



Kenneth W. Wire
kwire@wiregill.com
703-677-3129

June 5, 2023

VIA EMAIL TO karl.moritz@alexandriava.gov

Chairman Macek and Members of the Planning Commission
301 King Street, Suite 2100
Alexandria, VA 22314

RE: Docket Item 9, Development Special Use Permit #2022-10021
The Rutherford: 5050 Seminary Road (formerly 5000 Seminary Road)

Dear Chairman Macek and Members of the Planning Commission:

On behalf of my client, Mark Center Residential LLC (the "Applicant") I am requesting your support for the following changes to the Staff-recommended Sustainability Condition #37 for DSUP #2022-10027. The Staff recommended condition requiring all electric systems is not part of the City's current 2019 Green Building Policy; however, the Applicant request's the Planning Commission's support for the following amendments to Condition #37. The Applicant's proposal will emit less greenhouse gas emissions, 35 mtCOe2 per year in the first year and 200 mtCOe2 in 25 years, compared to the Staff-supported condition. Please see enclosed supporting documentation. The proposed condition will also enable the Applicant and the City to evaluate carbon emissions as systems are replaced overtime.

Condition 37.

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I look forward to discussing this application and the above requested changes with you at the Planning Commission hearing.

Sincerely,

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Kenneth W. Wire

The Rutherford – Sustainability Discussion Follow up

5-30-23

Per our discussion last week and per your request, please find the following attached documents:

1. SSA Engineering description of the building mechanical systems dated May 26, 2023.
2. Sustainable Building Partners Report summarizing the comprehensive study they conducted which evaluated the impact of various DOAS design schemes dated May 26, 2023.

The Report identified the following limitations when comparing a fully-electric DOAS system (with electric auxiliary) with an electric heat pump DOAS system with a gas auxiliary as back-up below 40 degrees Fahrenheit. Note, the auxiliary gas heating is estimated to operate during 35% of the total heating hours but only serve as the predominant heat source for 5% of those hours (see appendix).

Limitations to Full Electrification:

- **Short and Long-term Greenhouse Gas Emissions:**
 - 10% increase in day 1 emissions
 - 3% increase in 25-year cumulative emissions
 - **Added electric load: >0.5MW (and one added Transformer)**
 - **Increased demand (peak heating month): 300-500 KW**
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Date: May 26, 2023

Project: The Rutherford Apartments at Mark Center

Re: BUILDING MECHANICAL SYSTEMS

1.1 Apartment and Amenity Area Air Conditioning and Heating:

- A. All dwelling units shall be conditioned by single zone split system electric heat pump units. As a minimum, all air conditioning units shall have a minimum rating of 14.3 SEER2 or better. These heat pumps systems shall be split-DX complete with DX evaporator, supply air fan, throwaway filter, auxiliary electric heater for heating when the heat pump isn't available due to ambient air temperatures and have roof mounted condensers and condenser fans.
- B. Office/leasing areas, lobbies and associated common restrooms shall be conditioned by single zone heat pump, split system air conditioning units with auxiliary electric heat.

1.2 Common Area Heating, Ventilation and Air Conditioning:

- A. Trash compactor rooms shall be mechanically ventilated at the minimum rate of three air changes per hour. A roof exhaust fan shall operate continuously. Make up air will be provided through a wall louver.
- B. Loading areas shall be mechanically ventilated at the rate of three air changes per hour. An exhaust fan shall operate continuously. Make up air will be provided through a wall louver.
- C. Stairwells with fire sprinkler risers shall be heated at the lower level and at each outside door with a 3.0 kW electric wall heater.
- D. Elevator machine rooms shall be conditioned by electric rooftop cooling only units.

1.3 Ventilation:

- A. The dwelling units and corridors will have dedicated ducted outside air provided by rooftop Dedicated Outside Air Systems (DOAS). These DOAS Systems shall be electric heat pumps complete with DX evaporator, auxiliary natural gas heat for heating when the heat pump isn't available due to ambient air temperatures, supply air fan(s), filters, with integral condensers and condenser fans. Outside air provided by these DOAS units will ventilate and pressurize the building. Outside air ventilation rates for outdoor air intake flow rates for all rooms and occupied spaces will be designed to meet ASHRAE 62.1 or 62.2 as a minimum.
- B. Exhaust airflow rate for occupied spaces will be designed according to ASHRAE 62.1 or 62.2. Dwelling unit bathroom fans will be controlled via a light switch. Dwelling units will have kitchen exhaust fans ducted to the exterior for kitchen area ventilation.



Date: May 26th, 2023

Project: The Rutherford at Mark Center (Alexandria, VA)

Purpose: DOAS Electrification Study

Operational Performance

Sustainable Building Partners (SBP) has conducted a comprehensive electrification study that evaluates the impact of various DOAS design schemes. The team is currently positioning for a heat pump unit with a gas-fired auxiliary system as it best fits the projects short- and long-term goals but the team is actively evaluating potential alternates to better understand the environmental impacts.

Table 1: DOAS Alternates – Annual Energy Performance ⁽¹⁾

Design Scheme	Description	All Electric?	Annual Energy Cost ⁽²⁾ (\$/gsf-yr)	Energy Use Intensity (kBtu/gsf-yr)		Greenhouse Gas Emission ⁽³⁾ (mtCO2e/yr)	
				Site	Source	Year 1	25-Year Total
Current Design	Electric Heat Pump + Gas-Fired Auxiliary ⁽⁴⁾	No	\$0.19	8.8	21.5	330	6,730
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Alternate 3	Electric-Resistance	Yes	\$0.38	13.7	42.7	615	11,700

(1) Actual performance may vary based on a multitude of factors that cannot be accurately predicted at this point. Current projections are estimated based on the current design information, 'typical' operating schedules, average weather conditions, and ideal operating procedures.
(2) Operational cost is based on 2022 EIA average annual commercial electric rates - [\\$0.0955/kWh](#) & an extrapolation of the 2021 EIA average commercial gas rates - [\\$1.04/therm](#).
 • Current rates tend to favor high efficiency gas-fired systems on a dollar per unit-energy basis
(3) Emissions estimates are based on the [NREL Cambium](#) data which includes 25-year of emissions forecasting for various scenarios of renewable energy adoption rates.
(4) Please refer to *Appendix – Heat Pump Auxiliary* for additional context on how the auxiliary system will be able to operate.



Limitations to Full Electrification

The primary limiting factors of full DOAS electrification (electric auxiliary) have been defined below. The project team is still evaluating the feasibility of overcoming these challenges and is working to find a balance between the project's design performance goals and the electrification initiatives.

Electric Infrastructure

- Added electric load: **≥0.5 MW**
- Additional transformers: **1**

Electric Demand

- Increased demand (peak heating month): **300 - 500 kW**
- Added strain on regional grid capacity
- Potential to elevate electric rate structure

Operating Cost

- Increased demand charges
- Increased energy charges

Short- & Long-term Emissions

- 10% increase in day 1 emissions
- 3% increase in 25-year cumulative emissions



Appendix - Heat Pump Auxiliary

The heat pump system will require an auxiliary system to supplement the heat pump coil during low ambient temperatures. The auxiliary heating will be available at temperatures below 40°F, but will only provide partial heating until the heat pump compressor fully locks out. The DOAS specifications are not yet defined but it is assumed that the heat pump compressor will lock out between 0°F and 10°F and will serve as the predominant heat source (>50%) until temperatures dip below 15-20°F. Table 1 summarizes the estimated heat pump auxiliary operation based on actual 2021 weather data. The auxiliary heating is estimated to operate during 35% of the total heating hours but only serve as the predominant heat source for 5% of those hours.

Table 1: Estimated Heat Pump Auxiliary Operation (based on 2021 weather data)

Month	Avg OA Temp (°F)	Total Heating Hours	Hours with Auxiliary Heat (<40°F)	Total Hours >50% Auxiliary Heat
Jan	34	744	624	65
Feb	34	672	553	142
Mar	47	723	221	45
Apr	55	627	63	7
May	63	460	0	0
Jun	75	134	0	0
Jul	81	0	0	0
Aug	80	0	0	0
Sep	72	217	0	0
Oct	65	466	0	0
Nov	45	709	238	11
Dec	44	744	265	29
Total	--	5,496	1,964 (35%)	299 (5%)

Figure 1 shows a fully annual operating profile of the auxiliary heating system based on 2021 weather data. The primary Y-axis shows the percentage of total heating capacity provided by each heating systems and the secondary Y-axis shows the average temperature for that same period.

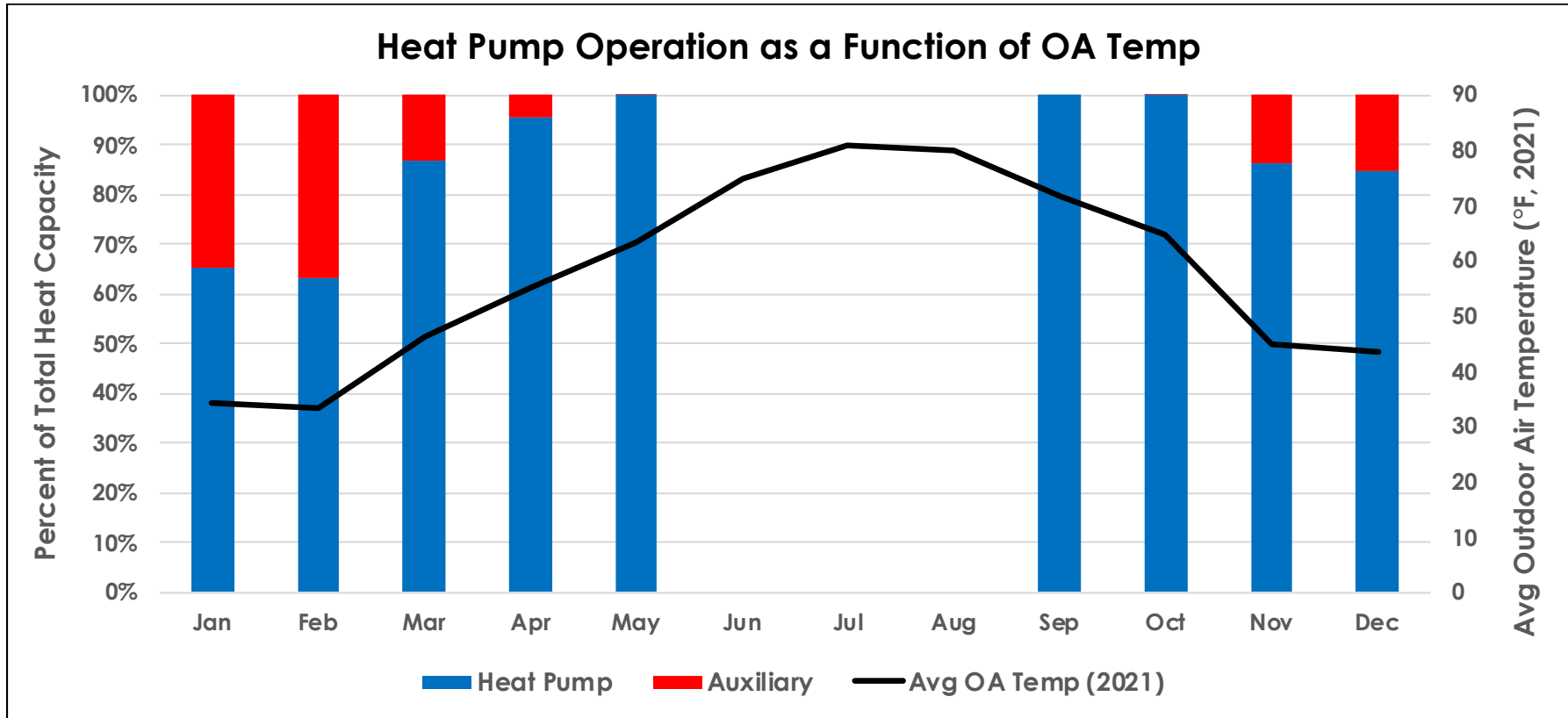


Figure 1: Heat Pump Auxiliary

Samantha Lockwood

From: Margaret O. Cooper
Sent: Tuesday, June 6, 2023 2:28 PM
To: Samantha Lockwood
Cc: Maya Contreras
Subject: FW: Docket Item #9, Letter to Planning Commission
Attachments: Ltr to PC Re Rutherford, 3.pdf

Hi Samantha,
Just got another updated version of the edited letter re: the Rutherford.

Thanks!
Maggie

From: Megan Rappolt <mrappolt@wiregill.com>
Sent: Tuesday, June 6, 2023 2:21 PM
To: Karl Moritz <Karl.Moritz@alexandriava.gov>
Cc: Ken Wire <kwire@wiregill.com>; Maya Contreras <Maya.Contreras@alexandriava.gov>; Margaret O. Cooper <Margaret.Cooper@alexandriava.gov>; Robert Kerns <robert.kerns@alexandriava.gov>; bkrokowski@requityrealestate.com; Tom Glatzel <tglatzel@wmhdevelopment.com>
Subject: RE: Docket Item #9, Letter to Planning Commission

Hello Karl,
We caught one more error in our condition regarding the "one in each courtyard" parenthetical; please see revised letter.
Thanks,

Megan C. Rappolt, AICP
Associate Attorney
Wire Gill LLP

C: (703) 362-5232

This email from Wire Gill may contain confidential or privileged information. If you are not the intended recipient, please advise by return email and delete immediately without reading or forwarding to others.

From: Megan Rappolt
Sent: Tuesday, June 6, 2023 11:32 AM
To: Karl Moritz <Karl.Moritz@alexandriava.gov>
Cc: Ken Wire <kwire@wiregill.com>; Maya Contreras <Maya.Contreras@alexandriava.gov>; Margaret O. Cooper <Margaret.Cooper@alexandriava.gov>; Robert Kerns <robert.kerns@alexandriava.gov>; bkrokowski@requityrealestate.com; Tom Glatzel <tglatzel@wmhdevelopment.com>
Subject: RE: Docket Item #9, Letter to Planning Commission

Hello Karl,
I made two minor edits on the letter: 1) corrected new address (5050 Mark Center Drive) and 2) continued underline of proposed text to include the last sentence of the condition.
Thanks,

Megan C. Rappolt, AICP

Associate Attorney

Wire Gill LLP

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Cc: Ken Wire <kwire@wiregill.com>; Maya Contreras <Maya.Contreras@alexandriava.gov>; Margaret O. Cooper <Margaret.Cooper@alexandriava.gov>; Robert Kerns <robert.kerns@alexandriava.gov>

Subject: Docket Item #9, Letter to Planning Commission

Hello Karl,

Please see attached letter regarding The Rutherford for distribution to the Planning Commission.

Thank you,

Megan C. Rappolt, AICP

Associate Attorney

Wire Gill LLP

700 Fairfax Street, Suite 600

Alexandria, VA 22314

C: (703) 362-5232

mrappolt@wiregill.com, www.wiregill.com

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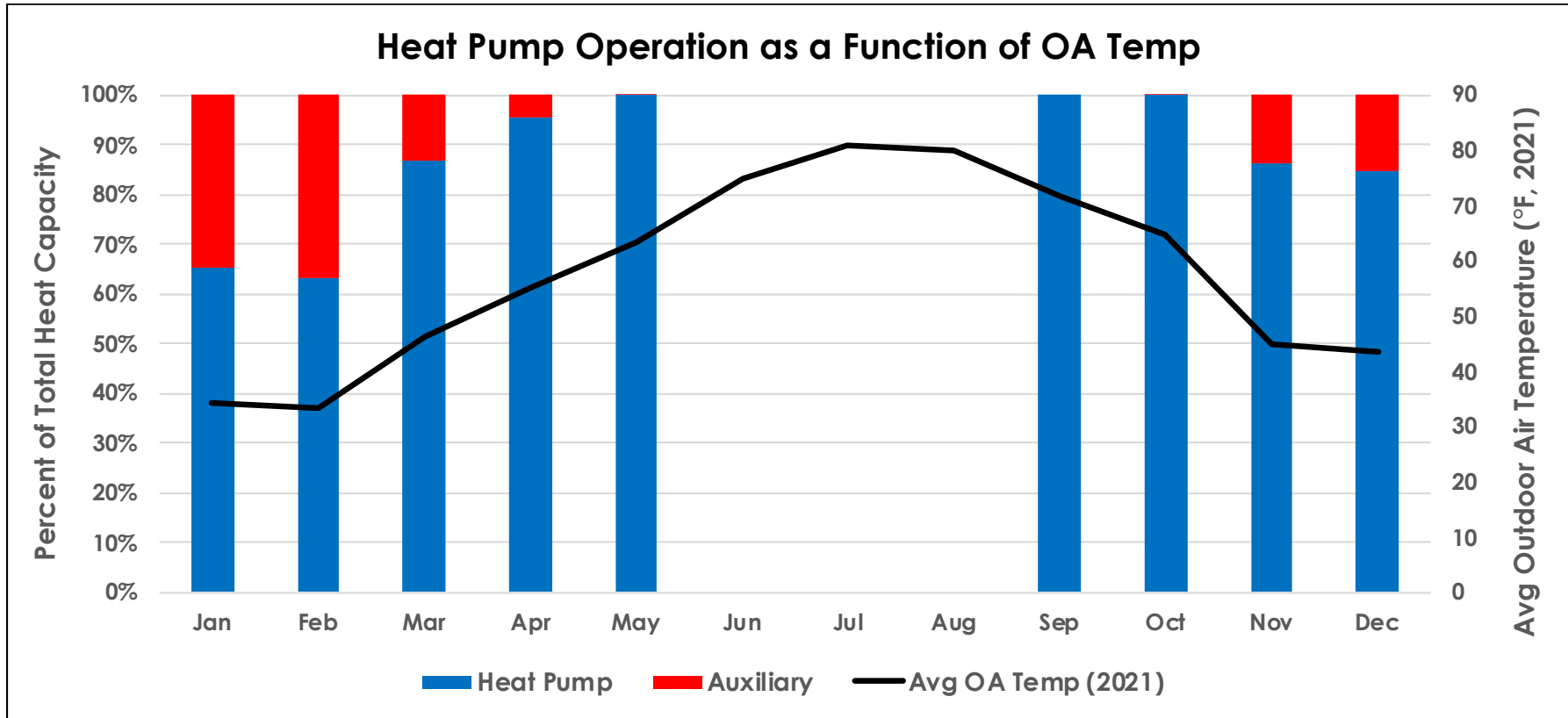


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