Zoo Parking	6		40' Pole Cobra Head LED	(1) 150W LED [LED 150W]	LED	150		-- No Change --	-- No Change --		
206	Exterior (Dusk-Dawn)	Classroom Annex	2		Jelly Jar	(1) 13W CFL [Spiral-sm, E26] - b	CFL	13	2		(1) 5-Watt LED A Lamp	LED	5
207	Exterior (Dusk-Dawn)	Ticketing	2		SM	(1) 23W CFL [Spiral-med, E26] - f	CFL	23	2		(1) 7-Watt LED A Lamp	LED	7
208	Exterior (Dusk-Dawn)	Babirusa Shack and Barn	1		Pole Top	(1) 23W CFL [Spiral-med, E26] - c	CFL	23	1		(1) 7-Watt LED A Lamp	LED	7
209	Exterior (Dusk-Dawn)	Hospital	7		Wallpack	(1) 23W CFL [Spiral-med, E26] - g	CFL	23	7		(1) 7-Watt LED A Lamp	LED	7
210	Exterior (Dusk-Dawn)	Alligator Shack	1		Wallpack	(1) 23W CFL [Spiral-med, E26] - g	CFL	23	1		(1) 7-Watt LED A Lamp	LED	7
211	Exterior (Dusk-Dawn)	Walkway Flamingos to Maintenance	1		Pole Top	(1) 23W CFL [Spiral-med, E26] - c	CFL	23	1		(1) 7-Watt LED A Lamp	LED	7
212	Exterior (Dusk-Dawn)	Education Center	5		Mini Wallpack	(1) 23W CFL [Spiral-med, E26] - a	CFL	23	5	new mini wp	(1) 7-Watt LED A Lamp	LED	7
213	Exterior (Dusk-Dawn)	Education Center	2		Security Fixture	(1) 23W CFL [Spiral-med, E26] - e	CFL	23	2	new security duel head	(1) 7-Watt LED Flood Lamp	LED	18
214	Exterior (Dusk-Dawn)	Marketing Trailer	4		Security Fixture	(1) 23W CFL [Spiral-med, E26] - e	CFL	23	4	new security duel head	(1) 7-Watt LED Flood Lamp	LED	18
215	Exterior (Dusk-Dawn)	Walkway Café around Lemur Circle	1		Wallpack	(1) 23W CFL [Spiral-med, E26] - g	CFL	23	1		(1) 7-Watt LED A Lamp	LED	7
216	Exterior (Dusk-Dawn)	Maintenance	5		Security Fixture	(1) 23W CFL [Spiral-med, E26] - e	CFL	23	5	new security duel head	(1) 7-Watt LED Flood Lamp	LED	18
217	Exterior (Dusk-Dawn)	oo Parking- Drive into Zoo From Belmor	6		Pole Top	(1) 23W CFL [Spiral-med, E26] - c	CFL	23	6		(1) 7-Watt LED A Lamp	LED	7
218	Exterior (Dusk-Dawn)	Orangutan	1		Flood	(1) 42W CFL [Spiral-lg, E26] - a	CFL	42	1	new flood	(1) 12-Watt LED Flood Lamp	LED	20
219	Exterior (Dusk-Dawn)	Bird Show Hill	6		Pole Top	(1) 42W CFL [Spiral-lg, E26] - b	CFL	42	6	A21	(1) 10-Watt LED A Lamp	LED	15
220	Exterior (Dusk-Dawn)	Reptile House	2		Wallpack	(1) 48.3W CFL [3U (PLT), 4-Pin (2x2)] - b	CFL	48.3	2	FXSECW15/850/DB/MV	15-Watt LED Mini Wallpack	LED	13
221	Exterior (Dusk-Dawn)	Rainforest Restroom	4		Strip 4'	(2) 31W T8 [4 ft] - ext	T8	62	4	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
222	Exterior (Dusk-Dawn)	Hospital	3		Strip 4'	(2) 31W T8 [4 ft] - ext	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
223	Exterior (Dusk-Dawn)	Safari Café	12		Strip 4'	(2) 31W T8 [4 ft] - ext	T8	62	12	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
224	Exterior (Dusk-Dawn)	Stingray Bay	13		Strip 4'	(2) 31W T8 [4 ft] - ext	T8	62	13	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24
225	Exterior (Dusk-Dawn)	Maintenance	3		Strip 4'	(2) 31W T8 [4 ft] - ext	T8	62	3	Espen- L48T8/840/12G-EB	(2) 4ft LED Tubes	LED	24

Detailed Lighting Inventory - Fresno Chaffee Zoo (continued)

General Information			Existing Fixture Data						Proposed Fixture Data				
Line	Measure Type	Space Description	Qty	Control	Fixture Description	Lamp Description	Lamp Type	Fixture Watts	Qty	Item Number	Description	Lamp Type	Fixture Watts
226	Exterior (Dusk-Dawn)	Ticketing	3		Wallpack	(1) 188W HPS [HPS 150W] - a	HPS	188	3	FXTWP28/50K/BZ-PHO	28-Watt LED Wallpack	LED	28
227	Exterior (Dusk-Dawn)	Ticketing	4		Flood Uplight	(1) 188W HPS [HPS 150W] - b	HPS	188	4	find	30-Watt LED Flood Uplight	LED	30
228	Exterior (Dusk-Dawn)	Babirusa Shack and Barn	5		Wallpack	(1) 188W HPS [HPS 150W] - a	HPS	188	5	FXTWP28/50K/BZ-PHO	28-Watt LED Wallpack	LED	28
229	Exterior (Dusk-Dawn)	Maintenance	1		Wallpack	(1) 188W HPS [HPS 150W] - a	HPS	188	1	FXTWP28/50K/BZ-PHO	28-Watt LED Wallpack	LED	28
230	Exterior (Dusk-Dawn)	Zoo Parking	13		40' Pole Cobra Head	(1) 295W HPS [HPS 250W] - a	HPS	295	13	FXSAL150	150-Watt LED Pole Cobra Head	LED	150
231	Exterior (Dusk-Dawn)	Zoo Parking	33		20' Pole Area	(1) 295W HPS [HPS 250W] - b	HPS	295	33	FXSAL100	80-Watt LED Pole Area	LED	100
232	Exterior (Dusk-Dawn)	Zoo Parking Bathrooms	5		Mini Wallpack	(1) 95W HPS [HPS 70W]	HPS	95	5	FXSECW15/850/DB/MV	15-Watt LED Mini Wallpack	LED	13
233	Exterior (Dusk-Dawn)	Reptile House	7		Recessed Can 8"	(1) 100W INC [INC 100W]	INC	100	7	VEKR8D/9T/27W-10V	20-Watt LED Recessed Can Retrofit	LED	27
234	Exterior (Dusk-Dawn)	Zoo Parking	6		40' Cobrahead	(1) 225W IND [Induction 200W]	IND	225	6	FXSAL150	150-Watt LED Pole Cobra Head	LED	150
235	Exterior (Dusk-Dawn)	Orangutan	4		Flood	(1) 190W MH [MH 150W] - b	MH	190	4	FXSAL50	50-Watt LED Flood	LED	50
236	Exterior (Dusk-Dawn)	Admin	4		Mini Wallpack	(1) 72W MH [MH 50W]	MH	72	4	FXSECW15/850/DB/MV	15-Watt LED Mini Wallpack	LED	13
237	Exterior (Dusk-Dawn)	Maintenance	1		Mini Wallpack	(1) 95W MH [MH 70W]	MH	95	1	FXSECW15/850/DB/MV	15-Watt LED Mini Wallpack	LED	13

A21 15W DIM. TITANIUM LED CRI^{SP} SERIES



CRI^{SP}



- Omnidirectional: 330° beam angle
- Exceptional color rendering 90 CRI
- Exceptional efficacy 73 LPW in Warm White
- Suitable for use in totally enclosed fixtures
- Richer reds and natural skin tones (R9 50, R13 90)
- Tight LED binning for consistent CCT across all lamps



LM 79

LM 80

TM 21



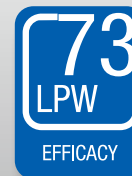
15W REPLACES



75W Inc.

80% Energy Savings

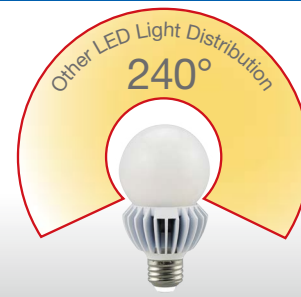
\$163 Savings per lamp*



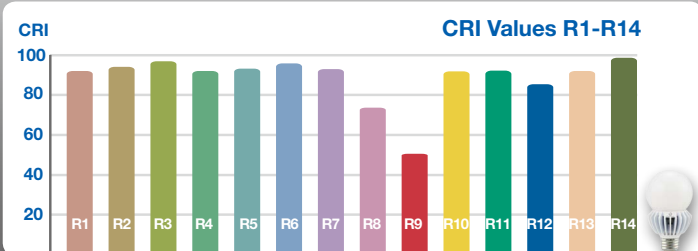
A21 PRODUCT FEATURES

Omnidirectional Lighting

This A21 meets the new ENERGY STAR® V1.1 requirements for omnidirectional bulbs by providing 330° of evenly distributed light intensity. In the 135° to 180° zone, this lamp emits 65% more lumens than what is required by ENERGY STAR, providing a fuller light than other LED A-lamps.



CRI & CA Quality Specification



The CRI^{SP} SERIES A21 15W lamp features a typical CRI 90, R9 50 and R13 90, providing crisp and vibrant colors across the whole spectrum. Its exceptional R9-R14 values (R9 & R13) provide redder reds, natural looking skin tones and whiter whites.

This lamp meets the California Quality Specification which requires a CRI of 90+ and demands color temperatures fall within a 4-step Macadam ellipse to ensure minimal color deviation across lamps.

A21 15W DIM. TITANIUM LED CRI^{SP} SERIES



APPLICATIONS

General Lighting



Downlighting



Uplighting



Ref.:#DS097-A21-15W-HIGH CRI

SPECIFICATIONS

Product Model	16326 15A21DIM/927
Type	A21
Base	E26
Power (W)	15
Voltage - Frequency	120V 60Hz
Color Temp. (ANSI)	Warm White 2700K
CRI (Ra) (typ.)	90
R9 / R13 (typ.)	50 / 90
Typical lumens (lm)	1100
Efficacy (LPW)	73
Beam Angle	330°
Dimmable	Yes***
Power Factor	0.9
Rated Lifetime - L70 (hrs.)	25,000
Dia. x MOL	2.56"x4.72" (65x120mm)
Weight (lb. / g)	0.44lb. / 199g

* Savings per lamp based on \$0.11 / kw energy cost, 12 hrs / day lamp usage, \$2 incandescent with 1000-hr lifetime, \$25 LED with 25,000-hr lifetime

** Suitable for use in totally enclosed fixtures

*** List of tested dimmer switches available on website

**** Suitable for damp locations. Not for use where directly exposed to weather or water



Turning Light into Savings ▶▶▶



TWP DLC V4.0

Traditional Wallpack Semi-Cutoff

28W, 40W, 42W, 59W, 60W, 80W, 90W

naturaLED® TWP traditional wallpack comes in rugged cast-aluminum housing with excellent thermal design. DesignLights Consortium V4.0 qualified, our TWP product offers a popular classic appearance for your needs.

Delivering up to 10,000 lumens by replacing up to 575-watt metal halide luminaires, with energy saving up to 80%. The traditional shape maintains an aesthetic appearance and will replace any building's wall pack, or perimeter lighting.

Our TWP is ideal for outdoor applications such as carports, loading areas, driveways, parking area and pathways. Designed for wall mounting above four feet from ground.

Key Features & Benefits

- ▶ DesignLights Consortium Qualified V4.0
- ▶ Long Life LED Chips
- ▶ Uniform and consistent color
- ▶ Excellent thermal design
- ▶ 15-30 foot height performance
- ▶ Shatter resistant glass
- ▶ Universal Voltage 120-277V
- ▶ Operating Temp: -4°F~120°F
- ▶ 50,000 Hours rated life
- ▶ Photocell sensor compatible
- ▶ Dimmable

Applications

- ▶ Area Lighting
- ▶ Security Lighting
- ▶ Pathway Lighting
- ▶ Perimeter Lighting
- ▶ Entryway Lighting

Color Choices



Bronze

Qualifications



Visor Not Included

Item Code	Description	Color Temp	Wattage	Lumen Output	Equivalent Wattage	Voltage (V)	Rated Hours	Beam Type	DIM	Visor Included	24	DLC	IP 65
7076	LED-FXTWP42/40K/DB	4000K	42	4,775	175-250	120-277	50,000	F. Throw	0-10V	--			
7077	LED-FXTWP42/50K/DB	5000K	42	4,886	175-250	120-277	50,000	F. Throw	0-10V	--			
7078	LED-FXTWP59/40K/DB	4000K	59	7,128	250-400	120-277	50,000	F. Throw	0-10V	--			
7079	LED-FXTWP59/50K/DB	5000K	59	7,179	250-400	120-277	50,000	F. Throw	0-10V	--			
7080	LED-FXTWP80/40K/DB	4000K	80	10,373	400-575	120-277	50,000	F. Throw	0-10V	--			
7081	LED-FXTWP80/50K/DB	5000K	80	10,416	400-575	120-277	50,000	F. Throw	0-10V	--			

Visor Included

Item Code	Description	Color Temp	Wattage	Lumen Output	Equivalent Wattage	Voltage (V)	Rated Hours	Beam Type	DIM	Visor Included	24	DLC	IP 65
7466	LED-FXTWP28/40K/DB	4000K	28	3,000	175	120-277	50,000	F. Throw	--	Yes			
7467	LED-FXTWP28/50K/DB	5000K	28	3,000	175	120-277	50,000	F. Throw	--	Yes			
7086	LED-FXTWP40/40K/DB	4000K	40	3,076	175	120-277	50,000	F. Throw	--	Yes			
7087	LED-FXTWP40/50K/DB	5000K	40	3,076	175	120-277	50,000	F. Throw	--	Yes			
7088	LED-FXTWP60/40K/DB	4000K	60	4,612	250	120-277	50,000	F. Throw	--	Yes			
7089	LED-FXTWP60/50K/DB	5000K	60	4,612	250	120-277	50,000	F. Throw	--	Yes			
7138	LED-FXTWP90/40K/DB	4000K	90	5,896	400	120-277	50,000	F. Throw	--	Yes			
7139	LED-FXTWP90/50K/DB	5000K	90	5,896	400	120-277	50,000	F. Throw	--	Yes			

Accessories

P10036	SEN-PHO-BT-MT/MV	Button Photocell 120-277V
P10022	CVR-TWP40/DB	TWP Visor
P10023	CVR-TWP60/DB	TWP Visor

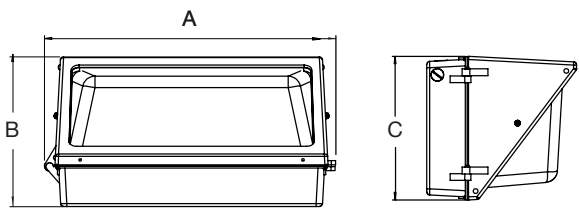


SEN-PHO-BT-MT/MV
Button Photocell
(120-277V)

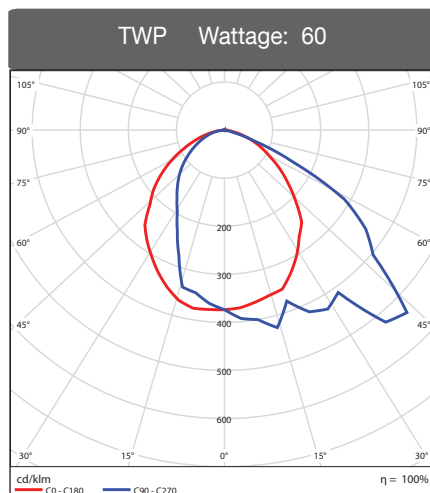
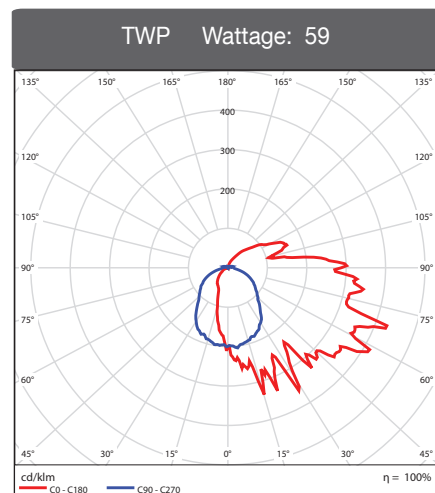
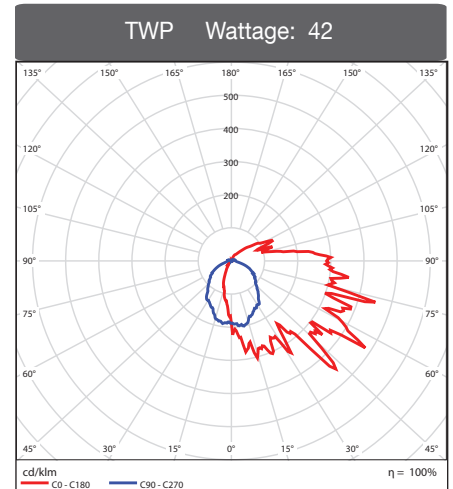
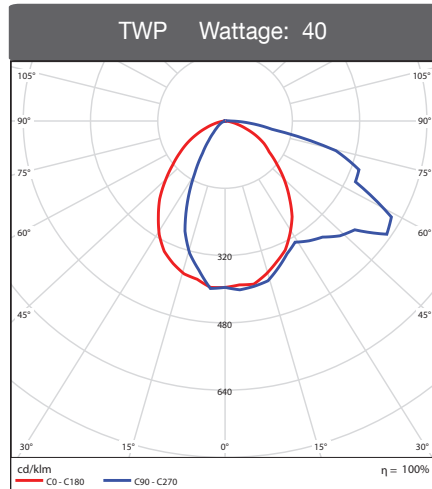
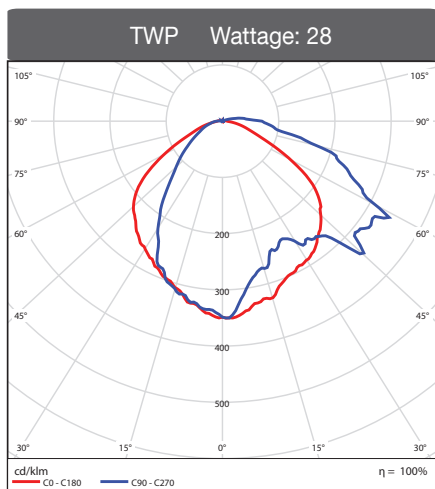


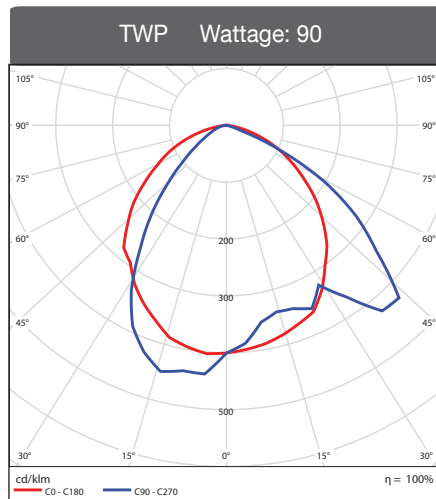
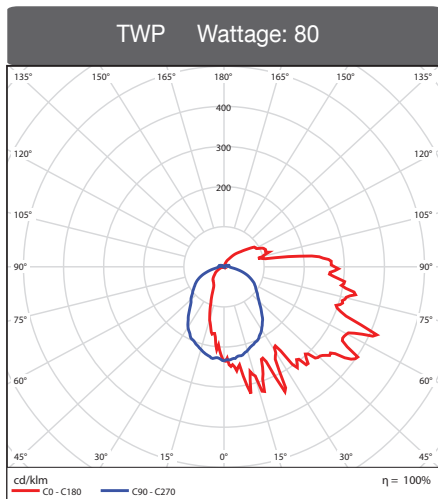
CVR-TWP40/DB
CVR-TWP60/DB
TWP Visor

Dimensions

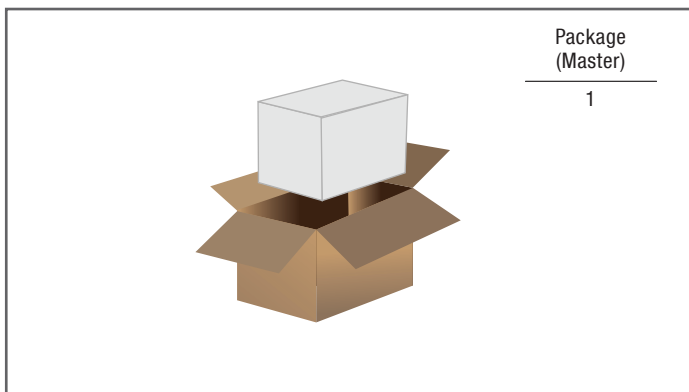
	Wattage	A	B	C	Weight (lbs)
	28	8.78-in	9.37-in	8.90-in	5.72
	40/42	14.50-in	7.50-in	9.00-in	9.50
	59/60	18.50-in	9.25-in	9.00-in	16.00
	80/90	18.50-in	9.25-in	9.00-in	18.60

Illuminance Distribution





► Master Carton Package





Turning Light into Savings ▶▶▶



SCM Slim Canopy DLC V4.0 Premium

28W, 42W, 45W, 59W, 70W

Our Slim canopy is DLC V4.0 listed and UL listed for wet locations with a rating of IP65.

Aesthetically pleasing construction, low-profile design with die-cast aluminum housing, shatter-resistant polycarbonate prismatic lens. Dustproof, sealed structure, multiple 1/2" conduit entrances on side. The Canopy supports pendant mounting and direct surface ceiling mounting.

Ideal applications for parking garage, walkway and entrance lighting etc.

Key Features & Benefits

- ▶ DesignLights Consortium Qualify V4.0 Premium
- ▶ Optional Microwave Motion Sensor
- ▶ Parking Garage Certified
- ▶ 0-10V dimmable with motion sensor option
- ▶ Default : Light dims to 30% when no motion is detected with motion sensor option
- ▶ Long Life LED chips
- ▶ Uniform and consistent color
- ▶ Excellent thermal design
- ▶ Aluminum & shatter-resistant polycarbonate lens
- ▶ Universal voltage 100-277V
- ▶ Working temperature : -4°F ~122°F
- ▶ 50,000 hrs rated average life

Applications

- ▶ Security Lighting
- ▶ Pathway Lighting
- ▶ Ceiling Lighting
- ▶ Parking Lighting




Color Choices






White Black

Qualifications

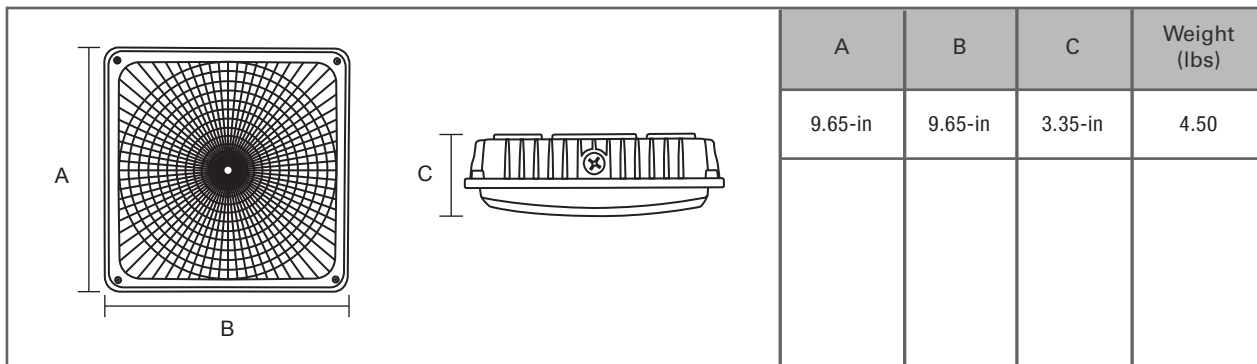


Item Code	Description	Color Temp	Wattage	Lumen Output	Equivalent Wattage	Voltage (V)	Dimming	Beam Angle	Color	Sensor			
7468	LED-FXSCM28/40K/BK	4000K	28	3,236	150W	120-277	0-10V	160°	Black		●	●	●
7469	LED-FXSCM28/50K/BK	5000K	28	3,375	150W	120-277	0-10V	160°	Black		●	●	●
7470	LED-FXSCM42/40K/BK	4000K	42	4,871	175W	120-277	0-10V	160°	Black		●	●	●
7471	LED-FXSCM42/50K/BK	5000K	42	5,003	175W	120-277	0-10V	160°	Black		●	●	●
7472	LED-FXSCM59/40K/BK	4000K	59	6,800	250W	120-277	0-10V	160°	Black		●	●	●
7473	LED-FXSCM59/50K/BK	5000K	59	6,985	250W	120-277	0-10V	160°	Black		●	●	●
7495	LED-FXSCM28/40K/WH	4000K	28	3,236	150W	120-277	0-10V	160°	White		●	●	●
7496	LED-FXSCM28/50K/WH	5000K	28	3,375	150W	120-277	0-10V	160°	White		●	●	●
7497	LED-FXSCM42/40K/WH	4000K	42	4,871	175W	120-277	0-10V	160°	White		●	●	●
7498	LED-FXSCM42/50K/WH	5000K	42	5,003	175W	120-277	0-10V	160°	White		●	●	●
7499	LED-FXSCM59/40K/WH	4000K	59	6,800	250W	120-277	0-10V	160°	White		●	●	●
7500	LED-FXSCM59/50K/WH	5000K	59	6,985	250W	120-277	0-10V	160°	White		●	●	●

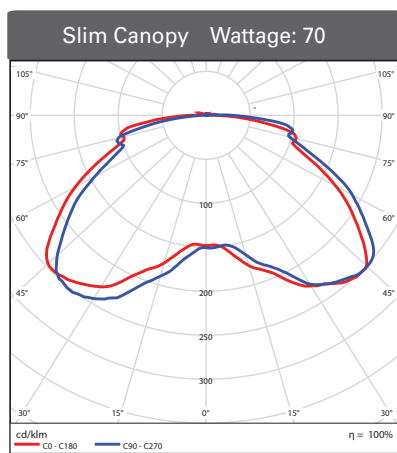
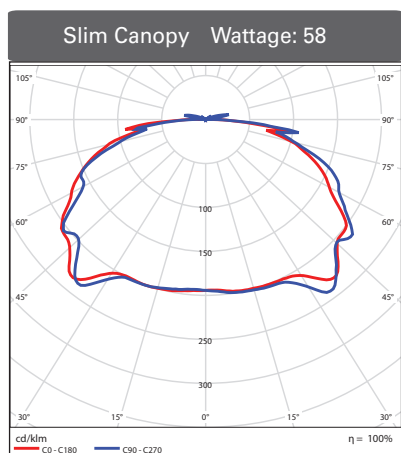
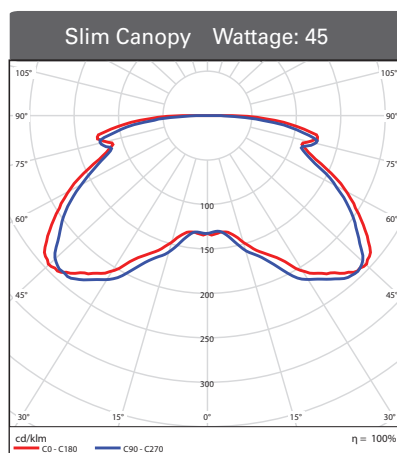
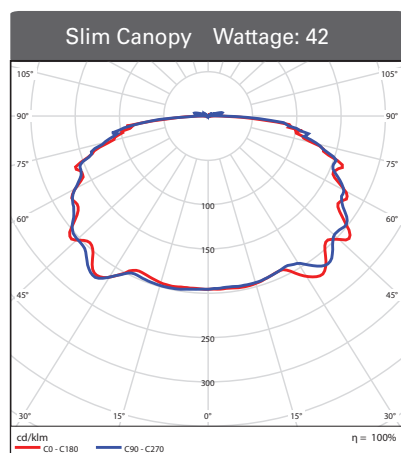
Microwave Motion Sensor Included

Item Code	Description	Color Temp	Wattage	Lumen Output	Equivalent Wattage	Voltage (V)	Dimming	Beam Angle	Beam Angle	Sensor			
7560	LED-FXSCM45/50K/BK-SEN	5000K	45	4,000	175W	120-277	--	140°	Black	●	●	●	●
7561	LED-FXSCM45/50K/WH-SEN	5000K	45	4,000	175W	120-277	--	140°	White	●	●	●	●
7489	LED-FXSCM28/40K/BK-SEN	4000K	28	3,236	150W	120-277	0-10V	160°	Black	●	●	●	●
7490	LED-FXSCM28/50K/BK-SEN	5000K	28	3,375	150W	120-277	0-10V	160°	Black	●	●	●	●
7491	LED-FXSCM42/40K/BK-SEN	4000K	42	4,871	175W	120-277	0-10V	160°	Black	●	●	●	●
7492	LED-FXSCM42/50K/BK-SEN	5000K	42	5,003	175W	120-277	0-10V	160°	Black	●	●	●	●
7493	LED-FXSCM59/40K/BK-SEN	4000K	59	6,800	250W	120-277	0-10V	160°	Black	●	●	●	●
7494	LED-FXSCM59/50K/BK-SEN	5000K	59	6,985	250W	120-277	0-10V	160°	Black	●	●	●	●
7564	LED-FXSCM70/50K/BK-SEN	5000K	70	5,900	250W	120-277	--	140°	Black	●	●	●	●
7565	LED-FXSCM70/50K/WH-SEN	5000K	70	5,900	250W	120-277	--	140°	White	●	●	●	●

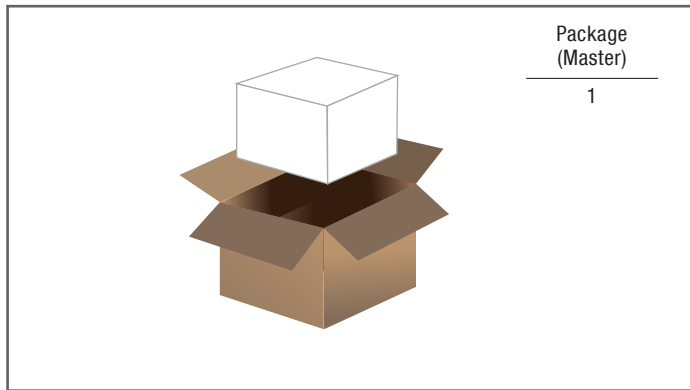
► Dimensions



► Illuminance Distribution



► Master Carton Package



Features & Benefits

- No rewiring needed
- Works with fluorescent electronic ballast (Instant Start, Programmed Start, and Dimming)*
- Long life
- High CRI
- Instant on, no delay
- Convenient and quick installation
- Utilizes existing instant start or rapid start sockets
- Compatible with controls and sensors
- Dimmable
- Works in cold temperature applications
- Glass tube for superior optical performance
- 5 Year Warranty



* EMERGENCY BALLAST RESTRICTIONS



RetroFlex™
LED T8 LAMP • Simplicity.
Commercial Grade LED T8 Lamp

Specification Data

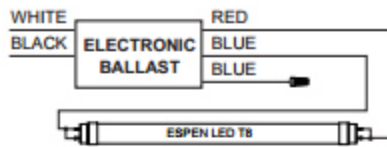
Order Code	Length	Lamp Wattage	System Wattage	CCT	Initial Lumens	CRI	Beam Angle	Lamp Efficacy	System Efficacy	Life	DLC
L48T8/830/12G-EB	48	12	13	3000K	1950	80+	325	165	150	50000	Yes
L48T8/835/12G-EB	48	12	13	3500K	1950	80+	325	165	150	50000	Yes
L48T8/840/12G-EB	48	12	13	4000K	1950	80+	325	165	150	50000	Yes
L48T8/850/12G-EB	48	12	13	5000K	1950	80+	325	165	150	50000	Yes

System Performance

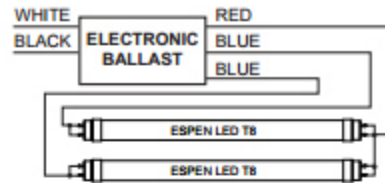
Lamp Model	Low Ballast Factor				High Ballast Factor			
	Lamp Power	System Power	Lumen Output	Lamp Efficacy	Lamp Power	System Power	Lumen Output	Lamp Efficacy
L48T8/830/12G-EB	9	11	1450	165	16	18	2800	160
L48T8/835/12G-EB	9	11	1450	165	16	18	2800	160
L48T8/840/12G-EB	9	11	1450	165	16	18	2800	160
L48T8/850/12G-EB	9	11	1450	165	16	18	2800	160

Wiring diagram

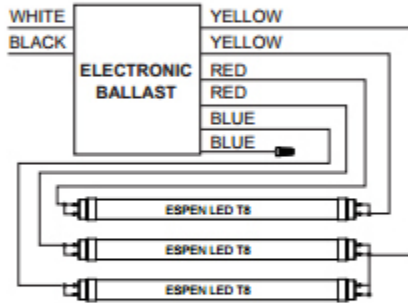
1-LAMP Instant Start Electronic Ballast



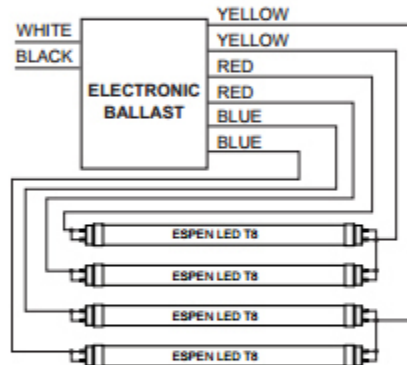
2-LAMP Instant Start Electronic Ballast



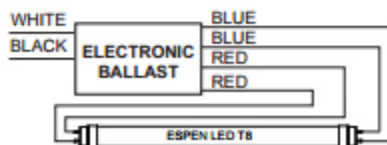
3-LAMP Instant Start Electronic Ballast



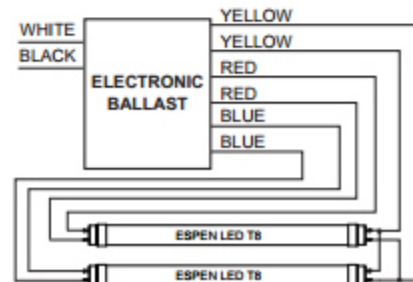
4-LAMP Instant Start Electronic Ballast



1-LAMP Programmed Start Electronic Ballast



2-LAMP Programmed Start Electronic Ballast



* Please refer to "Ballast Compatibility List" for compatible battery backup and/or emergency ballasts.

* Please refer to "Ballast Compatibility List" on Related Downloads.

Specification data is based on tests performed in a controlled environment and represents relative performance. Actual performance can vary depending on operating conditions. Application and performance data subject to change without notice. All specifications are nominal unless noted otherwise.

Features & Benefits

- No rewiring needed
- Works with Espen fluorescent electronic ballast [VE259MVHIP](#)
- Long life
- High CRI
- Instant on, no delay
- Convenient and quick installation
- Utilizes existing instant start or rapid start sockets
- Compatible with controls and sensors
- Works in cold temperature applications
- Glass tube for superior optical performance
- Wide View Angle
- 5 Year Warranty
- New Version with Integrated ArmorCoat
For use in food areas and refrigerated food displayers




* EMERGENCY BALLAST RESTRICTIONS



RetroFlex™
LED T8 LAMP • Simplicity.
Commercial Grade **LED T8 Lamp**

Specification Data

Order Code	Length	Lamp Power	System Power	CCT	Initial Lumens	CRI	Beam Angle	Lamp Efficacy	System Efficacy	Life	
L96T8/835/24G-EB	96	24	27	3500K	3500	83+	325	135	120	50,000	No
L96T8/840/24G-EB	96	24	27	4000K	3500	83+	325	135	120	50,000	No
L96T8/850/24G-EB	96	24	27	5000K	3500	83+	325	135	120	50,000	No

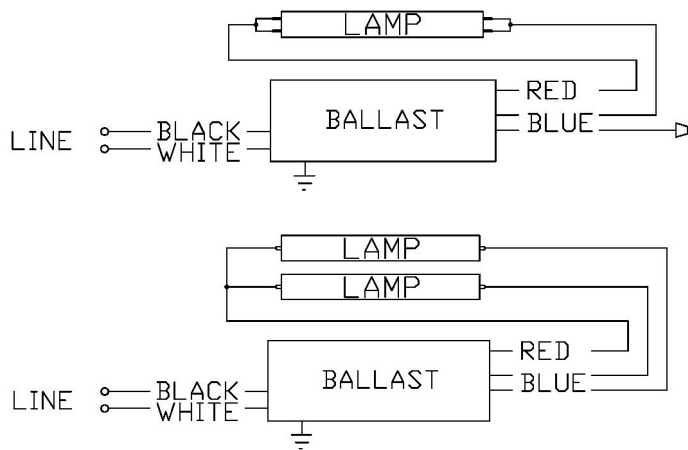
* Based on Normal Ballast Factor.

Ordering Information

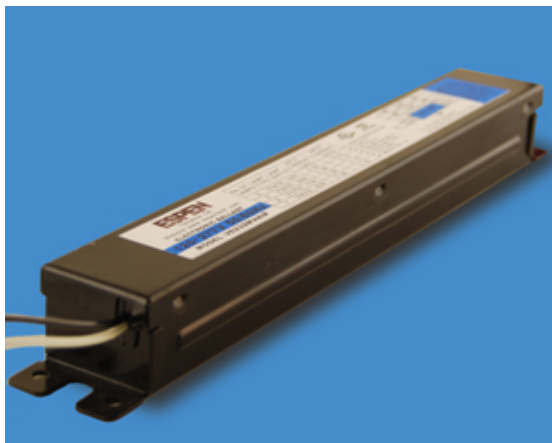
EXAMPLE: **L48T8/840/15G-EB-AC**

L	48	T8	8	40	15 G	- EB	- AC
Manufacturer's Code	Normal Length 48=48"	Lamp Shape T8=T8	CRI 8=>80	CCT 50 =5000K 40 =4000K 35 =3500K	Wattage 15G-15W	Electronic Ballast Compatible	ArmorCoat Shatterproof Coating

Wiring Diagram



Specification data is based on tests performed in a controlled environment and represents relative performance. Actual performance can vary depending on operating conditions. Application and performance data subject to change without notice. All specifications are nominal unless noted otherwise.



Model No.	VE2P32MVHIPE
Family	Elite
Ballast Type	Electronic
Lamp Operation	Parallel
Input Voltage	120/277V
Starting Method	Instant Start

PRODUCT SPECIFICATION

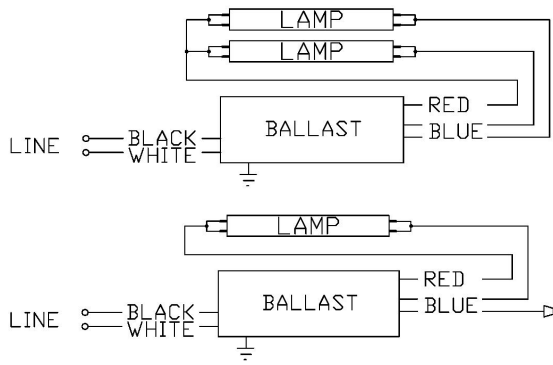
ELECTRONIC BALLASTS

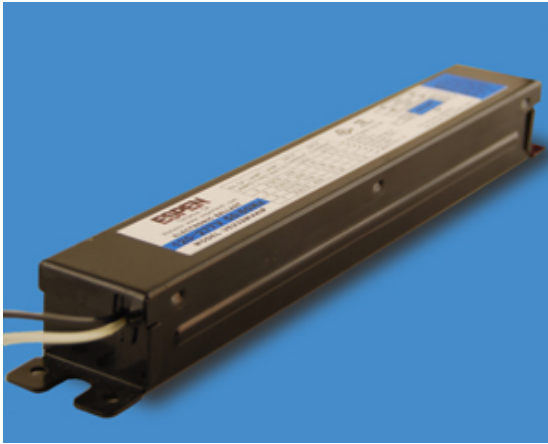
Lamp Type	No. of Lamps	Input Voltage (V)	Input Current (A)	Input Power (W)	Power Factor	MAX THD (%)	Ballast Factor	Min. Starting Temp.(F/C)	Lamp Current Crest Factor	B.E.F.
F17T8 17W	1	120/277	0.17/0.08	19	0.98	10	1.06	0	1.7	
F25T8 25W	1	120/277	0.23/0.10	28	0.98	10	1.05	0	1.7	
F32T8 32W	1	120/277	0.30/0.13	35	0.98	10	1.05	0	1.7	
F32T8/ES 25W	1	120/277	0.23/0.10	27	0.98	10	1.05	0	1.7	
F32T8/ES 28W	1	120/277	0.26/0.11	31	0.98	10	1.05	0	1.7	
F32T8/ES 30W	1	120/277	0.28/0.12	33	0.98	10	1.05	0	1.7	
F40T8 40W	1	120/277	0.35/0.15	41	0.98	10	1.01	0	1.7	
F17T8 17W	2	120/277	0.26/0.11	30	0.98	10	0.9	0	1.7	
F25T8 25W	2	120/277	0.37/0.16	43	0.98	10	0.88	0	1.7	
F32T8 32W	2	120/277	0.46/0.20	55/54	0.98	10	0.89	0	1.7	1.59/1.60
F32T8/ES 25W	2	120/277	0.39/0.17	44	0.98	10	0.89	0	1.7	
F32T8/ES 28W	2	120/277	0.41/0.18	49/47	0.98	10	0.89	0	1.7	1.82/1.70
F32T8/ES 30W	2	120/277	0.43/0.19	51	0.98	10/15	0.89	0	1.7	1.74/1.70

Physical Parameters

Enclosure (in)	Lead Length in.(+/-1.0)
Length	9.5
Width	1.3
Height	1
Mounting	8.91
	Black
	White
	Red
	Blue
	Yellow

Wiring Diagram





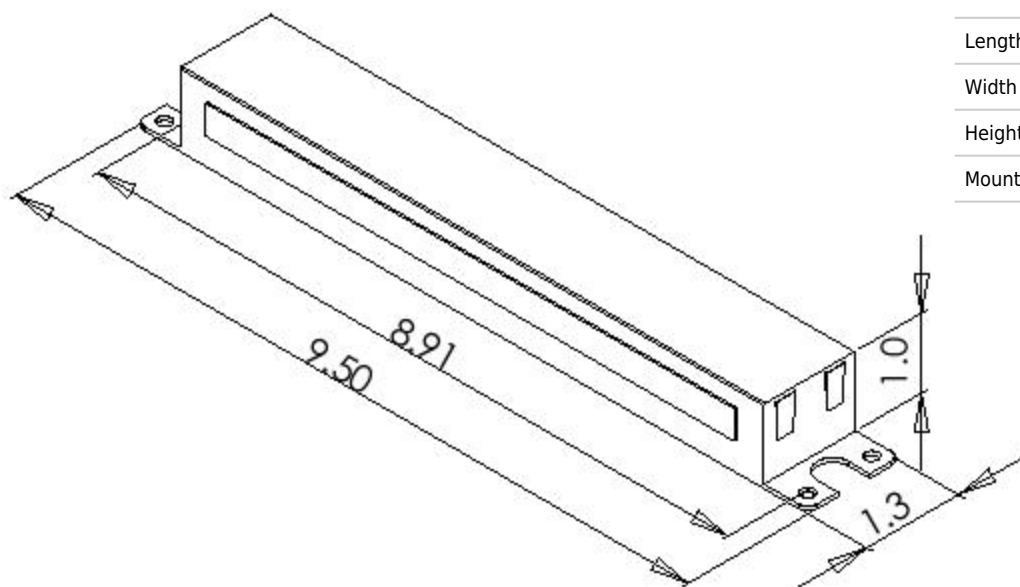
Model No.	VE3P32MVHIPE
Family	Elite
Ballast Type	Electronic
Lamp Operation	Parallel
Input Voltage	120/277V
Starting Method	Instant Start

PRODUCT SPECIFICATION

ELECTRONIC BALLASTS

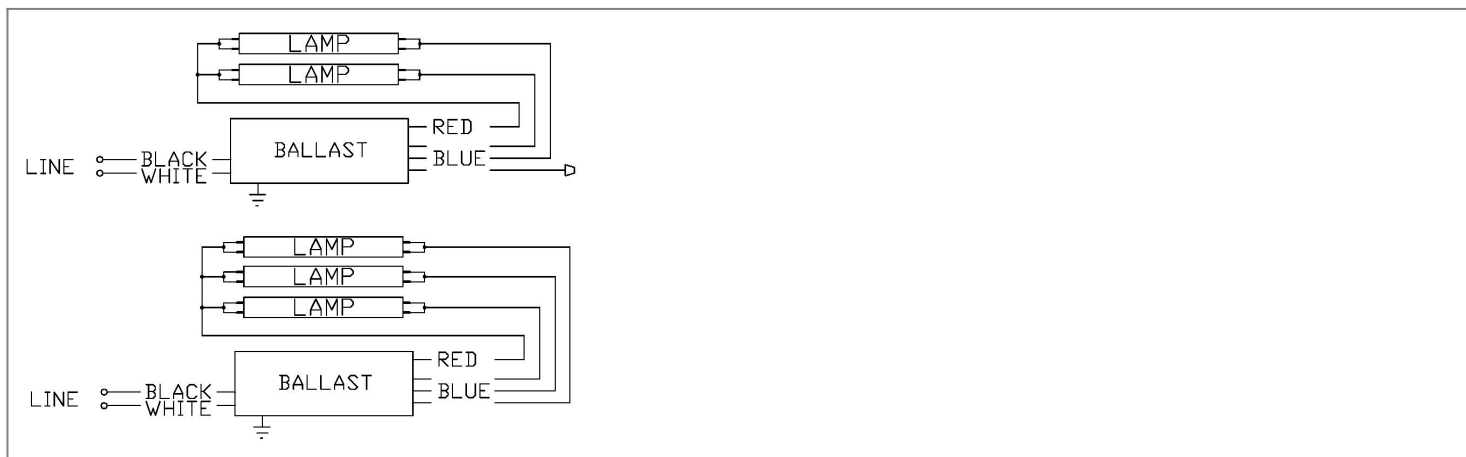
Lamp Type	No. of Lamps	Input Voltage (V)	Input Current (A)	Input Power (W)	Power Factor	MAX THD (%)	Ballast Factor	Min. Starting Temp.(F/C)	Lamp Current Crest Factor	B.E.F.
F17T8	2	120/277	0.31/0.14	36	0.98	15	1.07	0	1.7	
F25T8 25W	2	120/277	0.43/0.19	50	0.98	10	1.02	0	1.7	
F32T8 32W	2	120/277	0.53/0.24	63	0.98	10	1.02	0	1.7	
F32T8/ES 25W	2	120/277	0.43/0.19	50	0.98	10	1.02	0	1.7	
F32T8/ES 28W	2	120/277	0.47/0.21	56	0.98	10	1.02	0	1.7	
F32T8/ES 30W	2	120/277	0.49/0.22	59	0.98	10	1.02	0	1.7	
F40T8 40W	2	120/277	0.65/0.28	75/74	0.98	10	1.03	0	1.7	
F17T8 17W	3	120/277	0.39/0.18	46	0.98	10	0.92	0	1.7	
F25T8 25W	3	120/277	0.55/0.24	65	0.98	10	0.9	0	1.7	
F32T8 32W	3	120/277	0.71/0.31	84/83	0.98	10	0.88	0	1.7	1.05/1.06
F32T8/ES 25W	3	120/277	0.56/0.24	66	0.98	10	0.88	0	1.7	
F32T8/ES 28W	3	120/277	0.63/0.27	74	0.98	10	0.88	0	1.7	
F32T8/ES 30W	3	120/277	0.68/0.29	80	0.98	10	0.88	0	1.7	

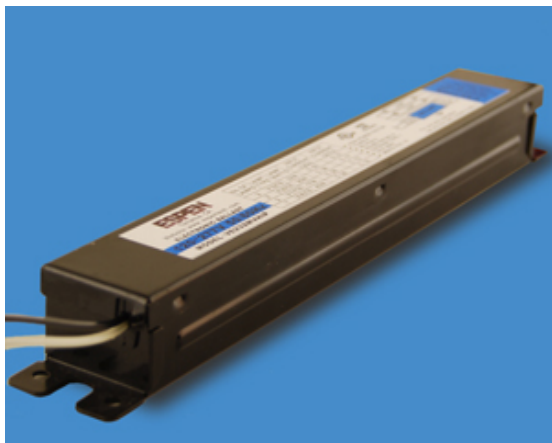
Physical Parameters



Enclosure (in)		Lead Length in.(+/-1.0)	
Length	9.5	Black	12
Width	1.3	White	12
Height	1	Red	36
Mounting	8.91	Blue	24
		Yellow	N/A

Wiring Diagram





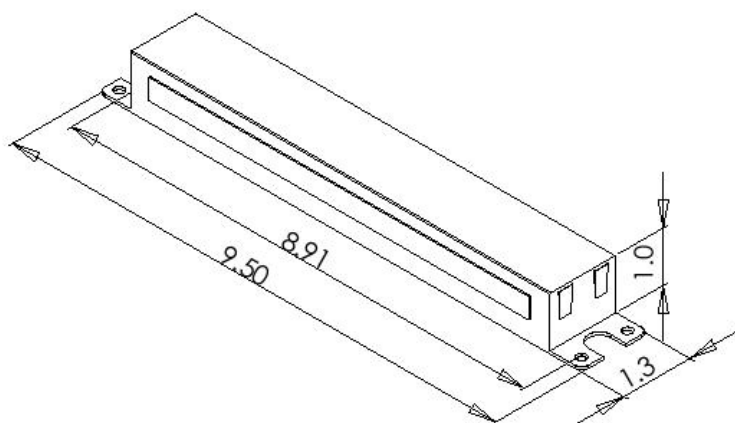
Model No.	VE259MVHIP
Family	Elite
Ballast Type	Electronic
Lamp Operation	Parallel
Input Voltage	120/277V
Starting Method	Instant Start

PRODUCT SPECIFICATION

ELECTRONIC BALLASTS

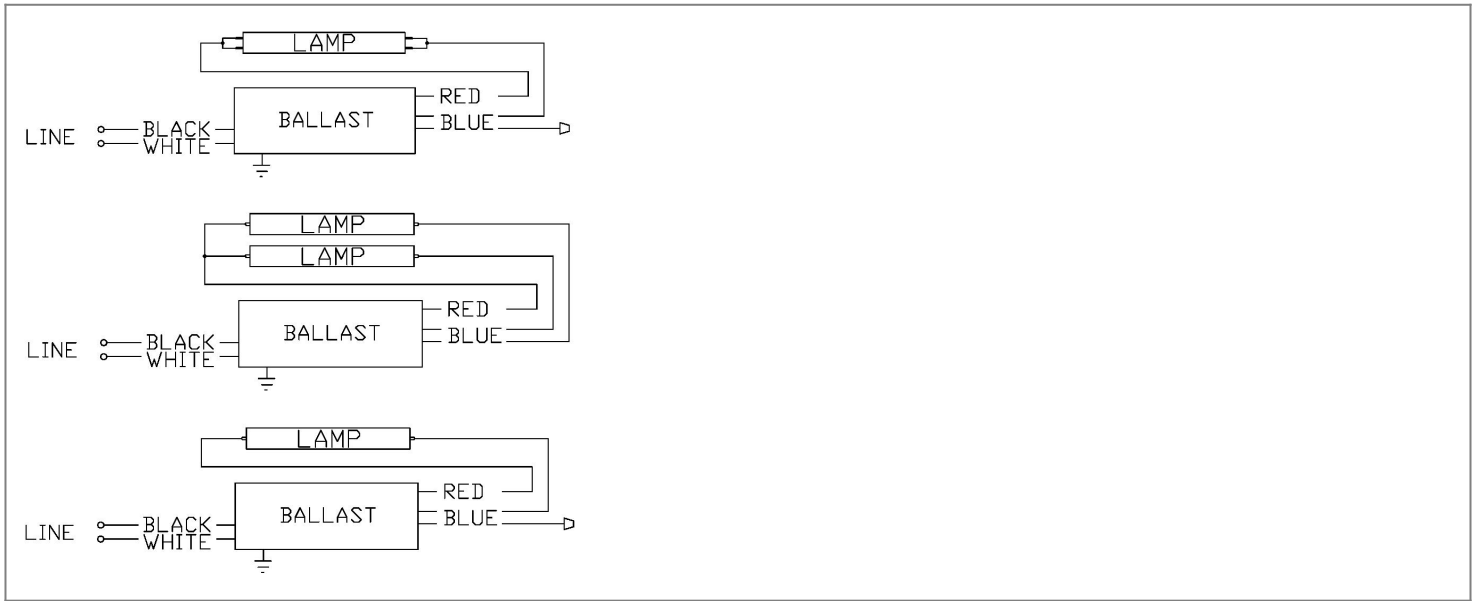
Lamp Type	No. of Lamps	Input Voltage (V)	Input Current (A)	Input Power (W)	Power Factor	MAX THD (%)	Ballast Factor	Min. Starting Temp.(F/C)	Lamp Current Crest Factor	B.E.F.
F96T8 59W	2	120/277	0.92/0.40	108/106	0.99	10	0.88	32	1.7	0.80
F96T8 59W	1	120/277	0.57/0.25	68/67	0.99	10	1.09	32	1.7	1.60/1.62
F40T8 40W	1	120/277	0.41/0.18	49	0.98	10	1.05	0	1.7	
F40T8 40W	2	120/277	0.62/0.27	74	0.98	10	0.90	32	1.7	
F72T8 46W	2	120/277	0.75/0.32	90	0.98	10	1.15	32	1.7	
F72T8 46W	1	120/277	0.48/0.21	58	0.98	10	1.20	32	1.7	
F96T8/ES 51W	1	120/277	0.49/0.22	59	0.98	10	1.10	32	1.7	
F96T8/ES 51W	2	120/277	0.81/0.35	96/95	0.98	10	1.00	32	1.7	
F96T8/ES 54W	1	120/277	0.47/0.21	57	0.98	10	1.05	32	1.7	
F96T8/ES 54W	2	120/277	0.77/0.33	93	0.98	10	0.87	32	1.7	
F96T8/ES 57W	1	120/277	0.53/0.23	63	0.98	10	1.09	32	1.7	
F96T8/ES 57W	2	120/277	0.86/0.37	104	0.98	10	0.90	32	1.7	

Physical Parameters



Enclosure (in)	Lead Length in.(+/-1.0)
Length	9.5
Width	1.3
Height	1.0
Mounting	8.91
	Black 12
	White 12
	Red 36
	Blue 24
	Yellow N/A

Wiring Diagram



Features & Benefits

- Commercial Downlight Retrofit or New Construction
- Universal Voltage 120-277V
- UL for Safety
- Three Adjustable Lumen Output
- Three Adjustable CCT Options (3000K, 3500K, 4000K)
- Driver Efficiency Greater than 85% at full power
- THD \leq 20% at full power
- High CRI
- Long Life
- Convenient and quick installation
- 0-10V Dimmable
- 25" Flexible Conduit
- Auto Recovery Short Circuit Protection, Over Load Protection, Over Voltage Protection
- Ambient Operating Temperature: -30 ~ 40°C
- Works in cold temperature applications
- 5 Year Warranty



Commercial Recessed Downlight



Specification Data

Model No.	Size	IC Rated	Watts	Lumens	CCT	Efficacy	Input Voltage	CRI	Power Factor	Beam Angle (°)	Dimension
VEKR6D/8T/13W-10V	6" Recess	Yes	6.5 / 9 / 13	790 / 1100 / 1560	3000K, 3500K, 4000K selectable	120	120-277	>80	0.9	100	Dia. 8.27" x Height 4.25"

Ordering Information

Sample model: VEKR4D/8T/10W-10V


VEKR	4D	8T	10W	10V
Series Retrofit Kit Recessed Light	Size 4" Downlight	CRI>80 T: three CCT adjustable	Wattage 10W Max.	0-10V dimming



User Manual [468inDownlightInstallation.pdf](#)

natural^{led}

Product Engineering Spec

Product Spec			
Category	LED Double Head Security Light	PICTURE	
Item Code	7031		
Stock Code	LED-FXBFD20/850/BK-SEN		
Mounting	Wall Mounted		
Housing Color	Black		

Electric Characteristics		Photometric Characteristics	
Rated Wattage (W)	20	Lumen (lm)	1400
Tested Wattage (W)	-	Efficacy (lm/w)	70
Input Voltage (V)	120V (due to motion sensor is only 120V)	CRI	80
Voltage Frequency (Hz)	50/60	CCT (K)	5000
Input Current (A)	0.2	Beam Angle (°)	70
Power Factor	>0.9	General Characteristics	
Replacement Wattage (W)		Operating Temperature	-4°F~104°F
Surge protect level	-	Storage Temperature	-4°F~122°F
Dimmable	No	IP rating	UL Wet Location
THD	/	Rated Life	50000 hrs
		Warranty	5 years

Product Dimensions		Suggested Accessory	
Weight (lbs.)	2.43		
Height (in)	5.75		
Length (in)	9.29		
Width (in)	6.89		
Mounting Height (ft)			
Cable Length (ft)			

Qualifications			
UL/ETL	UL,cUL	LM79	√
Energy Star	V2.0	LM80	√
DLC		IES File	√
CEC		FDA	
JA8		NEMA	
FCC	√	Dimmer List	
RoHS	√		

Comments:

PROJECT:

SCHEDULE:

DATE:

PREPARE BY:

NOTES:

DESCRIPTION

naturaLED® Slim Area Light is constructed with a durable, die-cast aluminum housing and excellent thermal design and is the perfect lighting solution for your parking lot, street, walkway, building flood up/down light and/or as a sign lighter. It provides uniform, consistent color with a wide range of wattage selections to replace from 50W to 1500W HID fixtures. Our fixtures are DLC Premium certified and IP65 rated with five types of mounting options available: Swivel Bracket, Slip Fitter, Yoke, 6" Extruded Arm and Pendant Mount. Compatible integrated autonomous and photocell motion sensors are available as options to address your needs. Energy savings can be as much as 85% while eliminating maintenance costs in labor and lamp and ballast replacement.

APPLICATIONS

Parking Lot, Street, Site, Streetscape, Area Lighting
















FEATURES

- DLC Premium
- IP65 Rated
- Aluminum Die-cast Housing
- Finish: Epoxy Powder Coat
- Input line voltage: 120-277 / 277-480
- Dimmable: 1-10V
- L90-100,000 hours rated chips
- Surge Protection:
 - 29W: 4KV
 - 150W: 10KV
 - 50/70/100/180/240/360W: 12KV
- Powerfactor >0.9
- Uniform and Consistent color
- Optimized Thermal Design
- Minimize Glare
- Available in Type 3, Type 4, Type 5 Light Distribution
- Operating temperature: - 40°F ~ 122°F



Rated Life 50,000 Hours*
Warranty 5 Years

ACCESSORIES

	Slip Fitter		Motion/Photocell Sensor
	Swivel Bracket		Step Down Driver
	6" Extruded Arm		Receptacle
	Round Pole Mounting Adaptor		Lens- Type 4 or 5
	Yoke Mount		Photocell Cap
	Wall Mount		Glare Shield
	Dual Pendant Box		Ballast
	Remote Controlled Motion/Photocell Sensor		

SAMPLE NUMBER LED-FXSAL180/40K/DB/3S/480

STYLE	FAMILY	SERIES	WATTAGE	COLOR TEMP	COLOR	TYPE	VOLTAGE
LED	FX	SAL	180	40K	DB	3S	480
led lighting	fixture	slim area light	180 watt	4000K	dark bronze	type3	277-480V

* Extended 10 year limited warranty available.
Contact your sales rep for more information



SLIM AREA LIGHT

WALL & AREA LUMINAIRES

ORDERING

*P= Premium DLC / *S = Standard DLC

Watts (W)	Ordering Code	Description	CCT (K)	Lumens (Lm)	Equiv. Wattage (W)	Voltage	Beam Angle	Color	IP65 Rated	DLC (S/P)
29	7616	LED-FXSAL29/40K/DB/3S	4000K	3,517	100-150	120-277	Type3	D.Bronze	•	P
29	7617	LED-FXSAL29/50K/DB/3S	5000K	3,576	100-150	120-277	Type3	D.Bronze	•	P
29	7618	LED-FXSAL29/40K/WH/3S	4000K	3,517	100-150	120-277	Type3	White	•	P
29	7619	LED-FXSAL29/50K/WH/3S	5000K	3,576	100-150	120-277	Type3	White	•	P
50	7620	LED-FXSAL50/40K/DB/3S	4000K	6,241	250	120-277	Type3	D.Bronze	•	P
50	7621	LED-FXSAL50/50K/DB/3S	5000K	6,247	250	120-277	Type3	D.Bronze	•	P
50	7622	LED-FXSAL50/40K/WH/3S	4000K	6,241	250	120-277	Type3	White	•	P
50	7623	LED-FXSAL50/50K/WH/3S	5000K	6,247	250	120-277	Type3	White	•	P
75	7752	LED-FXSAL75/30K/DB/3S	3000K	8,738	250-400	120-277	Type3	D.Bronze	•	-
75	7624	LED-FXSAL75/40K/DB/3S	4000K	8,738	250-400	120-277	Type3	D.Bronze	•	P
75	7625	LED-FXSAL75/50K/DB/3S	5000K	9,011	250-400	120-277	Type3	D.Bronze	•	P
75	7753	LED-FXSAL75/30K/WH/3S	3000K	8,738	250-400	120-277	Type3	White	•	-
75	7626	LED-FXSAL75/40K/WH/3S	4000K	8,738	250-400	120-277	Type3	White	•	P
75	7627	LED-FXSAL75/50K/WH/3S	5000K	9,011	250-400	120-277	Type3	White	•	P
100	7754	LED-FXSAL100/30K/DB/3S	3000K	11,540	400	120-277	Type3	D.Bronze	•	-
100	7628	LED-FXSAL100/40K/DB/3S	4000K	11,548	400	120-277	Type3	D.Bronze	•	P
100	7629	LED-FXSAL100/50K/DB/3S	5000K	11,821	400	120-277	Type3	D.Bronze	•	P
100	7755	LED-FXSAL100/30K/WH/3S	3000K	11,548	400	120-277	Type3	White	•	-
100	7630	LED-FXSAL100/40K/WH/3S	4000K	11,548	400	120-277	Type3	White	•	P
100	7631	LED-FXSAL100/50K/WH/3S	5000K	11,821	400	120-277	Type3	White	•	P
150	7700	LED-FXSAL150/30K/DB/3S	3000K	20,187	400-575	120-277	Type 3	D. Bronze	•	-
150	7701	LED-FXSAL150/30K/BK/3S	3000K	20,187	400-575	120-277	Type 3	Black	•	-
150	7702	LED-FXSAL150/30K/WH/3S	3000K	20,187	400-575	120-277	Type 3	White	•	-
150	7769	LED-FXSAL150/40K/DB/3S	4000K	20,000	400-575	120-277	Type 3	D.Bronze	•	P
150	7770	LED-FXSAL150/50K/DB/3S	5000K	20,000	400-575	120-277	Type 3	D.Bronze	•	P
150	9232	LED-FXSAL150/50K/WH/3S	5000K	20,604	400-575	120-277	Type 3	White	•	P
150	9234	LED-FXSAL150/50K/BK/3S	5000K	20,604	400-575	120-277	Type 3	Black	•	P
180	7746	LED-FXSAL180/30K/DB/3S	3000K	22,191	400-575	120-277	Type 3	D.Bronze	•	-
180	7632	LED-FXSAL180/40K/DB/3S	4000K	22,191	400-575	120-277	Type 3	D.Bronze	•	P
180	7633	LED-FXSAL180/50K/DB/3S	5000K	22,743	400-575	120-277	Type 3	D.Bronze	•	P
180	7747	LED-FXSAL180/30K/WH/3S	3000K	22,191	400-575	120-277	Type 3	White	•	-
180	7634	LED-FXSAL180/40K/WH/3S	4000K	22,191	400-575	120-277	Type 3	White	•	P
180	7635	LED-FXSAL180/50K/WH/3S	5000K	22,743	400-575	120-277	Type 3	White	•	P
240	7748	LED-FXSAL240/30K/DB/3S	3000K	29,794	750-1000	120-277	Type 3	D.Bronze	•	-
240	7636	LED-FXSAL240/40K/DB/3S	4000K	29,794	750-1000	120-277	Type 3	D.Bronze	•	P
240	7637	LED-FXSAL240/50K/DB/3S	5000K	30,274	750-1000	120-277	Type 3	D.Bronze	•	P
240	7749	LED-FXSAL240/30K/WH/3S	3000K	29,794	750-1000	120-277	Type 3	White	•	-

SLIM AREA LIGHT

WALL & AREA LUMINAIRES

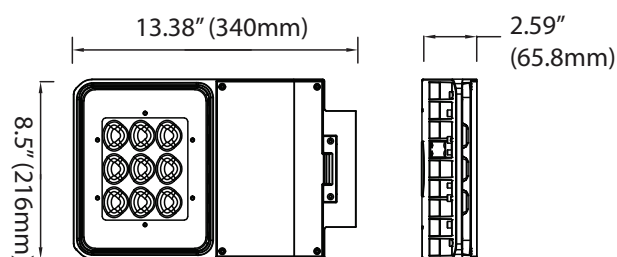
*P= Premium DLC / *S = Standard DLC

Watts (W)	Ordering Code	Description	CCT (K)	Lumens (Lm)	Equiv. Wattage (W)	Voltage	Beam Angle	Color	IP65 Rated	DLC (S/P)
240	7638	LED-FXSAL240/40K/WH/3S	4000K	29,794	750-1000	120-277	Type3	White	•	P
240	7639	LED-FXSAL240/50K/WH/3S	5000K	30,274	750-1000	120-277	Type3	White	•	P
240	9210	LED-FXSAL240/50K/BK/3S	5000K	30,274	750-1000	120-277	Type3	Black	•	P
360	7750	LED-FXSAL360/30K/DB/3S	3000K	44,796	1000-1500	120-277	Type3	D.Bronze	•	-
360	7640	LED-FXSAL360/40K/DB/3S	4000K	44,796	1000-1500	120-277	Type3	D.Bronze	•	P
360	7641	LED-FXSAL360/50K/DB/3S	5000K	45,878	1000-1500	120-277	Type3	D.Bronze	•	P
360	7751	LED-FXSAL360/30K/WH/3S	3000K	44,796	750-1000	120-277	Type3	White	•	-
360	7642	LED-FXSAL360/40K/WH/3S	4000K	44,796	1000-1500	120-277	Type3	White	•	P
360	7643	LED-FXSAL360/50K/WH/3S	5000K	45,878	1000-1500	120-277	Type3	White	•	P
180	7724	LED-FXSAL180/40K/DB/3S/480	4000K	22,147	400-575W	277-480	Type3	D.Bronze	•	P
180	7725	LED-FXSAL180/50K/DB/3S/480	5000K	22,717	400-575W	277-480	Type3	D.Bronze	•	P
180	7726	LED-FXSAL180/40K/WH/3S/480	4000K	22,147	400-575W	277-480	Type3	White	•	P
180	7727	LED-FXSAL180/50K/WH/3S/480	5000K	22,717	400-575W	277-480	Type3	White	•	P
240	7728	LED-FXSAL240/40K/DB/3S/480	4000K	28,912	750-1000W	277-480	Type3	D.Bronze	•	P
240	7729	LED-FXSAL240/50K/DB/3S/480	5000K	29,546	750-1000W	277-480	Type3	D.Bronze	•	P
240	7730	LED-FXSAL240/40K/WH/3S/480	4000K	28,912	750-1000W	277-480	Type 3	White	•	P
240	7731	LED-FXSAL240/50K/WH/3S/480	5000K	29,546	750-1000W	277-480	Type 3	White	•	P
360	7732	LED-FXSAL360/40K/DB/3S/480	4000K	43,560	1000-1500W	277-480	Type 3	D.Bronze	•	P
360	7733	LED-FXSAL360/50K/DB/3S/480	5000K	44,405	1000-1500W	277-480	Type 3	D.Bronze	•	P
360	7734	LED-FXSAL360/40K/WH/3S/480	4000K	43,560	1000-1500W	277-480	Type 3	White	•	P
360t	7735	LED-FXSAL360/40K/WH/3S/480	5000K	44,405	1000-1500W	277-480	Type 3	White	•	P

DIMENSIONS

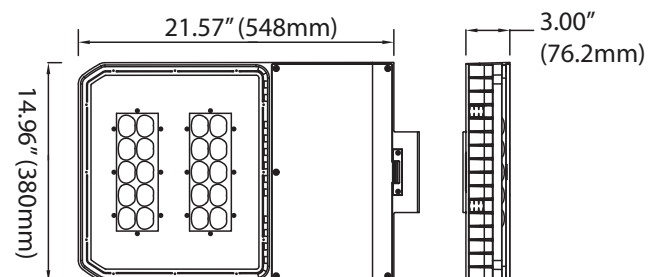
29W~100W

29W: 6-lbs
50W: 6-lbs
75W: 6-lbs
100W: 6-lbs



150W~360W

150W: 22-lbs
180W: 23.6-lbs
240W: 24.5-lbs
360W: 25.5-lbs



MOUNTINGS (Ordered Separately)



Wall Mount



Wall Mount + EA6



Swivel Bracket



6" Extended Arm



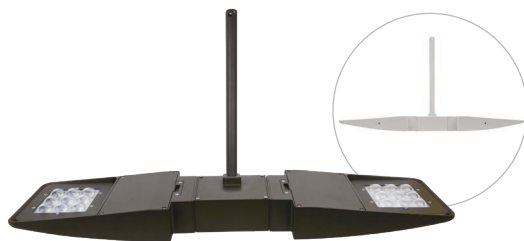
Round Pole Mounting Adaptor



Slip Fitter

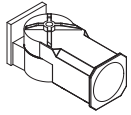


Yoke Mount



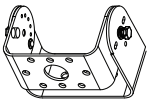
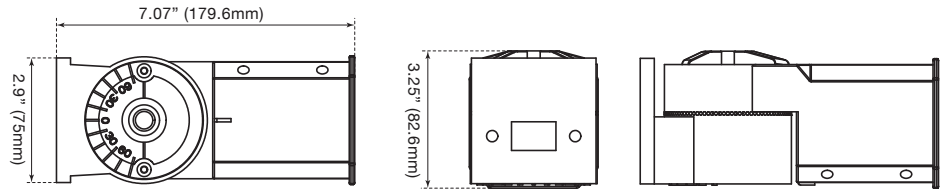
**Pendant Mount
(rigid pole not included)**

MOUNTINGS (Ordered Separately)



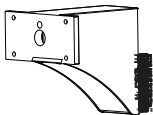
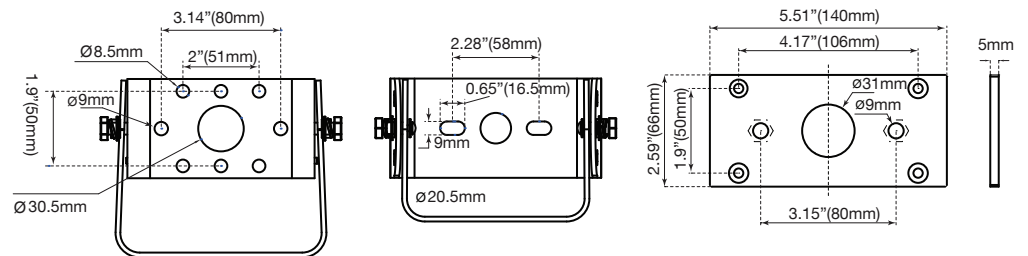
Slip Fitter -SF

- P10101 MT-SAL/SF/DB
- P10209 MT-SAL/SF/BK
- P10102 MT-SAL/SF/WH



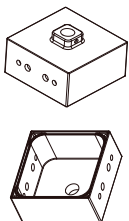
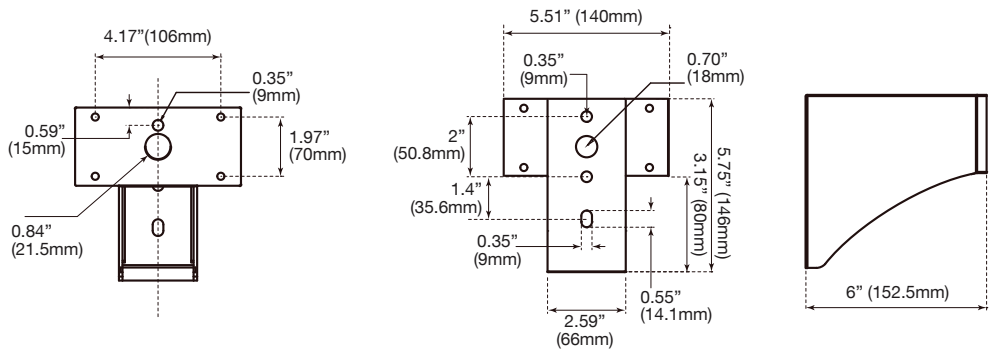
Swivel Bracket -SB

- P10103 MT-SAL/SB/DB
- P10210 MT-SAL/SB/BK
- P10104 MT-SAL/SB/WH



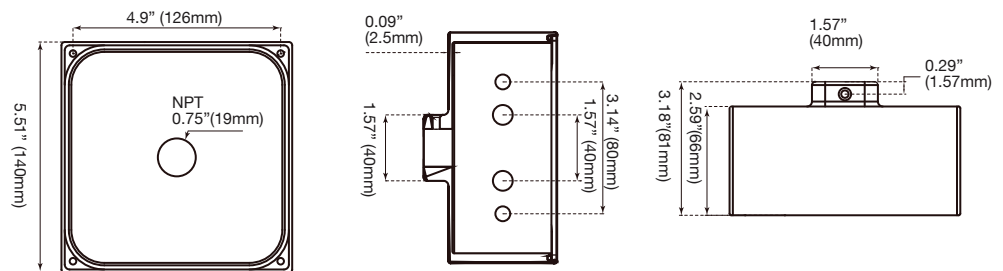
6" Extruded Arm

- P10105 MT-SAL/EA6/DB
- P10211 MT-SAL/EA6/BK
- P10106 MT-SAL/EA6/WH



Dual Pendant Box

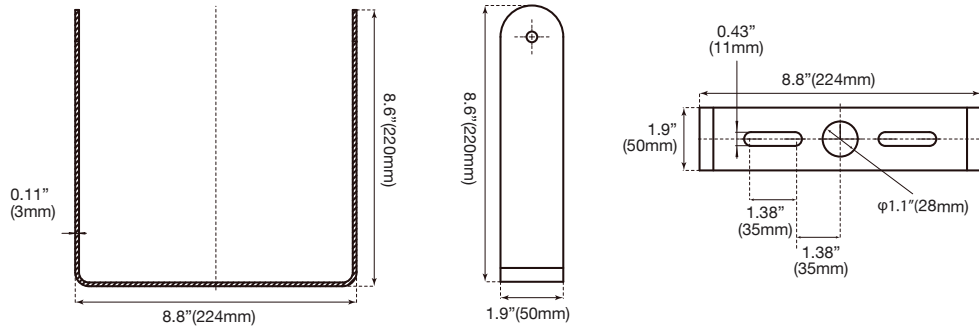
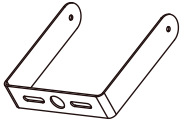
- P10107 MT-SAL/DPB/DB
- P10108 MT-SAL/DPB/WH



MOUNTING SPECIFICATIONS (SOLD SEPARATELY)

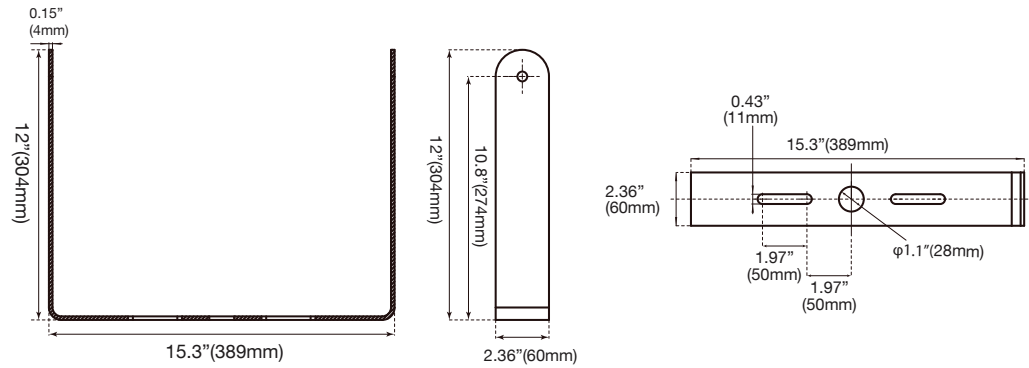
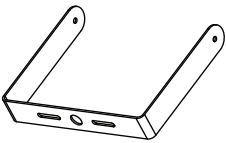
Yoke - 9" (29W~100W)

- P10111 MT-SAL/YK9/DB
- P10112 MT-SAL/YK9/WH



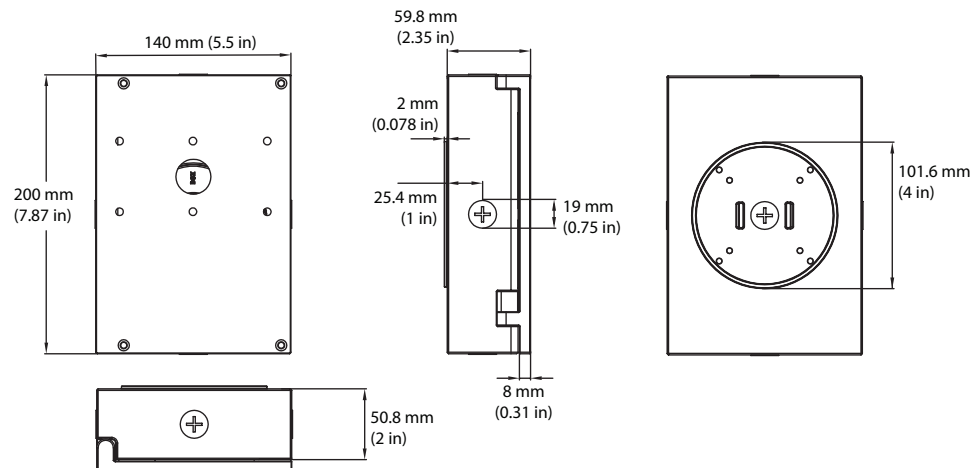
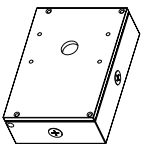
Yoke - 15" (150W~360W)

- P10113 MT-SAL/YK15/DB
- P10114 MT-SAL/YK15/WH



Wall Mount

- P10198 MT-SAL/WM/DB
- P10199 MT-SAL/WM/WH

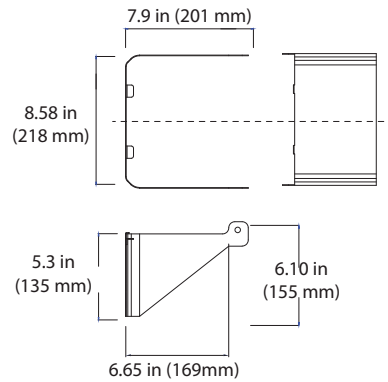
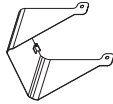


MOUNTING SPECIFICATIONS (SOLD SEPARATELY)

Shield (29W~100W)

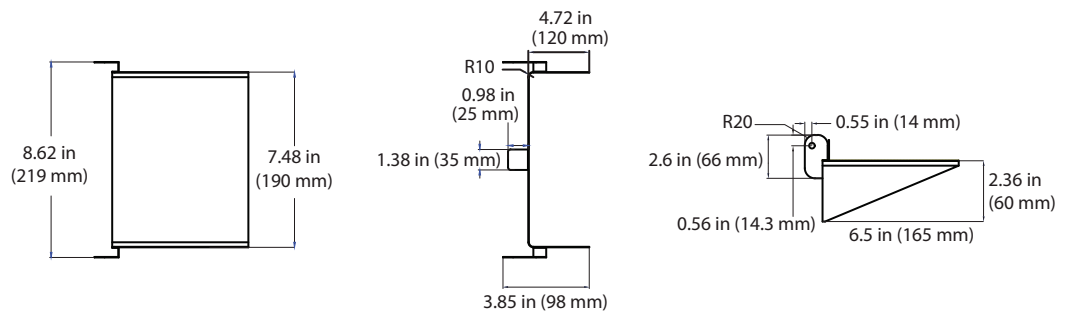
Front

- P10213 GSF-SAL-S/DB
- P10214 GSF-SAL-S/WH



Back

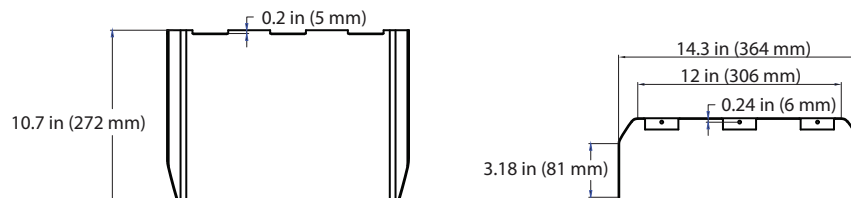
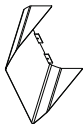
- P10205 GSB-SAL-S/DB
- P10206 GSB-SAL-S/WH



Shield (150W~360W)

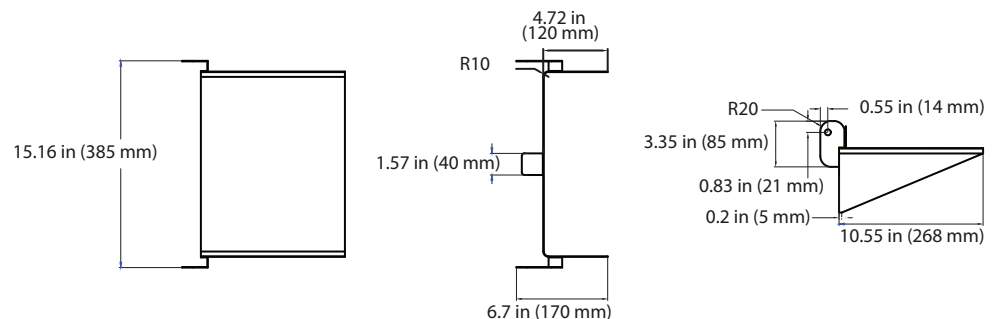
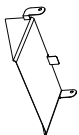
Front

- P10215 GSF-SAL-L/DB
- P10216 GSF-SAL-L/WH



Back

- P10207 GSB-SAL-L/DB
- P10208 GSB-SAL-L/WH



ACCESSORIES (Ordered Separately)

Mounting: Slip Fitter



Code	Model	Description
• P10101	MT-SAL/SF/DB	Slip Fitter Mount for Slim Area Light Dark Bronze
• P10209	MT-SAL/SF/BK	Slip Fitter Mount for Slim Area Light Black
• P10102	MT-SAL/SF/WH	Slip Fitter Mount for Slim Area Light White

Mounting: Swivel Bracket



Code	Model	Description
• P10103	MT-SAL/SB/DB	Swivel Bracket Mount for Slim Area Light Dark Bronze
• P10210	MT-SAL/SB/BK	Swivel Bracket Mount for Slim Area Light Black
• P10104	MT-SAL/SB/WH	Swivel Bracket Mount for Slim Area Light White

Mounting: 6" Extruded Arm



Code	Model	Description
• P10105	MT-SAL/EA6/DB	6" Extruded Arm Mount for Slim Area Light Dark Bronze
• P10211	MT-SAL/EA6/BK	6" Extruded Arm Mount for Slim Area Light Black
• P10106	MT-SAL/EA6/WH	6" Extruded Arm Mount for Slim Area Light White

Mounting: Round Pole Mounting Adaptor



Code	Model	Description
• P10119	MT-SAL/4PA/DB	4" Round pole adaptor for SAL-DB
• P10120	MT-SAL/5PA/DB	5" Round pole adaptor for SAL-DB
• P10121	MT-SAL/6PA/DB	6" Round pole adaptor for SAL-DB
• P10122	MT-SAL/4PA/WH	4" Round pole adaptor for SAL-WH
• P10123	MT-SAL/5PA/WH	5" Round pole adaptor for SAL-WH
• P10124	MT-SAL/6PA/WH	6" Round pole adaptor for SAL-WH

Mounting: Yoke Mount (9-inch and 15-inch)



Code	Model	Description
• P10111	MT-SAL/YK9/DB	9" Yoke Mount for Slim Area Light (29W-100W) Dark Bronze
• P10112	MT-SAL/YK9/WH	9" Yoke Mount for Slim Area Light (29W-100W) White
• P10113	MT-SAL/YK15/DB	15" Yoke Mount for Slim Area Light (180W-360W) Dark Bronze
• P10114	MT-SAL/YK15/WH	15" Yoke Mount for Slim Area Light (180W-360W) White

Mounting: Wall Mount



Code	Model	Description
• P10198	MT-SAL/WM/DB	Wall Mount Small Slim Area Light Dark Bronze
• P10199	MT-SAL/WM/WH	Wall Mount Small Slim Area Light White

Mounting: Dual Pendant Box



Code	Model	Description
• P10107	MT-SAL/DPB/DB	Dual Pendant Box 3/4" NPT Dark Bronze
• P10108	MT-SAL/DPB/WH	Dual Pendant Box 3/4" NPT White

ACCESSORIES (Ordered Separately)

Remote Controlled Motion/PhotoCell Sensor



Code	Model	Description
• K136178	PLT/LDB/9SWC	Remote Controllable Sensor 0-10V 3X C Lens (150-360W) Dark Bronze Plate
• K136179	PLT/LDB/9SWD	Remote Controllable Sensor 0-10V 2X D Lens (150-360W) Dark Bronze Plate
• K137178	PLT/LWH/9SWC	Remote Controllable Sensor 0-10V 3X C Lens (150-360W) White Plate
• K137179	PLT/LWH/9SWD	Remote Controllable Sensor 0-10V 100-277V 2X D Lens (150-360W) White Plate
• K134178	PLT/SDB/9SWC	Remote Controllable Sensor 0-10V 100-277V 3X C Lens (29-100W) Dark Bronze Plate
• K134179	PLT/SDB/9SWD	Remote Controllable Sensor 0-10V 100-277V 2X D Lens (29-100W) Dark Bronze Plate
• K135178	PLT/SWH/9SWC	Remote Controllable Sensor 0-10V 100-277V 3X C Lens (29-100W) White Plate
• K135179	PLT/SWH/9SWD	Remote Controllable Sensor 0-10V 100-277V 2X D Lens (29-100W) White Plate
• P10164	SEN-SRP280	Remote Control

Motion/Photocell Sensor



Code	Model	Description
• *K134115	PLT/SDB/SWC	Motion/Photocell 0-10V 100-277V 3X C Lens (29-100W) Dark Bronze Plate
• *K134116	PLT/SDB/SWD	Motion/Photocell 0-10V 100-277V 2X D Lens (29-100W) Dark Bronze Plate
• *K135115	PLT/SWH/SWC	Motion/Photocell 0-10V 100-277V 3X C Lens (29-100W) White Plate
• *K135116	PLT/SWH/SWD	Motion/Photocell 0-10V 100-277V 2X D Lens (29-100W) White Plate
• *K136115	PLT/LDB/SWC	Motion/Photocell 0-10V 100-277V 3X C Lens (150-360W) Dark Bronze Plate
• *K136116	PLT/LDB/SWD	Motion/Photocell 0-10V 100-277V 2X D Lens (150-360W) Dark Bronze Plate
• *K137115	PLT/LWH/SWC	Motion/Photocell 0-10V 100-277V 3X C Lens (150-360W) White Plate
• *K137116	PLT/LWH/SWD	Motion/Photocell 0-10V 100-277V 2X D Lens (150-360W) White Plate

* Limited Quantity

Step Down Driver for 29W-100W



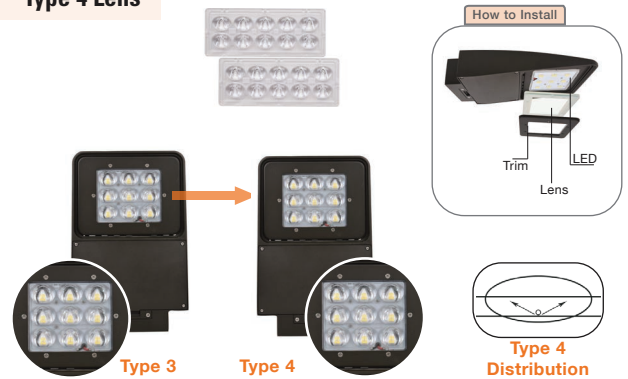
Code	Model	Description
• K134185	PLT/SDB/100BA480	347-480 to 277V Step Down Driver for SAL 100W and under Dark Bronze
• K135186	PLT/SWH/100BA480	347-480 to 277V Step Down Driver for SAL 100W and under White

Receptacle



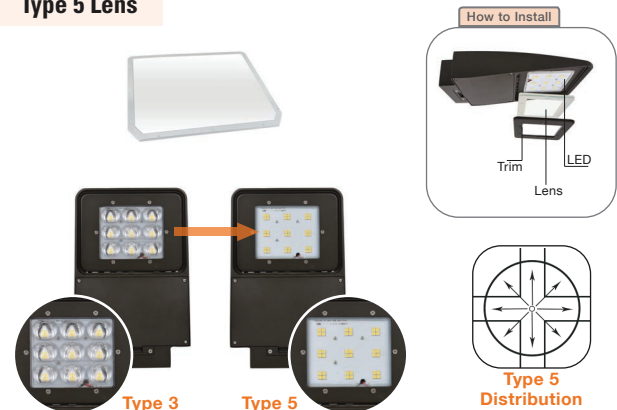
Code	Model	Description
• P10141	REC3PLK	3 prong twist lock receptacle mount
• P10142	REC7PLK	7 prong twist lock receptacle mount

Type 4 Lens



Code	Model	Description
• P10237	LENS-SAL-3X3-IV	Type 4 Lens for SAL (29W-100W)
• K238X2	LENS-SAL180-IV	Type 4 Lens for SAL (150W/180W)
• K238X3	LENS-SAL240-IV	Type 4 Lens for SAL (240W)
• K237X4	LENS-SAL360-IV	Type 4 Lens for SAL (360W)

Type 5 Lens



Code	Model	Description
• P10127	LENS-SAL-SMALL-V	Type 5 Lens for SAL (29W-100W)
• P10128	LENS-SAL-LARGE-V/DB	Type 5 Lens for SAL (150W-360W) Dark Bronze
• P10131	LENS-SAL-LARGE-V/WH	Type 5 Lens for SAL (150W-360W) White

ACCESSORIES (Ordered Separately)

Photocell Sensor & Short Cap



Code	Model	Description
• K141030	REC3PLK/PHO	Receptacle Mount & Photocell for SAL
• P10053	SEN-PHO-LK-MT/SRT	Twist-Lock Mount Shorting Cap

Glare Shield



Code	Model	Description
• P10205	GSB-SAL-S/DB	Back Glare Shields for SAL (29-100W) Dark Bronze
• P10206	GSB-SAL-S/WH	Back Glare Shields for SAL (29-100W) White
• P10207	GSB-SAL-L/DB	Back Glare Shields for SAL (150-360W) Dark Bronze
• P10208	GSB-SAL-L/WH	Back Glare Shields for SAL (150-360W) White
• P10213	GSF-SAL-S/DB	Front Glare Shields for SAL (29-100W) Dark Bronze
• P10214	GSF-SAL-S/WH	Front Glare Shields for SAL (29-100W) White
• P10215	GSF-SAL-L/DB	Front Glare Shields for SAL (150-360W) Dark Bronze
• P10216	GSF-SAL-L/WH	Front Glare Shields for SAL (150-360W) Dark Bronze

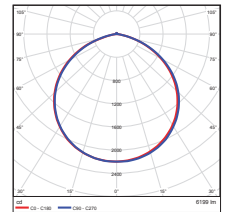
Ballast



Code	Model	Description
• P10183	BALED-ESD-240S460DT	Ballast Inventronics 150/180/360W*
• P10184	BALED-ESD-240S660DT	Ballast Inventronics 240W (480V)

*360W requires **2pcs** of P10183 BALED-ESD-240S460DT

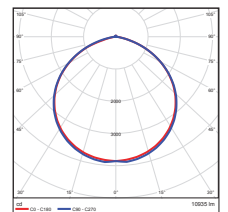
50W - Type5
DLC Premium



Distance (ft)	Center Beam (f)	Beam Width (f)	Illuminance (fc)
0.0	28.0	15.0	15.1
5.0	22.0	30.1	30.1
10.0	9.77	45.2	45.2
15.0	5.50	59.9	60.2
20.0	3.52	74.9	75.3
25.0	2.44	89.9	90.3
30.0			

■ Vert. Spread: 112.6°
 ■ Horiz. Spread: 112.8°

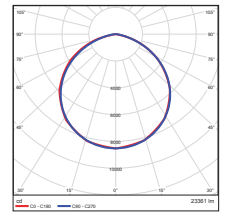
100W - Type5
DLC Premium



Distance (ft)	Center Beam (f)	Beam Width (ft)
5.0	15.4 f	14.9 ft
10.0	38.6 f	34.9 ft
15.0	17.1 f	44.0 ft
20.0	9.65 f	53.0 ft
25.0	6.17 f	74.7 ft
30.0	4.29 f	89.6 ft

■ Vert. Spread: 112.4°
 ■ Horiz. Spread: 112.9°

180W - Type5
DLC Premium

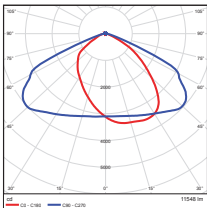


Distance	Illuminance at a Distance		
	Center beam fc	Beam width	
5.0 ft	341 fc	14.8 ft	14.6 ft
10.0 ft	85.2 fc	29.7 ft	29.2 ft
15.0 ft	37.9 fc	44.5 ft	43.8 ft
20.0 ft	21.3 fc	59.4 ft	58.4 ft
25.0 ft	13.6 fc	74.2 ft	73.0 ft
30.0 ft	9.47 fc	89.1 ft	87.6 ft

■ Vert. Spread: 112.1°
 ■ Horiz. Spread: 111.2°

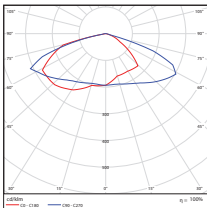
PHOTOMETRICS CHART

240W - Type3
DLC Premium



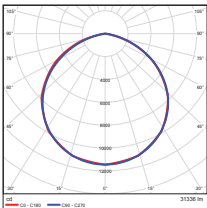
Illuminance at a Distance		Beam Width	
Center Beam Fc	Beam Width	Center Beam Fc	Beam Width
5.0ft	291 ft	9.1 ft	23.6 ft
10.0ft	72.7 ft	18.2 ft	47.3 ft
15.0ft	32.3 ft	27.4 ft	70.9 ft
20.0ft	18.2 ft	36.5 ft	94.5 ft
25.0ft	11.6 ft	45.6 ft	118.2 ft
30.0ft	8.97 ft	54.7 ft	141.8 ft
Vert. Spread: 04.7°		Horiz. Spread: 134.1°	

240W - Type4
DLC Premium



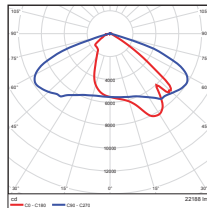
Illuminance at a Distance		Beam Width	
Center Beam Fc	Beam Width	Center Beam Fc	Beam Width
5.0ft	442 ft	11.7 ft	2.8 ft
10.0ft	107 ft	23.7 ft	5.6 ft
15.0ft	48.1 ft	35.3 ft	8.4 ft
20.0ft	27.2 ft	47.0 ft	11.2 ft
25.0ft	17.2 ft	58.8 ft	14.0 ft
30.0ft	12.0 ft	70.6 ft	16.8 ft
Vert. Spread: 120.9°		Horiz. Spread: 45.6°	

240W - Type5
DLC Premium



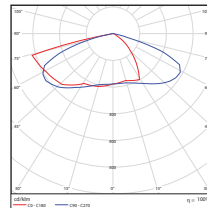
Illuminance at a Distance		Beam Width	
Center Beam Fc	Beam Width	Center Beam Fc	Beam Width
5.0ft	458 ft	14.8 ft	14.6 ft
10.0ft	114 ft	29.5 ft	29.2 ft
15.0ft	50.9 ft	44.3 ft	43.8 ft
20.0ft	28.6 ft	59.0 ft	58.4 ft
25.0ft	18.3 ft	73.8 ft	73.0 ft
30.0ft	12.7 ft	88.6 ft	87.7 ft
Vert. Spread: 111.0°		Horiz. Spread: 111.0°	

360W - Type3
DLC Premium



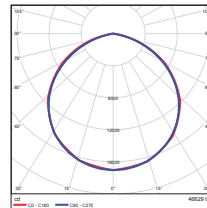
Illuminance at a Distance		Beam Width	
Center Beam Fc	Beam Width	Center Beam Fc	Beam Width
5.0ft	598 ft	16.7 ft	26.3 ft
10.0ft	127 ft	33.3 ft	40.7 ft
15.0ft	56.4 ft	50.0 ft	61.0 ft
20.0ft	31.7 ft	66.7 ft	81.3 ft
25.0ft	20.3 ft	83.4 ft	101.7 ft
30.0ft	14.3 ft	100.0 ft	122.0 ft
Vert. Spread: 93.7°		Horiz. Spread: 127.6°	

360W - Type4
DLC Premium



Illuminance at a Distance		Beam Width	
Center Beam Fc	Beam Width	Center Beam Fc	Beam Width
5.0ft	661 ft	9.4 ft	13.0 ft
10.0ft	160 ft	18.8 ft	26.3 ft
15.0ft	72.0 ft	28.2 ft	39.3 ft
20.0ft	40.7 ft	37.7 ft	52.2 ft
25.0ft	25.8 ft	47.4 ft	65.6 ft
30.0ft	18.0 ft	56.8 ft	78.6 ft
Vert. Spread: 109.6°		Horiz. Spread: 126.0°	

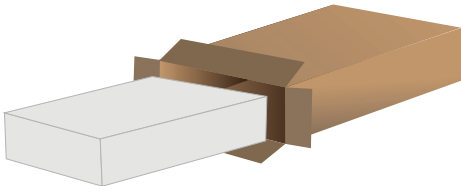
360W - Type5
DLC Premium



Illuminance at a Distance		Beam Width	
Center Beam Fc	Beam Width	Center Beam Fc	Beam Width
5.0ft	681 ft	14.8 ft	14.5 ft
10.0ft	170 ft	29.7 ft	29.0 ft
15.0ft	75.7 ft	44.5 ft	43.4 ft
20.0ft	42.6 ft	59.4 ft	57.9 ft
25.0ft	27.3 ft	74.2 ft	72.4 ft
30.0ft	18.9 ft	89.1 ft	86.9 ft
Vert. Spread: 112.1°		Horiz. Spread: 110.7°	

PACKAGE

Case Qty 1 pc





Attachment C

HVAC Systems

Fresno Zoo - HVAC Inventory

ABS ID	Existing Tag	Location Served	Equipment Type	Manufacturer	Model Number	Serial Number	Size / Capacity		Year	Replace Unit
1		Hospital Unit 1	Packaged Unit (Gas/DX)	Bryant	580DPV048074AAAB	3998G20994	4.0	ton	1998	Yes
2		Hospital Unit 2	Packaged Unit (Gas/DX)	Bryant	580DPV036074ABAB	4698G20717	3.0	ton	1998	Yes
3		Hospital Unit 3	Packaged Unit (Gas/DX)	Bryant	580DPV060074AAAA	4198G20716	5.0	ton	1998	Yes
4		Hospital Unit 4	Packaged Unit (Gas/DX)	Bryant	580DPV048074AAAB	_998G20996	4.0	ton	1998	Yes
5		Hospital Unit 5	Packaged Unit (Gas/DX)	Bryant	580DPV036074ABAB	4698G20718	3.0	ton	1998	Yes
6	AC-3LG	Lodge Unit 1	Packaged Unit (Gas/DX)	Carrier	48HCDD12A2A6A0A0A0	2914P70325	10.0	ton	2014	
7	AC-2LG	Lodge Unit 2	Packaged Unit (Gas/DX)	Carrier	48HCDD09A2A6A0A0A0	3714P34650	8.5	ton	2014	
8	AC-1LG	Lodge Unit 3	Packaged Unit (Gas/DX)	Carrier	48HCLA06A2A6A0A0A0	3214C84587	5.0	ton	2014	
9	MUA-1LG	Lodge Unit 4	MUA	Greenheck	16X-118-H32-DB	13691436-1406	n/a		2014	
10		Lodge	Ductless Split System	Ameristar	M4THS1324A11NA	171102058X	2.0	ton	2017	
11		Simba Classroom	FCU	Carrier	CNPVP6124ALAAAAA	1813X31678	5.0	ton	2013	
12	CU-1LG	Simba Classroom	Cond. Unit	Carrier	24ACB7608310	2214E11799	5.0	ton	2014	
13		Lodge RR Unit	Heat Pump	Daikin	RXYMQ48PVJU	E005185	4.0	ton		
14		Lodge Giftshop Unit	FCU	Daikin	FTXN24KVJU	E015596	2.0	ton	2014	
15	ODU-1RH	Lodge Giftshop Unit	Ductless Split System	Daikin	RKN24KEVJU5	G001866	2.0	ton	2014	
16	ODU-2RH	Lodge Giftshop Unit	Ductless Split System	Daikin	RXS12LVJU	E009492	1.0	ton	2014	
17	MUA-1L	Lions Unit 1	AHU	Temptrol	WF-DH6	T015248-001-00	n/a			
18		Lions Unit 2	Ductless Split System	Daikin	RKN24KEVJU5	G001685	2.0	ton		
19		Lions Unit 3		Daikin	RZQ24PVJ09	A002645	2.0	ton		
20		Meerkat Unit 1	FCU	Daikin	FTX524LVJU	E005578	n/a			
21		Meerkat Unit 2	Ductless Split System	Daikin	RXS24LVJU	E004997	2.0	ton		
22		Warthog Unit								
23	HC-1	Tropical Treasures Unit	Packaged Unit (Gas/DX)	Trane	YHC120A3EMA2101B10	540100627L	10.0	ton	2005	
24		Babirusa Unit	Packaged Unit (Gas/DX)	Day/Night	PGD324040K001C1	C143724198	2.0	ton	2014	
25		Gohr Unit 1	Forced Induction Gas Furnac	ICP	G9MXE1202422A2	A152546324	n/a	ton	2015	
26		Gohr Unit 2	Forced Induction Gas Furnac	ICP	G9MXE1202422A2	A153543924	n/a	ton	2015	
27		Commissary Unit	Packaged Unit (Gas/DX)	Day/Night	PGD324040K001C1	C122818177	2.0	ton	2012	
28		Old Hospital Unit	Packaged Unit (Gas/DX)	Bryant	574DNWA36090NA	1709C01027	2.5	ton	2009	
29		Orang Unit 1	Packaged Unit (Gas/DX)	Carrier	48HJE006	4699G20388	5.0	ton	1999	Yes
30		Orang Unit 2	Ductless Split System	Fujitsu	A0U18RLQ	GWN00176	1.5	ton		Yes
31		Tiger Unit 1			140HCDAC	25480030 0660				
32		Tiger Unit 2			140HCDAC	25480030 0658				
33		Sea Lion Cove Unit	Heat Pump	Daikin	RXYMQ36PVJU	E001216	3.0	ton		Yes
34	CU-2	Sea Lion Cove Unit	VRF Split	Daikin	RXYMQ48PVJU	E001747	4.0	ton	2011	
35		Security / VSO Unit	Packaged Unit (Gas/DX)	York	D1NA036N03606C	NCJM028539	3.0	ton	2000	Yes
36		Gift Shop Unit 1	Split System (Ht Pmp)	Carrier	38YRA060300	0898E04039	5.0	ton	1998	Yes
37		Gift Shop Unit 2	Split System (Ht Pmp)	Carrier	38YRA060300	0898E04036	5.0	ton	1998	Yes
38		Antieater Unit 1	Packaged Unit (Gas/DX)	Day/Night	PGD330060X001C1	C133319408	2.5	ton	2013	

Fresno Zoo - HVAC Inventory

ABS ID	Existing Tag	Location Served	Equipment Type	Manufacturer	Model Number	Serial Number	Size / Capacity		Year	Replace Unit
39		Antieater Unit 2	Packaged Unit (Gas/DX)	Day/Night	PGD330060X001C1	C123600378	2.5	ton	2012	
40		Antieater Unit 3	Packaged Unit (Gas/DX)	Day/Night	PGD330060X001C1	C123600652	2.5	ton	2012	
41		Ops Trailer Unit	WMHP	Bard	est 3-ton	125D0419****	3.0	ton	2004	Yes
42		Bird Show Unit 1	WMHP	Bard	est 3-ton	cant read	3.0	ton		
43		Bird Show Unit 2	WMHP	Bard	est 3-ton	cant read	3.0	ton		
44		Annex Unit 1	WMHP	Bard	WH361-A0SVP4XXX	125K082546299-02	3.0	ton	2008	Yes
45		Annex Unit 2	WMHP	Bard	WH361-A0SVP4XXX		3.0	ton		Yes
46		Marketing Unit 1	WMHP	Bard	36WH7-A05CD002	058N890629000	3.0	ton	1989	
47		Marketing Unit 2	WMHP	Bard	36WH7-A05CD002	058N890629002	3.0	ton	1989	
48	Ed Unit #1	Education Unit 1	Cond. Unit	Ruud	UAFD024JAS	4077F37883471	2.0	ton	1988	Yes
49	Ed Unit #2	Education Unit 2	Cond. Unit	Day/Night	N4A548GKC101	E163113806	4.0	ton	2016	
50	Ed Unit #3	Education Unit 3		Payne	569CJ036	5282A00812	3.0	ton	1982	
51	Ed Unit #4	Education Unit 4	Cond. Unit	Payne	PA15NC024-A	2317X36801	2.0	ton	2017	
52		Education Unit 5	Packaged Unit (Gas/DX)	York	H1DB060506A	EMDM453458	5.0	ton	1995	
53	Ed Unit #6	Education Unit 6	Cond. Unit	Carrier	SQJS-036	1604G21328	3.0	ton	2004	
54		Education Unit	Cond. Unit	Payne	R4A536AKB100	X202158544	3.0	ton	1982	
55		Admin Unit 1	WMHP	Bard	W60A2-A10XX4XXX	324L133056177-02	5.0	ton	2013	
56		Admin Unit 2	WMHP	Bard	W60A2-A10XX4XXX	324L133056176-02	5.0	ton	2013	
57		Admin	Ductless Split System	Fujitsu	AOU18RLXFW	KSN015326	1.5	ton		
58	MUA-1C	Cheetah Unit 1	AHU	Temptrol	WFDV5	T015248-002-00	n/a		2014	
59	ODU-1C	Cheetah Unit 2	Ductless Split System	Daikin	RKN24KEVJU5	G001908	2.0	ton	2014	
60	MainT #1	Maintenance Unit	Packaged Unit (Gas/DX)	ICP	PGD324040K001C1	C113811464	2.0	ton	2011	
61		Colobus Unit	Window AC	Freidrich	EM18N34-A	ADBY01641	1.5	ton		
62		Fennec Fox Unit	Window AC	Frididare	FFRE0633U10	HK90904866	0.5	ton		
63	AC-1	Reptile House Unit 1	Packaged Unit (Gas/DX)	Trane	YSC120F4RLA0	113111348L	10.0	ton	2011	
64	AC-2	Reptile House Unit 2	Packaged Unit (Gas/DX)	Carrier	48HJD006	1701G24314	5.0	ton	2001	
65	AC-3	Reptile House Unit 3	Packaged Unit (Gas/DX)	Trane	YSC090E4ELA0E0	112412321L	7.5	ton	2011	
66	AC-4	Reptile House Unit 4	Packaged Unit (Gas/DX)	Carrier	48HJD006	50DK506992C	5.0	ton	2001	Yes
67		LSS Sea Lion Cove Unit 1	FCU	Daikin	FXAQ24MVJU	E004264	2.0	ton		
68		LSS Sea Lion Cove Unit 2	FCU	Daikin	FXAQ24MVJU	E004256	2.0	ton		
69	FCU	LSS Elephant Unit 1	FCU	Daikin	FTXS30LVJU	E001762	2.5	ton		
70	FCU	LSS Elephant Unit 2	FCU	Daikin	FTXN24KVJU	E015603	2.0	ton		
71	ODU-1V	Stork Holding Bldg.	Ductless Split System	Daikin	RXS24LVJU	E005002	2.0	ton	2014	
72	ODU-1G	Giraffe Bldg.	Ductless Split System	Daikin	RZQ24PVJU9	A002549	2.0	ton	2014	
73	ODU-2G	Giraffe Bldg.	Ductless Split System	Daikin	RKN24KEVJU5	G001897	2.0	ton	2014	
74	ODU-3G	Giraffe Bldg.	Ductless Split System	Daikin	RZQ18PVJU5	A002561	1.5	ton	2014	
75	ODU-1H	Ungulate Bldg.	Ductless Split System	Daikin	RKN24KEVJU5	G001904	2.0	ton	2014	
76	ODU-2H	Ungulate Bldg.	Ductless Split System	Daikin	RZQ24PVJU9	A002549	2.0	ton	2014	
77	ODU-1E	Elephant Bldg.	Ductless Split System	Daikin	RKN24KEVJU5	G001896	2.0	ton	2014	
78	ODU-2E	Elephant Bldg.	Ductless Split System	Daikin	RZQ24PVJU9	A002554	2.0	ton	2014	

Fresno Zoo - HVAC Inventory

ABS ID	Existing Tag	Location Served	Equipment Type	Manufacturer	Model Number	Serial Number	Size / Capacity		Year	Replace Unit
79		Elephant Bldg.	Ductless Split System	Daikin	RZQ24PVJU9	A002550	2.0	ton	2014	
80	ODU-1RS	Temba Restroom	Ductless Split System	Daikin	RXS12LVJU	E009466	1.0	ton	2014	
81	ODU-1LV	Lion Viewing Area	Ductless Split System	Daikin	RXS09LVJU	E003732	0.75	ton	2014	
82	ODU-1RN	Twig RR	Ductless Split System	Daikin	RXS12LVJU	E009462	1.0	ton	2014	
83	ODU-1S	Twig Terrace	Ductless Split System	Daikin	RXS12LVJU	E009469	1.0	ton	2014	
84	ODU-1RH	Jamba Hut Bldg.	Ductless Split System	Daikin	RXS12LVJU	E009456	1.0	ton	2014	
85	Chiller #2	Sea Lion Cove	Air Cooled Chiller	Arctic Chill	PACVPV003054		30.0	ton		
86		Stingray Pool	Split System (CU)	Trane	TWA180		15.0	ton		Yes
87		Reptile House	Ductless Split	Daikin	RXYQ72PBYD	A000598	6.0	ton	2013	
88		Ticket Office	Ductless Split	Fujitsu	AOU24RLX	CTN005654	2.0	ton		

Replace Existing Equipment

Already Replaced by Zoo since Audit



THE WALL-MOUNT™ STEP CAPACITY HEAT PUMPS

Integrated Part Load Value (IPLV) Efficiency Up To 15.0 BTU/WATT

GREEN REFRIGERANT
R-410A

Models: C24H to C60H
Cooling Capacities:
Heating Capacities:

Up to 11.0 EER
22,200 to 55,500 BTUH
19,200 to 51,000 BTUH

QUIET CLIMATE FLEX™ *

The Bard Wall-Mount Heat Pump is a self-contained energy efficient heating and cooling system, which is designed to offer maximum indoor comfort at a minimal cost without using valuable indoor floor space or outside ground space. This unit is the ideal product for versatile applications such as: new construction, modular offices, school modernization, and the like. Factory or field installed accessories are available to meet specific job requirements.

CH Series Special Features

ECM Indoor Blower Motor:

Features a variable speed motor providing super-high efficiency, low sound levels & soft-start capabilities. The motor is self-adjusting to provide the proper airflow rate for the staged capacity, and for higher static pressure in ducted installations without user adjustment or wiring changes.

Step Capacity Compressor:

Scroll 2-Stage Compressors are standard on all 2 to 5 ton models. Eliminates need for crankcase heater.

Double isolated floating compressor mounting system, compressor sound blanket, and discharge line muffler for reduced sound level.

Quiet Curb Options:

Various curbs are specially designed for the CH product family that reduce sound levels for school and occupied building applications.

Draw-Thru Condenser Airflow:

Condenser air is brought in from the front of the unit condenser section, and exhausted through the side grilles. This allows quiet operation, and avoids heat pump defrost water accumulation in front of the CH unit.

Engineered Features

Copper Tube/Aluminum Fin Coils:

Grooved copper tubing and enhanced aluminum fins provide maximum heat transfer and high energy efficiency. Optional phenolic-coated coils are also available.

Twin Blowers:

Move air quietly. All models feature variable speed blower motors providing airflow adjustment for high and low static operation. Motor overload protection is standard on all models.

Phase Rotation Monitor:

Standard on all 3 phase scroll compressors. Protects against reverse rotation if power supply is not properly connected.

R-410A Refrigerant:

Designed with R-410A (HFC) non-ozone depleting refrigerant in compliance with the Montreal protocol and 2010 EPA requirements.

Liquid Line Filter Drier:

Standard on all units. Protects system against moisture.

Foil Faced Insulation:

Standard on all units.

Galvanized 20 Gauge Zinc Coated Cabinet:

Cleaned, rinsed, sealed and dried before the polyurethane primer is applied. The cabinet is handsomely finished with a baked on, beige textured enamel, which allows it to withstand 1000 hours of salt spray tests per ASTM B117-03. Stainless Steel cabinets available.

Electrical Components:

Are easily accessible for routine inspection and maintenance through a right side, service panel opening. Features a lockable, hinged access cover to the circuit breaker or rotary disconnect switch.

Electric Heat Strips:

Features an automatic limit and thermal cut-off safety control. Heater packages are factory or field installed for all 2 through 5 ton models. Features easy slide-in field assembly with various BTUH outputs.

Condenser Fan and Motor

Shroud Assembly:

Slide out for easy access.

Filter Service Door:

Separate service door provides easy access for filter change.

One Inch, Disposable Air Filters:

Are standard equipment. Filter rack permits the addition of 2" pleated filter. Factory or field installed.

Solid State Electronic Heat Pump Control:

Provides efficient 30, 60 or 90 minute defrost cycle. A thermistor sensor, speed up terminal for service and 10 minute defrost override are standard on the electronic heat pump control.

High & Low Pressure Switches are Auto-Reset:

Standard on all units. Built-in lockout circuit resets from the room thermostat. Provides commercial quality protection to the compressor.

Five Minute Compressor Time Delay:

Short cycle protection is standard. Built into the heat pump control.

Built-in Circuit Breakers:

Standard on all electric heat versions of single (230/208 volt) and three phase (230/208 volt) equipment. Rotary disconnects are standard on three phase (460 volt) equipment. 460V circuit breaker



Model C42H shown with
TCURBF3660 Wall Curb Attached

* Quiet Curb Option must be added to obtain
Quiet Climate Flex™ sound ratings.

available as option on OKW only.

Slope Top:

Standard feature for water run-off.

Full Length Mounting Brackets:

Built into cabinet for improved appearance and easy installation. NOTE: Bottom mounting bracket included to assist in installation.

Top Rain Flashing:

Standard feature on all models.

Outdoor Coil Drain Pan:

Standard built in feature. 8620-160 Drain Connection Kit is standard (recommended for non-freezing climates only).

* The AHRI Certified® mark indicates Bard Manufacturing Company participation in the AHRI Certification program. For verification of individual certified products, go to www.ahridirectory.org.



Certified Capacity and Efficiency Ratings at Full Capacity

MODELS	C24H2	C30H2	C36H1	C42H1	C48H1	C60H1
Cooling BTUH, Stage 2 (Full Capacity) ① 80/67-95	22,400	28,000	35,000	40,000	45,500	55,500
EER ①②	11.0	11.0	11.0	11.0	11.0	11.0
Rated CFM	740	900	1100	1250	1500	1650
IPLV (Integrated Stage 1 and Stage 2) ①③ 80/67-80	15.9	14.9	14.5	14.5	15.0	14.8
High Temperature 47° Heating BTUH, Stage 2 (Full Capacity)	19,400	24,400	31,000	38,500	41,500	51,000
COP ①④	3.30	3.30	3.30	3.40	3.40	3.30
Rated CFM	740	900	1100	1250	1500	1650

- ① Certified in accordance with ARI Standard 390-2003 for single package vertical units
 ② EER = Energy Efficiency Ratio - BTU/WATT efficiency
 ③ Integrated Part Load Value - BTU/WATT efficiency (combines Stage 1 & 2 performance)
 ④ COP = Coefficient of Performance - BTU/WATT efficiency

Specifications 2-1/2 through 3 Ton

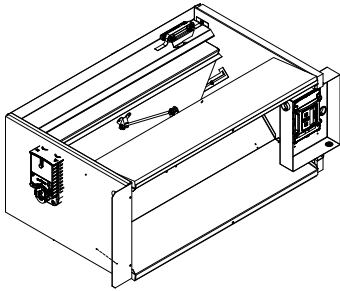
MODELS	C24H2-A	C24H2-B	---	C30H2-A	C30H2-B	C30H2-C	C36H1-A	C36H1-B	C36H1-C
Electrical Rating--60 Hz	230/208-1	230/208-3	---	230/208-1	230/208-3	460-3	230/208-1	230/208-3	460-3
Operating Voltage Range	197 - 253	197 - 253	---	197 - 253	197 - 253	414 - 506	197 - 253	197 - 253	414 - 506
Compressor--Circuit A									
Voltage	203/208	230/208	---	230/208	230/208	460	230/208	230/208	460
Rated Load Amps	7.5 / 8.4	4.2 / 4.7	---	9.7 / 11.2	7.2 / 8.3	4.2	11.8 / 13.3	9.0 / 10.1	5.0
Branch Circuit Selection Current	11.7	6.5	---	13.1	8.7	4.3	15.3	11.7	5.8
Lock Rotor Amps	58.3 / 58.3	55.4 / 55.4	---	73 / 73	58 / 58	28	83 / 83	73 / 73	38
Compressor Type	Scroll	Scroll	---	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Fan Motor & Condenser									
Fan Motor--HP-RPM-SPD	1/3-1060-1	1/3-1060-1	---	1/3-1060-1	1/3-1060-1	1/3-1060-1	1/3-825-2	1/3-825-2	1/3-825-2
Fan Motor--Amps	1.7	1.7	---	1.7	1.7	1.7	2.5	2.5	1.3
Fan--DIA/CFM	20"-1900	20"-1900	---	20"-1900	20"-1900	20"-1900	24"-2900	24"-2900	24"-2900
Blower Motor & Evap.									
Blower Motor--HP-RPM-SPD	1/3 Var.	1/3 Var.	---	1/3 Var.	1/3 Var.	1/3 Var.	1/2 Var.	1/2 Var.	1/2 Var.
Blower Motor--Amps	2.4	2.4	---	2.8	2.8	2.8	2.8	2.8	2.8
CFM w/Filter ①	740 - .10	740 - .10	---	900 - .10	900 - .10	900 - .10	1100 - .15	1100 - .15	1100 - .15
Filter Sizes (inches) STD.	16 x 30 x 1	16 x 30 x 1	---	16 x 30 x 1	16 x 30 x 1	16 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1
Basic Unit Weight-LBS.	380	380	---	380	380	380	475	475	475
Blank-Off Plate	1.0	1.0	---	1.0	1.0	1.0	1.0	1.0	1.0
Commercial Room Ventilator	35.0	35.0	---	35.0	35.0	35.0	35.0	35.0	35.0
Economizer	45.0	45.0	---	45.0	45.0	45.0	45.0	45.0	45.0
Energy Recovery Ventilator	64.0	64.0	---	64.0	64.0	64.0	64.0	64.0	64.0

Specifications 3-1/2 through 5 Ton

MODELS	C42H1-A	C42H1-B	C42H1-C	C48H1-A	C48H1-B	C48H1-C	C60H1-A	C60H1-B	C60H1-C
Electrical Rating--60 Hz	230/208-1	230/208-3	460-3	230/208-1	230/208-3	460-3	230/208-1	230/208-3	460-3
Operating Voltage Range	197 - 253	197 - 253	414 - 506	197 - 253	197 - 253	414 - 506	197 - 253	197 - 253	414 - 506
Compressor--Circuit A									
Voltage	230/208	230/208	460	230/208	230/208	460	230/208	230/208	460
Rated Load Amps	14.0 / 15.9	11.2 / 12.7	5.6	16.8 / 19.2	11.1 / 12.7	5.8	21.4 / 23.3	13.1 / 14.2	6.2
Branch Circuit Selection Current	18.0	14.2	6.3	21.2	14.1	6.5	27.2	16.6	7.3
Lock Rotor Amps	96 / 96	88 / 88	44	104	83 / 83	41	153 / 153	110 / 110	52
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Fan Motor & Condenser									
Fan Motor--HP-RPM-SPD	1/3-825-2	1/3-825-2	1/3-825-1	1/3-825-2	1/3-825-2	1/3-825-1	1/2-1025-1	1/2-1025-1	1/2-1025-1
Fan Motor--Amps	2.5	2.5	1.3	2.5	2.5	1.3	4.1	4.1	4.1
Fan--DIA/CFM	24"-2900	24"-2900	24"-2900	24"-2900	24"-2900	24"-2900	24"-3700	24"-3700	24"-3700
Blower Motor & Evap.									
Blower Motor--HP-RPM-SPD	3/4 Var.	3/4 Var.	3/4 Var.	3/4 Var.	3/4 Var.	3/4 Var.	3/4 Var.	3/4 Var.	3/4 Var.
Blower Motor--Amps	3.8	3.8	3.8	4.4	4.4	4.4	4.7	4.7	4.7
CFM w/Filter ①	1250 - .15	1250 - .15	1250 - .15	1550 - .2	1550 - .2	1550 - .2	1650 - .2	1650 - .2	1650 - .2
Filter Sizes (inches) STD.	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1	20 x 30 x 1
Basic Unit Weight-LBS.	520	520	540	550	550	595	555	555	600
Blank-Off Plate	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Commercial Room Ventilator	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Economizer	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Energy Recovery Ventilator	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0

Ventilation System Packages

Bard Wall-Mounts are designed to provide optional ventilation packages to meet all of your ventilation and indoor air quality requirements. All units are equipped with a barometric fresh air damper as the standard ventilation package. All ventilation packages can be built-in at the factory, or field-installed at a later date.



Commercial Room Ventilator

MS-3038

BLANK OFF PLATE - BOP

OPTIONAL

A blank off plate is installed on the inside of the service door. It covers the air inlet openings which restricts any outside air from entering into the unit. The blank off plate should be utilized in applications where outside air is not required to be mixed with the conditioned air.

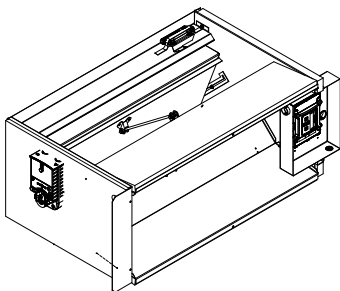
COMMERCIAL ROOM VENTILATOR - CHCRV

OPTIONAL

NOTE: Models C24H & C30H with CHCRV-3 require a Wall Curb Model TCURBF2430 or TCURBT2430 (See Page 10). Unit models using the CHCRV-5 do not require a wall curb for exhaust airflow.

The built-in commercial room ventilator is internally mounted behind the service door and allows outside ventilation air, up to 50% of the total airflow rating of the unit, to be introduced through the air inlet openings. It includes a built-in exhaust air damper.

The commercial room ventilator (CRV) is a simple and innovative approach to improving the indoor air quality by providing fresh air intake and exhaust capability through the CRV. The damper can be easily adjusted to control the amount of fresh air supplied into the building. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy. The CRV is modulating design with power open - spring return on power loss. Complies with ANSI/ASHRAE Standard 62.1 "Ventilation for Acceptable Indoor Air Quality."



Economizer

MS-3038

ECONOMIZER - ECONCHS

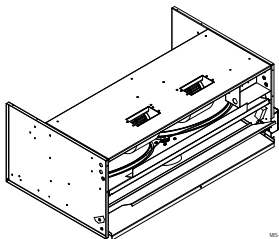
OPTIONAL

All economizers require matching TCURBF or TCURBT (See Page 10)

The built-in economizer system is internally mounted behind the service door and allows outdoor air to be introduced through the air inlet openings. The amount of outdoor air varies in response to the system controls and settings defined by the end user. It includes a built-in exhaust air damper. The economizer is designed to provide "free cooling" when outside air conditions are cool and dry enough to satisfy cooling requirements without running the compressor. This in turn provides lower operating costs, while extending the life of the compressor. A relief damper may be necessary for this model when using the economizer.

Standard Features:

- Designed to deliver 75% of cooling rated CFM when equipped with standard 3" air intake hood
- Honeywell Direct Drive Hi-Torque Actuator
- Positive shut-off with non-stick gaskets
- Electronic sensors, Enthalpy used for outdoor free cooling decision
- Honeywell JADE electronic economizer module with precision settings and diagnostics



Energy Recovery Ventilator

MS-3758

WALL-MOUNT ENERGY RECOVERY VENTILATOR - CHERV

OPTIONAL

The wall-mount energy recovery ventilator (ERV) is a highly innovative approach to meeting indoor air quality ventilation requirements as established by ANSI/ASHRAE Standard 62.1. The ERV allows from 200 to 450 CFM (depending upon model) of fresh air and exhaust through the unit while maintaining superior indoor comfort and humidity levels. In most cases this can be accomplished without increasing equipment sizing or operating costs. Heat transfer efficiency is up to 67% during summer and 75% during winter conditions.

The ERV consists of a unique "rotary energy recovery cassette" that provides effective sensible and latent heat transfer capabilities during summer and winter conditions. Various control schemes are addressed including limiting ventilation during building occupancy only.

The ERV is designed to be internally mounted behind the service door in the WA, WH or WL model wall-mount units. It can be built-in at the factory or field installed as an option. CHERV-*3 and CHERV-*5 can be independently adjusted for intake and exhaust rates. 3" air intake hood is standard.

CHERV Model ERV's have exhaust gravity shut-off dampers all sizes. CHERV-A5 & -C5 have motorized air intake damper.

DRAW-THRU CONDENSER AIRFLOW

The CH unit requires the use of a curb to meet the Quietflex sound ratings. Due to draw-thru air pressurizing the condenser section, room exhaust air exits the bottom of the curb. These special wall curbs allow for the exhaust air to pass through the bottom of the curb instead of through the condenser section of the CH unit.

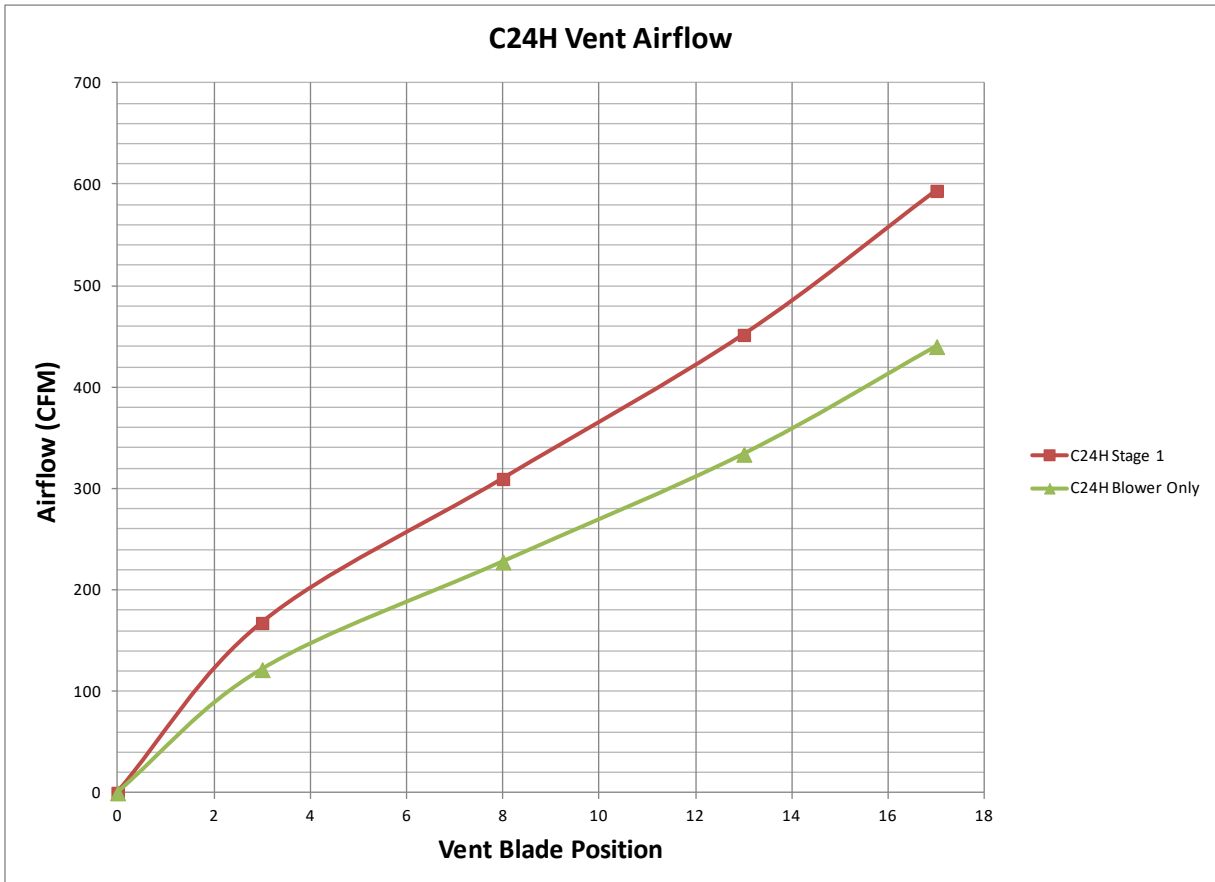
The following vent options require the use of a wall curb:

- CHCRV-3
- ECONCHS-E3
- ECONCHS-E5

Refer to the "C**H Unit to Wall Curb Application Guide" (Page 10) for curb selection options when using the vent

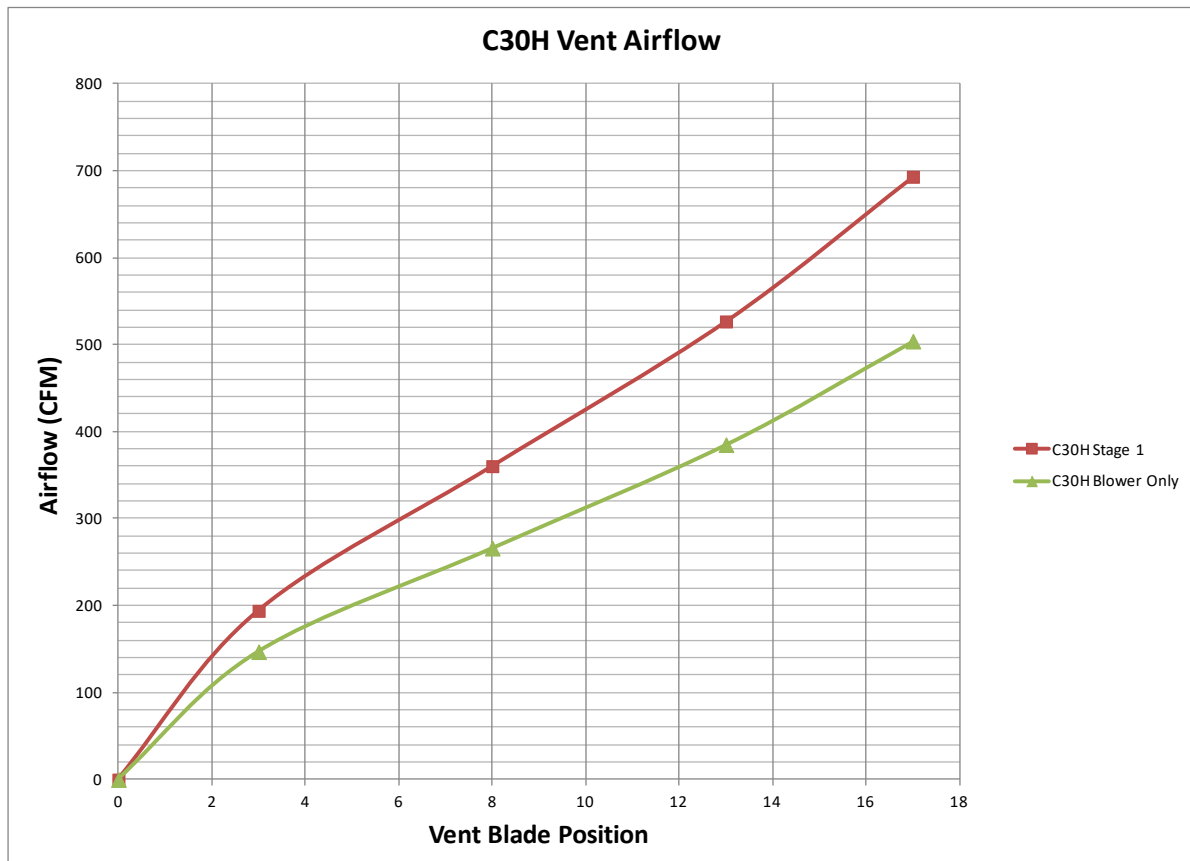
- Complies with efficiency requirements of ASHRAE/IESNA 90.1-2013.
- Certified to ANSI/ARI Standard 390-2003 for SPVU (Single Package Vertical Units).
- Intertek ETL Listed to Standard for Safety Heating and Cooling Equipment ANSI/UL 1995/CSA 22.2 No. 236-05, Fourth Edition.
- Commercial Product - Not intended for Residential application.

Modulating Commercial Room Ventilator Performance Data : CHCRV-3 for C24H



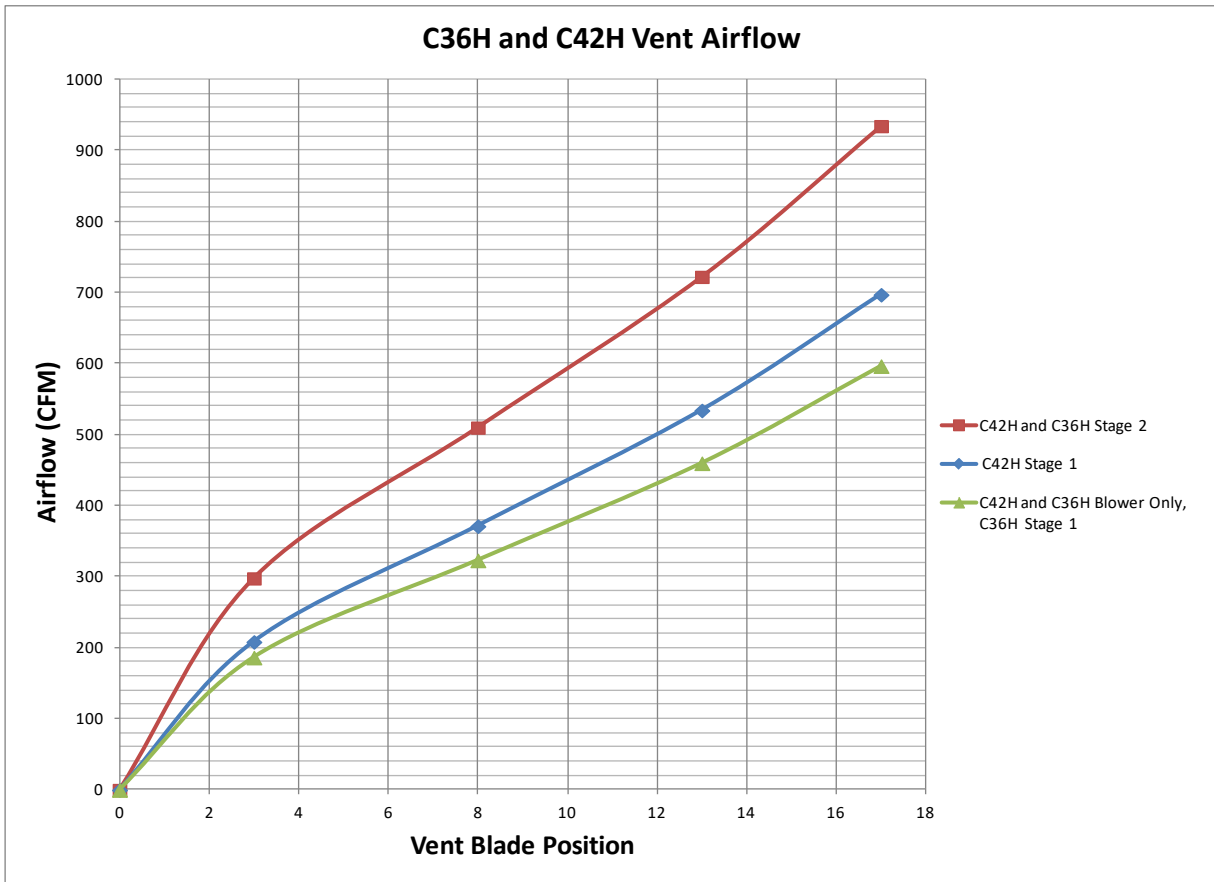
Airflow amounts less than 100 CFM may not be achievable.

Modulating Commercial Room Ventilator Performance Data : CHCRV-3 for C30H



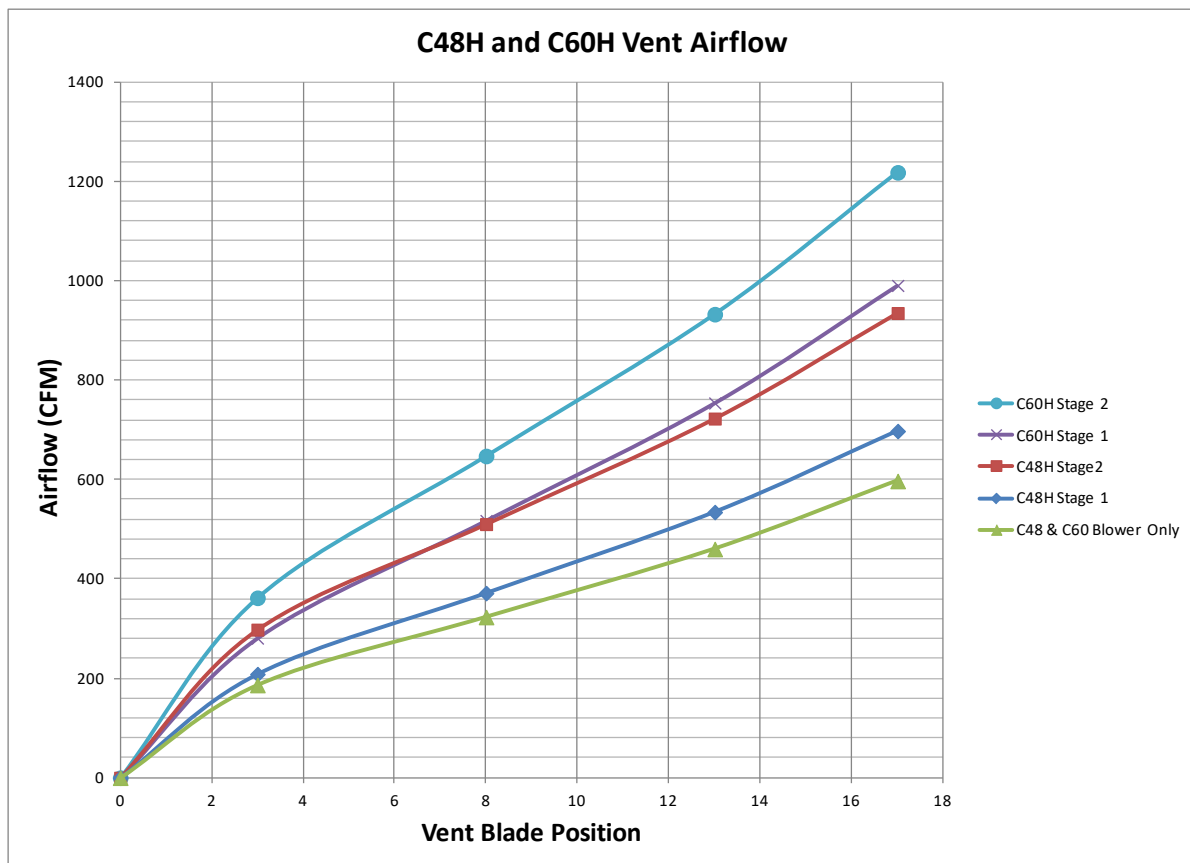
Airflow amounts less than 100 CFM may not be achievable.

Commercial Room Ventilator Performance Data : CHCRV-5 for C36H & C42H



Airflow amounts less than 100 CFM may not be achievable.

Commercial Room Ventilator Performance Data : CHCRV-5 for C48H & C60H



Airflow amounts less than 100 CFM may not be achievable.

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Performance and Application Data - CHERV-*3 (C24H2 & C30H2)

SUMMER COOLING PERFORMANCE (INDOOR DESIGN CONDITIONS 75°DB / 62°WB)

Ambient O.D.		VENTILATION RATE 400 CFM 63% EFFICIENCY						VENTILATION RATE 325 CFM 64% EFFICIENCY						VENTILATION RATE 250 CFM 65% EFFICIENCY					
DB/ WB	F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL
105	75	19080	12960	6120	12020	8164	3855	15502	10530	4972	9921	6739	3182	11925	8100	3825	7751	5265	2486
	70	12960	12960	0	8164	8164	0	10530	10530	0	6739	6739	0	8100	8100	0	5265	5265	0
	65	12960	12960	0	8164	8164	0	10530	10530	0	6739	6739	0	8100	8100	0	5265	5265	0
100	80	28080	10800	17280	17690	6804	10886	22815	8775	14040	14601	5616	8985	17550	6750	10800	11407	4387	7019
	75	19080	10800	8280	12020	6804	5216	15502	8775	6727	9921	5616	4305	11925	6750	5175	7751	4387	3363
	70	10980	10800	180	6717	6804	113	8921	8775	146	5709	5616	93	6862	6750	112	4460	4387	73
	65	10800	10800	0	6804	6804	0	8775	8775	0	5616	5616	0	6750	6750	0	4387	4387	0
	60	10800	10800	0	6804	6804	0	8775	8775	0	5616	5616	0	6750	6750	0	4387	4387	0
95	80	28080	8640	19440	17690	5443	12247	22815	7020	15795	14601	4492	10108	17550	5400	12150	11407	3510	7897
	75	19080	8640	10440	12020	5443	6577	15502	7020	8482	9921	4492	5428	11925	5400	6525	7751	3510	4241
	70	10980	8640	2340	6917	5443	1474	8921	7020	1901	5709	4492	1216	6862	5400	1462	4460	3510	950
	65	8640	8640	0	5443	5443	0	7020	7020	0	4492	4492	0	5400	5400	0	3510	3510	0
	60	8640	8640	0	5443	5443	0	7020	7020	0	4492	4492	0	5400	5400	0	3510	3510	0
90	80	28080	6480	21600	17690	4082	13608	22815	5265	17550	14601	3369	11232	17550	4050	13500	11407	2632	8774
	75	19080	6480	12600	12020	4082	7938	15502	5265	10237	9921	3369	6552	11925	4050	7875	7751	2632	5118
	70	10980	6480	4500	6917	4082	2835	8921	5265	3656	5709	3369	2340	6862	4050	2812	4460	2632	1828
	65	6480	6480	0	4082	4082	0	5265	5265	0	3369	3369	0	4050	4050	0	2632	2632	0
	60	6480	6480	0	4082	4082	0	5265	5265	0	3369	3369	0	4050	4050	0	2632	2632	0
85	80	28080	4320	23760	17690	2721	14968	22815	3510	19305	14601	2246	12355	17550	2700	14850	11407	1755	9652
	75	19080	4320	14760	12020	2721	9298	15502	3510	11992	9921	2246	7675	11925	2700	9225	7751	1755	5996
	70	10980	4320	6660	6917	2721	4195	8921	3510	5411	5709	2246	3463	6862	2700	4162	4460	1755	2705
	65	4320	4320	0	2721	2721	0	3510	3510	0	2246	2246	0	2700	2700	0	1755	1755	0
	60	4320	4320	0	2721	2721	0	3510	3510	0	2246	2246	0	2700	2700	0	1755	1755	0
80	75	19080	2160	16920	12020	1360	10659	15502	1755	13747	9921	1123	8798	11925	1350	10575	7751	877	6873
	70	10980	2160	8820	6917	1360	5556	8921	1755	7166	5709	1123	4586	6862	1350	5512	4460	877	3583
	65	3780	2160	1620	2381	1360	1020	3071	1755	1316	1965	1123	842	2362	1350	1012	1535	877	658
	60	2160	2160	0	1360	1360	0	1755	1755	0	1123	1123	0	1350	1350	0	877	877	0
75	70	10980	0	10980	6917	0	6917	8921	0	8921	5709	0	5709	6862	0	6862	4460	0	4460
	65	3780	0	3780	2381	0	2380	3071	0	3071	1965	0	1965	2362	0	2362	1535	0	1535
	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CHERV-*3 WINTER HEATING PERFORMANCE (INDOOR DESIGN CONDITIONS 70°DB)

Ambient O.D.	VENTILATION RATE					
	400 CFM 75% EFF.		325 CFM 76% EFF.		250 CFM 77% EFF	
DB/°F	WVL	WHR	WVL	WHR	WVL	WHR
65	2160	1620	1755	1333	1350	1039
60	4320	3240	3510	2667	2700	2079
55	6480	4860	5265	4001	4050	3118
50	8640	6480	7020	5335	5400	4158
45	10800	8100	8775	6669	6750	5197
40	12960	9720	10530	8002	8100	6237
35	15120	11340	12285	9336	9450	7276
30	17280	12960	14040	10670	10800	8316
25	19440	14580	15795	12004	12150	9355
20	21600	16200	17550	13338	13500	10395
15	23760	17820	19305	14671	14850	11434

LEGEND:

VLT = Ventilation Load - Total
 VLS = Ventilation Load - Sensible
 VLL = Ventilation Load - Latent
 HRT = Heat Recovery - Total
 HRS = Heat Recovery - Sensible
 HRL = Heat Recovery - Latent
 WVL = Winter Ventilation Load
 WHR = Winter Heat Recovery

NOTE: Sensible performance only is shown for winter application.

Performance and Application Data - CHERV-*5 (C36H1, C42H1, C48H1 & C60H1)

SUMMER COOLING PERFORMANCE (INDOOR DESIGN CONDITIONS 75°DB / 62°WB)

Ambient O.D.		VENTILATION RATE 450 CFM						VENTILATION RATE 375 CFM						VENTILATION RATE 300 CFM					
DB/ WB	F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL
105	75	21465	14580	6884	13952	9477	4475	17887	12150	5737	11805	8018	3786	14310	9720	4590	9587	6512	3075
	70	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0
	65	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0
100	80	31590	12150	19440	20533	7897	12635	26325	10125	16200	17374	6682	10692	21060	8100	12960	14110	5427	8683
	75	21465	12150	9314	13952	7897	6054	17887	10125	7762	11805	6682	5123	14310	8100	6210	9587	5427	4160
	70	12352	12150	202	8029	7897	131	10293	10125	168	6793	6682	111	8235	8100	135	5517	5427	90
	65	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0
	60	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0
95	80	31590	9720	21870	20533	6318	14215	26325	8100	18225	17374	5345	12028	21060	6480	14580	14110	4341	9768
	75	21465	9720	11744	13952	6318	7634	17887	8100	9787	11805	5345	6459	14310	6480	7830	9587	4341	5246
	70	12352	9720	2632	8029	6318	1711	10293	8100	2193	6793	5345	1447	8235	6480	1755	5517	4341	1175
	65	9720	9720	0	6318	6318	0	8100	8100	0	5345	5345	0	6480	6480	0	4341	4341	0
	60	9720	9720	0	6318	6318	0	8100	8100	0	5345	5345	0	6480	6480	0	4341	4341	0
90	80	31590	7290	24300	20533	4738	15794	26325	6075	20250	17374	4009	13365	21060	4860	16200	14110	3256	10854
	75	21465	7290	14175	13952	4738	9213	17887	6075	11812	11805	4009	7796	14310	4860	9450	9587	3256	6331
	70	12352	7290	5062	8029	4738	3290	10293	6075	4218	6793	4009	2784	8235	4860	3375	5517	3256	2261
	65	7290	7290	0	4738	4738	0	6075	6075	0	4009	4009	0	4860	4860	0	3256	3256	0
	60	7290	7290	0	4738	4738	0	6075	6075	0	4009	4009	0	4860	4860	0	3256	3256	0
85	80	31590	4860	26730	20533	3159	17374	26325	4050	22275	17374	2672	14701	21060	3240	17820	14110	2170	11939
	75	21465	4860	16605	13952	3159	10793	17887	4050	13837	11805	2672	9132	14310	3240	11070	9587	2170	7416
	70	12352	4860	7492	8029	3159	4870	10293	4050	6243	6793	2672	4120	8235	3240	4995	5517	2170	3346
	65	4860	4860	0	3159	3159	0	4050	4050	0	2672	2672	0	3240	3240	0	2170	2170	0
	60	4860	4860	0	3159	3159	0	4050	4050	0	2672	2672	0	3240	3240	0	2170	2170	0
80	75	21465	2430	19035	13952	1579	12372	17887	2025	15862	11805	1336	10469	14310	1620	12690	9587	1085	8502
	70	12352	2430	9922	8029	1579	6449	10293	2025	8268	6793	1336	5457	8235	1620	6615	5517	1085	4432
	65	4252	2430	1822	2764	1579	1184	3543	2025	1518	2338	1336	1002	2835	1620	1215	1899	1085	814
	60	2430	2430	0	1579	1579	0	2025	2025	0	1336	1336	0	1620	1620	0	1085	1085	0
75	70	12352	0	12352	8029	0	8029	10293	0	10293	6793	0	6793	8235	0	8235	5517	0	5517
	65	4252	0	4252	2764	0	2764	3543	0	3543	2338	0	2338	2835	0	2835	1899	0	1899
	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

CHERV-*5 WINTER HEATING PERFORMANCE (INDOOR DESIGN CONDITIONS 70°DB)

Ambient O.D.	VENTILATION RATE					
	450 CFM		375 CFM		300 CFM	
DB/°F	WVL	WHR	WVL	WHR	WVL	WHR
65	2430	1944	2025	1640	1620	1328
60	4860	3888	4050	3280	3240	2656
55	7290	5832	6075	4920	4860	3985
50	9720	7776	8100	6561	6480	5313
45	12150	9720	10125	8201	8100	6642
40	14580	11664	12150	9841	9720	7970
35	17010	13608	14175	11481	11340	9298
30	19440	15552	16200	13122	12960	10627
25	21870	17496	18225	14762	14580	11955
20	24300	19440	20250	16402	16200	13284
15	26730	21384	22275	18042	17820	14612

LEGEND:

VLT = Ventilation Load - Total
 VLS = Ventilation Load - Sensible
 VLL = Ventilation Load - Latent
 HRT = Heat Recovery - Total
 HRS = Heat Recovery - Sensible
 HRL = Heat Recovery - Latent
 WVL = Winter Ventilation Load
 WHR = Winter Heat Recovery

NOTE: Sensible performance only is shown for winter application.

Electrical Specifications — Standard Heat Pumps

	Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Multiple Circuit											
				① Minimum Circuit Ampacity	② Max. External Fuse or Ckt. Brkr.	③ Field Power Wire Size	④ Ground Wire	① Minimum Circuit Ampacity			② Max. Circuit Exterior Fuse or Ckt. Brkr.			③ Field Power Wire Size			④ Ground Wire		
								Ckt. A	Ckt. B	Ckt. C	Ckt. A	Ckt. B	Ckt. C	Ckt. A	Ckt. B	Ckt. C	Ckt. A	Ckt. B	Ckt. C
NOTE A	C24H2-A0Z -A04 ④ -AS8 ⑤ -AF8	230/208-60-1	1	22	30	10													
	1		42	50	8														
	1		48	50	8														
	1 or 2		63	70	6	8	22	42		30	45		10	8		10	10		
	C24H2-B0Z -B06 -B09	230/208-60-3	1	15	20	12													
	1		33	35	8														
	1		42	45	8														
	C30H2-A0Z -A04 ④ -AS8 ⑤ -AF8	230/208-60-1	1	23	30	10													
	1		44	50	8														
	1		49	50	8														
	1 or 2		65	70	6	8	23	42		30	45		10	8		10	10		
C30H2-B0Z -B06 -B09	230/208-60-3	1	18	25	10														
1		36	40	8															
1		45	45	8															
C30H2-C0Z/C0C -C06	460-60-3	1	10	15	14														
1		19	20	12															
1		24	25	10															
C36H1-A0Z -A05 -A10 ⑤ -A15	230/208-60-1	1	27	40	8														
1		53	60	6															
1 or 2		79	80	4	8	27	52		40	60		8	6		10	10			
1 or 2		85	90	4	8	33	52		40	60		8	6		10	10			
C36H1-B0Z -B06 -B09 ⑥ -B15	230/208-60-3	1	23	30	10														
1		41	45	8															
1		50	50	8															
1		52	60	6	10														
C36H1-C0Z/C0C -C06 -C09 ⑥ -C15	460-60-3	1	12	15	14														
1		21	25	10															
1		26	30	10															
1		27	30	10															
C42H1-A0Z -A05 -A10 ⑤ -A15	230/208-60-1	1	31	40	8														
1		57	60	6															
1 or 2		83	90	4	8	31	52		40	60		8	6		10	10			
1 or 2		86	90	3	8	34	52		40	60		8	6		10	10			
C42H1-B0Z -B06 -B09 ⑥ -B15	230/208-60-3	1	27	35	8														
1		45	50	8															
1		54	60	6															
1		54	60	6															
C42H1-C0Z/C0C -C06 -C09 ⑥ -C15	460-60-3	1	13	15	14														
1		22	25	10															
1		26	30	10															
1		27	30	10															
C48H1-A0Z -A04 -A05 -A10 ⑤ -A15 ⑥ -A20	230/208-60-1	1	37	50	8														
1		57	60	6															
1		62	70	6	8	37	26		50	30		8	10		10	10			
1 or 2		88	90	3	8	37	52		50	60		8	6		10	10			
1 or 2		88	90	3	8	37	52		50	60		8	6		10	10			
1 or 3		113	125	2	6	37	52	26	50	60	30	8	6	10	10	10	10		
C48H1-B0Z -B06 -B09 ⑥ -B15 ⑥ -B18	230/208-60-3	1	27	40	8														
1		45	50	8															
1		54	60	6															
1		54	60	6															
2		N/A	N/A	N/A	54	28		60	30		6	10		10	10				
C48H1-C0Z/C0C -C06 -C09 ⑥ -C15	460-60-3	1	13	20	12														
1		22	25	10															
1		27	30	10															
1		27	30	10															
C60H1-A0Z -A05 -A10 ⑤ -A15 ⑥ -A20	230/208-60-1	1	45	60	8														
1 or 2		71	80	4	8	45	26		50	30		8	10		10	10			
1 or 2		97	100	3	8	45	52		50	60		8	6		10	10			
1 or 2		97	100	3	8	45	52		50	60		8	6		10	10			
1 or 3		113	125	2	6	45	52	26	50	60	30	8	6	10	10	10	10		
C60H1-B0Z -B06 -B09 ⑥ -B15 ⑥ -B18	230/208-60-3	1	32	45	8														
1		50	60	8															
1		59	60	6															
1		59	60	6															
2		N/A	N/A	N/A	59	28		60	30		6	10		10	10				
C60H1-C0Z/C0C -C06 -C09 ⑥ -C15	460-60-3	1	17	20	12														
1		26	30	10															
1		31	35	8															
1		31	35	8															

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical Code (latest version), Article 310 for power conductor sizing.

Caution: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) conductors are in a raceway.

② Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.

③ Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.

④ Maximum KW that can operate with the heat pump on is 4KW. Full heat available during Emergency Heat Mode.

⑤ Maximum KW that can operate with the heat pump on is 10KW. Full heat available during Emergency Heat Mode.

⑥ Maximum KW that can operate with the heat pump on is 9KW. Full heat available during Emergency Heat Mode.

⑦ Maximum KW that can operate with the heat pump on is 8KW. Full heat available during Emergency Heat Mode.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses & conductor wires in accordance with the National Electrical Code & all local codes.

NOTE A: -C Models have Rotary Disconnect. C0C 460V circuit breaker only available for 0KW. All electrical ratings are the same.

NOTE: To obtain Quiet Climate Flex™ sound ratings, a TCURB Model Fig. 1 to Fig. 6 must be used.

C**H Unit to Wall Curb Application Guide

Fig. No.	Curb Model ①②	Application	Curb Depth	Curb Height	Used with Unit Model(s)	Unit Indoor Air Connections			Curb Indoor Air Connections				Shipping Weight Lbs.
						Supply Air H x W	Return Air H x W	Spacing SA to RA	Supply Air H x W	Return Air H x W	Spacing SA to RA	Alt. Spacing SA to RA	
1	TCURBF2430A		9.313	70-5/16	C24H, C30H	7.88 x 27.88	13.88 x 27.88	17.93	7.88 x 27.88	13.88 x 27.88	6.125	17.93	160
2	TCURBF3642A	Used to direct replace CH3S Models.	9.313	85¾	C36H, C42H	9.88 x 29.88	15.88 x 29.88	30.00	9.88 x 29.88	15.88 x 29.88	6.125	30.00	195
3	TCURBF4860A	Used to direct replace CH4S and CH5S Models.	9.313	85-5/16	C48H, C60H	9.88 x 29.88	15.88 x 29.88	30.00	9.88 x 29.88	15.88 x 29.88	6.125	30.00	195
4	TCURBT2430A	Used to install 2 or 2.5-ton cabinet machines installed in a soffit.	9.313	82¼	C24H, C30H	7.88 x 27.88	13.88 x 27.88	17.93	7.88 x 27.88	13.88 x 27.88	17.93		170
5	TCURBT3642A	Used to install 3 or 3.5-ton cabinet machines installed in a soffit.	9.313	109¼	C36H, C42H	9.88 x 29.88	15.88 x 29.88	30.00	9.88 x 29.88	15.88 x 29.88	30.00		235
6	TCURBT4860A	Used to install 4 or 5-ton cabinet machines installed in a soffit.	9.313	109¼	C48H, C60H	9.88 x 29.88	15.88 x 29.88	30.00	9.88 x 29.88	15.88 x 29.88	30.00		225
7	WMICF3A	Isolation Curb	3.625	70¾	C24H, C30H	7.88 x 27.88	13.88 x 27.88	17.93	7.88 x 27.88	13.88 x 27.88	17.93		110
8	WMICF5A	Isolation Curb	3.625	84¾	C36H, C42H	9.88 x 29.88	15.88 x 29.88	30.00	9.88 x 29.88	15.88 x 29.88	30.00		130
9	WMICF5A	Isolation Curb	3.625	84¾	C48H, C60H	9.88 x 29.88	15.88 x 29.88	30.00	9.88 x 29.88	15.88 x 29.88	30.00		130
10	TFCT-32A	Used to install new 2-ton in place of old 2-ton in a soffit.	9.313	80¼	C24H, C30H	7.88 x 27.88	13.88 x 27.88	17.93	7.88 x 19.88	11.88 x 19.88	20.56		175
11	TFCT-53A	Used to install new 3-ton in place of old 3-ton in a soffit.	9.313	82¼	C36H, C42H	9.88 x 29.88	15.88 x 29.88	30.00	7.88 x 27.88	13.88 x 27.88	17.93		185
12	TFCF-32A	Used to install new 2-ton in place of old 2-ton.	9.313	70¾	C24H, C30H	7.88 x 27.88	13.88 x 27.88	17.93	7.88 x 19.88	11.88 x 19.88	20.56		160
13	TFCF-53A	Used to install new 3-ton in place of old 3-ton.	9.313	70¾	C36H, C42H	9.88 x 29.88	15.88 x 29.88	30.00	7.88 x 27.88	13.88 x 27.88	17.93		170
14	WMRSC3SA	Used to install new 3-ton where there are obstacles (conduit, etc) underneath original unit.	9.313	72	C36H	9.88 x 29.88	15.88 x 29.88	30.00	7.88 x 27.88	13.88 x 27.88	17.93		170

① All curb model numbers followed by -X (beige), -4 (gray), etc to match unit color.

② All curbs have 4 rubber isolation mounts to reduce vibration to the installation wall.

NOTE A: For all economizer applications a TCURB***** is required. For C24 & C30 installations with CHCRV-3 a TCURB is also required.

All Dimensions in Inches.

FIG. 1
TCURBF2430A

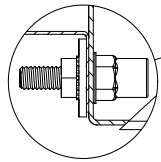


FIG. 2
TCURBF3642A

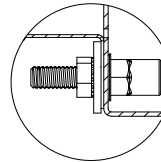


FIG. 3
TCURBF4860A

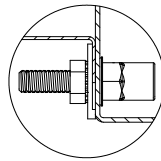
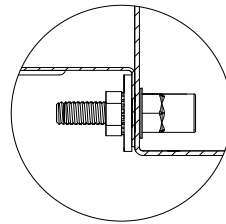


FIG. 4
TCURBT2430A



PATENTED UNDER 9,004,995

FIG. 5
TCURBT3642A

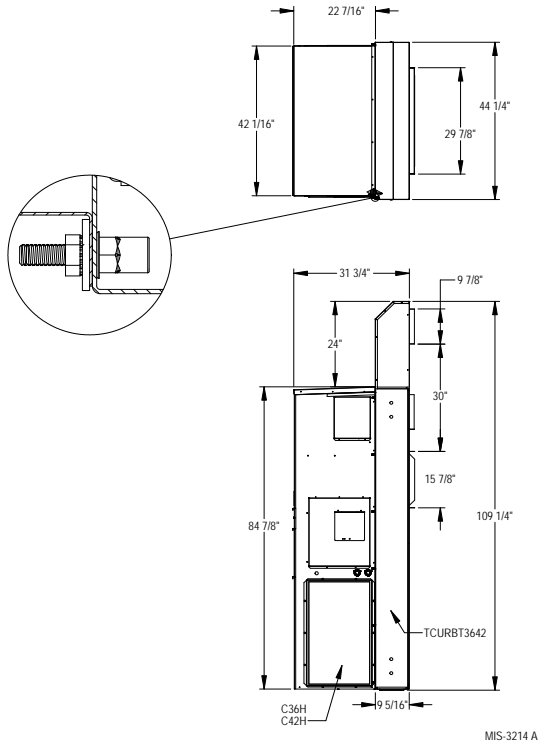


FIG. 6
TCURBT4860A

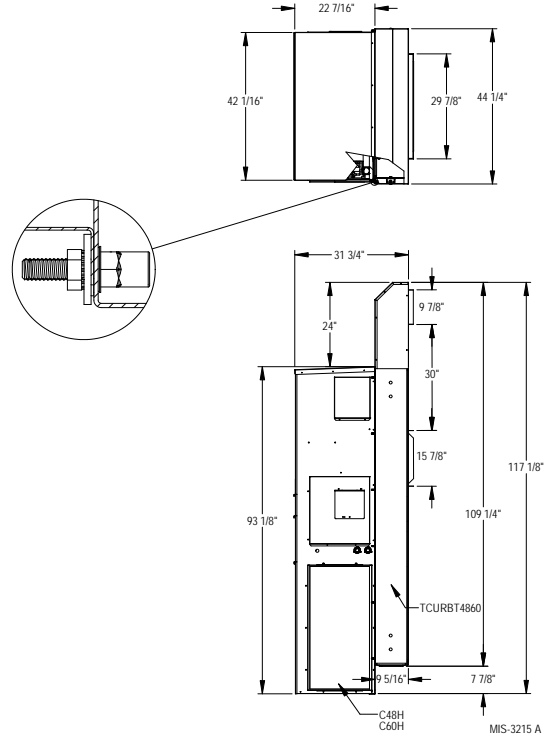


FIG. 7
WMICF3A

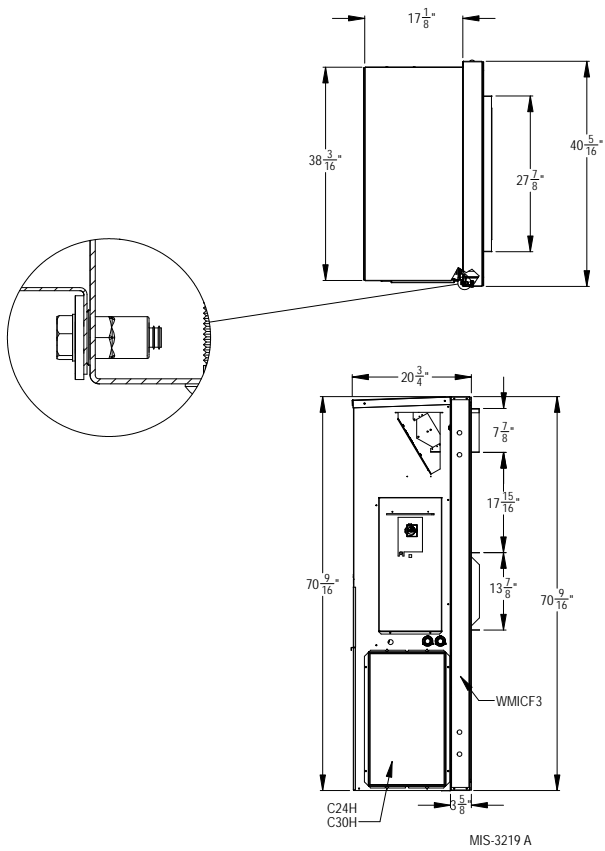


FIG. 8
WMICF5A

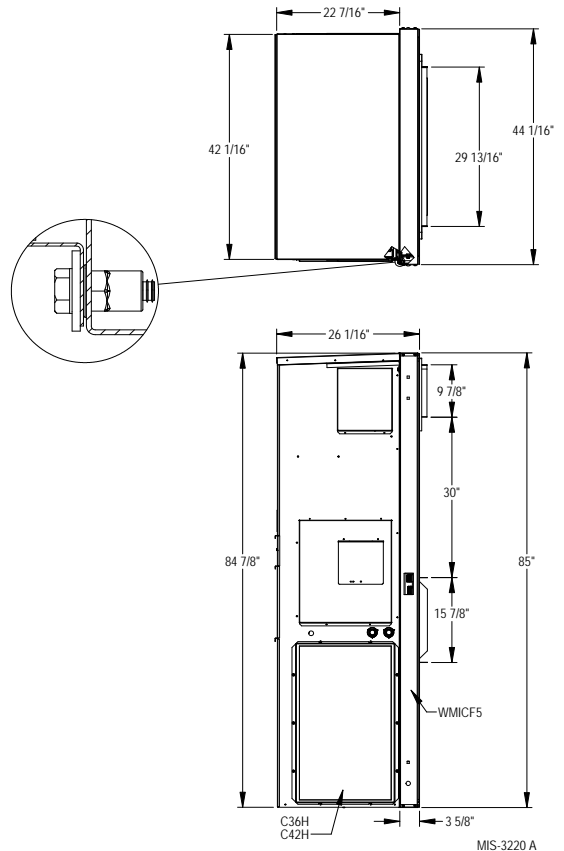


FIG. 13
TFCF-53A

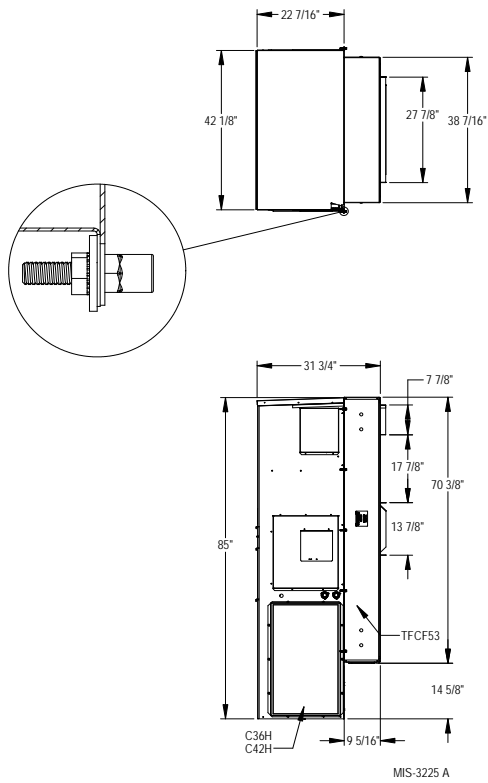
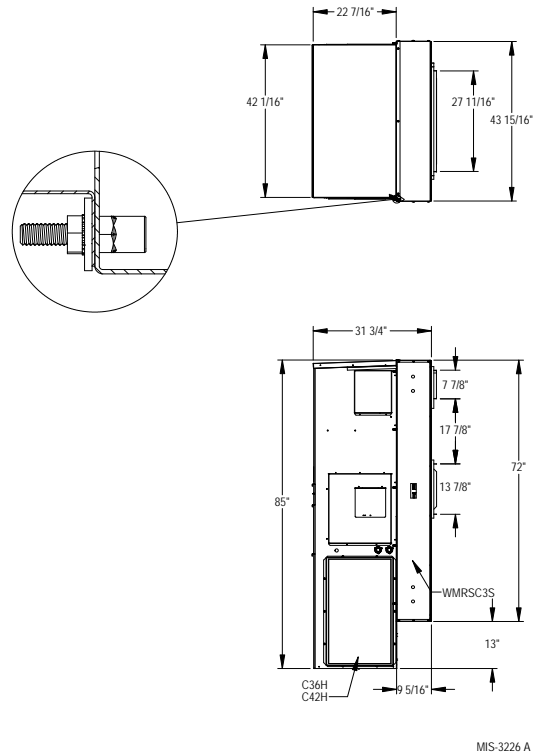


FIG. 14
WMRSC3SA

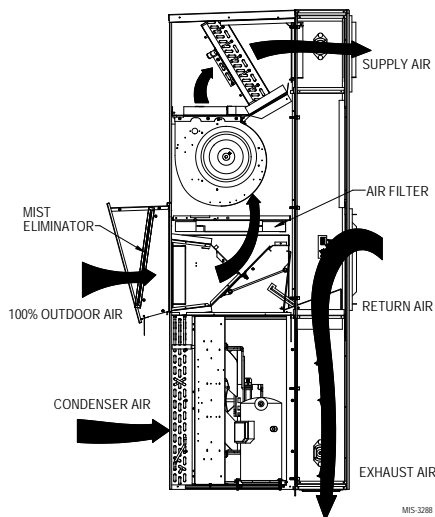


*** TFCT AND TFCF CURBS MAY REQUIRE WALL MODIFICATION FOR MOUNTING HOLE PATTERN.**

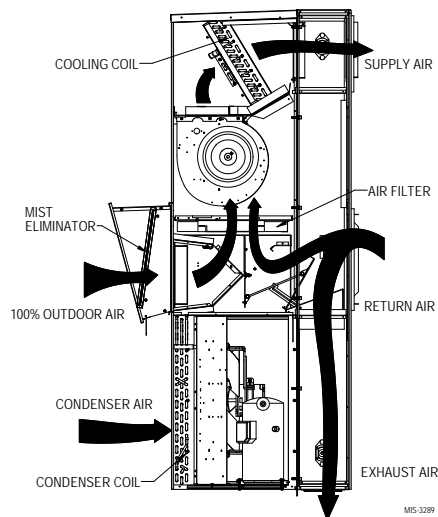
PATENTED UNDER 9,004,995

CH Unit & T Curb Economizer Airflow Path

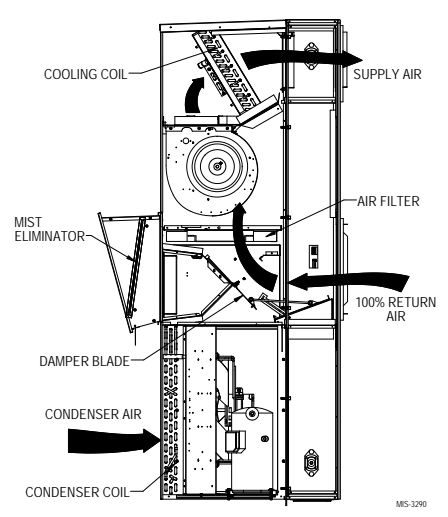
100% OUTSIDE AIRFLOW PATH



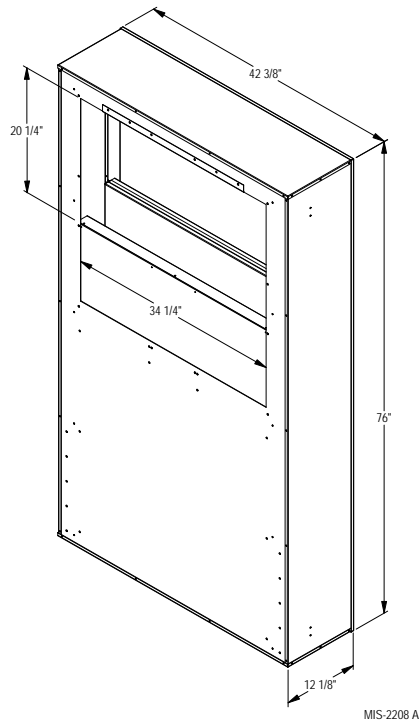
MIXED AIRFLOW PATH



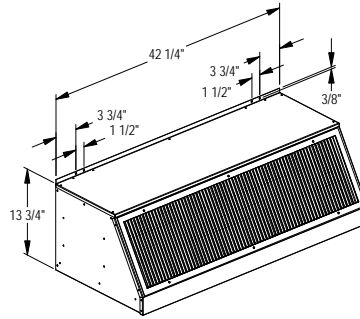
100% CLOSED LOOP AIRFLOW PATH



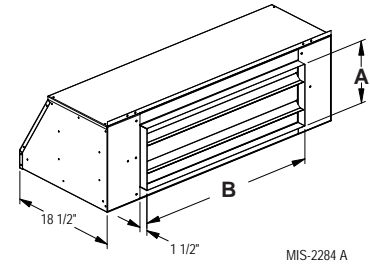
Return Air Acoustical Plenum WAPR11



Duct Free Acoustical Plenum



	A	B
WAPFB31	7-7/8	27-7/8
WAPFB51	9-7/8	29-7/8
WAPFB51FF	9-7/8	29-7/8

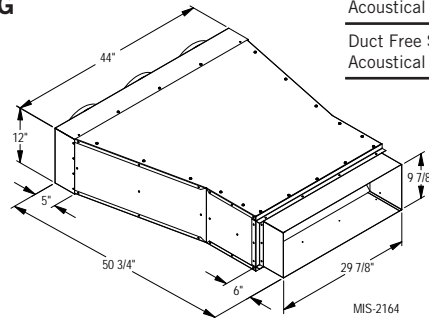
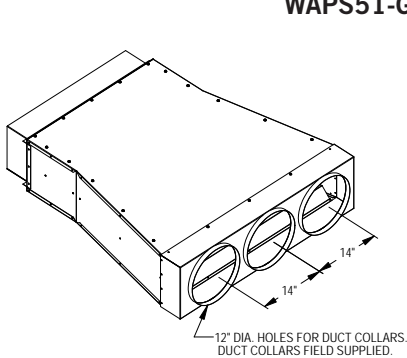


NOTE: WAPFB51FF same as shown, except has square front with grille straight up and down.

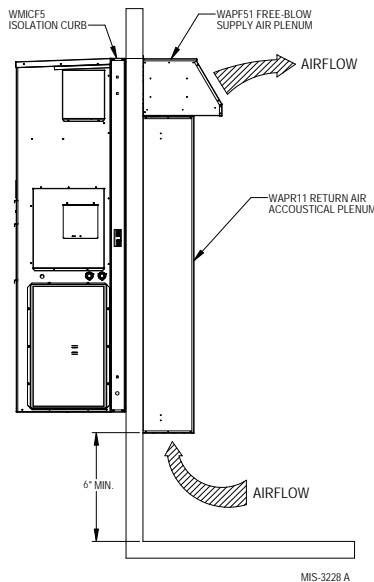
Optional Installation Accessories

Description	Model	Used With	Color	Shipping Weight (Lbs)
Return Air Acoustical Plenum	WAPR11-X WAPR11-4	C36H-C60H	Beige Buckeye Gray	205
Duct Free Supply Air Acoustical Plenum	WAPFB31-X WAPFB31-4	C24H-C30H	Beige Buckeye Gray	132
Ducted Supply Air Acoustical Plenum	WAPS51-G	C36H-C60H	Galvanized	140
Duct Free Supply Air Acoustical Plenum	WAPFB51-X WAPFB51-4	C36H-C60H	Beige Buckeye Gray	70
Duct Free Supply Air Acoustical Plenum	WAPFB51FF-X WAPFB51FF-4	C36H-C60H	Beige Buckeye Gray	70

Supply Air Acoustical Plenum WAPS51-G



Typical installation with isolation curb, free blow, supply air acoustical plenum & return air acoustical plenum.



Patent 8,336,672

Typical Sound Performance with Installation/Isolation Curbs & Acoustical Plenums

C24H2 Sound Data Matrix (dBA @ 5 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	Direct	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB31 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPSS1-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation with CRV	NA	28.6	30.1	29.4	NA	NA	26.5	25.7
Compressor Stage 1 Operation with CRV	NA	43.2	40.2	40.4	NA	NA	43.7	39.4
Compressor Stage 2 Operation	NA	43.8	41.3	41.7	NA	NA	43.2	40.6
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	NA	39.9	37.4	37.6	NA	NA	39.9	36.4
Compressor Stage 2 Outdoor Sound Level		65.4	65.4	65.4		65.4	65.4	65.4

Note 1: dBA is sound pressure measured 5 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C30H2 Sound Data Matrix (dBA @ 5 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	Direct	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB31 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPSS1-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	NA	35.5	33.8	32.5	NA	NA	31.2	32.5
Compressor Stage 1 Operation	NA	41.2	40.7	40.9	NA	NA	40.8	38.0
Compressor Stage 2 Operation	NA	44.3	43.1	43.2	NA	NA	42.3	40.9
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	NA	40.0	38.9	38.8	NA	NA	38.2	36.7
Compressor Stage 2 Outdoor Sound Level		63.8	63.8	63.8			63.8	63.8

Note 1: dBA is sound pressure measured 5 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C36H1 Sound Data Matrix (dBA @ 5 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	Direct	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPSS1-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	37.1	32.7	32.6	30.2	36.1	32.3	28.7	29.3
Compressor Stage 1 Operation	53.6	45.7	40.9	40.0	51.1	42.8	39.7	38.0
Compressor Stage 2 Operation	53.3	46.1	42.4	41.8	51.8	43.5	40.0	39.8
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	49.8	42.4	38.5	37.5	47.8	39.8	36.4	35.7
10' Compressor Stage 2 Outdoor Sound Level	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6

Note 1: dBA is sound pressure measured 5 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

Typical Sound Performance with Installation/Isolation Curbs & Acoustical Plenums

C42H1 Sound Data Matrix (dBA @ 5 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	Direct	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation with CRV	38.5	33.1	33.3	32.0	38.2	34.3	29.4	31.3
Compressor Stage 1 Operation with CRV	54.5	44.7	42.4	42.5	51.9	45.1	43.1	40.7
Compressor Stage 2 Operation	55.1	46.0	44.6	43.5	52.5	45.2	43.0	42.1
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	51.1	41.9	40.2	39.6	48.6	41.8	39.5	38.1
Compressor Stage 2 Outdoor Sound Level	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0

Note 1: dBA is sound pressure measured 5 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C48H1 Sound Data Matrix (dBA @ 5 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	Direct	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	38.7	32.3	34.1	31.6	38.4	33.5	29.0	30.0
Compressor Stage 1 Operation	50.5	43.0	42.5	41.1	48.6	40.5	40.3	39.1
Compressor Stage 2 Operation	53.5	46.5	45.0	44.3	52.2	45.3	43.6	42.0
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	48.5	41.3	40.5	39.4	47.0	39.9	38.5	37.2
Compressor Stage 2 Outdoor Sound Level	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8

Note 1: dBA is sound pressure measured 5 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C60H1 Sound Data Matrix (dBA @ 5 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	Direct	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	40.2	33.3	32.5	31.7	39.0	33.6	30.1	32.9
Compressor Stage 1 Operation	52.1	45.4	42.1	41.4	50.7	44.2	42.8	40.2
Compressor Stage 2 Operation	58.8	51.1	51.6	51.7	57.5	52.5	51.5	50.6
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	52.4	45.0	44.7	44.7	51.1	45.8	44.7	43.7
Compressor Stage 2 Outdoor Sound Level	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6

Note 1: dBA is sound pressure measured 5 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

Typical Sound Performance with Installation/Isolation Curbs & Acoustical Plenums

C24H2 Sound Data Matrix (dBA @ 10 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	Direct	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation with CRV	NA	27.4	28.1	25.9	NA	NA	24.5	24.8
Compressor Stage 1 Operation with CRV	NA	40.4	37.2	37.8	NA	NA	39.7	37.7
Compressor Stage 2 Operation	NA	41.2	38.9	38.7	NA	NA	39.5	39.3
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	NA	37.2	34.8	34.8	NA	NA	36.0	34.9
Compressor Stage 2 Outdoor Sound Level		65.4	65.4	65.4			65.4	65.4

Note 1: dBA is sound pressure measured 10 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C30H2 Sound Data Matrix (dBA @ 10 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb	Direct	Direct	TCURBF2430 Isolation Curb	TCURBF2430 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	NA	32.5	31.8	29.9	NA	NA	29.4	30.5
Compressor Stage 1 Operation	NA	38.6	36.7	36.3	NA	NA	38.7	37.5
Compressor Stage 2 Operation	NA	42.2	41.0	39.2	NA	NA	39.7	39.5
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	NA	37.5	36.2	34.8	NA	NA	36.0	35.5
Compressor Stage 2 Outdoor Sound Level		63.8	63.8	63.8			63.8	63.8

Note 1: dBA is sound pressure measured 10 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C36H1 Sound Data Matrix (dBA @ 10 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	Direct	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	35.1	31.7	30.4	27.6	33.0	29.9	27.2	27.1
Compressor Stage 1 Operation	48.7	43.5	40.9	37.1	47.0	40.2	39.7	38.3
Compressor Stage 2 Operation	48.8	43.8	42.4	38.8	48.1	40.8	40.0	38.4
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	45.2	40.2	38.5	34.6	43.9	37.2	36.4	35.0
Compressor Stage 2 Outdoor Sound Level	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6

Note 1: dBA is sound pressure measured 10 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

Typical Sound Performance with Installation/Isolation Curbs & Acoustical Plenums

C42H1 Sound Data Matrix (dBA @ 10 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb	Direct	Direct	TCURBF3642 Isolation Curb	TCURBF3642 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation with CRV	35.7	31.5	30.3	28.6	35.0	31.6	27.6	29.3
Compressor Stage 1 Operation with CRV	48.7	43.0	41.3	40.0	49.2	40.4	42.1	39.0
Compressor Stage 2 Operation	49.0	44.5	42.2	40.6	50.3	42.5	41.7	40.5
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	45.3	40.3	38.3	36.9	46.1	38.2	38.4	36.4
Compressor Stage 2 Outdoor Sound Level	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0

Note 1: dBA is sound pressure measured 10 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C48H1 Sound Data Matrix (dBA @ 10 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	Direct	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	36.1	32.2	31.7	28.4	35.3	30.8	27.6	27.4
Compressor Stage 1 Operation	45.8	41.3	40.2	38.4	45.9	38.2	39.0	38.8
Compressor Stage 2 Operation	49.6	45.0	42.1	41.3	49.0	42.7	42.1	40.8
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	44.4	39.9	37.9	36.5	44.0	37.4	37.1	36.3
Compressor Stage 2 Outdoor Sound Level	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8

Note 1: dBA is sound pressure measured 10 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

C60H1 Sound Data Matrix (dBA @ 10 feet)

Unit Mounting	Free Blow Configuration				Front Outlet Ducted Configuration			
	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb	Direct	Direct	TCURBF4860 Isolation Curb	TCURBF4860 Isolation Curb
Supply Air Treatment	Grille	Grille	Grille	WAPFB51 Free Blow Supply Air Plenum	Standard Supply Duct	Standard Supply Duct	Standard Supply Duct	WAPS51-G Supply Air Silencer
Return Air Treatment	Grille	Grille	WAPR11-X Return Air Silencer	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer	Grille	WAPR11-X Return Air Silencer
Blower Only Operation	37.1	31.7	29.9	29.0	35.7	29.6	27.9	27.5
Compressor Stage 1 Operation	48.2	42.8	41.0	39.4	48.1	40.9	42.4	39.1
Compressor Stage 2 Operation	54.8	47.7	45.3	45.0	54.5	47.3	48.2	44.1
Compressor Stage 2 with ERV High Speed Operation								
Indoor Integrated dBA	48.5	42.3	39.8	39.0	48.2	41.0	42.0	38.3
Compressor Stage 2 Outdoor Sound Level	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6

Note 1: dBA is sound pressure measured 10 feet in front of unit and 5 feet above floor.

Note 2: Unit or isolation curb is mounted to frame construction.

Note 3: Results may vary depending upon other factors such as room size, type of construction and acoustical variances.

Part Load Cooling Application Data - Outdoor Temperature °F ①②

Model	D.B. / W.B. ③	COOLING CAPACITY	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F	120°F	125°F	131°F
C24H2	75/62	Total Cooling Sensible Cooling	19,500 15,600	18,200 15,000	16,900 14,500	15,600 13,900	14,500 13,300	13,400 12,800	12,400 12,200	11,400 11,000	10,500 9,900	9,600 8,900	8,700 7,800	7,800 6,700
	80/67	Total Cooling Sensible Cooling	20,800 15,100	19,800 14,700	18,700 14,300	17,600 13,900	16,600 13,400	15,600 13,000	14,600 12,500	13,600 12,100	12,600 11,600	11,600 11,100	10,600 10,600	9,500 8,100
	85/72	Total Cooling Sensible Cooling	24,800 15,500	23,200 15,000	21,500 14,400	19,900 13,800	18,500 13,200	17,100 12,600	15,800 12,000	14,500 11,400	13,300 10,700	12,100 10,100	10,900 9,400	9,700 7,000
C30H2	75/62	Total Cooling Sensible Cooling	23,300 17,900	22,100 17,400	20,900 16,900	19,900 16,400	18,800 16,000	17,800 15,500	16,900 15,000	16,000 14,600	15,100 14,200	14,200 13,200	13,400 11,900	12,500 10,400
	80/67	Total Cooling Sensible Cooling	24,800 17,300	24,000 17,000	23,200 16,700	22,400 16,400	21,600 16,100	20,700 15,700	20,700 15,700	19,000 15,100	18,100 14,700	17,200 14,400	16,300 14,000	15,200 12,700
	85/72	Total Cooling Sensible Cooling	29,600 17,800	28,100 17,300	26,700 16,800	25,300 16,300	24,000 15,800	22,700 15,200	22,700 15,200	20,200 14,200	19,100 13,600	17,900 13,000	16,800 12,400	15,500 11,000
C36H1	75/62	Total Cooling Sensible Cooling	26,600 20,700	24,800 20,100	23,300 19,500	21,800 19,000	20,400 18,400	19,300 17,800	18,200 17,200	17,200 16,600	16,300 15,900	15,500 15,200	N/A	N/A
	80/67	Total Cooling Sensible Cooling	28,400 20,000	27,000 19,700	25,800 19,300	24,600 19,000	23,400 18,500	22,400 18,100	21,400 17,600	20,500 17,100	19,600 16,500	18,800 15,900	N/A	N/A
	85/72	Total Cooling Sensible Cooling	33,900 20,500	31,600 20,000	29,700 19,400	27,800 18,900	26,000 18,200	24,500 17,500	23,100 16,800	21,800 16,100	20,600 15,200	19,600 14,400	N/A	N/A
C42H1	75/62	Total Cooling Sensible Cooling	30,700 23,200	28,500 23,000	26,600 22,600	24,900 22,100	23,400 21,500	22,100 20,900	21,000 20,100	20,200 19,200	19,400 18,100	18,800 17,000	N/A	N/A
	80/67	Total Cooling Sensible Cooling	32,700 22,500	31,400 22,500	29,500 22,400	28,100 22,100	26,800 21,700	25,700 21,200	24,800 20,600	24,000 19,800	23,300 18,800	22,800 17,800	N/A	N/A
	85/72	Total Cooling Sensible Cooling	39,000 23,100	36,300 22,900	33,900 22,500	31,800 22,000	29,800 21,300	28,100 20,500	26,800 19,700	25,600 18,600	24,500 17,300	23,700 16,100	N/A	N/A
C48H1	75/62	Total Cooling Sensible Cooling	35,300 27,500	34,000 27,200	32,600 26,800	31,200 26,300	29,600 25,700	28,100 25,100	26,500 24,300	24,800 23,300	23,000 22,400	21,200 21,300	N/A	N/A
	80/67	Total Cooling Sensible Cooling	37,700 26,600	35,800 26,600	36,200 26,500	35,200 26,300	34,000 25,900	32,700 25,500	31,200 24,900	29,500 24,100	27,700 23,300	25,700 22,300	N/A	N/A
	85/72	Total Cooling Sensible Cooling	44,900 27,300	43,300 27,000	41,600 26,600	39,800 26,100	37,800 25,400	35,800 24,700	33,700 23,800	31,400 22,600	29,100 21,500	26,700 20,200	N/A	N/A
C60H1	75/62	Total Cooling Sensible Cooling	43,300 33,900	41,300 33,100	39,500 32,300	37,500 31,400	35,500 30,500	33,700 29,600	31,800 28,700	30,000 27,700	28,100 26,700	26,300 25,700	N/A	N/A
	80/67	Total Cooling Sensible Cooling	46,200 32,900	43,000 32,400	43,800 32,000	42,400 31,400	40,800 30,800	39,200 30,100	37,500 29,400	35,700 28,600	33,800 27,800	31,800 26,900	N/A	N/A
	85/72	Total Cooling Sensible Cooling	55,100 33,700	52,600 32,900	50,300 32,200	47,900 31,200	45,300 30,200	42,900 29,100	40,500 28,000	38,000 26,800	35,500 25,600	33,100 24,300	N/A	N/A

① Below 65°F, unit requires a factory or field installed low ambient control.

② Outdoor temperatures shown are measured at the condenser section air inlet.

③ Return air temperature °F.

Capacity Multiplier Factors

% of Rated Airflow	-10	Rated	+10
Total BTUH	0.975	1.0	1.02
Sensible BTUH	0.950	1.0	1.05

Part Load Heating Application Rating & Outdoor Temperature °F* ②

MODEL		0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°F
C24H2	BTUH	3,600	4,700	5,900	7,000	8,100	9,300	10,400	11,600	12,700	13,800	14,900	16,100	17,200
	WATTS	1390	1400	1410	1410	1420	1420	1420	1410	1440	1460	1470	1480	1490
	COP	0.76	0.99	1.23	1.46	1.68	1.92	2.15	2.42	2.59	2.77	2.97	3.19	3.39
C30H2	BTUH	6,200	7,600	8,900	10,300	11,500	12,500	13,500	14,600	16,400	18,300	19,900	21,200	22,600
	WATTS	1680	1700	1720	1740	1760	1700	1770	1780	1820	1860	1890	1910	1930
	COP	1.09	1.31	1.52	1.74	1.92	2.07	2.24	2.41	2.65	2.89	3.09	3.26	3.44
C36H1	BTUH	7,000	8,600	10,100	11,600	13,100	14,400	15,700	17,100	18,900	20,700	22,400	23,900	25,400
	WATTS	1930	1940	1960	1970	1980	1980	1990	1990	2020	2060	2080	2090	2110
	COP	1.07	1.30	1.51	1.73	1.94	2.14	2.32	2.52	2.75	2.95	3.16	3.36	3.53
C42H1	BTUH	8,800	10,600	12,500	14,300	16,200	18,100	20,000	21,900	23,600	25,400	27,100	29,000	30,800
	WATTS	2340	2360	2390	2410	2410	2400	2380	2370	2450	2540	2590	2610	2640
	COP	1.11	1.32	1.54	1.74	1.97	2.21	2.47	2.71	2.83	2.93	3.07	3.26	3.42
C48H1	BTUH	10,800	12,900	15,100	17,200	18,900	20,300	21,600	23,000	26,300	29,500	32,100	34,300	36,400
	WATTS	2490	2520	2550	2580	2590	2600	2600	2600	2670	2740	2790	2820	2850
	COP	1.28	1.50	1.74	1.96	2.14	2.29	2.44	2.60	2.89	3.16	3.38	3.57	3.75
C60H1	BTUH	11,400	14,200	17,100	19,900	22,700	25,500	28,300	31,000	33,900	36,900	39,700	42,600	45,400
	WATTS	2860	2900	2950	2990	3040	3110	3170	3230	3250	3260	3290	3340	3380
	COP	1.17	1.44	1.70	1.96	2.19	2.41	2.62	2.82	3.06	3.32	3.54	3.74	3.94

* 70°F DB indoor return air at rated CFM includes defrost operation below 45°.

② Outdoor temperatures shown are measured at the condenser section air inlet.

Full Load Cooling Application Data - Outdoor Temperature °F ①②

Model	D.B. / W.B. ③	COOLING CAPACITY	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F	120°F	125°F	131°F
C24H2	75/62	Total Cooling Sensible Cooling	26,600 21,100	24,600 19,900	22,800 18,900	21,200 18,000	19,600 17,200	18,300 16,500	17,100 15,800	16,000 15,300	14,900 14,200	14,000 10,000	13,200 7,800	12,400 5,100
	80/67	Total Cooling Sensible Cooling	28,400 20,400	26,800 19,500	25,300 18,700	23,900 18,000	22,400 17,300	21,300 16,800	20,100 16,200	19,000 15,800	17,900 15,400	16,900 15,000	16,000 14,800	15,100 6,200
	85/72	Total Cooling Sensible Cooling	33,900 20,900	31,400 19,800	29,100 18,800	27,000 17,900	25,000 17,000	23,300 16,300	21,700 15,500	20,200 14,800	18,800 14,200	17,600 13,600	16,500 13,100	15,400 5,400
C30H2	75/62	Total Cooling Sensible Cooling	32,800 25,200	30,200 23,700	28,000 22,400	26,100 21,300	24,400 20,400	23,000 19,800	21,900 19,100	21,000 18,800	20,400 18,500	19,900 18,400	19,600 17,700	19,700 16,800
	80/67	Total Cooling Sensible Cooling	35,000 24,400	32,900 23,200	31,100 22,200	29,500 21,300	28,000 20,600	26,800 20,100	25,800 19,600	25,000 19,400	24,500 19,200	24,100 19,200	23,900 19,400	24,000 19,800
	85/72	Total Cooling Sensible Cooling	41,700 25,000	38,500 23,600	35,700 22,300	33,300 21,200	31,100 20,200	29,300 19,500	27,800 18,700	26,600 18,200	25,800 17,700	25,100 17,400	24,600 17,200	24,500 17,100
C36H1	75/62	Total Cooling Sensible Cooling	37,200 29,500	35,500 28,700	33,800 27,800	32,100 26,900	30,500 26,100	28,900 25,300	27,400 24,500	25,800 23,600	24,400 22,900	22,900 22,100	N/A	N/A
	80/67	Total Cooling Sensible Cooling	39,700 28,600	38,600 28,100	37,500 27,500	36,300 26,900	35,000 26,300	33,700 25,700	32,300 25,100	30,800 24,400	29,300 23,800	27,700 23,100	N/A	N/A
	85/72	Total Cooling Sensible Cooling	47,300 29,300	45,200 28,500	43,100 27,700	41,000 26,700	38,900 25,800	36,900 24,900	34,900 23,900	32,800 22,900	30,800 21,900	28,800 20,900	N/A	N/A
C42H1	75/62	Total Cooling Sensible Cooling	42,100 33,400	40,100 32,400	38,300 31,300	36,500 30,400	34,700 29,500	33,000 28,600	31,300 27,800	29,700 27,100	28,100 26,400	26,500 25,700	N/A	N/A
	80/67	Total Cooling Sensible Cooling	44,900 32,400	43,700 31,700	42,500 31,000	41,200 30,400	40,000 29,700	38,400 29,100	36,900 28,500	35,400 28,000	33,800 27,400	32,100 26,900	N/A	N/A
	85/72	Total Cooling Sensible Cooling	53,500 33,200	51,100 32,200	48,800 31,200	46,500 30,200	44,200 29,200	42,000 28,200	39,800 27,200	37,700 26,300	35,500 25,300	33,400 24,300	N/A	N/A
C48H1	75/62	Total Cooling Sensible Cooling	48,800 39,400	46,600 38,500	44,600 37,600	42,500 36,700	40,500 35,700	38,600 34,800	36,800 33,800	35,000 32,800	33,200 31,800	31,400 30,800	N/A	N/A
	80/67	Total Cooling Sensible Cooling	52,100 38,200	50,800 37,700	49,500 37,200	48,000 36,700	45,500 36,000	43,000 35,400	40,400 34,700	37,900 33,900	35,900 33,100	33,000 32,200	N/A	N/A
	85/72	Total Cooling Sensible Cooling	62,100 39,100	59,400 38,300	56,900 37,400	54,200 36,500	51,700 35,300	49,200 34,300	46,800 33,100	44,400 31,800	41,900 30,500	39,500 29,100	N/A	N/A
C60H1	75/62	Total Cooling Sensible Cooling	58,100 45,200	55,600 43,700	53,200 42,400	51,000 41,100	48,800 39,900	46,700 38,800	44,700 37,800	42,700 36,900	40,800 36,000	38,900 35,200	N/A	N/A
	80/67	Total Cooling Sensible Cooling	62,000 43,800	60,600 42,800	59,100 42,000	57,600 41,100	55,500 40,300	54,400 39,500	52,700 38,800	50,900 38,100	49,100 37,400	47,200 36,800	N/A	N/A
	85/72	Total Cooling Sensible Cooling	73,900 44,900	70,900 43,400	67,900 42,200	65,000 40,800	62,200 39,500	59,500 38,200	56,800 37,000	54,200 35,700	51,600 34,500	49,100 33,300	N/A	N/A

① Below 65°F, unit requires a factory or field installed low ambient control.

② Outdoor temperatures shown are measured at the condenser section air inlet.

③ Return air temperature °F.

Capacity Multiplier Factors

% of Rated Airflow	-10	Rated	+10
Total BTUH	0.975	1.02	1.02
Sensible BTUH	0.950	1.05	1.05

Full Load Heating Application Rating & Outdoor Temperature °F* ②

MODEL		0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°F
C24H2	BTUH	5,100	6,600	8,100	9,600	11,100	12,400	13,800	15,200	16,900	18,600	20,100	21,600	23,100
	WATTS	1570	1600	1620	1640	1660	1680	1690	1710	1750	1790	1820	1840	1860
	COP	0.96	1.21	1.47	1.72	1.96	2.17	2.40	2.61	2.83	3.05	3.24	3.44	3.64
C30H2	BTUH	10,600	12,200	13,800	15,400	16,400	16,900	17,400	17,900	21,200	24,400	26,600	28,200	29,800
	WATTS	2000	2030	2060	2100	2120	2120	2130	2130	2210	2290	2340	2380	2410
	COP	1.56	1.77	1.97	2.15	2.27	2.34	2.40	2.47	2.82	3.13	3.34	3.48	3.63
C36H1	BTUH	12,200	14,200	16,200	18,200	19,900	21,200	22,600	24,000	26,900	29,900	32,200	34,200	36,200
	WATTS	2270	2300	2340	2380	2410	2430	2450	2470	2530	2600	2640	2680	2720
	COP	1.58	1.81	2.03	2.25	2.42	2.56	2.71	2.85	3.12	3.37	3.58	3.74	3.90
C42H1	BTUH	14,000	16,600	19,300	22,000	23,900	25,400	26,900	28,400	32,800	37,300	40,600	43,300	46,000
	WATTS	2750	2810	2870	2930	2960	2970	2980	2990	3130	3270	3370	3430	3490
	COP	1.50	1.74	1.98	2.20	2.37	2.51	2.65	2.79	3.08	3.35	3.53	3.70	3.87
C48H1	BTUH	18,000	20,600	23,300	26,000	28,000	29,500	31,100	32,700	37,000	41,300	44,600	47,300	50,000
	WATTS	3010	3070	3130	3190	3240	3280	3320	3360	3450	3540	3610	3670	3730
	COP	1.76	1.97	2.19	2.39	2.54	2.64	2.75	2.86	3.15	3.42	3.62	3.78	3.93
C60H1	BTUH	24,800	27,700	30,600	33,500	35,800	37,600	39,400	41,300	45,800	50,300	53,800	56,700	59,600
	WATTS	3770	3850	3930	4010	4080	4140	4200	4260	4370	4470	4560	4640	4720
	COP	1.93	2.11	2.29	2.45	2.58	2.67	2.75	2.85	3.08	3.30	3.46	3.59	3.70

* 70°F DB indoor return air at rated CFM includes defrost operation below 45°.

② Outdoor temperatures shown are measured at the condenser section air inlet.

Indoor Blower Performance - CFM (0.00" — 0.50" H₂O) ①

Model	Rated ESP	① Max ESP	② Blower Only	Cooling & Heat Pump Stage 1	④ Cooling & Heat Pump Stage 2	④ Electric Heat
C24H	.10	.50	550	550	740	900
C30H	.10	.50	650	650	900	900
C36H	.15	.50	800	800	1100	1100
C42H	.15	.50	800	900 ③	1250	1250
C48H	.20	.50	825	1000 ③	1550	1550
C60H	.20	.50	850	1300 ③	1650	1650

NOTE: These units are equipped with a variable speed (ECM) indoor motor that automatically adjusts itself to maintain approximately the same rate of indoor airflow in both heating & cooling, dry & wet coil conditions and at both 230/208 or 460 volts.

① Maximum ESP (inches WC) shown is with 2" thick disposable filter.

② Blower only CFM is the total air being circulated during continuous fan only mode.

③ Blower only CFM reduces during continuous fan only mode.

④ CFM output on Stage 2 Cooling and Heat Pump or Electric Heat.

Electric Heat Table - Refer to Electrical Specifications for Availability by Unit Model

Nominal KW	At 240V (1)				At 208V (1)				At 480V (2)			At 460V (2)		
	KW	1-Ph Amps	3-Ph Amps	Btuh	KW	1-Ph Amps	3-Ph Amps	Btuh	KW	3-Ph Amps	Btuh	KW	3-Ph Amps	Btuh
4.0	4.0	16.7		13,652	3.00	14.4		10,239						
5.0	5.0	20.8		17,065	3.75	18.0		12,799						
6.0	6.0		14.4	20,478	4.50		12.5	15,359	6.0	7.2	20,478	5.52	6.9	18,840
8.0	8.0	33.3		27,304	6.00	28.8		20,478						
9.0	9.0		21.7	30,717	6.75		18.7	23,038	9.0	10.8	30,717	8.28	10.4	28,260
10.0	10.0	41.7		34,130	7.50	36.1		25,598						
15.0	15.0	62.5	36.1	51,195	11.25	54.1	31.2	38,396	15.0	18.0	51,195	13.80	17.3	47,099
18.0			43.4	61,434	13.5		37.4	46,076	18.0	21.6	61,434	16.56	20.8	56,520
20.0	20.0	83.3		68,260	15.00	72.1		51,195						

(1) These electric heaters are available in 230/208V units only.

(2) These electric heaters are available in 480V units only.

Heater Packages - Field Installed

- Designed for adding Electric Heat to 0 KW Units
- Circuit Breaker standard on 230/208V Models

- ETL – US & Canada Listed
- Rotary Disconnect standard on 460V Models

Heat Pump Models	-A00 Models 230/208-1		-B00 Models 230/208-3		-C00 Models 460-3	
	Heater Model #	KW	Heater Model #	KW	Heater Model #	KW
C24H2	EHT03H-A04B EHT03H-AF8B EHT03H-AS8B	4 F8 S8	EHT02H-B06B EHT03H-B09B	6 9		
C30H2	EHT03H-A04B EHT03H-AF8B EHT03H-AS8B	4 F8 S8	EHT03H-B06B EHT03H-B09B	6 9	EHT03H-C06 EHT03H-C09	6 9
C36H1	EHS03H-A05B EHT05H-A10B EHT05H-A15B	5 10 15	EHT05H-B06B EHT05H-B09B EHS05H-B15B	6 9 15	EHS05H-C06 EHS03H-C09 EHS03H-C15	6 9 15
C42H1	EHS03H-A05B EHT05H-A10B EHT05H-A15B	5 10 15	EHS05H-B06B EHS05H-B09B EHS05H-B15B	6 9 15	EHS05H-C06 EHS05H-C09 EHS05H-C15	6 9 15
C48H1	EHT06H-A04B EHT06H-A05B EHT06H-A10B EHT06H-A15B EHT06H-A20B	4 5 10 15 20	EHT06H-B06B EHT06H-B09B EHT06H-B15B EHT06H-B18B	6 9 15 18	EHT06H-C06 EHT06H-C09 EHT06H-C15	6 9 15
C60H1	EHT06H-A05B EHT06H-A10B EHT06H-A15B EHT06H-A20B	5 10 15 20	EHT06H-B06B EHT06H-B09B EHT06H-B15B EHT06H-B18B	6 9 15 18	EHT06H-C06 EHT06H-C09 EHT06H-C15 EHT06H-C18	6 9 15 18

Clearances Required for Service Access and Adequate Condenser Airflow

MODELS	LEFT SIDE	RIGHT SIDE
All Models	36"	36"

Minimum Clearances Required to Combustible Materials

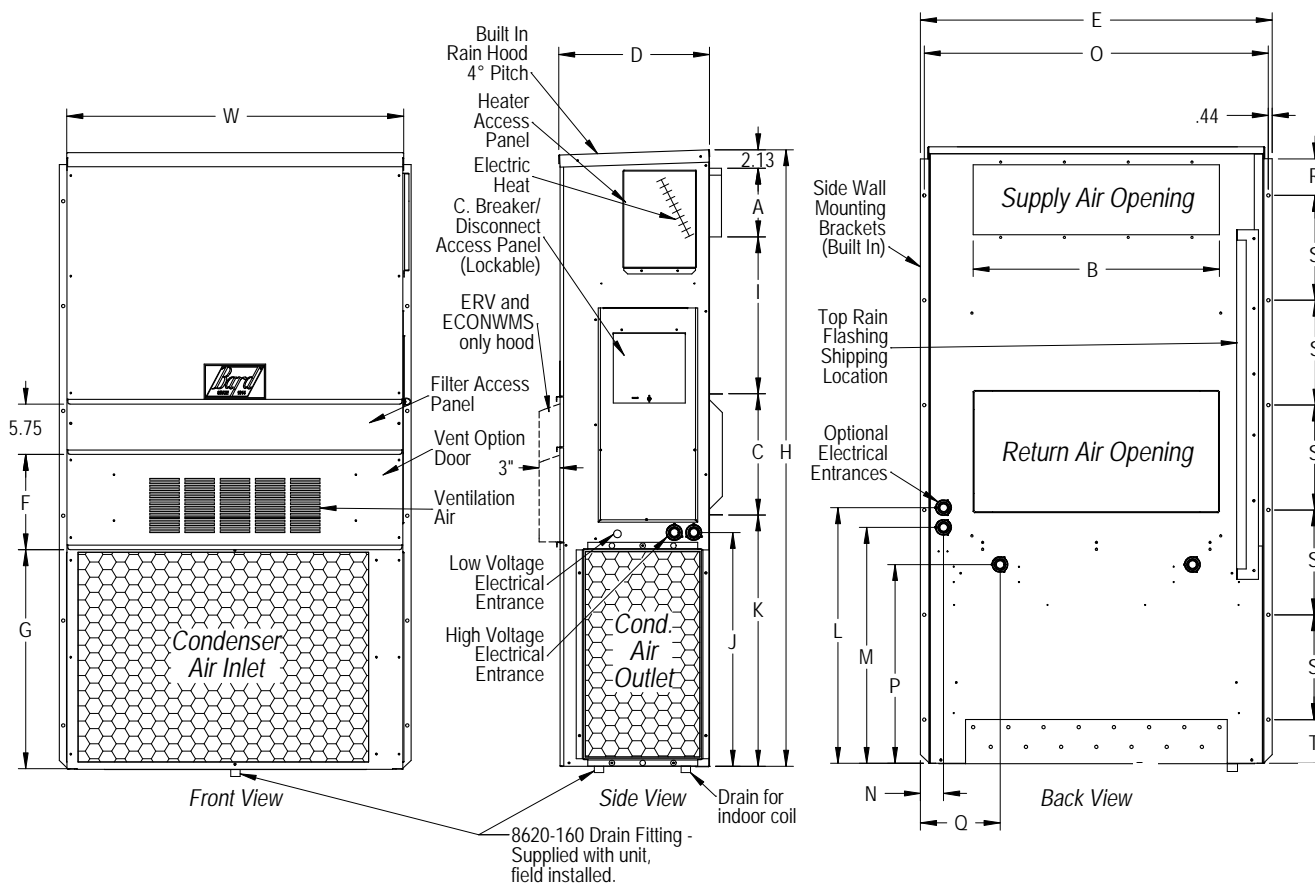
MODELS ①	SUPPLY AIR DUCT FIRST THREE FEET	CABINET
All Models	1/4"	0"

① Refer to the Installation Manual for more detailed information.

Dimensions of Basic Unit for Architectural and Installation Requirements (Nominal)

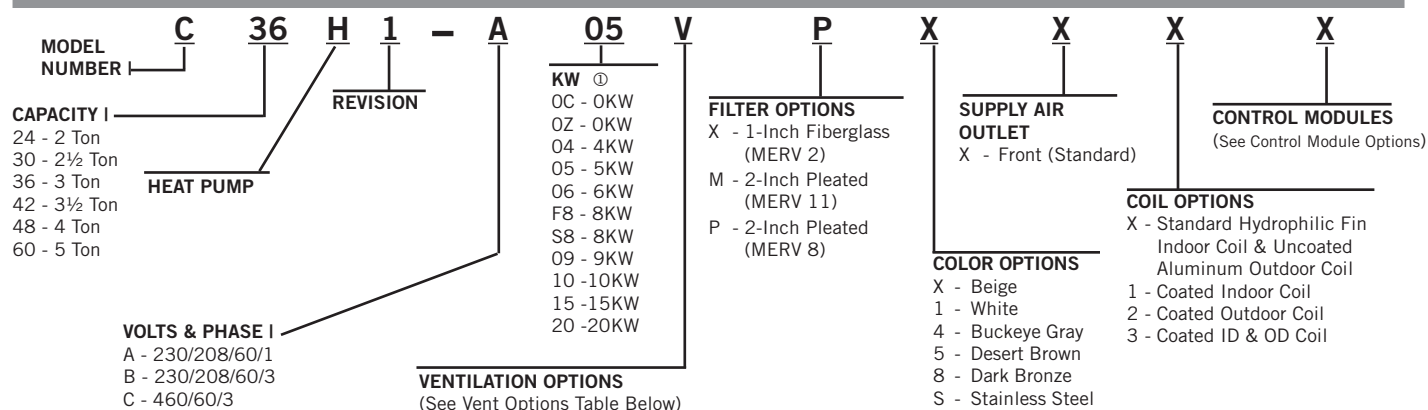
MODEL	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY		RETURN		E	F	G	I	J	K	L	M	N	O	P	Q	R	S	T
				A	B	C	B															
C24H2 C30H2	38.200	17.125	70.563	7.88	27.88	13.88	27.88	40.00	10.88	25.75	17.93	26.75	28.75	29.25	27.00	2.63	39.13	22.75	9.14	5.00	12.00	5.00
C36H1 C42H1	42.075	22.432	84.875	9.88	29.88	15.88	29.88	43.88	13.56	31.66	30.00	32.68	26.94	34.69	32.43	3.37	43.00	23.88	10.00	1.44	16.00	1.88
C48H1 C60H1	42.075	22.432	93.000	9.88	29.88	15.88	29.88	43.88	13.56	37.00	30.00	40.81	35.06	42.81	40.56	3.37	43.00	31.00	10.00	1.44	16.00	10.00

All dimensions are in inches. Dimensional drawings are not to scale.



MIS-3190

Heat Pump Wall-Mount Model Nomenclature



Note ① All 230/208V units with or without electric heat have circuit breaker. 0C is for 460V circuit breaker & 0KW. No 460V electric heat options w/circuit breaker available. 460V -0Z and all 460V KW options are with Rotary Disconnect. See Page 9 for available heater options by unit model number.

Ventilation Options

MODELS	C24H1, C30H1		C36H1, C42H1, C48H1, C60H1	
Description	Factory Installed Code No.	Field Installed Part No.	Factory Installed Code No.	Field Installed Part No.
Blank-Off Plate	B	BOP-3	B	BOP-5
Commercial Ventilator - Modulating Spring Return w/Exhaust	V	CHCRV-3 ③	V	CHCRV-5
Economizer (Internal) - Fully Modulating w/Exhaust mn	S	ECONCHS-E3 ②③	S	ECONCHS-E5 ②③
Energy Recovery Ventilator - 230V ①	R	CHERV-A3 ②③	R	CHERV-A5 ②③
Energy Recovery Ventilator - 460V ①	R	CHERV-C3 ②③	R	CHERV-C5 ②③

① Intake and exhaust can be independently adjusted.

② Insert color to match unit ("X" = Beige; "4" = Buckeye Gray; etc.)

③ Requires use of TCURB, depending on unit model, when installing ECONCHS-E3, -E5 or CHCRV-3. See Page 10 for additional information.

NOTE: The WMDK Door Kit cannot be used with the CH Product-Line, due to door sizes.

All parts are included in the field installed vent kits, including door panels.

Heat Pump Control Modules

DESCRIPTION									
Low Pressure Control ①	High Pressure Control ①	Low Ambient Control & Relay ②	Start Kit ③	Start Kit ④	Outdoor Sensor	Freezestat ⑥	Dirty Filter Switch ⑦	Factory Installed Code Number	Field Installed Part Number
STD	STD							X	N/A
STD	STD	C24H2-30H2 ● All						E	CMH-32
STD	STD	C36H1-48H1 ● 230V						E	CMH-20
STD	STD	C36H1-48H1 ● 460V						E	CMH-21
STD	STD	C60 ● All						E	CMH-19
STD	STD		●					Field Installed Only	CMC-15 ③
STD	STD			●				Field Installed Only	SK111 ④
STD	STD					●		Field Installed Only	CMC-29
STD	STD						●	Field Installed Only	CMC-30
STD	STD				●			Field Installed Only	8403-061 ⑤

STD = Standard Equipment

① The high & low pressure controls are auto reset. Operating circuit includes a lockout feature and is resettable from the wall thermostat. All low pressure controls use a timed bypass circuit to prevent nuisance tripping during low temperature start-up.

② The low ambient control includes an 8201-008 (fan relay) and permits cooling operation down to 0°F.

③ PTCR start kit can be used with all -A single phase models. Increases starting torque 2-3x. Not used for -B or -C three phase models. Do not use if SK111 is used.

④ Start capacitor and potential relay start kit can be used with all -A single phase models. Increases starting torque 9x. Not used for -B or -C three phase models. Do not use if CMC-15 is used.

⑤ ODT. Outdoor thermostat. Field-installed only. Bard Part #8403-061.

Comes with weatherproof enclosure. Works in conjunction with 8403-060 multi-stage thermostats offered by Bard and can be configured for any or all of compressor cut-off in heat pump mode, minimum cooling mode and maximum electric heat operation based on outdoor temperature.

⑥ Field installed option for standard units.

⑦ Dirty Filter Switch. Adjustable for different filter media. Normally open close-on-activation dry contact rated 1.5A 24VAC. Suitable for use with appropriate thermostat or alarm panels supplied by others.

NOTE: Standard heat pump control board has a 5-minute compressor anti-short cycle timer.

LAC control is required for operation of cooling mode below 55 degrees. This option is recommended for applications throughout most of the United States & Canada.



Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Due to our continuous product improvement policy,
all specifications subject to change without notice.

Form No.
S3459
January 2021

Supersedes: S3459-0720

Unit Report For 5 Ton

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM

Unit Parameters

Unit Model:.....**48GCGM06A3A5-0A0A0**
Unit Size:.....**06 (5 Tons)**
Volts-Phase-Hertz:.....**208-3-60**
Heating Type:.....**Gas**
Duct Cfg:.....**Vertical Supply / Vertical Return**
Ultra Low Nox, Low Heat
Two Stage Cooling Models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length:.....**6' 2.375"**
Unit Width:.....**3' 10.625"**
Unit Height:.....**3' 5.375"**
*** Total Operating Weight:.....**635 lb**

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Gas Line Size:.....**1/2**
Condensate Drain Line Size:.....**3/4**
Return Air Filter Type:.....**Throwaway**
Return Air Filter Quantity:.....**4**
Return Air Filter Size:.....**16 x 16 x 2**

Unit Configuration

Direct Drive - EcoBlue - High Static
Al/Cu - Al/Cu
Base controls set up for field installed air management devices
Standard Packaging

Warranty Information

1-Year parts(std.)
5-Year compressor parts(std.)

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48GCGM06A3A5-0A0A0	Rooftop Unit	3

Performance Summary For 5 Ton

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM

Part Number:48GCGM06A3A5-0A0A0

ARI SEER:.....16.10

Base Unit Dimensions

Unit Length:.....74.4 in
Unit Width:.....46.6 in
Unit Height:.....41.4 in

Operating Weight

Base Unit Weight:.....630 lb
Direct Drive - EcoBlue - High Static:.....5 lb

Total Operating Weight:.....635 lb

Unit

Unit Voltage-Phase-Hertz:.....208-3-60
Air Discharge:.....Vertical
Fan Drive Type:.....Direct
Actual Airflow:.....2000 CFM
Site Altitude:.....0 ft

Cooling Performance

Condenser Entering Air DB:.....105.0 F
Evaporator Entering Air DB:.....80.0 F
Evaporator Entering Air WB:.....67.0 F
Entering Air Enthalpy:.....31.44 BTU/lb
Evaporator Leaving Air DB:.....58.5 F
Evaporator Leaving Air WB:.....57.8 F
Evaporator Leaving Air Enthalpy:.....24.88 BTU/lb
Gross Cooling Capacity:.....58.99 MBH
Gross Sensible Capacity:.....46.38 MBH
Compressor Power Input:.....4.60 kW
Coil Bypass Factor:.....0.048

Heating Performance

Heating Airflow:.....2000 CFM
Entering Air Temp:.....70.0 F
Leaving Air Temp:.....92.7 F
Gas Heating Input Capacity:.....60.0 MBH
Gas Heating Output Capacity:.....49.0 MBH
Temperature Rise:.....22.7 F
Thermal Efficiency (%):.....81.0

Supply Fan

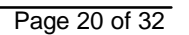
External Static Pressure:.....1.00 in wg
Fan RPM:.....2251
Fan Power:.....1.23 BHP
NOTE:.....Selected IFM RPM Range: 1387 - 2836

Electrical Data

Voltage Range:.....187 - 253
Compressor #1 RLA:.....16.2
Compressor #1 LRA:.....110
Indoor Fan Motor Type:.....HIGH
Indoor Fan Motor FLA:.....6.4
Combustion Fan Motor FLA (ea):.....0.48
Power Supply MCA:.....29
Power Supply MOCP (Fuse or HACR):.....40
Disconnect Size FLA:.....28
Disconnect Size LRA:.....123

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM



Certified Drawing for 5 Ton

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM

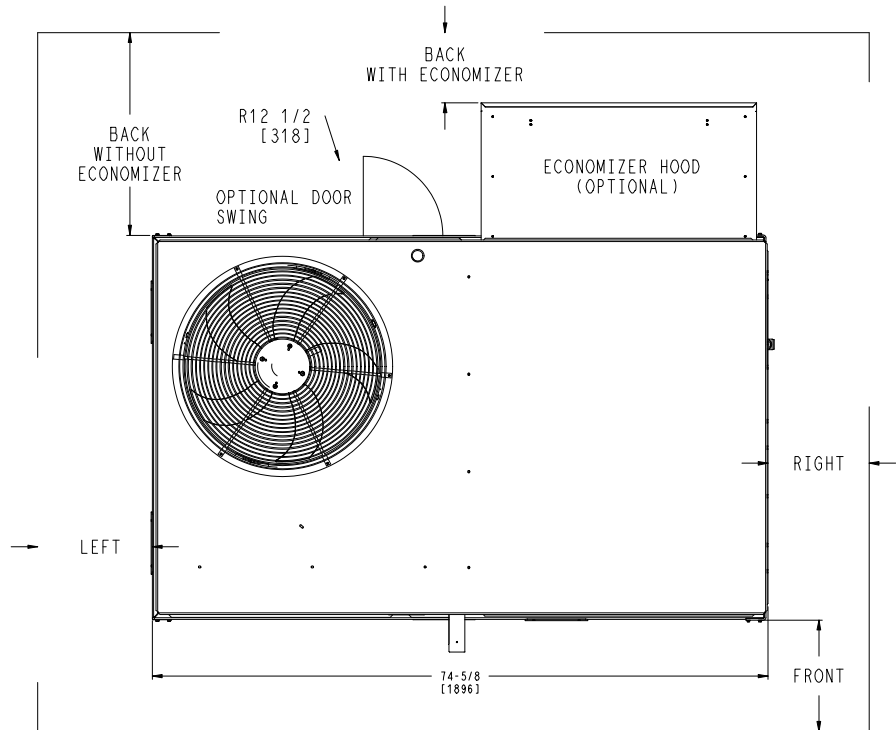
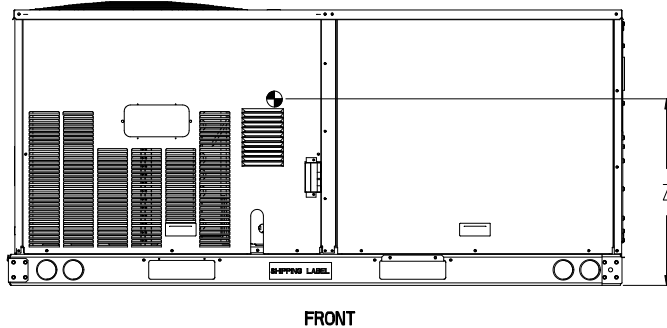
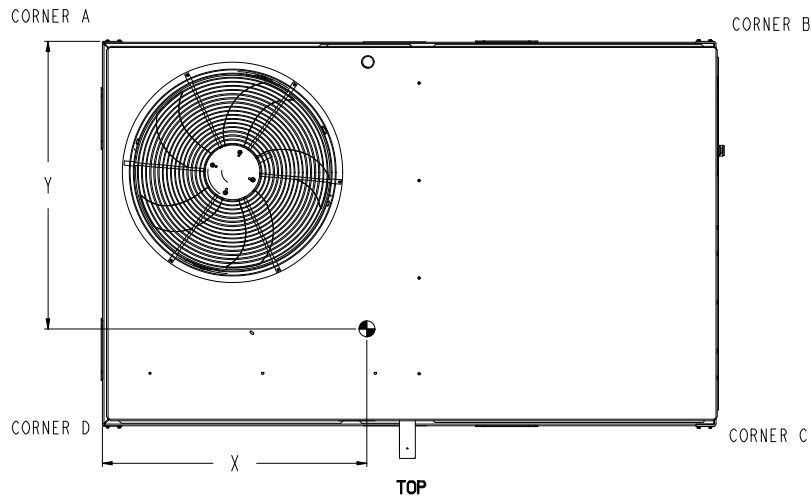
UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.			HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z	
48GC**04	513	233	131	59	127	58	125	57	130	59	36 1/2 [927]	23 1/4 [591]	18 1/4 [464]	
48GC**05	555	252	142	64	137	62	135	61	141	64	36 1/2 [927]	23 1/4 [591]	18 [457]	
48GC**06	600	272	161	73	151	68	140	64	149	68	36 [914]	22 1/2 [572]	19 3/8 [492]	

* - STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTINS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.



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SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.



NOTES:

- FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

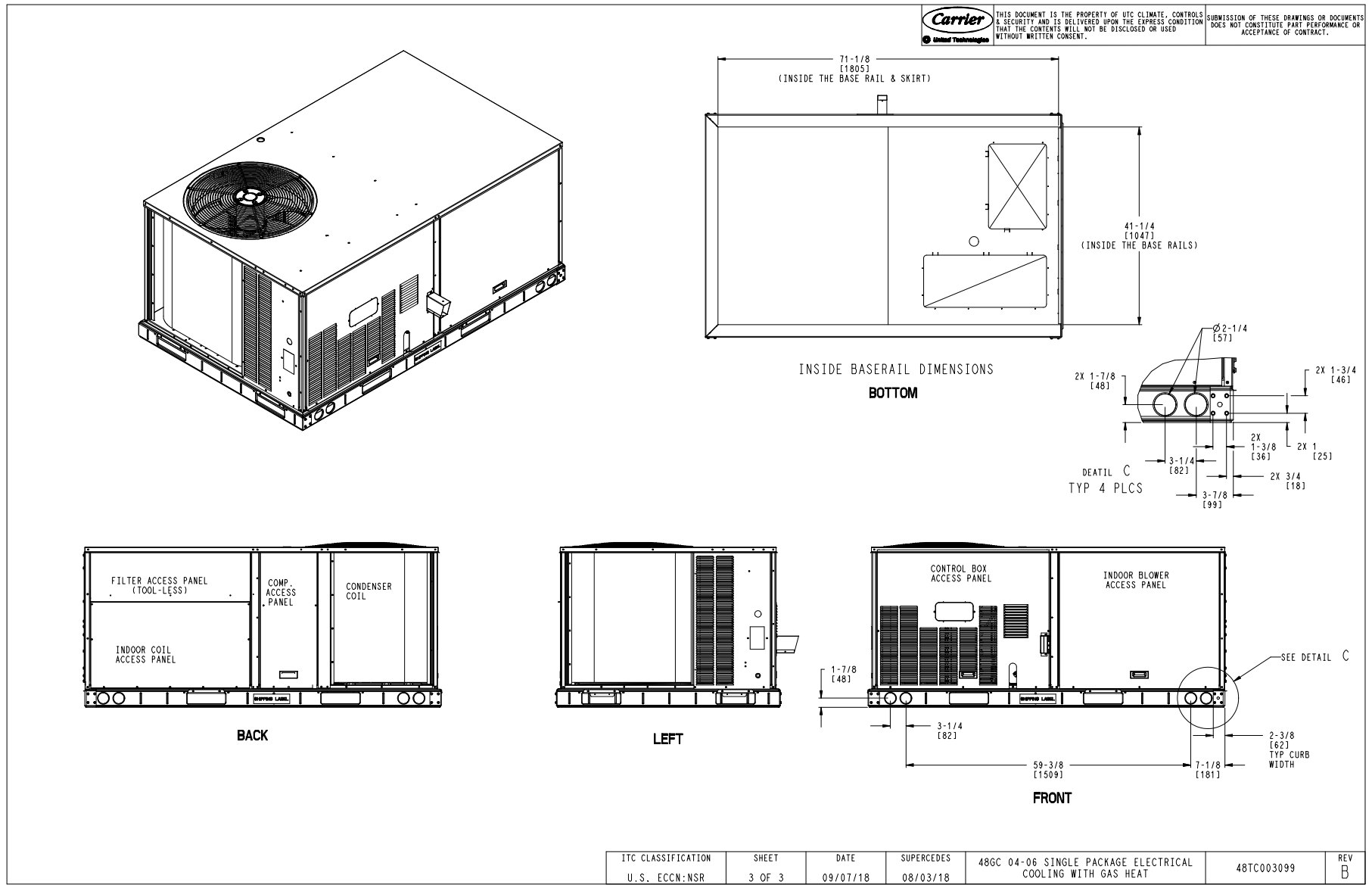
SURFACE	SERVICE WITH:		OPERATING CLEARANCE
	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION U.S. ECCN: NSR	SHEET 2 OF 3	DATE 09/07/18	SUPERCEDES 08/03/18	48GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC003099	REV B
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Certified Drawing for 5 Ton

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM

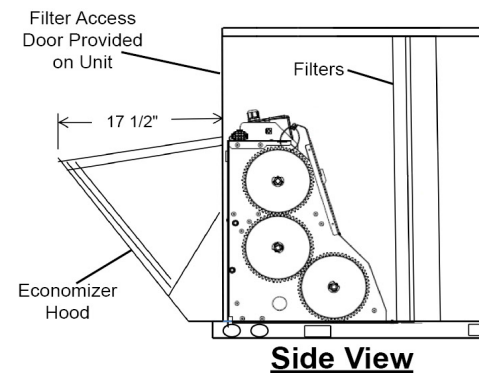
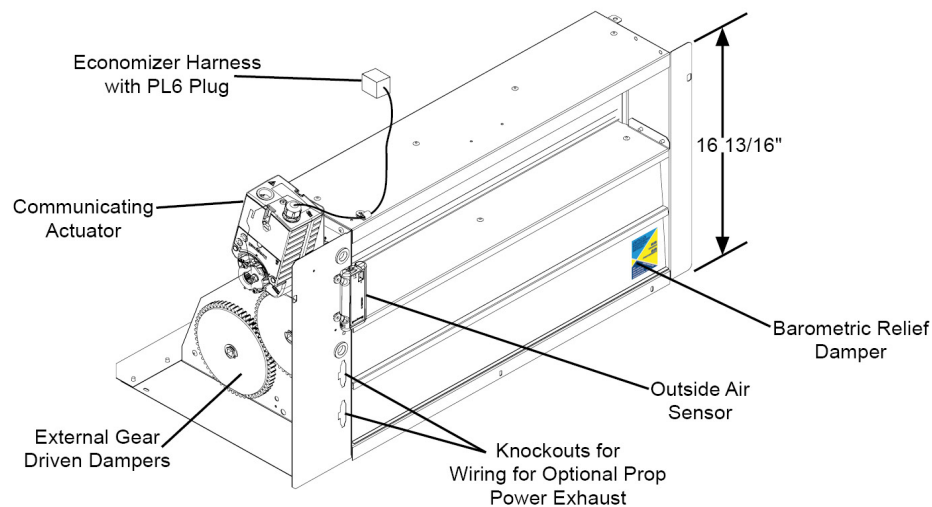





Date:	Weight: 49lbs (US) 22.23kg (Metric)	Part Number: ECD-SRT12CA-D2DH
RTU:	5 Ton	

Submitted to:	Approved by:	Notes:
---------------	--------------	--------

Economizer - Economizer - Ultra Low Leak Economizer, Vertical Orientation, Honeywell Jade W7220 Single/Multiple Speed Electromechanical Controller, Adjustable Dry Bulb Sensor, Honeywell Actuator. Painted Rain Hood With Aluminum Filter, Barometric Relief, All Necessary Panels And Hardware Included.



 MicroMetl	Date:	Weight: 49lbs (US) 22.23kg (Metric)	Part Number: ECD-SRT12CA-D2DH
	RTU:	5 Ton	
Submitted to:		Approved by:	Notes:
<p>Economizer - Economizer - Ultra Low Leak Economizer, Vertical Orientation, Honeywell Jade W7220 Single/Multiple Speed Electromechanical Controller, Adjustable Dry Bulb Sensor, Honeywell Actuator. Painted Rain Hood With Aluminum Filter, Barometric Relief, All Necessary Panels And Hardware Included.</p>			
<p>Compliant Economizer:</p> <ol style="list-style-type: none"> Title 24: Economizers meet California Energy Commission Title 24-2013 / 2016 prescriptive section 140.4 (damper leakage etc.), and mandatory section 120.2.i for Fault Detection and Diagnostic controls (JADE HJW10). ASHRAE 90.1: Economizers meet ASHRAE 90.1-2013 / 2016 damper leakage requirements, and meet 2016 Fault Detection and Diagnosis requirements. IECC: Economizers meet IECC 2012, IECC 2015, and IECC 2018 for outside air, return air, and relief damper (when provided) leakage requirements, and IECC 2015 and IECC 2018 for Fault Detection and Diagnostic requirements. Note: IECC 2015 and IECC 2018 requires differential return air sensor, which is included in some models (i.e. D2XH) and must be ordered separately on others (i.e. D2DH, D2ZH). AMCA: Outside air and return air (volume) dampers are AMCA Class 1A rated at 1" w.g. Refer to MicroMetl NS1 catalog sheet on web site for details. Relief air dampers (when provided) are also AMCA rated. Refer to GR1 series catalog sheet on web site for details. 			
<p>Features:</p> <ul style="list-style-type: none"> For single or 2 speed indoor fan units with Central Terminal Board (CTB) and Compressor Staging Board. Other control options available. Gear driven design for trouble-free operation, eliminating slippage and binding associated with standard linkage. Includes assembled rainhood with aluminum water entrainment filters in the outside air section. Rainhood is sloped for water run-off. Built-in barometric relief damper provided. Power exhaust options available. All harnesses and plugs needed are provided. Uses standard factory filter access door shipped with HVAC unit. If factory hinged access door option is installed on unit, an additional kit is required to seal hinged door properly. <ul style="list-style-type: none"> OEM part no. CRPECONV003A00 or MicroMetl part number 0640-0100-HDANGL 			
<p>Notes:</p> <ol style="list-style-type: none"> Control systems include Honeywell W7220 JADE controller, mixed (supply) air temperature sensor, OA sensor in description, and spring-return communicating actuator (some include differential return sensor as noted). JADE W7220 controller is field mounted in unit's control box. Mixed (supply) air sensor is field installed in indoor blower fan section. Differential return sensor (included in "-D2XH" and "-D2ZH" models or can be ordered separately - MicroMetl Part No. 9901-2022-DIFF JC2) is field installed in return duct. ASHRAE, IECC, and Title 24 require the economizer controller be capable of reporting faults to a fault management application accessible by day-to-day operating or service personnel, or annunciated locally on zone thermostats or in some codes other devices are acceptable. Refer to applicable code requirements and to MicroMetl instructions for suggestions. For older single speed models without the Central Terminal Board the "-D2" part number is replaced by "-DJ". (See separate submittal). 			
<small>This Document Is The Property Of MicroMetl Corporation And Is Delivered Upon The Express Condition That The Contents Will Not Be Disclosed Or Used Without MicroMetl's Written Consent. MicroMetl Reserves The Right To Discontinue, Or Change At Any Time, Specifications & Designs Without Any Notice Incurring Obligations.</small>			Master Revision 0001A Page Revision 0001A



MicroMetl Corporation certifies that the models GR1 and NS1 shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings.

Unit Report For 3 Ton VG

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM

Unit Parameters

Unit Model:.....48VGNE360603-TP
Unit Size:.....36 (3.0 Tons)
Volts-Phase-Hertz:.....208-1-60
Heating Type:.....Gas
Duct Cfg:.....Vertical Supply / Vertical Return
60,000 Btuh
Low NOx Unit

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length:.....4' 0.1875"
Unit Width:.....3' 8.125"
Unit Height:.....3' 8.75"

*** Weights and Dimensions are approximate. Weight does not include roof curbs, unit packaging, field installed accessories or factory installed options. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Total Operating Weight:.....447 lb

Unit Configuration

Tin-Plated Indoor Coil Hairpins

Warranty Information

1 year warranty on parts
5 year warranty on compressor
5 year warranty on heat exchanger

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48VGNE360603-TP	Rooftop Unit	1

Performance Summary For 3 Ton VG

Project: ~Untitled7
Prepared By: Jarrett Brooks

09/08/2021
11:15AM

Part Number:48VGNE360603-TP

ARI SEER:.....16.00

Base Unit Dimensions

Unit Length:.....48.2 in
Unit Width:.....44.1 in
Unit Height:.....44.8 in
Total Operating Weight:.....447 lb

Unit

Unit Voltage-Phase-Hertz:.....208-1-60
Air Discharge:.....Vertical
Fan Drive Type:.....Direct
Actual Airflow:.....1183 CFM
Site Altitude:.....0 ft

Cooling Performance

Condenser Entering Air DB:.....105.0 F
Evaporator Entering Air DB:.....80.0 F
Evaporator Entering Air WB:.....67.0 F
Entering Air Enthalpy:.....31.44 BTU/lb
Evaporator Leaving Air DB:.....60.3 F
Evaporator Leaving Air WB:.....58.5 F
Evaporator Leaving Air Enthalpy:.....25.37 BTU/lb
Net Cooling Capacity:.....32.32 MBH
Net Sensible Capacity:.....25.15 MBH
Total Unit Power Input:.....3.10 kW
Coil Bypass Factor:.....0.000

Heating Performance

Heating Airflow:.....1183 CFM
Entering Air Temp:.....70.0 F
Leaving Air Temp:.....108.3 F
Gas Heating Input Capacity:.....60.0 MBH
Gas Heating Output Capacity:.....49.0 MBH
Temperature Rise:.....38.3 F
AFUE (%):.....81.0

Supply Fan

External Static Pressure:.....0.70 in wg
Options / Accessories Static Pressure
Wet Coil:.....0.10 in wg
Total Application Static (ESP + Unit Opts/Acc.):.....0.80 in wg
Fan RPM:.....1000
Fan Power:.....0.38 BHP
Fan Motor Size, hp:.....3/4
NOTE:.....High Motor Speed, Vert

Electrical Data

Minimum Voltage:.....197
Maximum Voltage:.....253
Compressor RLA:.....15.3
Compressor LRA:.....83
Outdoor Fan FLA (ea):.....1.2
Indoor Fan Motor FLA:.....6
Power Supply MCA:.....26.3
Power Supply MOCP (Fuse or HACR):.....40

Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

TOP OF UNIT.....	14	[355.6]
DUCT SIDE OF UNIT.....	2	[50.8]
SIDE OPPOSITE DUCTS.....	14	[355.6]
BOTTOM OF UNIT.....	1/2	[12.7]
FLUE PANEL.....	36	[914.4]

	INCHES [MM]
BETWEEN UNITS, POWER ENTRY SIDE.....	42 [1066.8]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE...	36 [914.0]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER	
GROUND SURFACES, POWER ENTRY SIDE.....	42 [1066.8]

EVAP. COIL ACCESS SIDE.....	36	[914.0]
POWER ENTRY SIDE.....	42	[1066.8]
(EXCEPT FOR NEC REQUIREMENTS)		
UNIT TOP.....	48	[1219.2]
SIDE OPPOSITE DUCTS.....	36	[914.0]
DUCT PANEL.....	12	[304.8]*

*MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 12 [304.8] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

DIMENSIONS IN () ARE IN MM



UNIT	VOLTAGE	CORNER WEIGHT LB/KG							
		"1"	"2"	"3"	"4"				
48VG1-N/1E36(060/090)30	208/230	97.5	44.3	86.4	39.2	123.9	56.2	140	63.6
48VG1-N/1E42(060/090)30	208/230	97.5	44.2	86.5	39.2	124.2	56.3	139.8	63.4
48VG1-N/1E48(090/115/130)30	208/230	107.0	48.5	93.5	44.3	136.1	61.8	153.6	69.7
48VG1-N/1E60(090/115/130)30	208/230	110.9	50.3	98.6	44.2	142.2	64.5	160.2	72.7
48VG1-N/1A36(060/090)5/610	208/230/460	97.5	44.2	86.4	39.2	123.9	56.2	140	63.6
48VG1-N/1A42(060/090)5/610	208/230/460	97.5	44.2	86.5	39.2	124.2	56.3	139.8	63.4
48VG1-N/1A48(090/115/130)5/610	208/230/460	107.0	48.5	93.5	44.3	136.1	61.8	153.6	69.7
48VG1-N/1A60(090/115/130)5/610	208/230/460	110.9	50.3	98.6	44.2	142.2	64.5	160.2	72.7

NOTE: 1. ALL TABLE DATA RELEVANT FOR ALL FACTORY INSTALLED OPTIONS EXCEPT ECONOMIZER.
2. * - INDICATES ALL FIOP CODES FOR THE MODELS LISTED.



344825-4	-
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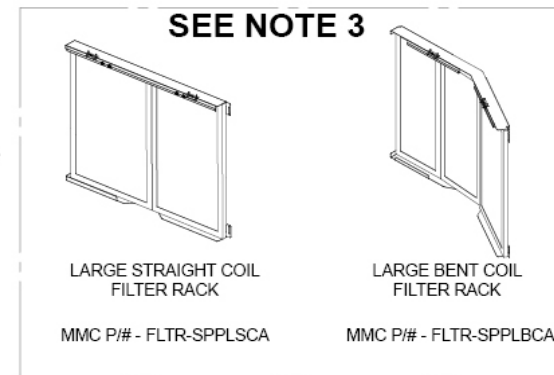
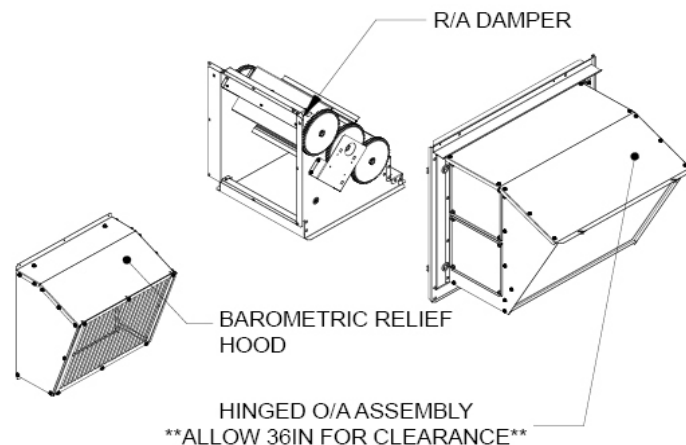
Date:	Weight: 89lbs (US) 40.37kg (Metric)	Part Number: ECC-SPPLGCA-DYDB-2
RTU:		

Submitted to:	Approved by:	Notes:
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Economizer - Economizer - Ultra Low Leak Economizer, Convertible Orientation, Belimo Zip Multiple Speed Electromechanical Controller, Adjustable Dry Bulb Sensor, Belimo Actuator. Painted Rain Hood With Aluminum Filter, Barometric Relief, All Necessary Panels And Hardware Included.

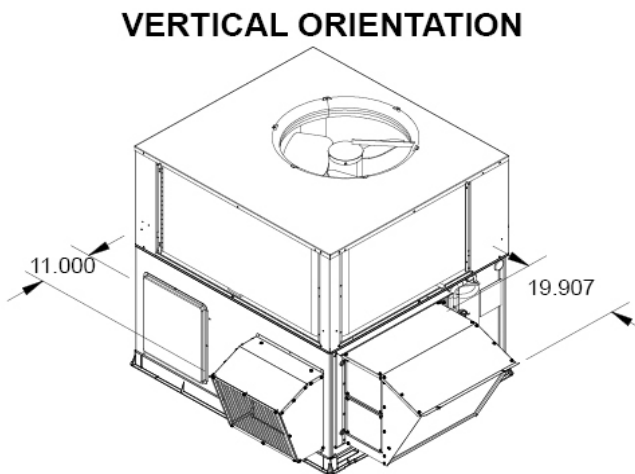


MicroMetl Corporation certifies that the models GR1 and NS1 shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings.

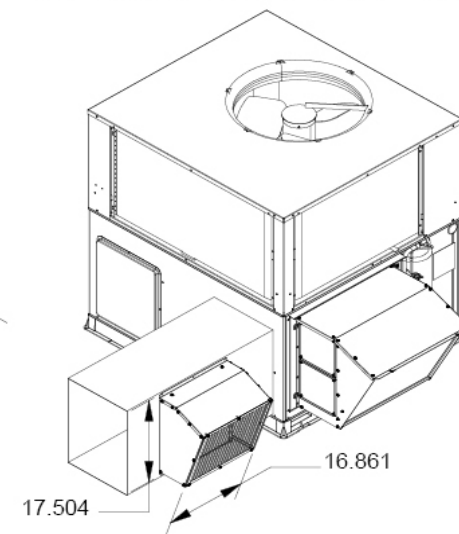




NOTES:

- For single phase and single speed units the extension harness (1002-0867) will need to be ordered as a separate line item.
- For heat pump applications a field supplied and installed 24VAC- SPST normally open relay will be needed.
 - If purchased through MicroMetl you'll need:
 - (1) Relay - 9901-5030
 - (4) Wire Leads - 9901-0134
- Filter racks are not included, will be a separate sales order item.



HORIZONTAL ORIENTATION



 MicroMetl	Date:	Weight: 89lbs (US) 40.37kg (Metric)	Part Number: ECC-SPPLGCA-DYDB-2
	RTU:		
Submitted to:		Approved by:	Notes:
<p>Economizer - Economizer - Ultra Low Leak Economizer, Convertible Orientation, Belimo Zip Multiple Speed Electromechanical Controller, Adjustable Dry Bulb Sensor, Belimo Actuator. Painted Rain Hood With Aluminum Filter, Barometric Relief, All Necessary Panels And Hardware Included.</p>			
<p><u>Compliant Economizer:</u></p> <ol style="list-style-type: none"> Title 24: Economizers meet California Energy Commission Title 24-2013 / 2016 prescriptive section 140.4 (damper leakage etc.), and mandatory section 120.2.i for Fault Detection and Diagnostic controls (Zip Economizer BZE1245). ASHRAE 90.1: Economizers meet ASHRAE 90.1-2013 / 2016 damper leakage requirements, and meet 2016 Fault Detection and Diagnosis requirements. IECC: Economizers meet IECC 2012, IECC 2015, and IECC 2018 for outside air, return air, and relief damper (when provided) leakage requirements, and IECC 2015 and IECC 2018 for Fault Detection and Diagnostic requirements. Note: IECC 2015 and IECC 2018 requires differential return air sensor, which is included in some models (i.e. -DYXB) and must be ordered separately on others (i.e. -DYDB, -DYEB). AMCA: Outside air and return air (volume) dampers are AMCA Class 1A rated at 1" w.g. Refer to MicroMetl NS1 catalog sheet on web site for details. Relief air dampers (when provided) are also AMCA rated. Refer to GR1 series catalog sheet on web site for details. 			
<div style="text-align: right;">  <p>MicroMetl Corporation certifies that the models GR1 and NS1 shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings.</p> </div>			
<small>This Document Is The Property Of MicroMetl Corporation And Is Delivered Upon The Express Condition That The Contents Will Not Be Disclosed Or Used Without MicroMetl's Written Consent. MicroMetl Reserves The Right To Discontinue, Or Change At Any Time, Specifications & Designs Without Any Notice Incurring Obligations.</small>			Master Revision 0001A Page Revision 0001A

Specifications

Intelli-Hood controls to include: System Controller, Hood Controller for each hood, Temperature and Optic Sensors for each hood, Touchpad(s), and VFDs for each fan motor.



Temperature Sensors mounted in hoods shall detect the cooking appliances being turned on and operate the fans at a min speed of 30%-50%. Temperature Sensors mounted in exhaust ducts shall modulate the fan speeds above the min based on actual heat load.

Optic Sensors with Air Purge Units mounted on opposite ends of hoods shall immediately increase fan speed to 100% upon the detection of smoke or vapors. As soon as the effluent is removed the fan speeds shall slow back down and modulate according to the actual heat load.

Touchpad shall be mounted on hood or convenient location to monitor and control system. Hood Controller to be mounted on top of hoods. System Controller and VFDs to be mounted in hood end-cabinet for new construction and on wall or above ceiling for retrofits.

Remote monitoring and control shall be provided by connecting the System Controller to a building automation system via BACnet and/or Internet gateway.

Electrical contractor shall be responsible for wiring the high-voltage components including System Controller, VFDs and fan motors. Melink or its Authorized Service Agency shall be responsible for wiring the low-voltage components including Hood Controller, Temperature and Optic Sensors, and Touchpad.

Field start-up shall be coordinated by Melink.



Features

Saves up to 97% fan energy and 70% conditioned air by EF and MUA fan modulation.

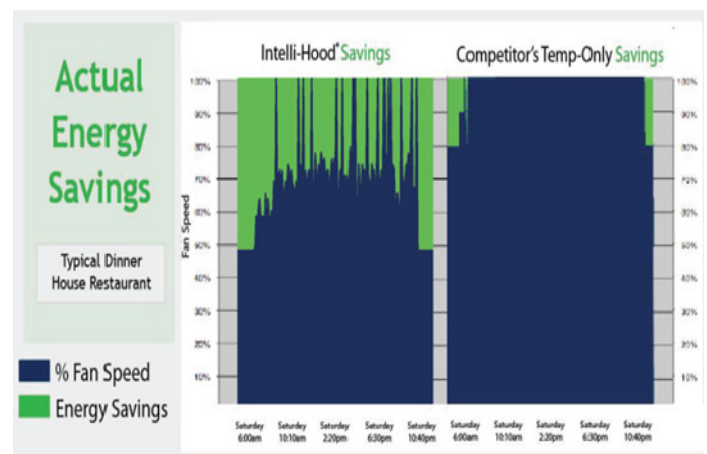
Includes infrared optics and temperature sensors to detect heat and visually monitor cooking activity.

Optic sensors mounted at ends of hoods respond in 0.2 seconds and auto-calibration for reliable savings.

Automatically starts/stops fans based on heat from cooking appliances or programmable schedules.

Provides remote monitoring and control via Ethernet and BACnet communications.

ANSI/ASHRAE/IES Standard 90.1 2010 Compliant



A demand control ventilation (DCV) system that only includes a temperature sensor for detecting cooking activity shall not be permitted. Additionally a DCV that includes infrared sensors in the pathway of the smoke without benefit of separate of air purge units and auto-recalibration shall not be permitted. Modulating dampers in the exhaust ducts shall not be permitted.

Table C-5
Standards for Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps
Manufactured on or After January 1, 2010

<i>Appliance</i>	<i>Cooling Capacity (BTU/hr)</i>	<i>System Type</i>	<i>Minimum Efficiency</i>	
			<i>Cooling Mode</i>	<i>Heating Mode</i>
Single package vertical air conditioners	< 65,000	Single-phase	9.0 EER	N/A
	< 65,000	3-phase	9.0 EER	N/A
	≥ 65,000 and < 135,000	All	8.9 EER	N/A
	≥ 135,000 and < 240,000	All	8.6 EER	N/A
Single package vertical heat pumps	< 65,000	Single-phase	9.0 EER	3.0 COP
	< 65,000	3-phase	9.0 EER	3.0 COP
	≥ 65,000 and < 135,000	All	8.9 EER	3.0 COP
	≥ 135,000 and < 240,000	All	8.6 EER	2.9 COP

Table D-2
Standards for Dehumidifiers

<i>Product capacity (pint/day)</i>	<i>Minimum energy factor (liters/kWh)</i>	
	<i>Effective October 1, 2007</i>	<i>Effective October 1, 2012</i>
25.00 or less	1.00	1.35
25.01 – 35.00	1.20	1.35
35.01 – 45.00	1.30	1.50
45.01 – 54.00	1.30	1.60
54.01 – 74.99	1.50	1.70
75.00 or more	2.25	2.50

BARD TYPE UNITS



Attachment D

Control Systems

Fresno Zoo - Units to be Controlled Inventory

ABS ID	Existing Tag	Location Served	Equipment Type	Manufacturer	Model Number	Serial Number	Size / Capacity		Year	Replace Unit in this Project?
1		Hospital Unit 1	Packaged Unit (Gas/DX)	Bryant	580DPV048074AAAB	3998G20994	4.0	ton	1998	YES
2		Hospital Unit 2	Packaged Unit (Gas/DX)	Bryant	580DPV036074ABAB	4698G20717	3.0	ton	1998	YES
3		Hospital Unit 3	Packaged Unit (Gas/DX)	Bryant	580DPV060074AAAA	4198G20716	5.0	ton	1998	YES
4		Hospital Unit 4	Packaged Unit (Gas/DX)	Bryant	580DPV048074AAAB	998G20996	4.0	ton	1998	YES
5		Hospital Unit 5	Packaged Unit (Gas/DX)	Bryant	580DPV036074ABAB	4698G20718	3.0	ton	1998	YES
6	AC-3LG	Lodge Unit 1	Packaged Unit (Gas/DX)	Carrier	48HCDD12A2A6A0A0A	2914P70325	10.0	ton	2014	
7	AC-2LG	Lodge Unit 2	Packaged Unit (Gas/DX)	Carrier	48HCDD09A2A6A0A0A	3714P34650	8.5	ton	2014	
8	AC-1LG	Lodge Unit 3	Packaged Unit (Gas/DX)	Carrier	48HCLA06A2A6A0A0A	3214C84587	5.0	ton	2014	
11		Simba Classroom	FCU	Carrier	CNPVP6124ALAAAAA	1813X31678	5.0	ton	2013	
12	CU-1LG	Simba Classroom	Cond. Unit	Carrier	24ACB7608310	2214E11799	5.0	ton	2014	
23	HC-1	Tropical Treasures Unit	Packaged Unit (Gas/DX)	Trane	YHC120A3EMA2101B1	540100627L	10.0	ton	2005	
24		Babirusa Unit	Packaged Unit (Gas/DX)	Day/Night	PGD324040K001C1	C143724198	2.0	ton	2014	
27		Commissary Unit	Packaged Unit (Gas/DX)	Day/Night	PGD324040K001C1	C122818177	2.0	ton	2012	
28		Old Hospital Unit	Packaged Unit (Gas/DX)	Bryant	574DNWA36090NA	1709C01027	2.5	ton	2009	
29		Orang Unit 1	Packaged Unit (Gas/DX)	Carrier	48HJE006	4699G20388	5.0	ton	1999	YES
35		Security / VSO Unit	Packaged Unit (Gas/DX)	York	D1NA036N03606C	NCJM028539	3.0	ton	2000	YES
36		Gift Shop Unit 1	Split System (Ht Pmp)	Carrier	38YRA060300	0898E04039	5.0	ton	1998	YES
37		Gift Shop Unit 2	Split System (Ht Pmp)	Carrier	38YRA060300	0898E04036	5.0	ton	1998	YES
38		Antieater Unit 1	Packaged Unit (Gas/DX)	Day/Night	PGD330060X001C1	C133319408	2.5	ton	2013	
39		Antieater Unit 2	Packaged Unit (Gas/DX)	Day/Night	PGD330060X001C1	C123600378	2.5	ton	2012	
40		Antieater Unit 3	Packaged Unit (Gas/DX)	Day/Night	PGD330060X001C1	C123600652	2.5	ton	2012	
41		Ops Trailer Unit	WMHP	Bard	est 3-ton	125D0419****	3.0	ton	2004	YES
42		Bird Show Unit 1	WMHP	Bard	est 3-ton	cant read	3.0	ton		
43		Bird Show Unit 2	WMHP	Bard	est 3-ton	cant read	3.0	ton		
44		Annex Unit 1	WMHP	Bard	WH361-A0SVP4XXX	125K082546299-02	3.0	ton	2008	YES
45		Annex Unit 2	WMHP	Bard	WH361-A0SVP4XXX		3.0	ton		YES
46		Marketing Unit 1	WMHP	Bard	36WH7-A05CD002	058N890629000	3.0	ton	1989	
47		Marketing Unit 2	WMHP	Bard	36WH7-A05CD002	058N890629002	3.0	ton	1989	
48	Ed Unit #1	Education Unit 1	Cond. Unit	Ruud	UAFD024JAS	4077F37883471	2.0	ton	1988	YES
49	Ed Unit #2	Education Unit 2	Cond. Unit	Day/Night	N4A548GKC101	E163113806	4.0	ton	2016	
50	Ed Unit #3	Education Unit 3		Payne	569CJ036	5282A00812	3.0	ton	1982	
51	Ed Unit #4	Education Unit 4	Cond. Unit	Payne	PA15NC024-A	2317X36801	2.0	ton	2017	
52		Education Unit 5	Packaged Unit (Gas/DX)	York	H1DB060506A	EMDM453458	5.0	ton	1995	
53	Ed Unit #6	Education Unit 6	Cond. Unit	Carrier	SQJS-036	1604G21328	3.0	ton	2004	
54		Education Unit	Cond. Unit	Payne	R4A536AKB100	X202158544	3.0	ton	1982	
55		Admin Unit 1	WMHP	Bard	W60A2-A10XX4XXX	324L133056177-02	5.0	ton	2013	
56		Admin Unit 2	WMHP	Bard	W60A2-A10XX4XXX	324L133056176-02	5.0	ton	2013	
60	MainT #1	Maintenance Unit	Packaged Unit (Gas/DX)	ICP	PGD324040K001C1	C113811464	2.0	ton	2011	
63	AC-1	Reptile House Unit 1	Packaged Unit (Gas/DX)	Trane	YSC120F4RLA0	113111348L	10.0	ton	2011	
64	AC-2	Reptile House Unit 2	Packaged Unit (Gas/DX)	Carrier	48HJD006	1701G24314	5.0	ton	2001	
65	AC-3	Reptile House Unit 3	Packaged Unit (Gas/DX)	Trane	YSC090E4ELAOE0	112412321L	7.5	ton	2011	
66	AC-4	Reptile House Unit 4	Packaged Unit (Gas/DX)	Carrier	48HJD006	50DK506992C	5.0	ton	2001	YES

Fresno Zoo - Enclosure Heaters Optimization



ZOO Heater ECM			
#	ECM #	Existing Equipment	Proposed Equipment
1		Radiant Heaters	Optimize Sequence of Operation

Fresno Zoo: Energy Savings by optimizing the Radiant Heaters Sequence of Operation									
Location	Model	Annual Hours Pre	Total Input (btu/hr)	Pre DC %	Post DC %	Therms Pre	Annual Hours Post	Therms Post	Therms Saved
Giraffe and Rhino Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Giraffe and Rhino Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Giraffe and Rhino Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Giraffe and Rhino Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Giraffe and Rhino Bldg	Reznor Heater	4,380	65,000	10%	12.5%	284.7	1,677	136.3	148
Giraffe and Rhino Bldg	Reznor Heater	4,380	65,000	10%	12.5%	284.7	1,677	136.3	148
Giraffe and Rhino Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Giraffe Heaters	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Giraffe Heaters	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Giraffe Heaters	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Giraffe Heaters	Reznor Heater	4,380	140,000	10%	12.5%	613.2	1,677	293.5	320
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Ungulate Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	120,000	10%	12.5%	525.6	1,677	251.6	274
Elephant Bldg	Reznor Heater	4,380	85,000	10%	12.5%	372.3	1,677	178.2	194
Lion Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
Lion Bldg	Reznor Heater	4,380	40,000	10%	12.5%	175.2	1,677	83.9	91
TOTAL						10,665		5,104	5,561

TS200 Internet-Enabled Thermostat

The Pelican Internet-Enabled Thermostat provides commercial customers with virtual climate management. The TS200 delivers accurate temperature management, leading edge energy efficiency, built-in safeties and alarming, and fine tuned comfort. Coupled with the Pelican Web App, the TS200 tracks space temperature and HVAC operational data in real-time and historically. All information is displayed in real-time online and is viewable on any Internet-connected device.

+ MESH WIRELESS NETWORK

The TS200 communicates wirelessly with a GW400 to reach the Internet. Each TS200 has built-in state-of-the-art wireless mesh network communication and repeating.

+ FAULT ALARMING

Built-in system and space analytics with automated email or text message alerts when a fault is detected.

+ WEB APP

Virtual and central management of TS200 available on all smart phones, tablets, and PCs. Directly manage thermostats through a web browser. Designed for intuitive control over multiple thermostats.

+ HISTORICAL TREND DATA

Online viewable historical data of space temperature, setpoints, HVAC demand, and fan demand.

+ INSTALLATION

Industry standard HVAC terminals utilize existing thermostat wire. Included with TS200 is Pelican's innovative limited wiring relay pack (WM500) used in applications where there are only three (3) wires to the HVAC unit.

+ SCHEDULING

Through the Pelican Web App you can schedule the TS200 thermostat for daily, 5-2, or 7-day schedules. Thermostats can also be scheduled as groups, for simple multi-thermostat management.

Designed and assembled in the USA
5-Year Limited Warranty



Specifications

POWER

Hardwire	24VAC, 60Hz; 50 mA
Voltage Range	23 - 30VAC
Relay Current	1.0A running

COMPATIBILITY

24VAC gas, electric, or oil heating systems.
Conventional and Heat Pump
Zone Damper Actuator

WIRING

Conventional	R, RC, W, W2, Y, Y2, G, C
Heat Pump	R, RC, O/B, AUX, Y, Y2, G, C
Damper Actuator	R, C, Y, Y2, W, W2

SYSTEM PROTECTION

Four minute compressor short cycle protection
Temporary Schedule Override
Auxiliary/Emergency Heat Efficiency Algorithm
Keypad Lockout
Trend Data Analytics and Fault Monitoring

THERMOSTAT RANGE

Operating Range	-4°F to 122°F
Differential Temperature	±0.5°F
Operating Humidity (%RH)	5 to 90% RH; non-condensing
Storage Temperature	-20°F to 160°F

SIZE

Inch	H 3.5 x W 5.97 x D 1.5
mm	H 89 x W 150 x D 38
Horizontal Mounting	

Pelican Wireless Systems | 2655 Collier Canyon Road, Livermore CA 94551
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WR400 Extended Range Wireless Repeater

The Pelican Wireless Repeater provides extended wireless range to help bridge Pelican's wireless in areas where it is weak. It bridges long distances eliminating dead spots especially when establishing communication between two buildings. While most sites will not require repeaters, they are available to assure reliable communication when needed.

+ MESH WIRELESS NETWORK

State of the art wireless mesh network extension bridge for the Pelican mesh network. Auto-connects to Pelican GW400 and other Pelican devices. The repeater has twice the range of a Pelican Thermostat.

+ LARGE SCALE COMPATIBLE

Can be used as a wireless bridge between buildings.

+ COMPACT

Small device that only needs a single electrical outlet. Does NOT require an Ethernet connection.

+ ENCRYPTED

All wireless communication is AES-encrypted for the highest level of security.



Specifications

POWER

Hardwire 5VDC; 50 mA
AC Adapter Provided

WIRELESS

2.4 GHz, IEEE 802.15.4
Complies with Class B Part 15 of FCC rules

WIRELESS RANGE

300 ft

INCLUDED WITH WR400

(1) 115 VAC Power Adapter

SIZE

Inch	H 4.5 x W 3.5 x D 1.25
mm	H 114 x W 89 x D 32
Antenna Inch	H 7.25
Antenna mm	H 184
Vertical Mounting	

Designed and assembled in the USA
5-Year Limited Warranty



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Pelican Wireless Extended Range Gateways - GW400 Series

Plug-and-Play Pelican Internet Connection

Pelican Gateways are simple bridges, which automatically connect all your on-site Pelican devices to your Pelican Web-app. Exceeding commercial security standards, all communication is secure, encrypted, and reliable.

Pelican has two gateway options depending on your networking requirements. The GW400 connects to an existing business Ethernet network using a standard CAT 5 connection. The GW400-LTE is a cellular gateway, which runs on the Pelican AnyWhere 4G/LTE cellular network.

Both gateways can provide Internet connectivity for up to 2000 Pelican devices.



- + Ideal for commercial customers
- + Easy to install and set up
- + Automatic Internet connection
- + Supports up to 2000 Pelican wireless devices
- + Uses Advanced Encryption Standards (AES) from the cloud to end device

ETHERNET CONNECTIVITY

The GW400 gateway is a plug-and-play wired Ethernet device. It plugs into an existing Ethernet switch or router and is designed to the highest enterprise security standards. It uses an outbound only connection, with encrypted end-to-end communication, and the option for DHCP (default) or Static IP addressing. Setup is fast and easy for any installation team.

CELLULAR CONNECTIVITY

The GW400-LTE gateway is an integrated cellular-enabled device, which connects your Pelican devices to the Internet. It can be installed anywhere there is cellular connectivity available, eliminating the need for a direct hardwired Ethernet source. It is designed to meet enterprise level security standards and will only communicate with Pelican products.

GW400 / GW400-LTE Gateways

Key Features and Specifications

FEATURES

INTERNET ACCESS AND DEVICE CONNECTIVITY

- + GW400 uses a standard Ethernet LAN/WAN port for Internet connectivity
- + GW400-LTE includes an integrated 4G/LTE modem for cellular Internet connectivity
- + Gateways support up to 2000 Pelican wireless device connections
- + 2.4 GHz, Wireless 802.15.4
- + Complies with Class B Part 15 of FCC rules
- + Pelican's wireless network co-exists with other wireless network standards, including WiFi
- + Self-creating and self-healing wireless mesh network

SECURITY

- + Advanced Encryption Standards (AES) from the cloud direct to end Pelican device (does not de-encrypt and re-encrypt)
- + GW400 uses outbound established connections, no inbound firewall rules required
- + GW400 defaults to DHCP or can be configured to a Static IP address
- + GW400-LTE communicates on the Pelican AnyWhere cellular network*
- + Gateways come factory locked to only allow for communication with other Pelican hardware
- + Does not interact with customer's internal network
- + Does not use WiFi (802.11) communication and remains separate from the business's enterprise WiFi network

*The Pelican AnyWhere Cellular Network requires you to agree to Pelican's cellular Terms of Service and any associated costs before service can be provided. This cellular service is provided by Pelican Wireless Systems and does not require you to sign any third-party cellular provider agreements.

Specifications

POWER

Hardwire 5 VDC; 200 mA (GW400)
Hardware 5 VDC; 2.0 A (GW400-LTE)

WIRELESS

2.4 GHz, IEEE 802.15.4
Complies with Class B Part 15 of FCC rules

TEMPERATURE

Operating Range -4°F to 122°F
Storage Range -20°F to 160°F

RELATIVE HUMIDITY (non-condensing)

5% to 90% Operating and Storage

CERTIFICATIONS

FCC (GW400 and GW400-LTE)
PTCRB (GW400-LTE)

SIZE

4.5-in x 3.5-in x 1.25-in (114 mm x 89 mm x 32 mm)
Antenna H 7.25-in (184 mm)

MOUNTS

Vertically on flat non-metallic surface

What's in the Box

GW400

Ethernet-enabled Gateway
120 VAC / 5 VAC Power Adapter
10-in CAT5 Ethernet Cable

GW400-LTE

Cellular-enabled Gateway
120 VAC / 5 VAC Power Adapter

Requirements

GW400 requires an active Ethernet port that provides outbound Internet connections (e.g., DSL, Cable, T1)

Web Browser to create a Pelican Site
(minimum of Firefox, Chrome, Safari, Internet Explorer 10, Edge, or any browser that supports HTML5)



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DS-GW400-2



Attachment E

Electrical Systems

Fresno Zoo- Transformer Inventory



ID TAG #	Bldg.	Make: Model #	kVA	Location	E-Star Rated (Y/N)	Replace?
	Hospital	MTM: AD270-D0192	25.0	Hospital	Y	
40T-ZH	Hospital	Square D: 150T3H	150.0	Hospital	N	Yes
	Rhino Barn	GE: 9723 L 1572	30.0	Rhino Barn	N	Yes
	Tropical Treasure Shack	GE: 9T2383072	30.0	Tropical Treasure Shack	N	Yes
49T-OU	Orangutan		75.0	Orangutan	N	Yes
17T-CS	Safari Café	Square D: 112T3H	112.5	Safari Café	N	Yes
	Stingray	MGM: HT150A3B2SH	112.5	Stingray	N	Yes
44T-RU	Rainforest Restroom	Square D	30.0	Rainforest Restroom	Y	
41T-RU	Rainforest Restroom	GE	75.0	Rainforest Restroom	N	Yes
3T-MS	Maintenance	Siemens	50.0	Maintenance	N	Yes
TF	Cheetah	GE: 9T83B3463	45.0	Cheetah	Y	
	Rhino Building		30.0	Rhino Building	y	
	Rhino Building		45.0	Rhino Building	y	
	Ungulate		45.0	Ungulate	y	
	Elephant			Elephant		
	Elephant			Elephant		
	Elephant		30.0	Elephant		
	Warthog		75.0	Warthog		
TA	Lodge	GE	225.0	Lodge	N	Yes
TH	Lodge Gift Shop		30.0	Lodge Gift Shop	y	
	Admin	GE	112.5	Admin	N	Yes
XFMR TCW	Sea Lion Cover	GE	75.0	Sea Lion Cover	y	
	Wilderness Falls	GE	45.0	Wilderness Falls	y	
	Bird Show	Siemens:1D1Y075	75.0	Bird Show	n	Yes
ZM5TH-BS	Bird Show	Squaare D: 75T3H	75.0	Bird Show	n	Yes
20TH-RH	Reptile Hjouse	Sorgel	225.0	Reptile House	n	Yes
	Front Restrooms	Square D:	75.0	Front Restrooms	n	Yes

Replace Existing Equipment

E-SAVER OPAL-R™ Series

OPAL-R TRANSFORMERS ARE OPTIMIZED FOR RETROFIT PROJECTS DELIVERING AN AVERAGE OF 80% LESS LOSSES WHEN REPLACING OLDER UNITS

APPLICATION

The OPAL-R Series (E-Saver-80R & E-Saver-81R) are ultra-efficient dry-type isolation transformers optimized to maximize energy savings and provide the fastest payback in retrofit applications.

Powersmiths has actively measured load profiles and losses for thousands of low-voltage transformers it has retrofitted for applications from K-12 schools to college and hospital campuses, from courthouses to military bases, from general commercial and office buildings to mission critical data centers.

Powersmiths has found that the most common profile is a lightly loaded transformer that feeds predominately electronic equipment.

OPAL-R's E-Saver-80R and -81R models have been optimized specifically for this profile delivering a per project average of an 80% reduction in losses when replacing existing older transformers.

For transformers optimized to feed dedicated equipment like fans, motors, elevators, or heavy harmonic rich loads, see the rest of the OPAL Series™ as well as OPAL T1000™.

OPAL™ - OPTIMIZED DESIGNS FOR RETROFITS

There is more to a transformer retrofit than simply matching the kVA and voltages with a typical transformer from the distributor's warehouse. A transformer has much more impact in an electrical system than just efficiency because of electrical characteristics that affect fault levels, arc flash levels and inrush. Other important considerations for a retrofit should also include site conditions, footprint and internal terminal layout.

Powersmiths has developed a transformer design best practice called OPAL - Optimized Performance for the Application Load to specifically address transformer retrofit considerations.

OPAL considers the system as a whole, including goals like managing impedance, arc flash, fault level, inrush, harmonics, and more. OPAL is possible thanks to the tight feedback loop between design, onsite manufacturing, and extensive real world performance verification.

Our flexible design and manufacturing process enables us to deliver solutions for the wide variety of site conditions and transformer manufacturers including footprint and internal terminal layouts, while the result is the most savings per dollar spent.

DOE IDENTIFIES BILLIONS IN SAVINGS BEYOND DOE 2016

Most manufacturers design low-voltage transformers to just meet the minimum requirement of U.S. Dept. of Energy law (DOE 2016). DOE 2016 has been set at a single 35% load point, under an ideal sine wave factory test profile, sacrificing performance elsewhere.

By exceeding the minimum efficiency, the DOE has quantified the savings potential to be in billions of dollars and that lifecycle savings can be maximized by optimizing for real-world loading. OPAL enables access to these savings – backed by real-world performance verification.

DEPARTMENT OF DEFENCE UFC COMPLIANCE

The OPAL-R with the T115 option complies with the US Department of Defense's Unified Facilities Criteria (UFC) - Interior Electrical Systems.



E-Saver OPAL-R™ Retrofits deliver maximum energy savings and follow best practices to measure & verify lifecycle savings, and ensure hassle-free transformer replacements.

RETROFITS REQUIRE A BEST PRACTICE

To replace existing transformers cost effectively, Powersmiths' professional engineers use a multi-step best practice for the entire project cycle including: vetted project savings calculations, comprehensive site audits and tagging, individualized product selection, baseline and post installation field measurements of load profiles, losses and efficiency, following IPMVP protocols, performance reports and more.

GUARANTEED PERFORMANCE FOR 32 YEARS

In a world filled with small print disclaimers and limited DOE compliance testing, you can count on Powersmiths performance. We guarantee that every transformer we manufacture meets our published technical data, and furthermore, that this performance is met over the full term of the 32-year pro-rated warranty. Trusting that savings are both real and long-term is part of why organizations choose Powersmiths.

K-RATING IS A MODERN REQUIREMENT

Typically, transformers are purchased and installed with lowest first cost in mind, however, these transformers' are UL listed on the basis of feeding only linear load. Today, most connected loads are electronic with nonlinear profiles, and in order to have a valid UL listing, a low-voltage isolation transformer needs to be appropriately K-rated for most applications

EXPANDED KVA SELECTION ENABLES RIGHT-SIZING

Powersmiths enables right-sizing of electrical infrastructure by offering a much broader selection of transformer kVA sizes. The capital cost, operating cost and footprint reductions can be dramatic – on the order of 30-50%, through smaller transformers, breakers, conductors, and distribution panels.

ENVIRONMENTAL/GREEN BUILDING/LEED®/NET ZERO

By going meaningfully beyond the DOE 2016 baseline efficiency, the E-Saver™ contributes to green building, LEED®, Net Zero and carbon footprint reduction. goals. Additional benefits include our ISO14001 certified manufacturing, integrated metering and ability to integrate with the Powersmiths WOW™ - Building Resource Management Platform.

CERTIFICATIONS & TESTING

Powersmiths certifications include ISO9001 (Quality), ISO14001 (Environment) ISO17025 (Efficiency Test Lab), UL and CSA. Powersmiths has a production-integrated nonlinear load test program that enables efficiency verification under real-world conditions, as well as Certified Test Lab Profile Test Reports.

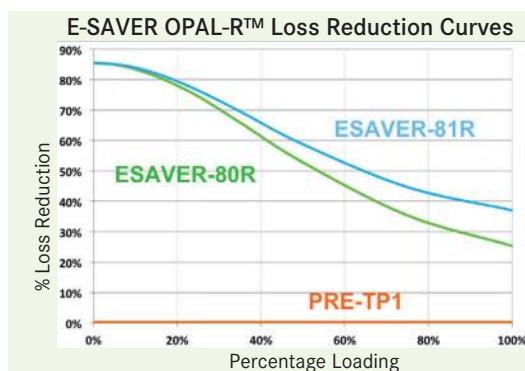
METERING & ARC FLASH OPTIONS

Integrated metering can provide information about capacity utilization, load profiles, power quality and energy use. The lockable hinged door option as well as our patented 360° Rotatable IR Port™ option enable quick and safe access to internal transformer connections, and reduces arc flash risk.

Powersmiths offers also transformers with Integrated Power Distribution, see the Energy Station TX™ brochure.

KEY FEATURES

- Optimized for light, nonlinear loads found in most applications K-rated as required by UL to feed modern electronic equipment
- Retrofit Best Practice ensures a smooth retrofit with verified savings
- Significant savings beyond DOE 2016 legislation
- Electrical system consideration: impedance, inrush, fault & arc flash levels
- Available with a wide range of safety & performance features like integrated hinged doors, 360° Rotatable IR Port™, and Cyberhawk™ Metering and Logging
- Manufactured in a certified ISO 9001, ISO 14001 and ISO 17025 facility for quality, low environmental impact, and transformer efficiency testing



¹ U.S. Dept. of Energy 10 CFR Part 431, [Docket No. EERE-2010-BT-STD-0048] Energy Conservation Program: Energy Conservation Standards for Distribution Transformers, Final Rule April 18, 2013.

TECHNICAL SPECIFICATIONS

The E-Saver™-80R and 81R are ultra-efficient low-voltage dry-type isolation transformers that meaningfully exceed the U.S. Dept. of Energy's new minimum efficiency law, commonly referred to as DOE 2016. All E-Saver transformers carry a UL Listing and CSA Approval, with application appropriate K-factor. The aluminum wound E-Saver-80R and the copper wound E-Saver-81R are both K-factor listed per UL 1561 and are K-7 rated per C57.110. Both models are compatible with electronic equipment all the way up to full load. The standard temperature rise is 130°C with a 115°C option available. E-Savers have a common-core (3-phase models), 10kV BIL, 200% rated neutral, are 60Hz rated (std), built to NEMA ST-20, UL1561, IEEE C57.110 and other applicable ANSI and IEEE standards. Both primary and secondary terminals and voltage taps (typically six 2.5%) are all front-accessible. E-Savers have a 220°C class insulation system that is NOMEX-based with an Epoxy Co-polymer impregnant with technical performance characteristics that embed lower environmental impact, long term reliability and long life expectancy. E-Savers carry OSHPD and IBC Seismic Certification. The seismic bracing option provides a higher 2.28g certification. All E-Saver models come standard in a Type 2 ventilated drip-proof indoor enclosure made of heavy gauge steel finished with epoxy powder coating for durability and low environmental impact, and are UL Listed for 2" rear clearance – a significant improvement over the typical industry 6" limit. A wide variety of enclosures and options are available.

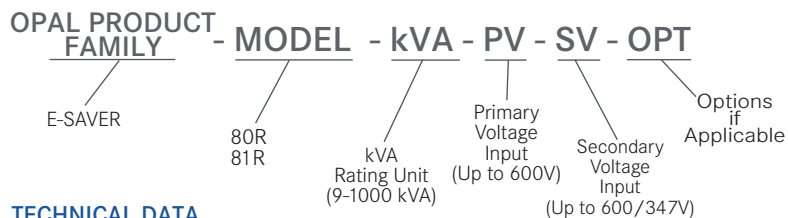
Low Noise: Keeping audible noise at a minimum is key. While the NEMA ST-20 standard sets levels referenced by industry only a type test, not a production test, is required – so transformers on actual projects may be noisy. Powersmiths builds 3dB quieter than NEMA standard values, and furthermore every unit is tested to ensure quiet operation. For very sensitive environments an additional 2dB lower noise option is available.

Management of Impedance, Inrush, Fault Level, Arc Flash: Powersmiths OPAL™ design best practice includes addressing key transformer attributes like impedance, inrush, fault level, arc flash, to ensure smooth integration into an electrical system, avoiding the negative impacts often associated with high efficiency transformers. See individual technical data sheets for comprehensive values for all parameters.

Impedance: For both the E-Saver-80R and E-Saver-81R, impedance is kept at or above 4.0% in order to manage downstream fault current and arc flash levels, and maintain compatibility with equipment interrupting capacity (kAIC) ratings. Higher impedance is available to meet specific project needs.

Inrush: Inrush currents are managed in order to avoid nuisance tripping of the primary breaker and to enable design engineers to use standard 125% rated primary protection, thereby avoiding expensive design changes that otherwise may be needed. Very low inrush designs are available as specific projects may require, for example some datacenter and medical applications.

ORDERING INFORMATION



TECHNICAL DATA

kVA	Audible Noise	80R, 81R Model Weight Range (lbs)	Standard Case Size (in)	Alternate Smaller Case Size (in)*
15	42 dB	230-300	17.5W x 17D x 27.5H	17.5W x 14.5D x 25H
20	42 dB	260-340	25.5W x 18D x 30H	23W x 15.5D x 27.5H
25	42 dB	300-380	25.5W x 18D x 30H	23W x 15.5D x 27.5H
30	42 dB	340-420	25.5W x 18D x 30H	23W x 15.5D x 27.5H
45	42 dB	400-540	25.5W x 18D x 30H	No Alternate
50	42 dB	450-600	31.5W x 21.5D x 40H	No Alternate
63	47 dB	500-650	31.5W x 21.5D x 40H	26.5W x 20D x 33H
75	47 dB	610-700	31.5W x 21.5D x 40H	26.5W x 20D x 33H
100	47 dB	675-900	31.5W x 21.5D x 40H	No Alternate
112.5	47 dB	770-990	31.5W x 21.5D x 40H	No Alternate
125	47 dB	875-1120	37.5W x 26.5D x 48H	33W x 23D x 38H
150	47 dB	1010-1230	37.5W x 26.5D x 48H	33W x 23D x 38H
175	52 dB	1100-1360	37.5W x 26.5D x 48H	34.5W x 26.5D x 42H
200	52 dB	1175-1450	37.5W x 26.5D x 48H	34.5W x 26.5D x 42H
225	52 dB	1295-1600	37.5W x 31.5D x 52H	34.5W x 26.5D x 42H
250	52 dB	1400-1800	37.5W x 31.5D x 52H	37.5W x 26.5D x 48H
300	52 dB	1575-1960	37.5W x 31.5D x 52H	37.5W x 26.5D x 48H
400	57 dB	2025-2450	51.5W x 38D x 61H	43.5W x 33.5D x 55.5H
450	57 dB	2200-2600	51.5W x 38D x 61H	43.5W x 33.5D x 55.5H
500	57 dB	2475-2900	51.5W x 38D x 61H	43.5W x 33.5D x 55.5H
600	59 dB	2725-3600	64W x 47D x 67H	51.5W x 38D x 61H
750	61 dB	3200-4300	64W x 47D x 67H	Contact Factory
850	61 dB	3600-5000	64W x 47D x 67H	Contact Factory
1000	61 dB	4200-6000	64W x 53D x 67H	Contact Factory

NOTE: The above data applies to the standard configuration of each kVA. Selection of some options may change enclosure size and/or transformer weight. Some options may be mutually exclusive. Consult factory for detailed product data sheet for these and other configurations. Efficiencies tested according to U.S. Dept. of Energy's 10 CFR Part 431, a linear load test at 35% of nameplate capacity. Refer to technical data sheet for comprehensive information for each specific model, kVA, and option selected.

As design optimization is continuous, technical data is updated over time. Please check with Powersmiths for latest revision.

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POWERSMITHS

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Email: info@powersmiths.com

WWW.POWERSMITHS.COM

AVAILABLE OPTIONS

Metering: Express Logger™, SMART™ or Cyberhawk TX™
(see product cut sheets for details)

CC: Core & Coils available for OEM Integration

3R: Type 3R, sprinkler proof/outdoor ventilated enclosure

OSEC: Enclosure for outdoor public areas

SS: Painted stainless steel enclosure

NVI: Non-ventilated indoor enclosure

IRP: 360° Rotatable IR Port™

HD: Hinged Door

F50: 50 Hz design

1S: Single electrostatic shield

2S: Dual electrostatic shields

3S: Triple electrostatic shields

SPD: (120/208 V OR 277/480V)

PRO80: 80kA, 7 mode, Filter

PRO120: 120kA, 7 mode, Filter

PRO160: 160kA, 7 mode, Filter

PROXX: Where XX is custom ID

VLI: Very Low Inrush

IMP: Custom Impedance

COL: Custom color

TS: Thermal sensors at 170°C and 200°C

RTR: Routine Test Report

NLT: Nonlinear Load Test with Certificate

2016TR: DOE 2016 Test Report

CTL: ISO 17025 Certified Test Lab, load profile test

SE: Sensitive environment, extra low noise

SB: Certified Seismic bracing for 2.28g

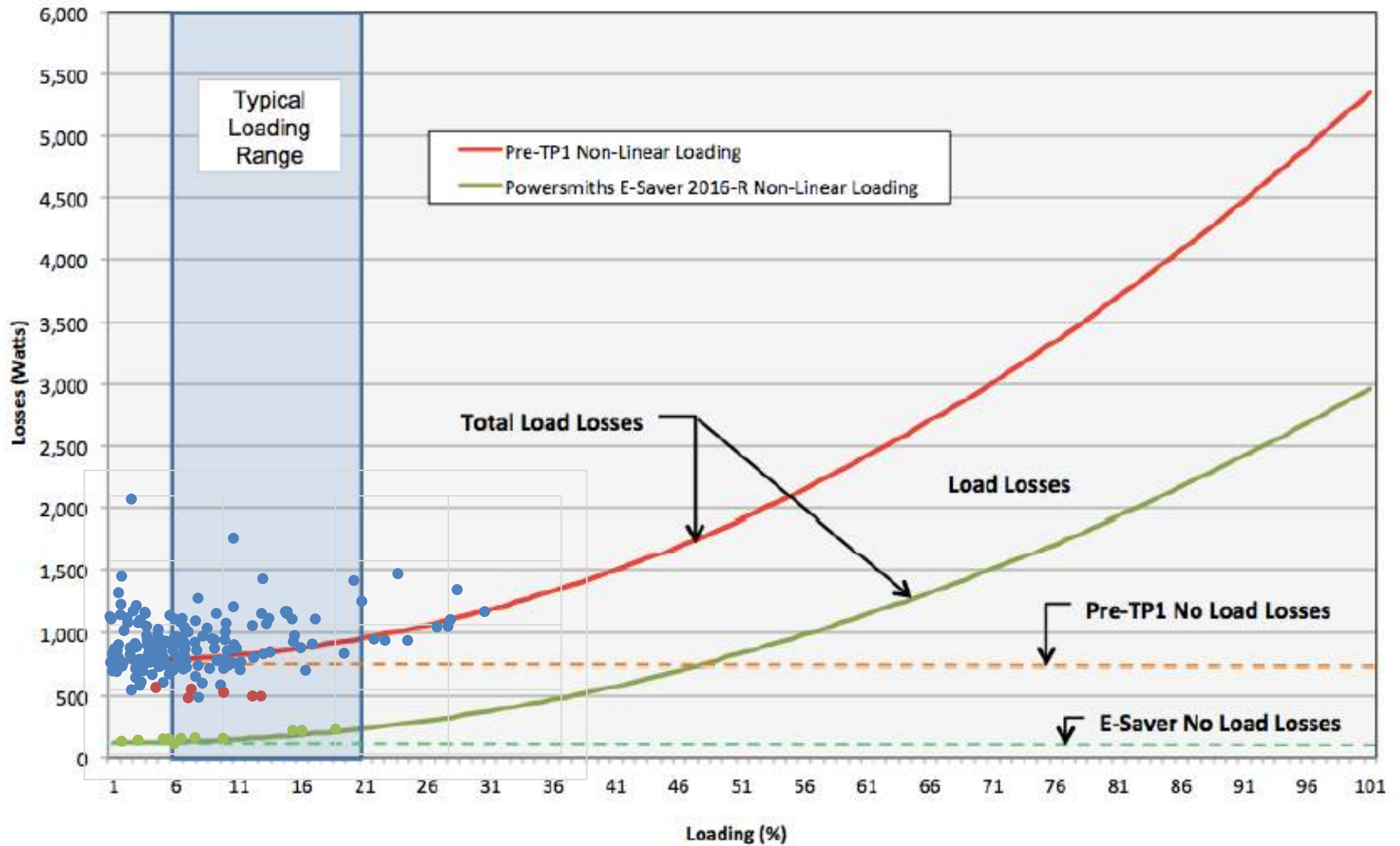
(for Certificate details contact Powersmiths)

WM: Wall-mount kit up to 75kVA is available (sold separately)

T115: 115°C Temperature Rise



75 kVA Losses vs Non-Linear Loading



OPAL-R Series™

Product Warranty

32 YEAR PRO-RATED LIMITED PRODUCT WARRANTY

WARRANTY PERIOD, LIMITATION OF LIABILITY, NOTICE OF CLAIM

This is a limited warranty. Powersmiths International Corp. ("Powersmiths") warrants that its OPAL-R™ Series, E-Saver 80-R and E-Saver 81-R, products meet applicable design specifications, and are free from defects in materials and workmanship. The warranty period is THIRTY-TWO YEARS - PRO- RATED from the date of factory shipment. Pro-rating is based upon the price paid on the original invoice.

Powersmiths' liability is expressly limited to the repair or replacement of defective product at the discretion of Powersmiths. Powersmiths' entire liability shall be limited to at a maximum the purchase price of the product, and in no way shall be liable for any consequential damages whatsoever. Powersmiths shall have no liability for damage resulting from external event, accident, improper application, installation, operation or repair. This limited warranty is in lieu of all other warranties. The Warranty is valid and honored globally. In case of dispute, the laws of Ontario Canada apply.

PERFORMANCE GUARANTEE

SEISMIC: Powersmiths warrants the unit will remain functional after a seismic event up to rated severity.

EFFICIENCY & LOSSES: Powersmiths guarantees that ALL units meet or exceed the performance levels listed in the table for the full duration of the 32-year warranty period.

kVA	DOE 2016 reference efficiency (35% LOADING)	ESAVER-81R Efficiency (35%)	ESAVER-80-R Efficiency (35%)	Maximum Allowable No Load Losses (W)
15	97.89%	98.25%	97.89%	49
30	98.23%	98.55%	98.23%	66
37.5	98.32%	98.62%	98.32%	83
45	98.40%	98.69%	98.40%	92
50	98.43%	98.71%	98.43%	105
75	98.60%	98.80%	98.60%	132
112.5	98.74%	98.93%	98.74%	194
150	98.83%	98.98%	98.83%	232
220	98.94%	99.10%	98.94%	319
225	98.94%	99.11%	98.94%	321
300	99.02%	99.14%	99.02%	388
330	99.04%	99.16%	99.04%	464
500	99.14%	99.24%	99.14%	613
750	99.23%	99.32%	99.23%	879

NOTES: EFFICIENCY AND TEST REFERENCE: U.S. Dept. of Energy 10CFR Part 431, Sub-part K
Efficiencies at other than standard kVAs are interpolated per DOE protocol.
This table applies to 3-phase, low-voltage, dry-type transformers.

POWERSMITHS™

8985 Airport Road, Brampton, Ontario, Canada, L6T 5T2

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AGENDA ITEM 11

DATE: June 29, 2022

TO: Fresno County Zoo Authority Board

FROM: Nora Crow, Contracted Chief Financial Officer
Fresno's Chaffee Zoo Corporation

SUBJECT: Request Retention Release for CLR Design for Kingdoms of Asia

RECOMMENDED ACTION:

Approve and authorize release of retention withheld on design work provided by CLR Design related to Kingdoms of Asia (\$2,765)

DISCUSSION:

In accordance with the Retention Policy Adopted September 30, 2015, and Revised January 30, 2019, retention of 5% was withheld on the various design work phases provided by CLR Design as related to the Kingdoms of Asia capital project. The total contract for these phases was a combined \$55,300, with a total retention of \$2,765.

CLR Design has completed the work associated with these contract phases to the satisfaction of Fresno's Chaffee Zoo Corporation personnel. Thus, we are requesting the release of \$2,765 retention.

Fresno's Chaffee Zoo Corporation Board of Directors approved this request on June 16, 2022.

ATTACHMENTS:

CLR Design Invoice



D E S I G N

EXHIBIT DESIGN • ARCHITECTURE • LANDSCAPE ARCHITECTURE

Fresno Chaffee Zoo
Rick Treatch
894 West Belmont Avenue
Fresno, CA 93728

Invoice number 10252
Date 05/20/2022
Project FCZ17ASI.01 FRESNO CHAFFEE ZOO ASIAN
EXHIBIT DD - CA

For the release of retainage associated with the following completed Additional Services:

Asian Exhibits

Invoice Summary

Description	Contract Amount	Percent Retainage	Fee Retainage	Incidental Retainage	Total Retainage Billed
RHINO SEWER LIFT STATION	\$7,900.00	5%	\$395.00	0.00	\$395.00
3D LSS BASEMENT MODELING	\$29,640.00	5%	\$1,482.00	0.00	\$1,482.00
ORANGUTAN STATION	\$17,760.00	5%	\$888.00	0.00	\$888.00

Invoice total **\$2,765.00**

Beneficiary Name: CLR Design, Inc.
Beneficiary Address: 833 Chestnut Street, Suite 909, Philadelphia, PA 19107
Beneficiary Bank: PNC Bank, N.A., Philadelphia, PA
Beneficiary Account: 8400633794
Beneficiary Routing #: 031000053



AGENDA ITEM 12

DATE: June 29, 2022
TO: Fresno County Zoo Authority Board
FROM: Siau-Lin Hampton, Zoo Authority Treasurer Staff
SUBJECT: Zoo Authority Budget for Budget Year 2022-23

RECOMMENDED ACTION:

Approve and authorize the estimated revenues and appropriations for the 2022-2023 budget year.

ALTERNATIVE ACTION:

An alternative action is to solely use the Zoo Authority's Net Position, which was \$2,605,291 as of March 31, 2022.

DISCUSSION:

Expenditure appropriations for Other Services and Supplies budgeted at \$13,050 remains the same as prior year. Professional and Specialized Services budgeted at \$160,482 represents an increase of \$41,574 (35%) over the current year adopted budget due to the anticipation of rates increasing for FY 2022-23 pending Board of Supervisors' approval in September 2022.

The budget, as presented, would utilize none of the available net position from the Zoo Authority fund, assuming that all revenues and appropriations occur as outlined.

FISCAL IMPACT:

There are sufficient revenues, available net position, and proposed appropriations to cover the cost associated with Zoo Authority administration.

ATTACHMENTS:

Budget Presentation



Fiscal Year 2022-23 Budget Proposal

Presented by
Siau-Lin Hampton
June 29, 2022

Summarized Proposed Budget vs Prior Year Adopted/Adjusted Budget



FRESNO COUNTY ZOO AUTHORITY Proposed Administrative Budget For Fiscal Year 2022-23

<u>Fiscal Summary</u>	<u>Draft Budget FY 2022-23</u>	<u>Adopted Budget FY 2021-22</u>
<u>Revenues</u>		
Measure Z Administration (2%)	\$ 402,538	\$ 342,928
Interest	37,000	37,000
Total Revenues	<u>\$ 439,538</u>	<u>\$ 379,928</u>
<u>Appropriations</u>		
Professional & Specialized Services	\$ 160,482	\$ 118,908
Other Services & Supplies	13,050	13,050
Total Appropriations	<u>\$ 173,532</u>	<u>\$ 131,958</u>
Revenue in Excess of Appropriations	\$ 266,006	\$ 247,970
Available Net Position Used	\$ -	\$ -
Contracted FTE (Based on 2080 hrs):	0.66	0.52

Revenue Forecast

Fresno County Zoo Authority

Fiscal Year 2022-23 Revenue Estimates

	PRIOR YEARS		CURRENT FISCAL YEAR				NEXT FISCAL YEAR	
	2019-2020	2020-2021	2021-2022				2022-2023	
	ACTUAL TAX RECEIPTS	ACTUAL TAX RECEIPTS	ADOPTED BUDGET TAX RECEIPTS	ACTUAL & ESTIMATED TAX RECEIPTS	ADOPTED TO ACTUAL/ESTIMATED VARIANCE		REVENUE ESTIMATE MEASURE Z	REVENUE ESTIMATE (ZA 2%)
July	\$ 1,436,673	\$ 1,493,025	\$ 1,537,816	\$ 2,124,574	\$ 586,758	38.16%	\$ 2,188,311	\$ 43,766
August	1,123,640	1,669,386	1,619,304	1,637,692	18,388	1.14%	1,588,561	31,771
September	1,367,439	1,417,789	1,403,611	1,638,799	235,188	16.76%	1,622,411	32,448
October	1,571,111	1,609,453	1,657,737	1,919,542	261,805	15.79%	1,977,128	39,543
November	1,073,344	1,437,716	1,480,847	1,649,471	168,624	11.39%	1,698,955	33,979
December	1,194,027	1,302,722	1,289,695	1,573,898	284,203	22.04%	1,558,159	31,163
January	1,263,406	1,388,858	1,430,524	1,555,927	125,403	8.77%	1,602,605	32,052
February	1,707,967	1,728,158	1,710,876	2,256,736	545,860	31.91%	2,234,169	44,683
March	1,063,584	1,292,553	1,279,627	1,529,499	249,872	19.53%	1,514,204	30,284
April	1,031,402	1,513,199	1,558,595	1,542,639	(15,956)	-1.02%	1,588,918	31,778
May*	989,444	1,632,214	1,049,701	1,228,789	179,088	17.06%	1,265,653	25,313
June*	1,105,857	1,682,042	1,128,085	1,275,132	147,047	13.04%	1,287,883	25,758
Total	<u>\$ 14,927,894</u>	<u>\$ 18,167,115</u>	<u>\$ 17,146,418</u>	<u>\$ 19,932,698</u>	<u>\$ 2,786,280</u>	<u>16.25%</u>	<u>\$ 20,126,957</u>	<u>\$ 402,538</u>
Estimated Interest Revenue (based on PY actuals)								\$ 37,000
Total Projected Revenue								<u>\$ 439,538</u>

* Estimated Measure Z tax receipts

Draft Administrative Budget-Detail

		Recommended Appropriations 2022-23	
Account	Account Description		
7040	Telephone Charges	\$	250
7250	Memberships		500
7265	Office Expense		6,000
7268	Postage		1,000
7287	PeopleSoft Financials Charges		800
7295	Professional & Specialized Services		160,482
7296	Data Processing Services		1,500
7325	Publications & Legal Notices		500
7415	Trans, Travel & Education		2,500
	Total Services and Supplies		173,532
	Total Appropriations	\$	173,532

Revenue Forecast

- The total estimated and actual Measure Z revenues for FY 2021-22 are \$19,932,698 resulting in a \$398,654 allocation to the Zoo Authority. This represents a 16.25% increase over budgeted amounts.
- Revenues for fiscal year 2022-23 are projected to increase by 1% and will reflect the 2021-22 expected totals of \$20,126,957. This would provide \$402,538 for Zoo Authority operations.
- Interest revenues were determined by an analysis of the County of Fresno's investment pool rates, cash balances and prior year averages of interest receipts.

Professional & Specialized Services (\$)

- The recommended appropriations for Professional Services for fiscal year 2022-23 are \$160,482 which is an increase under last year's adopted budget by 34.96%.
- The estimated appropriations increased from prior year due to the following:
 - Anticipation of rates increasing in FY 22-23 pending Board approval.

Professional Services Detail

2022-23 Proposed Budget

Estimated Professional & Specialized Services FY2022-23

Title	Budget Hours	Estimated Rates	Line Item % to 100%	FY22-23 Budget
Coordinator	600	\$ 131	49%	\$ 78,312
Account Clerk I	360	69	15%	24,660
Accountant I	200	98	12%	19,640
A & F Manager	100	138	9%	13,760
A & F Division Chief	10	171	1%	1,710
County Counsel	100	159	10%	15,900
PWP - IT Website	-	-	2%	3,000
Audit Fees	-	-	2%	3,500
Total	1,370		100%	<u>\$ 160,482</u>

Professional Service Detail

Estimated Professional & Specialized Services FY2022-23 Prior Year Comparison

Title	2021-22 Budget Hours	2021-22 Actual Hours	2022-23 Proposed Budget Hours	Adjusted Budget % Variance	Original Budget % Variance
Coordinator	600	407	600	-47%	0%
Account Clerk I	150	343	360	-5%	-140%
Accountant I	220	13	200	-1438%	9%
Accountant II	-	89	-	100%	0%
A & F Manager	50	93	100	-8%	-100%
A & F Division Chief	10	7	10	-43%	0%
County Counsel	50	81	100	-23%	-100%
	1,080	1,033	1,370	-33%	-27%

Title	FY21-22 Original Budget	FY21-22 Actual Budget	FY22-23 Proposed Budget	Adjusted Budget % Variance	Original Budget % Variance
Coordinator	\$ 78,312	\$ 55,527	78,312	-41%	0%
Account Clerk I	7,269	16,622	24,660	-48%	-239%
Accountant I	13,812	816	19,640	-2306%	-42%
Accountant II	-	6,657	-	100%	0%
A & F Manager	4,590	8,537	13,760	-61%	-200%
A & F Division Chief	925	647	1,710	-164%	-85%
County Counsel	7,500	12,150	15,900	-31%	-112%
	\$ 112,408	\$ 100,956	\$ 153,982	-53%	-37%

* Actual hours through 3rd Quarter, estimated 4th Quarter

Fiscal Year 22-23 Budget Approval

- Revenues in excess of appropriations will be recognized as available net position should any budget amendments be required.
- Requesting approval of the budget as recommended or subject to changes discussed.