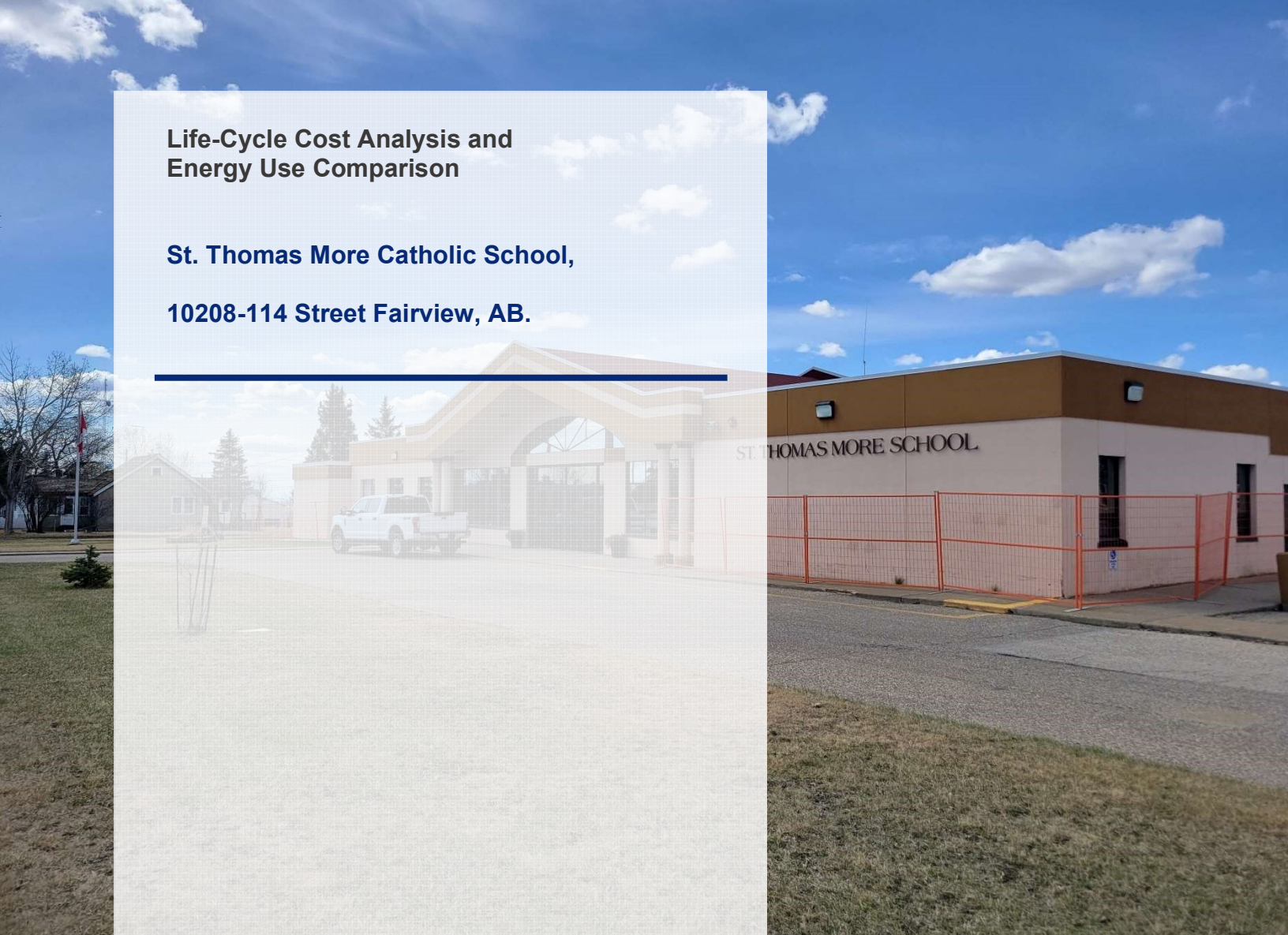


Life-Cycle Cost Analysis and Energy Use Comparison

St. Thomas More Catholic School,
10208-114 Street Fairview, AB.



June 19, 2024

PREPARED FOR ALBERTA INFRASTRUCTURE

bacz CONSULTING Inc.
Consulting Professional Engineers

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1. Executive Summary

1.1 Introduction

Total Lifecycle Costs are detailed in the following sections. The Life Cycle of the options are calculated over 30 years of useful life. Operations costs were extrapolated based on available data from the 2023 school year and year to date data for the 2024 school year. Building energy usage was modeled for the modernized school, and new construction. Energy costs were based on an average of the 2023 and 2024 school year data per unit of energy. It should be noted that future energy costs are a significant unknown. Increases in electrical or natural gas pricing over the next 30 years could have major operating cost implications. Maintenance and repair costs were calculated based on existing building expenditures and industry practice. Costs which normally occur over larger periods of time are calculated as an annually occurring cost.

2.0 Lifecycle Cost Analysis

2.1 Modernization Option

Based on the building age and original components the existing building will require significant amount of replacement / upgrade work to address concerns related to compliance with the present building code, building safety, energy efficiency and operating costs. For detailed breakdown of building component upgrades see main FCA report.

2.1.1 Initial Construction Costs of Option

The tables represents budget estimates for the building modernization option:

Site	
Site Domestic Water Distribution	\$45,000
Total	\$45,000

Structure – Upgrade / Replacement	
Structure	\$1,500,000
Total	\$1,500,000

Interior – Upgrade / Replacement	
Partitions and Doors	\$553,742
Finishes (Floor, Ceiling, Wall)	\$2,489,550
Fittings and Equipment (Fixtures, Equipment, Systems)	\$1,498,500
Roof/Ceiling Fire Rating	\$320,000
Fire Rated Wall	\$200,000
Total	\$5,061,792

EXTERIOR ENCLOSURE – Upgrade / Replacement	
Walls	\$272,395
Windows & Entrances	\$335,000
Roof Covering	\$1,675,000
Projections	\$6,900
Total	\$2,289,295

Building Mechanical – Upgrade/ Replacement	
Plumbing and Drainage	\$264,400
Fire Protection	\$300,020
HVAC	\$1,975,480
Controls	\$171,440
Total	\$2,711,340

Building Electrical – Upgrade/ Replacement	
Service Distribution	\$153,000
Lighting and Devices	\$218,000
Systems & Ancillaries	\$541,142
Total	\$912,142

Misc. and not otherwise specified – Upgrade/ Replacement	
Misc.	\$372,380
Abatement	\$496,450
Total	\$868,830

Site Services – Upgrade / Replacement	
Site Re - Development	\$593,600
Total	\$593,600

Summary of Project Costs	
Construction Total	\$13,936,999
Project Expenses	\$696,850
Net Construction Budget Estimate	\$14,633,849
Contingency	\$1,317,046
Professional Fees	\$1,170,708
Total Project Budget	\$17,121,603

2.3.2 Total Lifecycle Costs of Option

Total lifecycle costs over 30 years are detailed in the following table. The Life Cycle is assumed to begin at the end of construction. The time of construction is not accounted for in the analysis.

Modernization Option						
	Quantity	Unit	Unit Cost	Total Cost	Years	Present Value
Initial Expenses						
Initial Investment Cost (one time start-up costs)						
Project Expenses	1	LSUM	\$696,850	\$696,850	0	\$696,850
Professional Fees	1	LSUM	\$1,170,708	\$1,170,708	0	\$1,170,708
Construction	1	LSUM	\$13,936,999	\$13,936,999	0	\$13,936,999
Contingency	1	LSUM	\$1,317,046	\$1,317,046	0	\$1,317,046
Future Expenses						
Operations Cost (annual costs)						
Custodial Salaries	1	LSUM	\$37,925.41	\$37,925	30	\$655,807
Custodial Benefits	1	LSUM	\$5,288.66	\$5,289	30	\$91,452
Contract Custodial Services	1	LSUM	\$56,073.61	\$56,074	30	\$969,627
Insurance	1	LSUM	\$30,000.00	\$30,000	30	\$518,761
Custodial Supplies	1	LSUM	\$7,185.94	\$7,186	30	\$124,260
Natural Gas	3,455	GJ	\$5.98	\$20,671	30	\$357,435
Electricity	445,380	KWH	\$0.09	\$41,121	30	\$711,064
Garbage	1	LSUM	\$4,988.12	\$4,988	30	\$86,255
Water & Sewer	1	LSUM	\$38,010.94	\$38,011	30	\$657,286
Playground Maintenance	1	LSUM	\$2,217.06	\$2,217	30	\$38,337
Maintenance & Repair Cost (upkeep costs ... estimate on annual basis)						
Site Development	1	LSUM	\$0	\$0	30	\$0
Site Mechanical	1	LSUM	\$0	\$0	30	\$0
Site Electrical	1	LSUM	\$0	\$0	30	\$0
Substructure	4,286	GSM	\$0	\$0	30	\$0
Structure	4,286	GSM	\$0	\$0	30	\$0
Walls Below Grade	0	EWSM	\$0	\$0	30	\$0
Walls Above Grade	1,718.3	EWSM	\$0	\$0	30	\$0
Exterior Windows	125.0	GLSM	\$0	\$0	30	\$0
Exterior Doors	24	LEAF	\$0	\$0	30	\$0
Roof Covering	4,286	RFSM	\$0	\$0	30	\$0
Projections	1	LSUM	\$0	\$0	30	\$0
Interior Partitions	4,286	PTSM	\$0	\$0	30	\$0
Interior Doors	117	LEAF	\$0	\$0	30	\$0
Interior Floor Finishes	4,286	FFSM	\$0	\$0	30	\$0

Interior Wall Finishes	4,286	WFSM	\$0	\$0	30	\$0
Interior Ceiling Finishes	4,286	CFSM	\$0	\$0	30	\$0
Fitting and Equipment	4,286	GSM	\$0	\$0	30	\$0
Plumbing and Drainage	4,286	GSM	\$0	\$0	30	\$0
Plumbing Fixtures	92	FIXT	\$0	\$0	30	\$0
Fire Protection Systems	0	GSM	\$0	\$0	30	\$0
HVAC Distribution	4,286	GSM	\$0	\$0	30	\$0
HVAC Equipment	1	LSUM	\$0	\$0	30	\$0
HVAC Controls	4,286	GSF	\$0	\$0	30	\$0
Electrical Distribution	4,286	GSF	\$0	\$0	30	\$0
Lighting and Devices	4,286	GSF	\$0	\$0	30	\$0
Systems & Ancillaries	4,286	GSF	\$0	\$0	30	\$0
Other	1	LSUM	\$21,376	\$21,376	30	\$369,627
Replacement Cost (scheduled replacement of building system or component)						
Site Development	1	LSUM	\$593,600.00	\$593,600	50	\$0
Site Mechanical	1	LSUM	\$234,000.00	\$234,000	50	\$0
Site Electrical	1	LSUM	\$113,100.00	\$113,100	50	\$0
Substructure	4,286	GSM	\$21.94	\$94,035	50	\$0
Structure	4,286	GSM	\$349.98	\$1,500,000	50	\$0
Walls Below Grade	0	EWSM	\$183.94	\$0	50	\$0
Walls Above Grade	1,718.3	EWSM	\$158.53	\$272,395	50	\$0
Exterior Windows	125.0	GLSM	\$1,200.00	\$150,000	40	\$0
Exterior Doors	24	LEAF	\$9,458.33	\$227,000	30	\$0
Roof Covering	4,286	RFSM	\$390.81	\$1,675,000	25	\$628,321
Projections	1	LSUM	\$6,900.00	\$6,900	40	\$0
Interior Partitions	4,286	PTSM	\$97.00	\$415,742	50	\$0
Interior Doors	117	LEAF	\$1,179.49	\$138,000	50	\$0
Interior Floor Finishes	4,286	FFSM	\$290.52	\$1,245,169	20	\$568,279
Interior Wall Finishes	4,286	WFSM	\$114.16	\$489,290	30	\$0
Interior Ceiling Finishes	4,286	CFSM	\$207.12	\$887,703	25	\$332,992
Fitting and Equipment	4,286	GSM	\$349.63	\$1,498,500	20	\$683,896
Plumbing and Drainage	4,286	GSM	\$30.69	\$131,537	50	\$0
Plumbing Fixtures	92	FIXT	\$1,950.00	\$179,400	35	\$0
Fire Protection Systems	4,286	GSM	\$70.00	\$300,020	50	\$0
HVAC Distribution	4,286	GSM	\$223.86	\$959,480	40	\$0
HVAC Equipment	1	LSUM	\$1,016,000.00	\$1,016,000	30	\$0
HVAC Controls	4,286	GSM	\$40.00	\$171,440	30	\$0
Electrical Distribution	4,286	GSM	\$35.70	\$153,000	40	\$0
Lighting and Devices	4,286	GSM	\$50.86	\$218,000	30	\$0
Systems & Ancillaries	4,286	GSM	\$126.26	\$541,142	20	\$246,970
Other	1	LPSM	\$372,380.00	\$372,380	30	\$0

Residual Value (value of facility at end of study period)						
Site Development	1	LSUM	\$593,600.00	\$593,600	50	-\$73,207
Site Mechanical	1	LSUM	\$234,000.00	\$234,000	50	-\$28,859
Site Electrical	1	LSUM	\$113,100.00	\$113,100	50	-\$13,948
Substructure	4,286	GSM	\$21.94	\$94,035	50	-\$11,597
Structure	4,286	GSM	\$349.98	\$1,500,000	50	-\$184,991
Walls Below Grade	0	EWSM	\$183.94	\$0	50	\$0
Walls Above Grade	1,718.3	EWSM	\$158.53	\$272,395	50	-\$33,594
Exterior Windows	125.0	GLSM	\$1,200.00	\$150,000	40	-\$11,562
Exterior Doors	24	LEAF	\$9,458.33	\$227,000	30	\$0
Roof Covering	4,286	RFSM	\$390.81	\$1,675,000	25	-\$413,147
Projections	1	LPSM	\$6,900.00	\$6,900	40	-\$532
Interior Partitions	4,286	PTSM	\$97.00	\$415,742	50	-\$51,272
Interior Doors	117	LEAF	\$1,179.49	\$138,000	50	-\$17,019
Interior Floor Finishes	4,286	FFSM	\$290.52	\$1,245,169	20	-\$191,954
Interior Wall Finishes	4,286	WFSM	\$114.16	\$489,290	30	\$0
Interior Ceiling Finishes	4,286	CFSM	\$207.12	\$887,703	25	-\$218,956
Fitting and Equipment	4,286	GSM	\$349.63	\$1,498,500	20	-\$231,008
Plumbing and Drainage	4,286	GSM	\$30.69	\$131,537	50	-\$16,222
Plumbing Fixtures	92	FIXT	\$1,950.00	\$179,400	35	-\$7,902
Fire Protection Systems	4,286	GSM	\$70.00	\$300,020	50	-\$37,001
HVAC Distribution	4,286	GSM	\$223.86	\$959,480	40	-\$73,956
HVAC Equipment	1	LSUM	\$1,016,000.00	\$1,016,000	30	\$0
HVAC Controls	4,286	GSM	\$40.00	\$171,440	30	\$0
Electrical Distribution	4,286	GSM	\$35.70	\$153,000	40	-\$11,793
Lighting and Devices	4,286	GSM	\$50.86	\$218,000	30	\$0
Systems & Ancillaries	4,286	GSM	\$126.26	\$541,142	20	-\$83,422
Other	1	LPSM	\$372,380.00	\$372,380	30	\$0
Total Life Cycle of Modernization					\$22,450,030	

2.4 New Construction Option

The new construction option allows for the complete demolition of the existing building and an entirely new building of the same approximate size being constructed in its place.

2.4.1 Initial Construction Costs of Option

The tables represent the budget estimates for the new construction option:

Pre-Construction	
Abatement	\$2,205,375
Demolition	\$382,000
Total	\$2,587,375

Sub Structure	
Standard Foundations	\$956,000
Total	\$956,000

STRUCTURE	
Main Floor Construction	\$2,218,000
Roof Construction	\$2,563,000
Total	\$4,781,000

Interior	
Partitions and Doors	\$1,912,000
Finishes (Floor, Ceiling, Wall)	\$2,065,000
Fittings and Equipment (Fixtures, Equipment, Systems)	\$956,000
Total	\$4,933,000

EXTERIOR ENCLOSURE	
Walls Above Grade	\$1,392,000
Windows & Entrances	\$1,109,000
Roof Covering	\$918,000
Projections	\$711,000
Total	\$4,130,000

Building Mechanical	
Plumbing and Drainage	\$2,180,000
Fire Protection	\$300,020
HVAC	\$3,443,000
Controls	\$535,000
Total	\$6,458,020

Building Electrical	
Service Distribution	\$775,000
Lighting and Devices	\$1,389,000
Systems & Ancillaries	\$971,000
Total	\$3,135,000

Site	
Site Development	\$1,377,000
Mechanical	\$688,000
Electrical	\$332,000
Total	\$2,397,000

Summary of Project Costs	
Total	\$29,377,395
Project Expenses	\$1,468,870
Net Construction Budget Estimate	\$30,846,265
Contingency	\$3,217,239
Professional Fees	\$2,467,701
Total Project Budget	\$36,531,205

2.4.2 Total Lifecycle Costs of Option

Total lifecycle costs over 30 years are detailed in the following table. The Life Cycle is assumed to begin at the end of construction. The time of construction is not accounted for in the analysis.

New Construction Option						
	Quantity	Unit	Unit Cost	Total Cost	Years	Present Value
Initial Expenses						
Initial Investment Cost (one time start-up costs)						
Project Expenses	1	LPSM	\$1,468,870	\$1,468,870	0	\$1,468,870
Professional Fees	1	LPSM	\$2,467,701	\$2,467,701	0	\$2,467,701
Construction	1	LPSM	\$29,377,395	\$29,377,395	0	\$29,377,395
Contingency	1	LPSM	\$3,217,239	\$3,217,239	0	\$3,217,239
Future Expenses						
Operations Cost (annual costs)						
Custodial Salaries	1	LSUM	\$37,925.41	\$37,925	30	\$655,807
Custodial Benefits	1	LSUM	\$5,288.66	\$5,289	30	\$91,452
Contract Custodial Services	1	LSUM	\$56,073.61	\$56,074	30	\$969,627
Insurance	1	LSUM	\$30,000.00	\$30,000	30	\$518,761
Custodial Supplies	1	LSUM	\$7,185.94	\$7,186	30	\$124,260
Natural Gas	1,950	GJ	\$5.98	\$11,666	30	\$201,736
Electricity	404,995	KWH	\$0.09	\$37,392	30	\$646,588
Garbage	1	LSUM	\$4,988.12	\$4,988	30	\$86,255
Water & Sewer	1	LSUM	\$38,010.94	\$38,011	30	\$657,286
Playground Maintenance	1	LSUM	\$2,217.06	\$2,217	30	\$38,337
Maintenance & Repair Cost (upkeep costs ... estimate on annual basis)						
Site Development	1	LSUM	\$0	\$0	30	\$0
Site Mechanical	1	LSUM	\$0	\$0	30	\$0
Site Electrical	1	LSUM	\$0	\$0	30	\$0
Substructure	4,286	GSM	\$0	\$0	30	\$0
Structure	4,286	GSM	\$0	\$0	30	\$0
Walls Below Grade	2,403	EWSM	\$0	\$0	30	\$0
Walls Above Grade	9,903	EWSM	\$0	\$0	30	\$0
Exterior Windows	422	GLSM	\$0	\$0	30	\$0
Exterior Doors	5	LEAF	\$0	\$0	30	\$0
Roof Covering	11,004	RFSM	\$0	\$0	30	\$0
Projections	1	LSUM	\$0	\$0	30	\$0
Interior Partitions	14,530	PTSM	\$0	\$0	30	\$0
Interior Doors	51	LEAF	\$0	\$0	30	\$0
Interior Floor Finishes	21,924	FFSM	\$0	\$0	30	\$0
Interior Wall Finishes	14,530	WFSM	\$0	\$0	30	\$0

Interior Ceiling Finishes	21,924	CFSM	\$0	\$0	30	\$0
Fitting and Equipment	4,286	GSM	\$0	\$0	30	\$0
Plumbing and Drainage	4,286	GSM	\$0	\$0	30	\$0
Plumbing Fixtures	35	FIXT	\$0	\$0	30	\$0
Fire Protection Systems	4,286	GSM	\$0	\$0	30	\$0
HVAC Distribution	4,286	GSM	\$0	\$0	30	\$0
HVAC Equipment	1	LSUM	\$0	\$0	30	\$0
HVAC Controls	4,286	GSF	\$0	\$0	30	\$0
Electrical Distribution	4,286	GSF	\$0	\$0	30	\$0
Lighting and Devices	4,286	GSF	\$0	\$0	30	\$0
Systems & Ancillaries	4,286	GSF	\$0	\$0	30	\$0
Other	1	LSUM	\$21,376	\$21,376	30	\$369,627
Replacement Cost (scheduled replacement of building system or component)						
Site Development	1	LSUM	\$593,600.00	\$593,600	50	\$0
Site Mechanical	1	LSUM	\$234,000.00	\$234,000	50	\$0
Site Electrical	1	LSUM	\$113,100.00	\$113,100	50	\$0
Substructure	4,286	GSM	\$21.94	\$94,035	50	\$0
Structure	4,286	GSM	\$349.98	\$1,500,000	50	\$0
Walls Below Grade	0	EWSM	\$183.94	\$0	50	\$0
Walls Above Grade	1,718.3	EWSM	\$158.53	\$272,395	50	\$0
Exterior Windows	125.0	GLSM	\$1,200.00	\$150,000	40	\$0
Exterior Doors	24	LEAF	\$9,458.33	\$227,000	30	\$0
Roof Covering	4,286	RFSM	\$390.81	\$1,675,000	25	\$628,321
Projections	1	LSUM	\$6,900.00	\$6,900	40	\$0
Interior Partitions	4,286	PTSM	\$97.00	\$415,742	50	\$0
Interior Doors	117	LEAF	\$1,179.49	\$138,000	50	\$0
Interior Floor Finishes	4,286	FFSM	\$290.52	\$1,245,169	20	\$568,279
Interior Wall Finishes	4,286	WFSM	\$114.16	\$489,290	30	\$0
Interior Ceiling Finishes	4,286	CFSM	\$207.12	\$887,703	25	\$332,992
Fitting and Equipment	4,286	GSM	\$349.63	\$1,498,500	20	\$683,896
Plumbing and Drainage	4,286	GSM	\$30.69	\$131,537	50	\$0
Plumbing Fixtures	92	FIXT	\$1,950.00	\$179,400	35	\$0
Fire Protection Systems	4,286	GSM	\$70.00	\$300,020	50	\$0
HVAC Distribution	4,286	GSM	\$223.86	\$959,480	40	\$0
HVAC Equipment	1	LSUM	\$1,016,000	\$1,016,000	30	\$0
HVAC Controls	4,286	GSM	\$40.00	\$171,440	30	\$0
Electrical Distribution	4,286	GSM	\$35.70	\$153,000	40	\$0
Lighting and Devices	4,286	GSM	\$50.86	\$218,000	30	\$0
Systems & Ancillaries	4,286	GSM	\$126.26	\$541,142	20	\$246,970
Other	1	LPSM	\$372,380.00	\$372,380	30	\$0
Residual Value (value of facility at end of study period)						
Site Development	1	LSUM	\$593,600.00	\$593,600	50	-\$73,207

Site Mechanical	1	LSUM	\$234,000.00	\$234,000	50	-\$28,859
Site Electrical	1	LSUM	\$113,100.00	\$113,100	50	-\$13,948
Substructure	4,286	GSM	\$21.94	\$94,035	50	-\$11,597
Structure	4,286	GSM	\$349.98	\$1,500,000	50	-\$184,991
Walls Below Grade	0	EWSM	\$183.94	\$0	50	\$0
Walls Above Grade	1,718.3	EWSM	\$158.53	\$272,395	50	-\$33,594
Exterior Windows	125.0	GLSM	\$1,200.00	\$150,000	40	-\$11,562
Exterior Doors	24	LEAF	\$9,458.33	\$227,000	30	\$0
Roof Covering	4,286	RFSM	\$390.81	\$1,675,000	25	-\$413,147
Projections	1	LPSM	\$6,900.00	\$6,900	40	-\$532
Interior Partitions	4,286	PTSM	\$97.00	\$415,742	50	-\$51,272
Interior Doors	117	LEAF	\$1,179.49	\$138,000	50	-\$17,019
Interior Floor Finishes	4,286	FFSM	\$290.52	\$1,245,169	20	-\$191,954
Interior Wall Finishes	4,286	WFSM	\$114.16	\$489,290	30	\$0
Interior Ceiling Finishes	4,286	CFSM	\$207.12	\$887,703	25	-\$218,956
Fitting and Equipment	4,286	GSM	\$349.63	\$1,498,500	20	-\$231,008
Plumbing and Drainage	4,286	GSM	\$30.69	\$131,537	50	-\$16,222
Plumbing Fixtures	92	FIXT	\$1,950.00	\$179,400	35	-\$7,902
Fire Protection Systems	4,286	GSM	\$70.00	\$300,020	50	-\$37,001
HVAC Distribution	4,286	GSM	\$223.86	\$959,480	40	-\$73,956
HVAC Equipment	1	LSUM	\$1,016,000	\$1,016,000	30	\$0
HVAC Controls	4,286	GSM	\$40.00	\$171,440	30	\$0
Electrical Distribution	4,286	GSM	\$35.70	\$153,000	40	-\$11,793
Lighting and Devices	4,286	GSM	\$50.86	\$218,000	30	\$0
Systems & Ancillaries	4,286	GSM	\$126.26	\$541,142	20	-\$83,422
Other	1	LPSM	\$372,380.00	\$372,380	30	\$0
Total Life Cycle of New Construction					\$41,639,455	

2.5 Summary of LCCA Results

Life Cycle Costs of Project Alternatives		
	Modernization	New Construction
Initial Investment Cost	\$17,121,603	\$36,531,205
Operations Cost	\$4,210,284	\$3,990,109
Maintenance & Repair Cost	\$369,627	\$369,627
Replacement Cost	\$2,460,458	\$2,460,458
Residual Value	-\$1,711,944	-\$1,711,944
Total Life Cycle Cost	\$22,450,030	\$41,639,455
GSM of Project	4,286 GSM	4,286 GSM
Initial Cost/GSM	\$3,994.77	\$8,523.38
LCC/GSM	\$5,237.99	\$9,715.23

3. Summary of Energy Modeling Results

St Thomas More Catholic School - Summary of Energy Modeling Results

Project/building occupancy type and description School
Floor area of conditioned space (m ²) 4,286m ² [46,132ft ²]
Basis for space use classification ☒ Building Type ☐ Space Function

Summary of Annual Building Energy Use

	Electrical (MJ)	Nat. Gas (MJ)	Total (MJ)	Energy Intensity (MJ/m ²)
Current School	1,575,621	5,400,093	6,975,714	1,628
Modernization	1,603,369	3,455,308	5,058,677	1,180
New Construction	1,457,982	1,950,799	3,408,780	795

Annual Building Energy Use by Type

		Modernization		New Construction	
	Current School (MJ)	Energy Use (MJ)	Percent Improvement	Energy Use (MJ)	Percent Improvement
Lights	734,424	396,596	46%	396,596	46%
Misc. Equipment	206,158	206,158	--	206,158	--
Space Heating	2,002,496	1,888,550	6%	1,068,772	47%
Ventilation Air	3,147,760	1,314,283	58%	647,488	79%
Space Cooling	78,707	158,258	-101%	512,441	-551%
Pumps & Misc.	48,005	41,253	14%	46,739	3%
Ventilation Fans	501,257	796,673	-59%	273,787	45%
Domestic Hot Water	242,768	242,768	0%	242,663	0%
Total Energy Use	6,975,714	5,058,677	27%	3,408,780	51%

3.1 Energy Modeling Analysis:

The energy efficiency is primarily limited by the building envelope and mechanical ventilation systems. Improvements due to modernization will be highly dependent on the design and extent of the modernization. The modernization option achieves substantial efficiency improvement with the addition of heat recovery in the ventilation system. The heat recovery will require increased ventilation fan energy requirements but this is offset by the savings in heating the ventilation air.

New construction will create significant improvement due to the building envelope incorporating improved thermal performance of the wall structure as well as doors and windows required by current National Energy Code for Buildings requirements.

4.0 Limitations

The opinions of probable cost provided in this report are estimations only and are subject to confirmation and adjustment from contractor and suppliers.

Any opinions of probable cost and any maintenance, repair or replacement schedules contained in this report assume that the recommendations contained in this report will be carried out, that the property will be maintained on a regular and routine basis by skilled and qualified tradesmen, and that a program of periodic professional review will be carried out throughout the life of the property. Failure to undertake any of these tasks in an expeditious manner may result in unanticipated failure of any of the systems and components that form the property and its improvements and lead to issues of public safety.

The information presented in this report is based on direct visual observation made by personnel of Bacz Consulting Inc. and their sub-consultants / employees. Recommendations contained within this report reflect our informed opinion, based on the information gathered during the site visit. The findings cannot be extended to components of the building or portions of the site that were not reviewed, or that were concealed, or unavailable for direct observation at the time of visit. There is a possibility of additional deficiencies being present in the building which have not been identified during our visit, given the limited nature of this review.

Our mandate was to complete a visual walk-through survey of items, components and systems that were conspicuous, patent and which could be observed visually during the walk-through survey without intrusion, removal of material, exploratory probing, or the use of special equipment. Therefore, concealed, or inaccessible physical deficiencies were specifically excluded from our review. Our interviews of building personnel attempted to uncover known concerns in the building, but we cannot attest to the integrity or knowledge of the interviewees, nor can this process, or the accepted scope of work in its entirety, be considered technically exhaustive or be considered to eliminate all risks related to owning or having a financial interest in this property.

No legal survey, geotechnical investigation, detailed structural engineering investigation, or quantity survey compilation have been made. Our scope of services for this assignment did not include a design review or engineering analysis of any of the building's systems or components. No responsibility, therefore, is assumed concerning these matters, or for any failure to carry out those technical or engineering procedures required to discover any inherent or hidden condition of this property.

The conclusions and recommendations detailed in this report are based upon the information available at the time of preparation of the report. No investigative method eliminates the possibility of obtaining imprecise or incomplete information. Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of our conclusions and recommendations. The recommendations are not intended to be utilized as a detailed specification for any remedial work that may be required. Bacz Consulting Inc. accepts no responsibility for interpretation of our recommendations, or actions taken based on them without our consultation and supervision.

The mechanical and electrical equipment and the fire safety systems were visually reviewed where accessible. The systems were not dismantled to verify the condition of the internal components. We did not carry out a review to check compliance with all Building or Fire Code requirements which may have been applied at the time of construction, or which may be retroactively applied to this building. Our review assumes that the design professionals and building permit process have created a design (and subsequent construction) that is code compliant.

Information provided by Bacz Consulting Inc. is intended for the exclusive use of the Alberta Infrastructure ("AI"), and their approved agents. Bacz Consulting Inc. will not provide results or information to any party other than the Alberta Infrastructure, unless "AI", in writing, requests that information be provided to a third party or unless disclosure by Bacz Consulting Inc. is required by law.

Any use by a third party of reports or documents authored by Bacz Consulting Inc., or any reliance by a third party, or decisions made by a third party, on the findings described in reports or documents authored by Bacz Consulting Inc., is the sole responsibility of such third parties.

Bacz Consulting Inc. accepts no responsibility for damages suffered by any third party because of decisions made or work carried out based on reports or documents authored by Bacz Consulting Inc. Bacz Consulting Inc. makes no representations concerning the legal and medical significance of our findings.

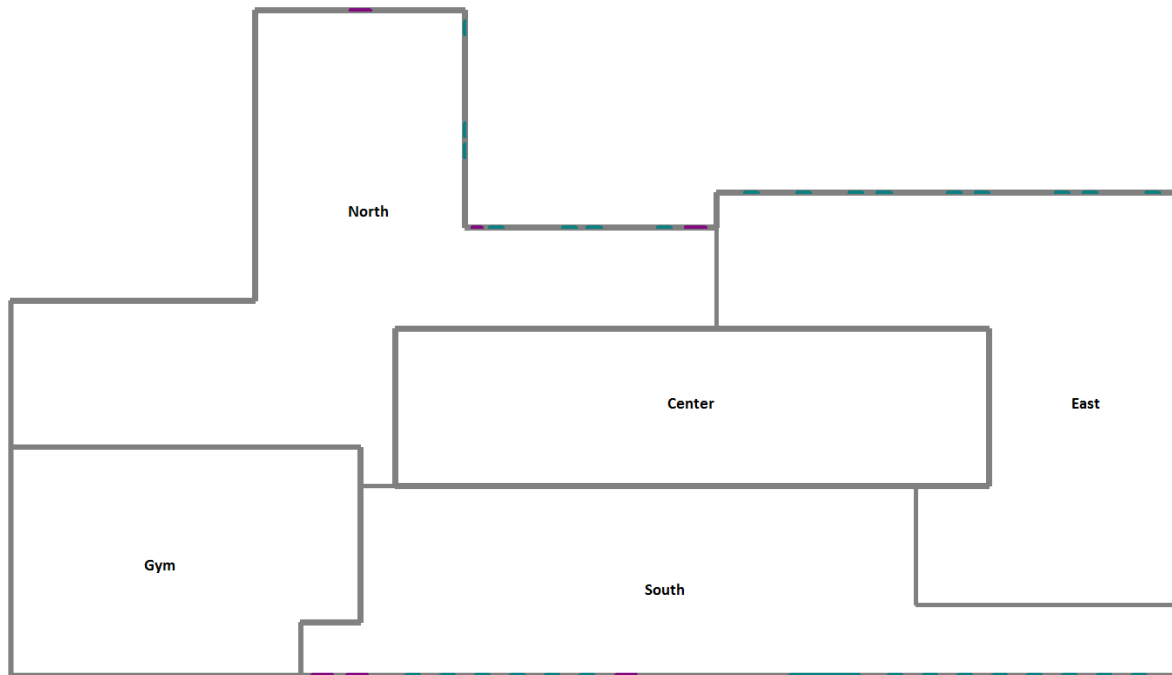
With respect to regulatory compliance requirements, regulations change from time to time, and interpretation of their meaning and intent may also change. Bacz Consulting Inc. accepts no responsibility for any legal interpretation of the Regulations, or the consequent financial effect on transactions, property values, or requirements for follow-up actions and costs. Bacz Consulting Inc. is not responsible for consequential or indirect damages.

Alberta Infrastructure expressly agrees that it has entered into this agreement with Bacz Consulting Inc., both on its own behalf and as agent on behalf of its employees and principals. The Alberta Infrastructure expressly agrees that Bacz Consulting Inc. employees and principals shall have no personal liability to Bacz Consulting Inc. in respect of a claim, whether in contract, or tort, or in any other cause of action in law. Accordingly, Alberta Infrastructure expressly agrees that it will bring no proceedings and will take no action in any court of law against any of Bacz Consulting Inc.'s employees, sub-consultants, or principals.

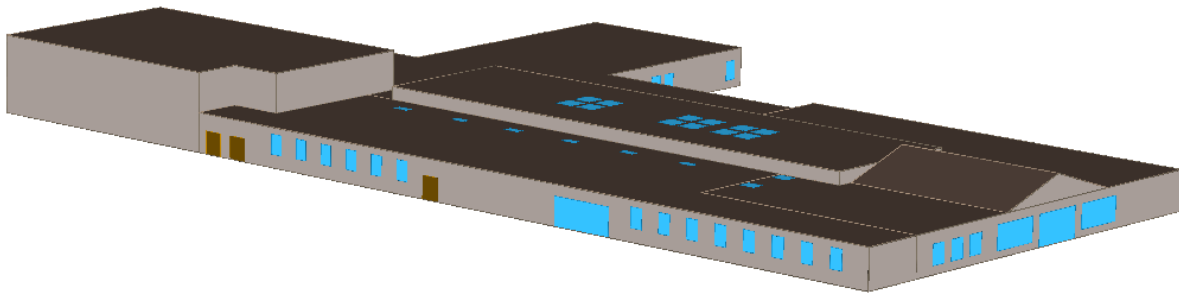
We trust that the information provided is sufficient for your present needs and will be pleased to review the contents of this report in greater detail should you so require.

5.0 Appendix A - Energy Model Data

Layout of Building Thermal Zones



3-D Building Geometry



REPORT- BEPS Building Energy Performance

WEATHER FILE- EPW Grand Prairie,AB

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	696.1	0.0	195.4	5.5	74.6	0.0	33.3	475.1	0.0	0.0	0.0	13.4	1493.4
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	4876.0	0.0	0.0	12.2	0.0	0.0	0.0	230.1	0.0	5118.3
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
MBTU	696.1	0.0	195.4	4882.0	74.6	0.0	45.5	475.1	0.0	0.0	230.1	13.4	6611.7

TOTAL SITE ENERGY 6611.65 MBTU 142.7 KBTU/SQFT-YR GROSS-AREA 142.7 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 9598.39 MBTU 207.2 KBTU/SQFT-YR GROSS-AREA 207.2 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.07
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 1
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 5

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

24-35 - St. Thomas More School

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REPORT- LV-A General Project Parameters

WEATHER FILE- EPW Grand Prairie,AB

PERIOD OF STUDY

STARTING DATE	ENDING DATE	NUMBER OF DAYS
1 JAN 2025	31 DEC 2025	365

SITE CHARACTERISTIC DATA

STATION NAME	LATITUDE (DEG)	LONGITUDE (DEG)	ALTITUDE (FT)	TIME ZONE	BUILDING AZIMUTH (DEG)
EPW Grand Prairie,AB	55.2	118.9	2200.	7 MST	0.0

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REPORT- LS-C Building Peak Load Components

WEATHER FILE- EPW Grand Prairie,AB

*** BUILDING ***

FLOOR AREA	46322 SQFT	4303 M2
VOLUME	661404 CUFT	18731 M3

TIME	COOLING LOAD		HEATING LOAD	
	JUL 2 3PM		FEB 17 8AM	
DRY-BULB TEMP	79 F	26 C	-34 F	-37 C
WET-BULB TEMP	58 F	14 C	-34 F	-37 C
TOT HORIZONTAL SOLAR RAD	283 BTU/H.SQFT	892 W/M2	0 BTU/H.SQFT	0 W/M2
WINDSPEED AT SPACE	5.6 KTS	2.9 M/S	6.4 KTS	3.3 M/S
CLOUD AMOUNT 0(CLEAR)-10	0		0	

	SENSIBLE		LATENT		SENSIBLE	
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)
WALL CONDUCTION	4.287	1.256	0.000	0.000	-90.888	-26.630
ROOF CONDUCTION	149.413	43.778	0.000	0.000	-233.798	-68.503
WINDOW GLASS+FRM COND	20.018	5.865	0.000	0.000	-146.519	-42.930
WINDOW GLASS SOLAR	153.921	45.099	0.000	0.000	1.594	0.467
DOOR CONDUCTION	1.597	0.468	0.000	0.000	-4.225	-1.238
INTERNAL SURFACE COND	0.000	0.000	0.000	0.000	0.000	0.000
UNDERGROUND SURF COND	-30.455	-8.923	0.000	0.000	-30.455	-8.923
OCCUPANTS TO SPACE	119.279	34.949	87.573	25.659	0.003	0.001
LIGHT TO SPACE	193.814	56.787	0.000	0.000	11.255	3.298
EQUIPMENT TO SPACE	57.476	16.840	0.000	0.000	3.252	0.953
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000
INFILTRATION	28.496	8.349	0.000	0.000	-322.157	-94.392
TOTAL	697.846	204.469	87.573	25.659	-811.938	-237.898
TOTAL / AREA	0.015	0.048	0.002	0.006	-0.018	-0.055
TOTAL LOAD	785.420 KBTU/H	230.128 KW	-811.938 KBTU/H	-237.898 KW		
TOTAL LOAD / AREA	16.96 BTU/H.SQFT	53.475 W/M2	17.528 BTU/H.SQFT	55.281 W/M2		

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*****
*
* NOTE 1)THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR *
* ---- LOADS *
* 2)TIMES GIVEN IN STANDARD TIME FOR THE LOCATION *
* IN CONSIDERATION *
* 3)THE ABOVE LOADS ARE CALCULATED ASSUMING A *
* CONSTANT INDOOR SPACE TEMPERATURE *
*
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WEATHER FILE- EPW Grand Prairie, AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)		
PSZ	1.080	20469.0	273.	0.326	422.926	0.784	-1332.736	0.360	0.000	0.000		
FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)	
SUPPLY	18064.	1.00	12.613	2.33	2.6	0.40	0.62	DRAW-THRU	CONSTANT	1.10	0.30	
ZONE NAME		SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
East - Therm.		8352.	0.	0.000	1.000	2917.	0.00	0.00	165.36	0.00	-515.69	1.
South - Therm.		9713.	0.	0.000	1.000	2978.	0.00	0.00	192.31	0.00	-64.02	1.

REPORT- SV-A System Design Parameters for RTU WEATHER FILE- EPW Grand Prairie,AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)	
PSZ	1.080	7650.0	102.	0.250	256.856	0.609	-540.770	0.360	0.000	0.000	
FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)
SUPPLY	8808.	1.00	6.150	2.33	2.6	0.40	0.55	BLOW-THRU	CONSTANT	1.10	0.30
ZONE NAME	SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
Center - Therm.	8808.	0.	0.000	1.000	2203.	0.00	0.00	184.97	0.00	-508.28	1.
									-200.00	(BASEBOARDS)	

REPORT- SV-A System Design Parameters for AHU-3 WEATHER FILE- EPW Grand Prairie,AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)
PMZS	1.080	18203.0	243.	0.502	248.690	0.713	-933.037	0.360	0.000	0.000

FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)
SUPPLY	10438.	1.00	7.289	2.33	2.6	0.40	0.55	BLOW-THRU	CONSTANT	1.10	0.30

ZONE NAME	SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
North - Therm.	6738.	0.	0.000	0.507	3444.	0.00	0.00	139.97	0.00	-185.03	1.
Gym - Therm.	3198.	0.	0.000	0.500	1799.	0.00	0.00	66.11	0.00	-126.04	1.

DUAL-DUCT/MULTIZONE MIXING BOX SUMMARY

ZONE NAME	COLD AIRFLOW (CFM)	MIN COLD AIRFLOW (FRAC)	HOT AIRFLOW (CFM)	MIN HOT AIRFLOW (FRAC)	OUTLET AIRFLOW (CFM)	MIN OUTLET (FRAC)	OUTLET MIN FLOW SOURCE
North - Therm.	6738.	0.01	5316.	0.01	6792.	0.51	COLD-DECK
Gym - Therm.	3198.	0.01	3615.	0.01	3647.	0.50	COLD-DECK

MONTH	- - - - - C O O L I N G - - - - -					- - - - - H E A T I N G - - - - -					- - - E L E C - - -		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.14392	22 7	38.F	35.F	54.675	-234.080	31 8	-33.F	-33.F	-1036.956	14195.	49.547	
FEB	0.09204	28 7	32.F	29.F	52.258	-180.279	5 8	-11.F	-11.F	-818.657	12835.	49.535	
MAR	0.23708	28 7	31.F	28.F	52.054	-148.699	5 8	-21.F	-22.F	-906.633	14207.	49.717	
APR	1.59162	17 8	35.F	32.F	55.748	-74.020	2 8	13.F	12.F	-573.044	14936.	49.761	
MAY	2.24938	19 8	44.F	38.F	56.316	-33.954	6 8	33.F	31.F	-398.342	14454.	49.853	
JUN	1.64486	16 8	56.F	52.F	61.041	-16.098	10 8	38.F	38.F	-380.072	14317.	49.732	
JUL	1.56021	25 8	54.F	53.F	66.777	-11.269	17 8	51.F	49.F	-263.908	14950.	49.888	
AUG	1.60536	13 8	56.F	52.F	59.122	-15.266	29 8	41.F	37.F	-345.917	14359.	49.725	
SEP	2.19383	3 8	43.F	43.F	54.253	-37.533	15 8	26.F	26.F	-447.814	14401.	49.822	
OCT	1.35371	27 7	43.F	38.F	54.096	-80.825	24 8	20.F	20.F	-499.779	14950.	50.296	
NOV	0.29301	5 8	36.F	34.F	53.703	-158.793	28 8	-11.F	-11.F	-830.317	12359.	49.705	
DEC	0.27684	19 8	39.F	35.F	54.718	-237.247	11 8	-30.F	-30.F	-1010.722	14814.	49.541	
TOTAL	13.242					-1228.063					170774.		
MAX					66.777					-1036.956		50.296	

MONTH	- - - - - C O O L I N G - - - - -					- - - - - H E A T I N G - - - - -					- - - E L E C - - -	
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)
JAN	0.00000	31 24	-23.F	-24.F	0.000	-83.287	31 8	-33.F	-33.F	-368.453	5804.	19.729
FEB	0.00000	28 24	21.F	20.F	0.000	-63.689	5 8	-11.F	-11.F	-291.682	5250.	19.729
MAR	0.00000	31 1	31.F	29.F	0.000	-51.844	5 8	-21.F	-22.F	-323.742	5804.	19.729
APR	0.59320	25 15	60.F	47.F	110.857	-25.006	4 8	13.F	12.F	-207.211	6082.	29.198
MAY	5.68763	30 15	74.F	51.F	170.017	-11.557	6 8	33.F	31.F	-160.411	6286.	35.103
JUN	14.95752	25 15	82.F	58.F	192.691	-5.068	10 8	38.F	38.F	-143.067	7119.	38.882
JUL	19.13654	22 14	80.F	66.F	201.309	-3.653	18 8	50.F	46.F	-99.601	7737.	39.127
AUG	16.33828	5 15	82.F	67.F	210.895	-4.857	29 8	41.F	37.F	-134.483	7282.	40.409
SEP	2.27593	5 15	75.F	61.F	164.021	-12.728	15 8	26.F	26.F	-188.461	5974.	34.726
OCT	0.07519	9 15	65.F	52.F	75.192	-28.500	24 8	20.F	20.F	-200.000	6053.	26.542
NOV	0.00000	30 24	4.F	4.F	0.000	-56.650	28 8	-11.F	-11.F	-293.487	5040.	19.729
DEC	0.00000	31 24	4.F	2.F	0.000	-83.816	11 8	-30.F	-30.F	-359.539	6052.	19.729
TOTAL	59.064					-430.655					74483.	
MAX					210.895					-368.453		40.409

REPORT- SS-Q Heat Pump Cooling Summary for RTU

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)		INDOOR FAN ENERGY (MBTU)
JAN	0.	0.000	0.000	0.127	0.000	0.000	0.000	0.000	0.000	2.466
FEB	0.	0.000	0.000	0.115	0.000	0.000	0.000	0.000	0.000	2.750
MAR	0.	0.000	0.000	0.127	0.000	0.000	0.000	0.000	0.000	3.159
APR	2.	0.593	0.176	0.115	0.000	0.000	0.000	0.000	0.000	3.589
MAY	22.	5.688	1.706	0.066	0.000	0.000	0.000	0.000	0.000	3.967
JUN	58.	14.958	4.643	0.033	0.000	0.000	0.000	0.000	0.000	4.880
JUL	74.	19.137	5.863	0.017	0.000	0.000	0.000	0.000	0.000	5.457
AUG	62.	16.338	5.145	0.028	0.000	0.000	0.000	0.000	0.000	4.943
SEP	9.	2.276	0.699	0.071	0.000	0.000	0.000	0.000	0.000	3.621
OCT	0.	0.075	0.023	0.108	0.000	0.000	0.000	0.000	0.000	3.600
NOV	0.	0.000	0.000	0.122	0.000	0.000	0.000	0.000	0.000	2.760
DEC	0.	0.000	0.000	0.127	0.000	0.000	0.000	0.000	0.000	2.172
ANNUAL	227.	59.064	18.256	1.055	0.000	0.000	0.000	0.000	0.000	43.366

CSPF (WITH PARASITICS) = 0.94 (KBTU/HR)

CSPF (WITHOUT PARASITICS) = 3.24 (BTU/BTU)

24-35 - St. Thomas More School

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REPORT- SS-Q Heat Pump Heating Summary for RTU

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)	DEFROST LOAD (MBTU)	INDOOR FAN ENERGY (MBTU)
JAN	9.	-4.635	8.127	0.588	-78.651	78.651	0.000	0.000	0.000	4.586
FEB	2.	-1.249	2.397	0.536	-62.440	62.440	0.000	0.000	0.000	3.631
MAR	2.	-1.289	2.353	0.593	-50.555	50.555	0.000	0.000	0.000	3.894
APR	0.	-0.108	0.376	0.576	-24.898	24.898	0.000	0.000	0.000	3.799
MAY	0.	-0.084	0.259	0.595	-11.473	11.473	0.000	0.000	0.000	3.086
JUN	0.	-0.033	0.103	0.576	-5.035	5.035	0.000	0.000	0.000	2.172
JUL	0.	-0.015	0.063	0.595	-3.638	3.638	0.000	0.000	0.000	1.931
AUG	0.	-0.038	0.124	0.595	-4.820	4.820	0.000	0.000	0.000	2.110
SEP	0.	-0.103	0.342	0.576	-12.625	12.625	0.000	0.000	0.000	3.432
OCT	0.	-0.061	0.226	0.595	-28.439	28.439	0.000	0.000	0.000	3.789
NOV	1.	-0.625	1.254	0.575	-56.025	56.025	0.000	0.000	0.000	3.285
DEC	12.	-6.628	11.632	0.585	-77.187	77.187	0.000	0.000	0.000	5.216
ANNUAL	27.	-14.869	27.259	6.986	-415.786	415.786	0.000	0.000	0.000	40.931

HSPF (WITH PARASITICS) = 0.96 (KBTU/HR)

HSPF (WITHOUT PARASITICS) = 0.97 (BTU/BTU)

MONTH	C O O L I N G					H E A T I N G					E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	0.00017	31 7	-32.F	-33.F	0.073	-362.298	31 7	-32.F	-33.F	-926.445	13763.	37.698	
FEB	0.00000	28 24	21.F	20.F	0.000	-297.148	17 9	-34.F	-34.F	-883.840	12442.	37.698	
MAR	0.00000	31 1	31.F	29.F	0.000	-263.889	5 8	-21.F	-22.F	-839.790	13763.	37.698	
APR	1.56298	25 18	66.F	49.F	76.144	-146.559	4 8	13.F	12.F	-547.383	14060.	44.323	
MAY	14.72066	30 18	75.F	51.F	125.291	-81.931	6 8	33.F	31.F	-359.503	15297.	48.518	
JUN	29.91272	25 16	84.F	58.F	166.150	-46.207	10 8	38.F	38.F	-319.771	16485.	53.353	
JUL	41.20883	22 14	80.F	66.F	210.511	-37.325	18 8	50.F	46.F	-214.716	18015.	57.780	
AUG	45.38686	3 20	77.F	68.F	245.638	-42.946	29 8	41.F	37.F	-289.600	18057.	60.612	
SEP	13.09468	6 14	78.F	63.F	179.131	-82.641	15 8	26.F	26.F	-432.682	14926.	51.577	
OCT	3.13024	9 15	65.F	52.F	77.060	-143.447	24 8	20.F	20.F	-482.966	14458.	44.577	
NOV	0.07245	4 15	51.F	42.F	10.025	-265.810	28 8	-11.F	-11.F	-766.556	12549.	38.919	
DEC	0.00013	5 8	-21.F	-21.F	0.065	-349.916	11 7	-29.F	-29.F	-908.131	14099.	37.698	
TOTAL	149.090					-2120.117					177923.		
MAX					245.638					-926.445		60.612	

REPORT- SS-Q Heat Pump Cooling Summary for AHU-3

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)		INDOOR FAN ENERGY (MBTU)
JAN	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAR	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
APR	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAY	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OCT	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ANNUAL	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CSPF (WITH PARASITICS) = 0.00 (KBTU/HR)

CSPF (WITHOUT PARASITICS) = 0.00 (BTU/BTU)

REPORT- SS-Q Heat Pump Heating Summary for AHU-3

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)	DEFROST LOAD (MBTU)	INDOOR FAN ENERGY (MBTU)
JAN	388.	-362.298	520.909	0.285	0.000	0.000	0.000	0.000	0.000	18.508
FEB	318.	-297.148	430.578	0.283	0.000	0.000	0.000	0.000	0.000	16.717
MAR	283.	-263.889	389.387	0.369	0.000	0.000	0.000	0.000	0.000	18.508
APR	157.	-146.559	227.281	0.450	0.000	0.000	0.000	0.000	0.000	17.911
MAY	88.	-81.931	136.203	0.525	0.000	0.000	0.000	0.000	0.000	18.508
JUN	50.	-46.207	84.235	0.536	0.000	0.000	0.000	0.000	0.000	17.911
JUL	40.	-37.325	72.003	0.563	0.000	0.000	0.000	0.000	0.000	18.508
AUG	46.	-42.946	80.084	0.558	0.000	0.000	0.000	0.000	0.000	18.508
SEP	89.	-82.641	136.748	0.505	0.000	0.000	0.000	0.000	0.000	17.911
OCT	154.	-143.447	223.898	0.472	0.000	0.000	0.000	0.000	0.000	18.508
NOV	285.	-265.810	391.628	0.348	0.000	0.000	0.000	0.000	0.000	17.911
DEC	375.	-349.916	502.797	0.295	0.000	0.000	0.000	0.000	0.000	18.508
ANNUAL	2272.	-2120.117	3195.750	5.190	0.000	0.000	0.000	0.000	0.000	217.913

HSPF (WITH PARASITICS) = 0.68 (KBTU/HR)

HSPF (WITHOUT PARASITICS) = 0.66 (BTU/BTU)

REPORT- PV-A Plant Design Parameters

WEATHER FILE- EPW Grand Prairie,AB

*** CIRCULATION LOOPS ***

HEATING CAPACITY (MBTU/HR)	COOLING CAPACITY (MBTU/HR)	LOOP FLOW (GAL/MIN)	TOTAL HEAD (FT)	SUPPLY UA PRODUCT (BTU/HR-F)	SUPPLY LOSS DT (F)	RETURN UA PRODUCT (BTU/HR-F)	RETURN LOSS DT (F)	LOOP VOLUME (GAL)	FLUID HEAT CAPACITY (BTU/LB-F)
Domestic Hot Water Loop -0.299	0.000	2.1	6.4	0.0	0.00	0.0	0.00	3.1	1.00
Heating Loop -1.929	0.000	134.1	31.6	0.0	0.00	0.0	0.00	201.2	1.00

*** PUMPS ***

ATTACHED TO	FLOW (GAL/MIN)	HEAD (FT)	HEAD SETPOINT (FT)	CAPACITY CONTROL	POWER (KW)	MECHANICAL EFFICIENCY (FRAC)	MOTOR EFFICIENCY (FRAC)
DHW Recirc Pump Domestic Hot Water Loop PRIMARY LOOP	1 PUMP(s) 1.0	12.0	12.0	STAGED	0.007	0.770	0.400
P-1 B-1 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-2 B-2 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-5,6 Heating Loop PRIMARY LOOP	2 PUMP(s) 169.9	40.0	32.6	VFD&STAGED	2.980	0.537	0.800
P-3 B-3 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-4 B-4 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800

*** PRIMARY EQUIPMENT ***

RATED CAPACITY	FLOW	RATED EIR	RATED HIR	AUXILIARY
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EQUIPMENT TYPE	ATTACHED TO	(MBTU/HR)	(GAL/MIN)	(FRAC)	(FRAC)	(KW)
B-1 HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000
B-2 HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000
B-3 HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000

B-4

HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000		
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*** DW-HEATERS ***

EQUIPMENT TYPE	ATTACHED TO	CAPACITY (MBTU/HR)	FLOW (GAL/MIN)	EIR (FRAC)	HIR (FRAC)	AUXILIARY (KW)	TANK (GAL)	TANK UA (BTU/HR-F)
Domestic Water Heater								
GAS DW-HEATER	Domestic Hot Water Loop	-0.299	2.1	0.000	1.200	0.000	75.0	3.12

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	375.9	0.0	195.4	3.7	150.0	0.0	26.2	755.1	0.0	0.0	0.0	13.4	1519.8
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	3032.0	0.0	0.0	12.9	0.0	0.0	0.0	230.1	0.0	3275.2
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
MBTU	375.9	0.0	195.4	3036.0	150.0	0.0	39.1	755.1	0.0	0.0	230.1	13.4	4795.1

TOTAL SITE ENERGY 4795.06 MBTU 103.5 KBTU/SQFT-YR GROSS-AREA 103.5 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 7834.68 MBTU 169.1 KBTU/SQFT-YR GROSS-AREA 169.1 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.08
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 3
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 4

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

PERIOD OF STUDY

STARTING DATE	ENDING DATE	NUMBER OF DAYS
1 JAN 2025	31 DEC 2025	365

SITE CHARACTERISTIC DATA

STATION NAME	LATITUDE (DEG)	LONGITUDE (DEG)	ALTITUDE (FT)	TIME ZONE	BUILDING AZIMUTH (DEG)
EPW Grand Prairie,AB	55.2	118.9	2200.	7 MST	0.0


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* NOTE 1)THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR *
* ---- LOADS *
* 2)TIMES GIVEN IN STANDARD TIME FOR THE LOCATION *
* IN CONSIDERATION *
* 3)THE ABOVE LOADS ARE CALCULATED ASSUMING A *
* CONSTANT INDOOR SPACE TEMPERATURE *
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WEATHER FILE- EPW Grand Prairie, AB

		FLOOR AREA	MAX	OUTSIDE	COOLING		HEATING	COOLING	HEATING	HEAT PUMP		
SYSTEM TYPE	ALTITUDE FACTOR	(SQFT)	PEOPLE	AIR RATIO	CAPACITY (KBTU/HR)	SENSIBLE (SHR)	CAPACITY (KBTU/HR)	EIR (BTU/BTU)	EIR (BTU/BTU)	SUPP-HEAT (KBTU/HR)		
PSZ	1.080	20469.0	273.	0.372	373.233	0.781	-1261.392	0.360	0.000	0.000		
		DIVERSITY FACTOR	POWER DEMAND	FAN DELTA-T	STATIC PRESSURE	TOTAL EFF	MECH EFF	FAN	FAN	MAX FAN	MIN FAN	
FAN TYPE	CAPACITY (CFM)	(FRAC)	(KW)	(F)	(IN-WATER)	(FRAC)	(FRAC)	PLACEMENT	CONTROL	RATIO (FRAC)	RATIO (FRAC)	
SUPPLY	15852.	1.00	11.069	2.33	2.6	0.40	0.62	DRAW-THRU	CONSTANT	1.10	0.30	
ZONE NAME		SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
East - Therm.		7339.	0.	0.000	1.000	2917.	0.00	0.00	145.32	0.00	-477.43	1.
South - Therm.		8513.	0.	0.000	1.000	2978.	0.00	0.00	168.56	-200.00	(BASEBOARDS)	
										0.00	-80.82	1.
										-200.00	(BASEBOARDS)	

REPORT- SV-A System Design Parameters forRTU

WEATHER FILE- EPW Grand Prairie,AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)	
PSZ	1.080	7650.0	102.	0.289	223.190	0.607	-504.172	0.360	0.000	0.000	
FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)
SUPPLY	7618.	1.00	5.319	2.33	2.6	0.40	0.55	BLOW-THRU	CONSTANT	1.10	0.30
ZONE NAME	SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
Center - Therm.	7618.	0.	0.000	1.000	2203.	0.00	0.00	159.98	0.00	-466.64	1.
									-200.00	(BASEBOARDS)	

REPORT- SV-A System Design Parameters for AHU-3 WEATHER FILE- EPW Grand Prairie,AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)
PMZS	1.080	18203.0	243.	0.561	208.320	0.709	-931.505	0.360	0.000	0.000

FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)
SUPPLY	9345.	1.00	6.525	2.33	2.6	0.40	0.55	BLOW-THRU	CONSTANT	1.10	0.30

ZONE NAME	SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
North - Therm.	5635.	0.	0.000	0.606	3444.	0.00	0.00	116.82	0.00	-180.35	1.
Gym - Therm.	2633.	0.	0.000	0.500	1799.	0.00	0.00	54.24	0.00	-126.74	1.

DUAL-DUCT/MULTIZONE MIXING BOX SUMMARY

ZONE NAME	COLD AIRFLOW (CFM)	MIN COLD AIRFLOW (FRAC)	HOT AIRFLOW (CFM)	MIN HOT AIRFLOW (FRAC)	OUTLET AIRFLOW (CFM)	MIN OUTLET (FRAC)	OUTLET MIN FLOW SOURCE
North - Therm.	5635.	0.01	5177.	0.01	5686.	0.61	COLD-DECK
Gym - Therm.	2633.	0.01	3632.	0.01	3659.	0.50	COLD-DECK

REPORT- SS-A System Loads Summary for AHU-1,2

WEATHER FILE- EPW Grand Prairie,AB

- - - - - C O O L I N G - - - - -													
- - - - - H E A T I N G - - - - -													
- - - E L E C - - -													
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	1.25105	6 7	13.F	12.F	54.096	-142.435	31 8	-33.F	-33.F	-610.438	14012.	46.346	
FEB	1.54340	7 7	21.F	19.F	54.398	-107.460	18 8	-9.F	-10.F	-483.624	12730.	46.335	
MAR	1.97187	10 7	9.F	8.F	53.393	-82.782	5 8	-21.F	-22.F	-531.281	14108.	47.149	
APR	2.37512	7 7	28.F	27.F	53.092	-36.807	4 8	13.F	12.F	-390.221	14739.	46.356	
MAY	1.76652	19 7	39.F	35.F	53.175	-17.597	7 8	37.F	37.F	-252.501	14067.	46.249	
JUN	0.93986	16 8	56.F	52.F	58.678	-7.221	10 8	38.F	38.F	-241.984	13921.	46.289	
JUL	0.55538	21 8	56.F	53.F	56.015	-5.814	17 8	51.F	49.F	-139.222	14509.	45.552	
AUG	0.87860	25 8	49.F	44.F	52.268	-7.274	28 8	42.F	40.F	-203.221	13943.	46.150	
SEP	2.02314	29 7	44.F	43.F	52.657	-18.687	15 8	26.F	26.F	-315.448	14072.	46.416	
OCT	2.32752	27 7	43.F	38.F	52.935	-41.930	24 8	20.F	20.F	-351.933	14762.	46.278	
NOV	1.69216	24 7	9.F	9.F	53.264	-96.910	28 8	-11.F	-11.F	-490.100	12203.	46.253	
DEC	1.27250	26 7	22.F	21.F	53.250	-141.650	11 8	-30.F	-30.F	-596.018	14625.	46.338	

TOTAL	18.597					-706.566					167693.		
MAX					58.678					-610.438		47.149	

REPORT- ERV Energy Recovery Summary for: AHU-1,2

WEATHER FILE- EPW Grand Prairie,AB

		AIR FLOW		PURGE		POWER CONSUMPTION									
OUTDOOR (CFM)		EXHAUST (CFM)		(CFM)		OA FAN (KW)		EXH FAN (KW)		HT EXCH (KW)		PREHEAT (KBTU/HR)			
5895.		5895.		0.		0.000		0.000		0.000		0.			
MON	SUM PEAK DAY/HR	----- SENSIBLE -----		----- TOTAL -----		--- EXCESS		SENSIBLE --		-- POWER -		----- PREHEAT -----		-- HOURS -	
		HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	FANS&HX (KWH) (KW)	HOT WATER (MBTU) (KBTU/HR)	ELECTRIC (KWH) (KW)	HEAT	COOL			
JAN	SUM	-68.372	0.000	-68.372	0.000	-1.256	0.000	3677.380	0.000	0.000	336	0			
	PEAK	-331.222	0.000	-331.222	0.000	-54.006	0.000	10.945	0.000	0.000					
	DAY/HR	31/10	0/ 0	31/10	0/ 0	6/ 7	0/ 0	2/ 7	0/ 0	0/ 0					
FEB	SUM	-54.054	0.000	-54.054	0.000	-1.619	0.000	3327.154	0.000	0.000	304	0			
	PEAK	-256.950	0.000	-256.950	0.000	-54.506	0.000	10.945	0.000	0.000					
	DAY/HR	5/ 8	0/ 0	5/ 8	0/ 0	7/ 7	0/ 0	3/ 7	0/ 0	0/ 0					
MAR	SUM	-54.666	0.000	-54.666	0.000	-2.444	0.000	3677.380	0.000	0.000	336	0			
	PEAK	-288.770	0.000	-288.770	0.000	-53.411	0.000	10.945	0.000	0.000					
	DAY/HR	5/ 8	0/ 0	5/ 8	0/ 0	10/ 7	0/ 0	3/ 7	0/ 0	0/ 0					
APR	SUM	-42.888	0.000	-42.888	0.000	-3.878	0.000	3852.494	0.000	0.000	352	0			
	PEAK	-187.184	0.000	-187.184	0.000	-52.915	0.000	10.945	0.000	0.000					
	DAY/HR	2/11	0/ 0	2/11	0/ 0	7/ 7	0/ 0	1/ 7	0/ 0	0/ 0					
MAY	SUM	-30.827	0.000	-30.827	0.000	-4.071	0.000	3677.380	0.000	0.000	336	0			
	PEAK	-141.913	0.000	-141.913	0.000	-53.248	0.000	10.945	0.000	0.000					
	DAY/HR	2/19	0/ 0	2/19	0/ 0	19/ 7	0/ 0	1/ 7	0/ 0	0/ 0					
JUN	SUM	-27.262	0.000	-27.262	0.000	-3.629	0.000	3677.380	0.000	0.000	336	0			
	PEAK	-122.923	0.000	-122.923	0.000	-52.321	0.000	10.945	0.000	0.000					
	DAY/HR	2/17	0/ 0	2/17	0/ 0	11/ 8	0/ 0	2/ 7	0/ 0	0/ 0					
JUL	SUM	-26.664	0.000	-26.664	0.000	-3.646	0.000	3852.494	0.000	0.000	352	0			
	PEAK	-121.597	0.000	-121.597	0.000	-52.288	0.000	10.945	0.000	0.000					
	DAY/HR	3/18	0/ 0	3/18	0/ 0	7/ 8	0/ 0	1/ 7	0/ 0	0/ 0					
AUG	SUM	-25.513	0.000	-25.513	0.000	-3.671	0.000	3677.380	0.000	0.000	336	0			
	PEAK	-123.849	0.000	-123.849	0.000	-52.245	0.000	10.945	0.000	0.000					
	DAY/HR	27/21	0/ 0	27/21	0/ 0	25/ 8	0/ 0	1/ 7	0/ 0	0/ 0					

SEP	SUM	-29.575	0.000	-29.575	0.000	-3.952	0.000	3677.380	0.000	0.000	336	0
	PEAK	-139.878	0.000	-139.878	0.000	-52.490	0.000	10.945	0.000	0.000		
	DAY/HR	15/ 8	0/ 0	15/ 8	0/ 0	29/ 7	0/ 0	2/ 7	0/ 0	0/ 0		
OCT	SUM	-38.929	0.000	-38.929	0.000	-3.442	0.000	3852.494	0.000	0.000	352	0
	PEAK	-164.167	0.000	-164.167	0.000	-52.739	0.000	10.945	0.000	0.000		
	DAY/HR	24/ 9	0/ 0	24/ 9	0/ 0	27/ 7	0/ 0	1/ 7	0/ 0	0/ 0		
NOV	SUM	-45.891	0.000	-45.891	0.000	-1.867	0.000	3152.041	0.000	0.000	288	0
	PEAK	-256.897	0.000	-256.897	0.000	-53.282	0.000	10.945	0.000	0.000		
	DAY/HR	28/ 8	0/ 0	28/ 8	0/ 0	24/ 7	0/ 0	3/ 7	0/ 0	0/ 0		

REPORT- ERV Energy Recovery Summary for: AHU-1,2

WEATHER FILE- EPW Grand Prairie,AB

(CONTINUED)

DEC	SUM	-71.845	0.000	-71.845	0.000	-1.291	0.000	3852.494	0.000	0.000	352	0
	PEAK	-319.616	0.000	-319.616	0.000	-53.307	0.000	10.945	0.000	0.000		
	DAY/HR	11/ 9	0/ 0	11/ 9	0/ 0	26/ 7	0/ 0	1/ 7	0/ 0	0/ 0		
		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
YR	SUM	-516.485	0.000	-516.485	0.000	-34.768	0.000	43953.449	0.000	0.000	4016	0
	PEAK	-331.222	0.000	-331.222	0.000	-54.506	0.000	10.945	0.000	0.000		
	MON/DAY	1/31	0/ 0	1/31	0/ 0	2/ 7	0/ 0	1/ 2	0/ 0	0/ 0		

	---	EXHAUST	OUTLET	---	---	MAKE-UP	OUTLET	---	CONDENSATE
		WET	FROSTED			WET	FROSTED		CONTROL
		-----	-----			-----	-----		-----
ANNUAL HOURS:		0	8			0	0		8

REPORT- SS-A System Loads Summary for RTU

WEATHER FILE- EPW Grand Prairie,AB

- - - - - C O O L I N G - - - - -													
- - - - - H E A T I N G - - - - -													
- - - E L E C - - -													
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	1.10485	2 7	4.F	3.F	31.234	-47.874	31 8	-33.F	-33.F	-210.302	6195.	20.661	
FEB	1.35840	28 15	35.F	31.F	29.512	-35.396	5 8	-11.F	-11.F	-190.152	5653.	23.426	
MAR	3.94689	27 15	43.F	36.F	65.106	-27.146	5 8	-21.F	-22.F	-200.000	6523.	25.498	
APR	11.31889	25 15	60.F	47.F	134.150	-11.601	4 8	13.F	12.F	-139.912	7458.	31.088	
MAY	18.84778	30 15	74.F	51.F	176.454	-5.680	6 8	33.F	31.F	-91.665	7841.	35.432	
JUN	25.85730	25 15	82.F	58.F	189.380	-1.761	10 8	38.F	38.F	-82.221	8428.	38.038	
JUL	30.07161	3 16	76.F	63.F	199.281	-1.036	18 8	50.F	46.F	-54.715	9048.	38.185	
AUG	26.21945	5 15	82.F	67.F	205.110	-1.853	29 8	41.F	37.F	-76.440	8504.	39.292	
SEP	13.87051	5 15	75.F	61.F	166.707	-6.042	15 8	26.F	26.F	-110.416	7443.	34.816	
OCT	6.43838	9 15	65.F	52.F	96.696	-13.109	24 8	20.F	20.F	-124.189	7045.	27.851	
NOV	1.65519	4 15	51.F	42.F	44.184	-32.264	28 8	-11.F	-11.F	-191.559	5443.	24.302	
DEC	1.16535	12 7	-13.F	-13.F	28.236	-47.047	11 8	-30.F	-30.F	-205.721	6471.	22.041	

TOTAL	141.854					-230.808					86055.		
MAX					205.110					-210.302		39.292	

REPORT- SS-Q Heat Pump Cooling Summary for RTU

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)		INDOOR FAN ENERGY (MBTU)
JAN	31.	1.105	0.504	0.092	0.000	0.000	0.000	0.000	0.000	3.858
FEB	25.	1.358	0.620	0.086	0.000	0.000	0.000	0.000	0.000	3.404
MAR	38.	3.947	1.630	0.086	0.000	0.000	0.000	0.000	0.000	4.575
APR	62.	11.319	3.957	0.072	0.000	0.000	0.000	0.000	0.000	5.646
MAY	89.	18.848	6.167	0.048	0.000	0.000	0.000	0.000	0.000	5.955
JUN	119.	25.857	8.235	0.023	0.000	0.000	0.000	0.000	0.000	6.009
JUL	134.	30.072	9.400	0.015	0.000	0.000	0.000	0.000	0.000	6.282
AUG	118.	26.219	8.457	0.021	0.000	0.000	0.000	0.000	0.000	5.973
SEP	69.	13.871	4.846	0.048	0.000	0.000	0.000	0.000	0.000	5.855
OCT	44.	6.438	2.504	0.075	0.000	0.000	0.000	0.000	0.000	5.147
NOV	28.	1.655	0.738	0.092	0.000	0.000	0.000	0.000	0.000	3.549
DEC	33.	1.165	0.532	0.089	0.000	0.000	0.000	0.000	0.000	4.285
ANNUAL	792.	141.855	47.590	0.746	0.000	0.000	0.000	0.000	0.000	60.537

CSPF (WITH PARASITICS) = 1.30 (KBTU/HR)

CSPF (WITHOUT PARASITICS) = 2.98 (BTU/BTU)

REPORT- SS-Q Heat Pump Heating Summary for RTU

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)	DEFROST LOAD (MBTU)	INDOOR FAN ENERGY (MBTU)
JAN	0.	-0.047	1.551	0.595	-47.827	47.827	0.000	0.000	0.000	2.242
FEB	0.	-0.058	1.339	0.538	-35.338	35.338	0.000	0.000	0.000	2.115
MAR	0.	-0.087	1.016	0.595	-27.059	27.059	0.000	0.000	0.000	1.525
APR	0.	-0.029	0.398	0.576	-11.571	11.571	0.000	0.000	0.000	0.744
MAY	0.	0.000	0.000	0.595	-5.680	5.680	0.000	0.000	0.000	0.145
JUN	0.	0.000	0.000	0.576	-1.761	1.761	0.000	0.000	0.000	0.091
JUL	0.	0.000	0.000	0.595	-1.036	1.036	0.000	0.000	0.000	0.109
AUG	0.	0.000	0.000	0.595	-1.853	1.853	0.000	0.000	0.000	0.127
SEP	0.	-0.005	0.020	0.576	-6.037	6.037	0.000	0.000	0.000	0.245
OCT	0.	-0.046	0.613	0.595	-13.062	13.062	0.000	0.000	0.000	1.244
NOV	0.	-0.050	1.087	0.576	-32.214	32.214	0.000	0.000	0.000	1.679
DEC	0.	-0.049	1.377	0.595	-46.998	46.998	0.000	0.000	0.000	2.106
ANNUAL	1.	-0.372	7.402	7.007	-230.435	230.435	0.000	0.000	0.000	12.373

HSPF (WITH PARASITICS) = 0.95 (KBTU/HR)

HSPF (WITHOUT PARASITICS) = 0.97 (BTU/BTU)

REPORT- ERV Energy Recovery Summary for: RTU

WEATHER FILE- EPW Grand Prairie,AB

		AIR FLOW		PURGE		POWER CONSUMPTION									
OUTDOOR (CFM)		EXHAUST (CFM)		(CFM)		OA FAN (KW)		EXH FAN (KW)		HT EXCH (KW)		PREHEAT (KBTU/HR)			
2203.		2203.		0.		0.000		0.000		0.000		0.			
		----- SENSIBLE -----		----- TOTAL -----		--- EXCESS		SENSIBLE --		-- POWER -		----- PREHEAT -----		-- HOURS -	
		HEATING		COOLING		HEATING		COOLING		FANS&HX		HOT WATER		ELECTRIC	
		(MBTU)		(MBTU)		(MBTU)		(MBTU)		(KWH)		(MBTU)		(KWH)	
		(KBTU/HR)		(KBTU/HR)		(KBTU/HR)		(KBTU/HR)		(KW)		(KBTU/HR)		(KW)	
MON	SUM														
PEAK															
DAY/HR															
JAN	SUM	-25.564	0.000	-25.564	0.000	-1.561	0.000	1831.892	0.000	1831.892	0.000	0.000	336	0	
	PEAK	-123.789	0.000	-123.789	0.000	-48.422	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	31/10	0/ 0	31/10	0/ 0	15/16	0/ 0	2/ 7	0/ 0	2/ 7	0/ 0	0/ 0			
FEB	SUM	-20.201	0.000	-20.201	0.000	-3.029	0.000	1657.427	0.000	1657.427	0.000	0.000	304	0	
	PEAK	-96.359	0.000	-96.359	0.000	-62.219	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	5/ 8	0/ 0	5/ 8	0/ 0	21/15	0/ 0	3/ 7	0/ 0	3/ 7	0/ 0	0/ 0			
MAR	SUM	-20.149	0.000	-20.149	0.000	-5.124	0.000	1831.892	0.000	1831.892	0.000	0.000	336	0	
	PEAK	-108.074	0.000	-108.074	0.000	-67.207	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	5/ 8	0/ 0	5/ 8	0/ 0	12/17	0/ 0	3/ 7	0/ 0	3/ 7	0/ 0	0/ 0			
APR	SUM	-14.424	0.000	-14.424	0.000	-8.070	0.000	1919.124	0.000	1919.124	0.000	0.000	352	0	
	PEAK	-69.990	0.000	-69.990	0.000	-61.063	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	2/11	0/ 0	2/11	0/ 0	3/15	0/ 0	1/ 7	0/ 0	1/ 7	0/ 0	0/ 0			
MAY	SUM	-8.353	0.000	-8.353	0.000	-6.895	0.000	1831.892	0.000	1831.892	0.000	0.000	336	0	
	PEAK	-46.962	0.000	-46.962	0.000	-46.627	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	6/12	0/ 0	6/12	0/ 0	6/10	0/ 0	1/ 7	0/ 0	1/ 7	0/ 0	0/ 0			
JUN	SUM	-5.735	0.090	-5.735	0.090	-5.007	0.000	1831.892	0.000	1831.892	0.000	0.000	309	27	
	PEAK	-38.539	9.310	-38.539	9.310	-38.316	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	10/ 8	25/17	10/ 8	25/17	9/22	0/ 0	2/ 7	0/ 0	2/ 7	0/ 0	0/ 0			
JUL	SUM	-4.621	0.059	-4.621	0.059	-4.421	0.000	1919.124	0.000	1919.124	0.000	0.000	329	23	
	PEAK	-28.710	6.327	-28.710	6.327	-28.710	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	16/10	22/16	16/10	22/16	16/10	0/ 0	1/ 7	0/ 0	1/ 7	0/ 0	0/ 0			
AUG	SUM	-5.037	0.142	-5.037	0.142	-4.640	0.000	1831.892	0.000	1831.892	0.000	0.000	301	35	
	PEAK	-40.361	10.399	-40.361	10.399	-39.980	0.000	5.452	0.000	5.452	0.000	0.000			
	DAY/HR	27/21	1/15	27/21	1/15	27/22	0/ 0	1/ 7	0/ 0	1/ 7	0/ 0	0/ 0			

SEP	SUM	-8.720	0.000	-8.720	0.000	-6.845	0.000	1831.892	0.000	0.000	334	2
	PEAK	-52.712	0.173	-52.712	0.173	-40.202	0.000	5.452	0.000	0.000		
	DAY/HR	15/ 8	5/17	15/ 8	5/17	12/10	0/ 0	2/ 7	0/ 0	0/ 0		
OCT	SUM	-13.562	0.000	-13.562	0.000	-6.390	0.000	1919.124	0.000	0.000	352	0
	PEAK	-61.674	0.000	-61.674	0.000	-49.255	0.000	5.452	0.000	0.000		
	DAY/HR	24/ 9	0/ 0	24/ 9	0/ 0	14/20	0/ 0	1/ 7	0/ 0	0/ 0		
NOV	SUM	-17.096	0.000	-17.096	0.000	-2.420	0.000	1570.194	0.000	0.000	288	0
	PEAK	-96.331	0.000	-96.331	0.000	-50.911	0.000	5.452	0.000	0.000		
	DAY/HR	28/ 8	0/ 0	28/ 8	0/ 0	20/16	0/ 0	3/ 7	0/ 0	0/ 0		

REPORT- ERV Energy Recovery Summary for:RTU

WEATHER FILE- EPW Grand Prairie,AB

(CONTINUED)

DEC	SUM	-26.885	0.000	-26.885	0.000	-2.019	0.000	1919.124	0.000	0.000	352	0
	PEAK	-119.440	0.000	-119.440	0.000	-45.800	0.000	5.452	0.000	0.000		
	DAY/HR	11/ 9	0/ 0	11/ 9	0/ 0	19/16	0/ 0	1/ 7	0/ 0	0/ 0		
		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
YR	SUM	-170.348	0.291	-170.348	0.291	-56.421	0.000	21895.469	0.000	0.000	3929	87
	PEAK	-123.789	10.399	-123.789	10.399	-67.207	0.000	5.452	0.000	0.000		
	MON/DAY	1/31	8/ 1	1/31	8/ 1	3/12	0/ 0	1/ 2	0/ 0	0/ 0		

	---	EXHAUST	OUTLET	---	---	MAKE-UP	OUTLET	---	CONDENSATE
		WET	FROSTED			WET	FROSTED		CONTROL
	-----			-----				-----	
ANNUAL HOURS:		0	8			0	0		8

REPORT- SS-A System Loads Summary forAHU-3

WEATHER FILE- EPW Grand Prairie,AB

MONTH	C O O L I N G						H E A T I N G						E L E C		
	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)			
JAN	1.39982	22 14	38.F	35.F	25.410	-211.912	31 7	-32.F	-33.F	-558.878	13137.	32.452			
FEB	2.26430	25 15	39.F	35.F	27.998	-174.363	17 9	-34.F	-34.F	-515.853	11957.	32.776			
MAR	5.04989	27 16	45.F	36.F	44.089	-153.180	5 8	-21.F	-22.F	-513.197	13486.	33.782			
APR	16.18792	25 14	64.F	48.F	100.712	-89.989	4 8	13.F	12.F	-349.073	14558.	37.847			
MAY	34.34789	30 16	75.F	52.F	134.213	-57.680	6 8	33.F	31.F	-239.466	16154.	41.157			
JUN	47.21410	25 16	84.F	58.F	154.268	-36.214	10 8	38.F	38.F	-219.698	16932.	44.208			
JUL	57.70854	22 14	80.F	66.F	206.443	-32.009	18 8	50.F	46.F	-164.675	18245.	48.289			
AUG	60.21957	5 15	82.F	67.F	230.317	-34.757	29 8	41.F	37.F	-202.400	18318.	49.735			
SEP	32.26809	5 15	75.F	61.F	159.495	-59.712	15 8	26.F	26.F	-284.115	15755.	43.812			
OCT	17.83345	9 15	65.F	52.F	95.056	-92.029	24 8	20.F	20.F	-312.527	15007.	37.368			
NOV	3.93578	4 15	51.F	42.F	51.636	-157.705	28 8	-11.F	-11.F	-479.774	12424.	34.210			
DEC	2.76882	18 23	41.F	36.F	39.294	-205.459	11 7	-29.F	-29.F	-544.869	13556.	33.415			
TOTAL	281.198					-1305.009					179532.				
MAX					230.317					-558.878		49.735			

REPORT- SS-Q Heat Pump Cooling Summary for AHU-3

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)		INDOOR FAN ENERGY (MBTU)
JAN	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
FEB	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAR	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
APR	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MAY	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUN	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JUL	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AUG	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SEP	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OCT	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NOV	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DEC	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ANNUAL	0.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CSPF (WITH PARASITICS) = 0.00 (KBTU/HR)

CSPF (WITHOUT PARASITICS) = 0.00 (BTU/BTU)

REPORT- SS-Q Heat Pump Heating Summary for AHU-3

WEATHER FILE- EPW Grand Prairie,AB

	UNIT RUN TIME (HOURS)	TOTAL LOAD ON UNIT (MBTU)	ENERGY IN TO UNIT (MBTU)	AUXILIARY ENERGY (MBTU)	SUP UNIT LOAD (MBTU)	SUP UNIT ENERGY (MBTU)	WASTE HEAT GENERATED (MBTU)	WASTE HEAT USE (MBTU)	DEFROST LOAD (MBTU)	INDOOR FAN ENERGY (MBTU)
JAN	227.	-211.912	319.617	0.413	0.000	0.000	0.000	0.000	0.000	16.569
FEB	187.	-174.363	264.974	0.388	0.000	0.000	0.000	0.000	0.000	14.966
MAR	164.	-153.180	237.643	0.464	0.000	0.000	0.000	0.000	0.000	16.569
APR	97.	-89.989	147.544	0.499	0.000	0.000	0.000	0.000	0.000	16.035
MAY	62.	-57.680	101.595	0.546	0.000	0.000	0.000	0.000	0.000	16.569
JUN	39.	-36.214	69.855	0.545	0.000	0.000	0.000	0.000	0.000	16.035
JUL	34.	-32.009	64.325	0.568	0.000	0.000	0.000	0.000	0.000	16.569
AUG	37.	-34.757	68.298	0.565	0.000	0.000	0.000	0.000	0.000	16.569
SEP	64.	-59.712	104.005	0.525	0.000	0.000	0.000	0.000	0.000	16.035
OCT	99.	-92.029	151.205	0.516	0.000	0.000	0.000	0.000	0.000	16.569
NOV	169.	-157.705	243.536	0.441	0.000	0.000	0.000	0.000	0.000	16.035
DEC	221.	-205.459	310.149	0.419	0.000	0.000	0.000	0.000	0.000	16.569
ANNUAL	1401.	-1305.009	2082.744	5.887	0.000	0.000	0.000	0.000	0.000	195.087

HSPF (WITH PARASITICS) = 0.66 (KBTU/HR)

HSPF (WITHOUT PARASITICS) = 0.63 (BTU/BTU)

REPORT- ERV Energy Recovery Summary for: AHU-3

WEATHER FILE- EPW Grand Prairie,AB

		AIR FLOW		PURGE		POWER CONSUMPTION							
OUTDOOR (CFM)		EXHAUST (CFM)		CFM)		OA FAN (KW)		EXH FAN (KW)		HT EXCH (KW)		PREHEAT (KBTU/HR)	
5242.		5242.		0.		0.000		0.000		0.000		0.	
MON	SUM PEAK DAY/HR	----- SENSIBLE -----		----- TOTAL -----		--- EXCESS SENSIBLE ---		-- POWER --		----- PREHEAT -----		-- HOURS --	
		HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	FANS&HX (KWH) (KW)	HOT WATER (MBTU) (KBTU/HR)	ELECTRIC (KWH) (KW)	HEAT	COOL	
JAN	SUM	-127.212	0.000	-127.212	0.000	-4.192	0.000	2858.268	0.000	0.000	744	0	
	PEAK	-297.344	0.000	-297.344	0.000	-52.798	0.000	6.139	0.000	0.000			
	DAY/HR	31/10	0/ 0	31/10	0/ 0	22/ 8	0/ 0	31/ 8	0/ 0	0/ 0			
FEB	SUM	-105.996	0.000	-105.996	0.000	-6.239	0.000	2540.514	0.000	0.000	672	0	
	PEAK	-283.433	0.000	-283.433	0.000	-53.653	0.000	6.071	0.000	0.000			
	DAY/HR	17/ 8	0/ 0	17/ 8	0/ 0	7/12	0/ 0	18/ 8	0/ 0	0/ 0			
MAR	SUM	-100.293	0.000	-100.293	0.000	-10.849	0.000	2754.308	0.000	0.000	744	0	
	PEAK	-259.029	0.000	-259.029	0.000	-66.501	0.000	6.139	0.000	0.000			
	DAY/HR	5/ 8	0/ 0	5/ 8	0/ 0	27/18	0/ 0	4/ 8	0/ 0	0/ 0			
APR	SUM	-64.455	0.000	-64.455	0.000	-25.226	0.000	2627.433	0.000	0.000	720	0	
	PEAK	-167.931	0.000	-167.931	0.000	-71.541	0.000	4.570	0.000	0.000			
	DAY/HR	2/11	0/ 0	2/11	0/ 0	17/13	0/ 0	4/ 8	0/ 0	0/ 0			
MAY	SUM	-39.453	0.144	-39.453	0.144	-28.049	0.000	2709.732	0.000	0.000	723	21	
	PEAK	-110.315	15.949	-110.315	15.949	-72.111	0.000	3.911	0.000	0.000			
	DAY/HR	6/10	17/17	6/10	17/17	28/ 9	0/ 0	5/ 8	0/ 0	0/ 0			
JUN	SUM	-24.104	0.846	-24.104	0.846	-21.661	0.000	2621.419	0.000	0.000	641	79	
	PEAK	-90.226	25.885	-90.226	25.885	-71.654	0.000	3.704	0.000	0.000			
	DAY/HR	10/ 8	1/18	10/ 8	1/18	5/ 9	0/ 0	10/ 8	0/ 0	0/ 0			
JUL	SUM	-19.134	1.008	-19.134	1.008	-18.918	0.000	2708.693	0.000	0.000	640	104	
	PEAK	-76.515	21.624	-76.515	21.624	-62.313	0.000	3.641	0.000	0.000			
	DAY/HR	19/ 6	20/19	19/ 6	20/19	16/10	0/ 0	2/17	0/ 0	0/ 0			
AUG	SUM	-21.021	1.979	-21.021	1.979	-19.314	0.000	2708.693	0.000	0.000	610	134	
	PEAK	-90.536	36.673	-90.536	36.673	-69.418	0.000	3.641	0.000	0.000			
	DAY/HR	27/21	2/15	27/21	2/15	27/18	0/ 0	21/23	0/ 0	0/ 0			

SEP	SUM	-38.535	0.260	-38.535	0.260	-29.148	0.000	2622.143	0.000	0.000	704	16
	PEAK	-124.624	46.046	-124.624	46.046	-71.087	0.000	3.965	0.000	0.000		
	DAY/HR	15/ 8	6/16	15/ 8	6/16	30/12	0/ 0	15/ 8	0/ 0	0/ 0		
OCT	SUM	-60.261	0.000	-60.261	0.000	-26.994	0.000	2713.449	0.000	0.000	744	0
	PEAK	-146.257	0.000	-146.257	0.000	-70.785	0.000	4.199	0.000	0.000		
	DAY/HR	24/ 9	0/ 0	24/ 9	0/ 0	10/10	0/ 0	24/ 8	0/ 0	0/ 0		
NOV	SUM	-96.449	0.000	-96.449	0.000	-8.908	0.000	2663.681	0.000	0.000	720	0
	PEAK	-229.944	0.000	-229.944	0.000	-70.714	0.000	6.003	0.000	0.000		
	DAY/HR	28/ 8	0/ 0	28/ 8	0/ 0	4/11	0/ 0	28/ 8	0/ 0	0/ 0		

REPORT- ERV Energy Recovery Summary for: AHU-3

WEATHER FILE- EPW Grand Prairie,AB

(CONTINUED)

DEC	SUM	-123.307	0.000	-123.307	0.000	-7.391	0.000	2896.259	0.000	0.000	744	0
	PEAK	-286.667	0.000	-286.667	0.000	-64.964	0.000	6.139	0.000	0.000		
	DAY/HR	11/10	0/ 0	11/10	0/ 0	18/15	0/ 0	4/ 8	0/ 0	0/ 0		
		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
YR	SUM	-820.221	4.237	-820.221	4.237	-206.889	0.000	32424.592	0.000	0.000	8406	354
	PEAK	-297.344	46.046	-297.344	46.046	-72.111	0.000	6.139	0.000	0.000		
	MON/DAY	1/31	9/ 6	1/31	9/ 6	5/28	0/ 0	1/31	0/ 0	0/ 0		

	---	EXHAUST	OUTLET ---	---	MAKE-UP	OUTLET ---	CONDENSATE
		WET	FROSTED		WET	FROSTED	CONTROL
	-----		-----		-----	-----	-----
ANNUAL HOURS:		0	3		0	0	3

REPORT- PV-A Plant Design Parameters

WEATHER FILE- EPW Grand Prairie,AB

*** CIRCULATION LOOPS ***

HEATING CAPACITY (MBTU/HR)	COOLING CAPACITY (MBTU/HR)	LOOP FLOW (GAL/MIN)	TOTAL HEAD (FT)	SUPPLY UA PRODUCT (BTU/HR-F)	SUPPLY LOSS DT (F)	RETURN UA PRODUCT (BTU/HR-F)	RETURN LOSS DT (F)	LOOP VOLUME (GAL)	FLUID HEAT CAPACITY (BTU/LB-F)
Domestic Hot Water Loop -0.299	0.000	2.1	6.4	0.0	0.00	0.0	0.00	3.1	1.00
Heating Loop -1.857	0.000	129.2	31.6	0.0	0.00	0.0	0.00	193.7	1.00

*** PUMPS ***

ATTACHED TO	FLOW (GAL/MIN)	HEAD (FT)	HEAD SETPOINT (FT)	CAPACITY CONTROL	POWER (KW)	MECHANICAL EFFICIENCY (FRAC)	MOTOR EFFICIENCY (FRAC)
DHW Recirc Pump Domestic Hot Water Loop PRIMARY LOOP	1 PUMP(s) 1.0	12.0	12.0	STAGED	0.007	0.770	0.400
P-1 B-1 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-2 B-2 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-5,6 Heating Loop PRIMARY LOOP	2 PUMP(s) 169.9	40.0	32.6	VFD&STAGED	2.980	0.537	0.800
P-3 B-3 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-4 B-4 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800

*** PRIMARY EQUIPMENT ***

RATED CAPACITY	FLOW	RATED EIR	RATED HIR	AUXILIARY
-------------------	------	--------------	--------------	-----------

EQUIPMENT TYPE	ATTACHED TO	(MBTU/HR)	(GAL/MIN)	(FRAC)	(FRAC)	(KW)
B-1 HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000
B-2 HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000
B-3 HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000

B-4

HW-CONDENSING	Heating Loop	-0.472	32.8	0.003	1.059	0.000		
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*** DW-HEATERS ***

EQUIPMENT TYPE	ATTACHED TO	CAPACITY (MBTU/HR)	FLOW (GAL/MIN)	EIR (FRAC)	HIR (FRAC)	AUXILIARY (KW)	TANK (GAL)	TANK UA (BTU/HR-F)
Domestic Water Heater								
GAS DW-HEATER	Domestic Hot Water Loop	-0.299	2.1	0.000	1.200	0.000	75.0	3.12

REPORT- BEPS Building Energy Performance

WEATHER FILE- EPW Grand Prairie,AB

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	375.9	0.0	195.4	7.7	485.7	0.0	44.3	259.5	0.0	0.0	0.0	13.4	1381.9
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	1619.0	0.0	0.0	0.0	0.0	0.0	0.0	230.0	0.0	1849.3
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
MBTU	375.9	0.0	195.4	1627.0	485.7	0.0	44.3	259.5	0.0	0.0	230.0	13.4	3231.2

TOTAL SITE ENERGY 3231.21 MBTU 69.8 KBTU/SQFT-YR GROSS-AREA 69.8 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 5994.98 MBTU 129.4 KBTU/SQFT-YR GROSS-AREA 129.4 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.07
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 0
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 3

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

PERIOD OF STUDY

STARTING DATE	ENDING DATE	NUMBER OF DAYS
1 JAN 2025	31 DEC 2025	365

SITE CHARACTERISTIC DATA

STATION NAME	LATITUDE (DEG)	LONGITUDE (DEG)	ALTITUDE (FT)	TIME ZONE	BUILDING AZIMUTH (DEG)
EPW Grand Prairie,AB	55.2	118.9	2200.	7 MST	0.0

WEATHER FILE- EPW Grand Prairie,AB

*** BUILDING ***

FLOOR AREA	46322	SQFT	4303	M2				
VOLUME	661404	CUFT	18731	M3				
	COOLING LOAD				HEATING LOAD			
	=====				=====			
TIME	JUL 2 3PM				FEB 17 8AM			
DRY-BULB TEMP	79	F	26	C	-34	F	-37	C
WET-BULB TEMP	58	F	14	C	-34	F	-37	C
TOT HORIZONTAL SOLAR RAD	283	BTU/H.SQFT	892	W/M2	0	BTU/H.SQFT	0	W/M2
WINDSPEED AT SPACE	5.6	KTS	2.9	M/S	6.4	KTS	3.3	M/S
CLOUD AMOUNT 0(CLEAR)-10	0				0			
	SENSIBLE		LATENT		SENSIBLE			
	(KBTU/H)	(KW)	(KBTU/H)	(KW)	(KBTU/H)	(KW)		
	-----	-----	-----	-----	-----	-----		
WALL CONDUCTION	15.645	4.584	0.000	0.000	-51.513	-15.093		
ROOF CONDUCTION	52.841	15.483	0.000	0.000	-107.553	-31.513		
WINDOW GLASS+FRM COND	16.157	4.734	0.000	0.000	-161.866	-47.427		
WINDOW GLASS SOLAR	389.705	114.184	0.000	0.000	4.651	1.363		
DOOR CONDUCTION	2.651	0.777	0.000	0.000	-6.923	-2.028		
INTERNAL SURFACE COND	0.000	0.000	0.000	0.000	0.000	0.000		
UNDERGROUND SURF COND	-13.784	-4.039	0.000	0.000	-13.784	-4.039		
OCCUPANTS TO SPACE	123.441	36.168	87.573	25.659	0.001	0.000		
LIGHT TO SPACE	108.029	31.653	0.000	0.000	6.198	1.816		
EQUIPMENT TO SPACE	58.198	17.052	0.000	0.000	3.279	0.961		
PROCESS TO SPACE	0.000	0.000	0.000	0.000	0.000	0.000		
INFILTRATION	28.496	8.349	0.000	0.000	-322.157	-94.392		
	-----	-----	-----	-----	-----	-----		
TOTAL	781.381	228.945	87.573	25.659	-649.666	-190.352		
TOTAL / AREA	0.017	0.053	0.002	0.006	-0.014	-0.044		
TOTAL LOAD	868.954	KBTU/H	254.604	KW	-649.666	KBTU/H	-190.352	KW
TOTAL LOAD / AREA	18.76	BTU/H.SOFT	59.163	W/M2	14.025	BTU/H.SOFT	44.232	W/M2

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* NOTE 1)THE ABOVE LOADS EXCLUDE OUTSIDE VENTILATION AIR *
* ---- LOADS *
* 2)TIMES GIVEN IN STANDARD TIME FOR THE LOCATION *
* IN CONSIDERATION *
* 3)THE ABOVE LOADS ARE CALCULATED ASSUMING A *
* CONSTANT INDOOR SPACE TEMPERATURE *
*
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DOE-2.2-50a 5/17/2024 10:41:14 BDL RUN 25

WEATHER FILE- EPW Grand Prairie, AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)		
PVAVS	1.080	40077.0	534.	0.208	1411.139	0.722	0.000	0.360	0.000	0.000		
FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)	
SUPPLY	55613.	1.00	38.832	2.33	2.6	0.40	0.62	DRAW-THRU	INLET	1.10	0.30	
ZONE NAME		SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
East - Therm.		16905.	0.	0.000	0.173	2917.	0.00	0.00	334.71	0.00	-181.67	1.
Center - Therm.		9624.	0.	0.000	0.229	2203.	0.00	0.00	190.55	-300.00	(BASEBOARDS)	1.
North - Therm.		7995.	0.	0.000	0.431	3444.	0.00	0.00	158.31	0.00	-232.64	1.
South - Therm.		21089.	0.	0.000	0.141	2978.	0.00	0.00	417.57	-300.00	(BASEBOARDS)	1.
										0.00	-244.03	1.
										-300.00	(BASEBOARDS)	1.

REPORT- SV-A System Design Parameters forAHU-2

WEATHER FILE- EPW Grand Prairie,AB

SYSTEM TYPE	ALTITUDE FACTOR	FLOOR AREA (SQFT)	MAX PEOPLE	OUTSIDE AIR RATIO	COOLING CAPACITY (KBTU/HR)	SENSIBLE (SHR)	HEATING CAPACITY (KBTU/HR)	COOLING EIR (BTU/BTU)	HEATING EIR (BTU/BTU)	HEAT PUMP SUPP-HEAT (KBTU/HR)	
PSZ	1.080	6245.0	83.	1.000	63.131	0.665	-372.920	0.360	0.000	0.000	
FAN TYPE	CAPACITY (CFM)	DIVERSITY FACTOR (FRAC)	POWER DEMAND (KW)	FAN DELTA-T (F)	STATIC PRESSURE (IN-WATER)	TOTAL EFF (FRAC)	MECH EFF (FRAC)	FAN PLACEMENT	FAN CONTROL	MAX FAN RATIO (FRAC)	MIN FAN RATIO (FRAC)
SUPPLY	2160.	1.00	1.508	2.33	2.6	0.40	0.62	DRAW-THRU	CONSTANT	1.10	0.30
ZONE NAME	SUPPLY FLOW (CFM)	EXHAUST FLOW (CFM)	FAN (KW)	MINIMUM FLOW (FRAC)	OUTSIDE AIR FLOW (CFM)	COOLING CAPACITY (KBTU/HR)	SENSIBLE (FRAC)	EXTRACTION RATE (KBTU/HR)	HEATING CAPACITY (KBTU/HR)	ADDITION RATE (KBTU/HR)	ZONE MULT
Gym - Therm.	2160.	0.	0.000	1.000	2160.	0.00	0.00	45.36	0.00	-381.65	1.
									-300.00	(BASEBOARDS)	

- - - - - C O O L I N G - - - - -													
- - - - - H E A T I N G - - - - -													
- - - E L E C - - -													
MONTH	COOLING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM COOLING LOAD (KBTU/HR)	HEATING ENERGY (MBTU)	TIME OF MAX DY HR	DRY- BULB TEMP	WET- BULB TEMP	MAXIMUM HEATING LOAD (KBTU/HR)	ELEC- TRICAL ENERGY (KWH)	MAXIMUM ELEC LOAD (KW)	
JAN	137.51311	31 10	-33.F	-33.F	728.479	-271.596	31 8	-33.F	-33.F	-1131.481	31971.	128.205	
FEB	110.48273	5 8	-11.F	-11.F	571.169	-202.331	5 8	-11.F	-11.F	-987.081	27919.	113.981	
MAR	104.82587	5 8	-21.F	-22.F	641.868	-155.502	5 8	-21.F	-22.F	-1067.882	29639.	119.879	
APR	98.12338	25 14	64.F	48.F	534.895	-76.381	2 8	13.F	12.F	-721.422	30087.	112.677	
MAY	105.38084	30 14	73.F	50.F	741.241	-36.141	7 8	37.F	37.F	-494.547	29612.	134.322	
JUN	131.28555	2 12	72.F	56.F	964.653	-15.421	10 8	38.F	38.F	-464.340	31624.	158.090	
JUL	153.87242	22 13	79.F	65.F	988.578	-12.840	17 8	51.F	49.F	-404.315	34148.	164.439	
AUG	143.89227	4 14	79.F	66.F	1174.571	-20.326	28 8	42.F	40.F	-452.242	32815.	186.914	
SEP	104.62911	5 15	75.F	61.F	856.602	-49.953	15 8	26.F	26.F	-519.090	29504.	146.125	
OCT	101.99684	7 14	63.F	52.F	436.695	-97.732	24 8	20.F	20.F	-647.417	30495.	103.880	
NOV	97.78635	28 8	-11.F	-11.F	570.582	-186.736	28 8	-11.F	-11.F	-996.005	26230.	113.976	
DEC	152.19940	11 9	-29.F	-29.F	704.379	-277.173	11 8	-30.F	-30.F	-1125.896	34035.	126.117	
TOTAL	1441.990					-1402.127					368073.		
MAX					1174.571					-1131.481		186.914	

REPORT- ERV Energy Recovery Summary for: AHU-1

WEATHER FILE- EPW Grand Prairie,AB

		AIR FLOW		PURGE		POWER CONSUMPTION							
OUTDOOR (CFM)		EXHAUST (CFM)		PURGE (CFM)		OA FAN (KW)		EXH FAN (KW)		HT EXCH (KW)		PREHEAT (KBTU/HR)	
11542.		11542.		0.		0.000		0.000		0.000		0.	
MON	SUM PEAK DAY/HR	----- SENSIBLE -----		----- TOTAL -----		--- EXCESS SENSIBLE ---		-- POWER --		----- PREHEAT -----		-- HOURS --	
		HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	FANS&HX (KWH) (KW)	HOT WATER (MBTU) (KBTU/HR)	ELECTRIC (KWH) (KW)	HEAT	COOL	
JAN	SUM	-129.777	0.000	-140.519	0.000	-121.288	0.000	391.333	0.000	0.000	0.000	336	0
	PEAK	-630.522	0.000	-667.886	0.000	-630.522	0.000	1.264	0.000	0.000	0.000		
	DAY/HR	31/10	0/ 0	31/11	0/ 0	31/10	0/ 0	23/15	0/ 0	0/ 0	0/ 0		
FEB	SUM	-102.453	0.000	-111.737	0.000	-96.977	0.000	344.474	0.000	0.000	0.000	304	0
	PEAK	-486.822	0.000	-522.029	0.000	-486.822	0.000	1.269	0.000	0.000	0.000		
	DAY/HR	18/10	0/ 0	18/10	0/ 0	18/10	0/ 0	21/15	0/ 0	0/ 0	0/ 0		
MAR	SUM	-102.012	0.000	-112.457	0.000	-92.313	0.000	358.524	0.000	0.000	0.000	336	0
	PEAK	-546.656	0.000	-568.923	0.000	-546.656	0.000	1.297	0.000	0.000	0.000		
	DAY/HR	5/ 8	0/ 0	3/11	0/ 0	5/ 8	0/ 0	4/14	0/ 0	0/ 0	0/ 0		
APR	SUM	-72.127	0.000	-81.714	0.000	-69.533	0.000	354.101	0.000	0.000	0.000	352	0
	PEAK	-354.727	0.000	-403.107	0.000	-354.728	0.000	1.283	0.000	0.000	0.000		
	DAY/HR	2/11	0/ 0	2/11	0/ 0	2/11	0/ 0	25/14	0/ 0	0/ 0	0/ 0		
MAY	SUM	-40.780	0.001	-48.890	0.000	-40.477	0.000	320.869	0.000	0.000	0.000	335	1
	PEAK	-236.229	1.300	-270.223	0.000	-236.229	0.000	1.444	0.000	0.000	0.000		
	DAY/HR	6/10	30/18	6/12	0/ 0	6/10	0/ 0	30/14	0/ 0	0/ 0	0/ 0		
JUN	SUM	-27.952	0.616	-34.722	0.131	-27.902	0.000	321.683	0.000	0.000	0.000	305	31
	PEAK	-236.443	53.114	-254.250	22.820	-236.443	0.000	1.828	0.000	0.000	0.000		
	DAY/HR	23/ 7	25/17	23/ 7	24/20	23/ 7	0/ 0	2/12	0/ 0	0/ 0	0/ 0		
JUL	SUM	-21.965	0.456	-25.571	1.299	-21.965	0.000	333.956	0.000	0.000	0.000	324	28
	PEAK	-198.973	40.450	-225.191	100.274	-198.973	0.000	1.543	0.000	0.000	0.000		
	DAY/HR	28/ 7	22/16	28/ 7	22/14	28/ 7	0/ 0	2/15	0/ 0	0/ 0	0/ 0		
AUG	SUM	-24.188	0.973	-28.071	3.270	-24.176	0.000	322.017	0.000	0.000	0.000	298	38
	PEAK	-213.529	63.679	-293.851	135.013	-213.529	0.000	1.849	0.000	0.000	0.000		
	DAY/HR	11/ 7	1/15	11/ 7	4/19	11/ 7	0/ 0	4/15	0/ 0	0/ 0	0/ 0		

SEP	SUM	-42.432	0.012	-49.241	0.082	-42.207	0.000	327.969	0.000	0.000	333	3
	PEAK	-266.061	5.871	-294.548	28.165	-266.061	0.000	1.420	0.000	0.000		
	DAY/HR	15/ 8	5/17	15/ 7	5/18	15/ 8	0/ 0	5/15	0/ 0	0/ 0		
OCT	SUM	-67.570	0.000	-77.020	0.000	-66.829	0.000	376.029	0.000	0.000	352	0
	PEAK	-311.392	0.000	-343.056	0.000	-311.392	0.000	1.222	0.000	0.000		
	DAY/HR	24/ 9	0/ 0	24/10	0/ 0	24/ 9	0/ 0	1/ 7	0/ 0	0/ 0		
NOV	SUM	-86.440	0.000	-95.100	0.000	-82.636	0.000	329.202	0.000	0.000	288	0
	PEAK	-486.529	0.000	-508.964	0.000	-486.529	0.000	1.249	0.000	0.000		
	DAY/HR	28/ 8	0/ 0	28/10	0/ 0	28/ 8	0/ 0	3/14	0/ 0	0/ 0		

REPORT- ERV Energy Recovery Summary for:AHU-1

WEATHER FILE- EPW Grand Prairie,AB

(CONTINUED)

DEC	SUM	-136.336	0.000	-147.012	0.000	-131.190	0.000	412.351	0.000	0.000	352	0
	PEAK	-606.786	0.000	-648.315	0.000	-606.786	0.000	1.222	0.000	0.000		
	DAY/HR	11/10	0/ 0	11/12	0/ 0	11/10	0/ 0	1/ 7	0/ 0	0/ 0		
		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
YR	SUM	-854.032	2.058	-952.054	4.782	-817.493	0.000	4192.508	0.000	0.000	3915	101
	PEAK	-630.522	63.679	-667.886	135.013	-630.522	0.000	1.849	0.000	0.000		
	MON/DAY	1/31	8/ 1	1/31	8/ 4	1/31	0/ 0	8/ 4	0/ 0	0/ 0		

	---	EXHAUST	OUTLET	---	---	MAKE-UP	OUTLET	---	CONDENSATE
		WET	FROSTED			WET	FROSTED		CONTROL
	-----			-----	-----			-----	
ANNUAL HOURS:		0	0		0	0	0		0

WEATHER FILE- EPW Grand Prairie, AB

REPORT- ERV Energy Recovery Summary for: AHU-2

WEATHER FILE- EPW Grand Prairie,AB

		AIR FLOW		PURGE		POWER CONSUMPTION									
OUTDOOR (CFM)		EXHAUST (CFM)		CFM)		OA FAN (KW)		EXH FAN (KW)		HT EXCH (KW)		PREHEAT (KBTU/HR)			
2160.		2160.		0.		0.000		0.000		0.000		0.			
MON	SUM	SENSIBLE		TOTAL		EXCESS		SENSIBLE		POWER		PREHEAT		HOURS	
		HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	HEATING (MBTU) (KBTU/HR)	COOLING (MBTU) (KBTU/HR)	FANS&HX (KWH) (KW)	HOT WATER (MBTU) (KBTU/HR)	ELECTRIC (KWH) (KW)	HEAT	COOL			
JAN	SUM	-25.922	0.000	-29.613	0.000	-0.180	0.000	35.493	0.000	0.000	0.000	336	0		
	PEAK	-125.580	0.000	-133.243	0.000	-10.528	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	31/10	0/ 0	31/10	0/ 0	22/16	0/ 0	2/ 7	0/ 0	0/ 0	0/ 0				
FEB	SUM	-20.437	0.000	-19.913	0.000	-0.440	0.000	32.112	0.000	0.000	0.000	304	0		
	PEAK	-97.436	0.000	-101.245	0.000	-11.812	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	18/10	0/ 0	18/10	0/ 0	25/16	0/ 0	3/ 7	0/ 0	0/ 0	0/ 0				
MAR	SUM	-20.212	0.000	-19.383	0.000	-1.007	0.000	35.493	0.000	0.000	0.000	336	0		
	PEAK	-108.949	0.000	-115.271	0.000	-21.282	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	4/ 9	0/ 0	4/ 9	0/ 0	27/16	0/ 0	3/ 7	0/ 0	0/ 0	0/ 0				
APR	SUM	-14.460	0.000	-12.874	0.000	-4.375	0.000	37.183	0.000	0.000	0.000	352	0		
	PEAK	-71.391	0.000	-74.222	0.000	-33.241	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	2/11	0/ 0	2/11	0/ 0	25/22	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0				
MAY	SUM	-8.838	0.000	-8.518	0.000	-6.500	0.000	35.493	0.000	0.000	0.000	336	0		
	PEAK	-47.517	0.000	-47.406	0.000	-31.123	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	6/10	0/ 0	6/ 9	0/ 0	9/17	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0				
JUN	SUM	-6.808	0.000	-5.471	0.064	-5.860	0.000	35.493	0.000	0.000	0.000	336	0		
	PEAK	-37.980	0.000	-40.072	8.475	-36.802	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	9/22	0/ 0	20/22	20/12	2/17	0/ 0	2/ 7	0/ 0	0/ 0	0/ 0				
JUL	SUM	-6.019	0.000	-5.189	0.182	-5.964	0.000	37.183	0.000	0.000	0.000	352	0		
	PEAK	-29.061	0.000	-36.359	17.459	-29.061	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	16/16	0/ 0	28/22	22/13	16/16	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0				
AUG	SUM	-6.310	0.000	-6.154	0.335	-5.849	0.000	35.493	0.000	0.000	0.000	336	0		
	PEAK	-39.472	0.000	-49.616	18.262	-30.822	0.000	0.106	0.000	0.000	0.000				
	DAY/HR	27/21	0/ 0	27/21	1/13	19/20	0/ 0	1/ 7	0/ 0	0/ 0	0/ 0				

SEP	SUM	-9.000	0.000	-8.315	0.050	-6.310	0.000	35.493	0.000	0.000	336	0
	PEAK	-52.065	0.000	-64.628	11.472	-32.117	0.000	0.106	0.000	0.000		
	DAY/HR	15/ 9	0/ 0	15/ 8	5/15	15/21	0/ 0	2/ 7	0/ 0	0/ 0		
OCT	SUM	-13.627	0.000	-14.085	0.000	-4.061	0.000	37.183	0.000	0.000	352	0
	PEAK	-62.753	0.000	-73.423	0.000	-29.351	0.000	0.106	0.000	0.000		
	DAY/HR	24/ 9	0/ 0	15/ 9	0/ 0	1/18	0/ 0	1/ 7	0/ 0	0/ 0		
NOV	SUM	-17.286	0.000	-17.964	0.000	-1.043	0.000	30.422	0.000	0.000	288	0
	PEAK	-97.214	0.000	-103.107	0.000	-27.580	0.000	0.106	0.000	0.000		
	DAY/HR	28/ 9	0/ 0	28/ 9	0/ 0	4/16	0/ 0	3/ 7	0/ 0	0/ 0		

REPORT- ERV Energy Recovery Summary for: AHU-2 WEATHER FILE- EPW Grand Prairie,AB
----- (CONTINUED) -----

DEC	SUM	-27.241	0.000	-26.918	0.000	-0.634	0.000	37.183	0.000	0.000	352	0
	PEAK	-121.054	0.000	-125.950	0.000	-18.326	0.000	0.106	0.000	0.000		
	DAY/HR	11/10	0/ 0	11/10	0/ 0	18/16	0/ 0	1/ 7	0/ 0	0/ 0		
		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
YR	SUM	-176.160	0.000	-174.397	0.631	-42.223	0.000	424.221	0.000	0.000	4016	0
	PEAK	-125.580	0.000	-133.243	18.262	-36.802	0.000	0.106	0.000	0.000		
	MON/DAY	1/31	0/ 0	1/31	8/ 1	6/ 2	0/ 0	1/ 2	0/ 0	0/ 0		

	---	EXHAUST	OUTLET ---	---	MAKE-UP	OUTLET ---	CONDENSATE
		WET	FROSTED		WET	FROSTED	CONTROL
	-----			-----			-----
ANNUAL HOURS:		0	4		0	0	4

REPORT- PV-A Plant Design Parameters

WEATHER FILE- EPW Grand Prairie,AB

*** CIRCULATION LOOPS ***

HEATING CAPACITY (MBTU/HR)	COOLING CAPACITY (MBTU/HR)	LOOP FLOW (GAL/MIN)	TOTAL HEAD (FT)	SUPPLY UA PRODUCT (BTU/HR-F)	SUPPLY LOSS DT (F)	RETURN UA PRODUCT (BTU/HR-F)	RETURN LOSS DT (F)	LOOP VOLUME (GAL)	FLUID HEAT CAPACITY (BTU/LB-F)
Domestic Hot Water Loop -0.299	0.000	2.1	6.4	0.0	0.00	0.0	0.00	3.1	1.00
Heating Loop -1.869	0.000	130.0	31.6	0.0	0.00	0.0	0.00	194.9	1.00

*** PUMPS ***

ATTACHED TO	FLOW (GAL/MIN)	HEAD (FT)	HEAD SETPOINT (FT)	CAPACITY CONTROL	POWER (KW)	MECHANICAL EFFICIENCY (FRAC)	MOTOR EFFICIENCY (FRAC)
DHW Recirc Pump Domestic Hot Water Loop PRIMARY LOOP	1 PUMP(s) 1.0	12.0	12.0	STAGED	0.007	0.770	0.400
P-1 B-1 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-2 B-2 HOT WATER (RUN-AROUND)	1 PUMP(s) 84.9	15.0	0.0	ONE-SPEED	0.750	0.400	0.800
P-3,4 Heating Loop PRIMARY LOOP	2 PUMP(s) 169.9	40.0	32.6	VFD&STAGED	2.980	0.537	0.800

*** PRIMARY EQUIPMENT ***

EQUIPMENT TYPE	ATTACHED TO	RATED CAPACITY (MBTU/HR)	FLOW (GAL/MIN)	RATED EIR (FRAC)	RATED HIR (FRAC)	AUXILIARY (KW)
B-1 HW-CONDENSING	Heating Loop	-0.932	65.0	0.003	1.059	0.000
B-2 HW-CONDENSING	Heating Loop	-0.932	65.0	0.003	1.059	0.000

*** DW-HEATERS ***

EQUIPMENT TYPE	ATTACHED TO	CAPACITY (MBTU/HR)	FLOW (GAL/MIN)	EIR (FRAC)	HIR (FRAC)	AUXILIARY (KW)	TANK (GAL)	TANK UA (BTU/HR-F)
Domestic Water Heater								
GAS DW-HEATER	Domestic Hot Water Loop	-0.299	2.1	0.000	1.200	0.000	75.0	3.12