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Solving Electrification Challenges with Applied Products

Charlie Jelen | Sustainable Systems Sales Leader

May, 2025

WAVES of INNOVATION TOGETHER WE RISE





Special Thanks to our Sponsors:





Presenter





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Charlie Jelen Sustainable Systems Sales Leader Trane®



Electrification Challenges

De-risk | Move Faster







DEFROST CONSIDERATIONS



LOW AMBIENT OPERATIONS

Low Carbon Design: Operational and Construction (Embodied)

CLIENT NAME	PRO
evolution Projects	5-St
	34,1
LOCATION	182
Seattle, WA	103
	4,70
SERVICES	
Architecture	COI
Core & Shell Interior Design	Q4 2



OGRAM OVERVIEW

tory Office Building 63 SF Site

.000 GSF

,000 SF Office 00 SF Retail/Restaurant

MPLETION DATE

2024

CONTACTS Kristen Scott Principal in Charge

CERTIFICATIONS

Pursuing Living Building

Challenge Petal Certification

(Materials, Place and Beauty)

Bernadette Kelly Interior Design Principal

NAIOP COMMERCIAL REAL ESTATE DEVELOPMENT ASSOCIATION

WASHINGTON STATE CHAPTER

2024 NAIOP AWARDS

NOVEMBER 4, 2024

FINALISTS

SUSTAINABLE DEVELOPMENT OF THE YEAR















Low Carbon Design: Operational and Construction (Embodied)





5.31 ft H2O

3.23 ft H2O

Pressure Drop Evap.

Pressure Drop at Min Flow



8







ASHP R-1

SPARTNFI

35th Anniversary



	Chiller Performance Information							
	Cooling Mode Capacity	166.50 tons	Cooling Mode Entering To	emperature	54.00 F			
	Cooling Mode Efficiency	1.126 kW/ton	Cooling Mode Leaving To	emperature	42.00 F			
	IPLV or Application IPLV or NPLV	16.812 EER (Btu/W-h)	Cooling Mode D	esign Flow	331.82 gpm			
	Cooling Mode Total Power	182.67 kW	Heat Exchanger	Head Loss	9.46 ft H2O			
	Ambient Dry Bulb Temperature	85.00 F	Strainer	Head Loss	0.70 ft H2O			
	-∞-∞ -∞∞		VP	PF Min Flow	255.27 gpm		BP R-2	6"
	Heating Performance Information				, , , , , , , , , , , , , , , , , , ,		h/	
	Heating Mode Capacity	1442.61 MBh	Heating Mode Entering T	emperature	106.51 F		4"	
	Heating Mode Efficiency	2.09 COP (kW/kW)	Heating Mode Leaving T	emperature	120.00 F			
	Heating Mode Total Power	202.18 kW	Cooling Mode D	Design Flow	216.00 gpm			
	Ambient Dry Bulb Temperature	24.00 F	Heating Mode D	Design Flow	3.70 ft H2O		R-2	
	Ambient Wet Bulb Temperature	20.00 F	Heat Exchanger	Head Loss	3.70 ft H2O			
			Strainer	r Head Loss	0.05 ft H2O		30 GPM	
	AS R-1 R-1 R-1		R-2				2	
			Ambient Air	СОР				
			24 2.	1	E E	Rule of		
			30 2.	4	Thu	mb: 2.0% /		
2			35 2.	5			7	
GE			47 2.	9			10	

Low Carbon Design: Operational and Construction (Embodied)





EXCHANGE 35th Anniversary





Alternative Approaches



Air-Source Heat Pump Heat Recovery Combined **SPARTNI**

Thermafit® AXM Air-to-Water Heat Pump

- Capacity range 30 tons cooling
- 390 MBh heating
- 2-12 mod/bank
- Drain pan

Thermafit® MWC Modular Heat Recovery

- Capacity range 15-80 tons cooling
- 200-1100 MBh heating
- Max of 12 modules per bank

Thermafit® MAS Air-source Multi-pipe Unit

- Capacity range 30 tons cooling
- 390 MBh heating
- Expandable up to 10 modules
- Simultaneous operation



Install Scheduled for March 2025







Reduce Carbon / Lower Costs

TRANE

Fuel Source	Cost [WI]
Electricity	\$0.125/kWh
Natural Gas	\$1.1/Therm
Propane	\$1.20/Gal



$Spark Spread = \frac{Cost of Electricity}{Cost of Fuel} = \frac{Efficiency Incrase}{to Breakeven}$







Reduce Carbon / Lower Costs







Reduce Carbon / Lower Costs

\$250,000 in annual savings





Alternative Approaches







Series R[®] RTWD Heater / Heat Recovery

Capacity range 80 to 250 tons

CenTraVac[®] ECTV Heat Recovery

- Capacity range 800 to 2000 tons cooling
- 6-pipe heat recovery
 - Separate bundles within the same condenser shell

Operating	Limitations	Operating Limitations			
Chilled Water	10 to 65F	Chilled Water	36 to 65F		
Hot Water	60 to 165F	Hot Water	60 to 140F		
Max lift	100F-120F	Max lift 80F			

Project: McKnight Foundation

Cold Climate Electrification

- 50,000 SqFt Office Building
- Electrification Driver
- 10 Year Extreme Low = -25F
- Energy Efficient
 - (i.e. no electric resistance)

Startup = December 2024





Project: McKnight Foundation



Cold Climate Electrification







Project: McKnight Foundation



Cold Climate Electrification





Morning Warmup Heating Mode RTWD Heating, No ACX Operation



—Ice Inventory% —OA Temperature °F







5 4.5 4

25 20 3.5 $\mathbf{\Sigma}$ 3 Temperature 15 COP 2.5 10 2 1.5 5 (°F) 0 0.5 0 -5 12/11/2024 0:00 12/14/2024 0:00 12/12/2024 0:00 12/13/2024 0:00 Date/Time ••• Heating COP-Daily ••• Combined COP- Daily - OA Temperature °F **SPARTNER**

Daily System Efficiency



30



Thank you!

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BREAKOUT WORKSHOPS







SPARTNER SEXCHANGE 35th Anniversary

WAVES of INNOVATION TOGETHER WE RISE

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