VAV Review
Summary Report

DEPARTMENT OF GENERAL SERVICES

301 West Preston Street, Rm. 104, Baltimore MD, 21201

La Plata, Barracks H

9500 Mitchell Road, La Plata MD, 20646

Date Submitted:

April 3, 2023

Prepared by:

Global Facility Solutions, LLC

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1. SUMMARY OF VAV REVIEW PLAN

1.1. Summary of General Building Info and Goal of VAV Review Plan

The La Plata Police Barrack H building is a state-owned facility located in La Plata, Maryland. It was originally constructed around the year 2000 and has a total square footage of approximately 12,000 square feet. The building is primarily used as a police barracks and administrative office for the Maryland State Police. As part of the Maryland Department of General Services (DGS) renovation effort for the building, they have requested a review of the VAV (Variable Air Volume) terminal units. The VAV terminal units are a critical component of the building's HVAC system and play a significant role in maintaining zone temperature control for the building.

The review of the VAV terminal units will include a functional performance testing (FPT) of the units to evaluate if they are operating as originally intended and to assess their current condition. The testing will also help to identify any issues or inefficiencies in the system that may be impacting the building's energy efficiency or occupant comfort. Overall, the DGS renovation effort for the La Plata Police Barrack H building is intended to improve the functionality, energy efficiency, and occupant comfort of the facility, while also assess the remaining useful life of the VAVs.

1.2. VAV FPT Review Plan

Functional testing is an essential process for evaluating the existing condition of the VAVs. The VAV review plan for functional testing of the twenty-one (21), VAV terminal units with hydronic heating included the following steps:

1. Review the design and operating documentation of the VAV terminal units with hydronic heating.
2. Establish benchmarks for room space setpoint temperature, discharge air temperature, control valve actuation, damper actuation, and t-stat calibration.
3. Inspect components of VAV terminal units with hydronic heating, including the control valves, dampers, t-stats, and other sensors, to ensure they are functioning correctly.
4. Verify the calibration of the t-stats by comparing their readings to a reference thermometer. If necessary, adjust the t-stats to ensure they are accurate. Take and record space CO2 parts per million (PPM) readings with handheld meter.
5. Verify that the valve is opening and closing based on the control signal from the building automation system (BAS) if applicable or local thermostat.
6. Verify that the damper actuator is opening and closing based on the control signal from the BAS if applicable or local thermostat.

7. Test the room space setpoint temperature by setting the t-stats to a specific temperature and verifying that the VAV terminal units are maintaining that temperature.

8. Test the discharge air temperature by measuring the air temperature at the VAV terminal unit discharge and verifying that it is within the specified range.

9. Record the findings and deficiencies from the functional testing and summarize recommendations for DGS to evaluate.

2. INVOLVED PARTIES AND RESPONSIBILITIES

2.1. Owner:

Department of General Services
301 West Preston Street, Rm. 104
Baltimore MD, 21201

- Rob Andalora, Project Manager

2.2. State Police Facilities:

La Plata, State Police Facilities Team
9500 Mitchell Road
La Plata, MD

- Alan A. Rodriguez, State Police Facilities

2.3. RCx Agent:

Global Facility Solutions LLC
6310 Hillside Court
Columbia MD, 21046

- Robert Calloway, PE, CxA, President/CEO (Project Oversight)
- Justin Tunzi, PE, Mechanical Engineer (Project lead, conduct field investigation)
- Tom Pilarz, EIT, Energy Engineer (conduct field investigation)

3. VAV TERMINAL UNITS CONDITION SUMMARY:

The FPT sheets for the 21 VAV (Variable Air Volume) terminal units can be found in **Appendix 1**, and photos of the deficiencies can be found in **Appendix 2**. Each VAV was controlled locally by a manually operated thermostat. Upon observation, it was found that the VAVs had common deficiencies, including malfunctioned damper actuators (no modulation), outdated controls (line voltage 120v transformed to 24v to control devices), corroded heating water coils, moisture collecting underneath the unit, Inlet sizes observed to be less than design, and malfunctioned control valves. The occupants at the barracks also reported thermal comfort issues in both heating and cooling seasons and supplemental heating and cooling units were observed throughout the building. The VAVs were found to be in poor condition overall as summarized in the table below.

Building VAV Terminal Unit Summary	
Description	Rating
Damper Actuator operation	
Heating Coil Condition	
Control valve operation	
Thermostat Calibration	

Rating Index:	
	Newer equipment, good to excellent condition with no visible issues or concerns. Equipment that is well within the rated life cycle and the ownership hold term.
	Equipment that is 50% or more through their rated life or showing signs of corrosion, operational issues impacting operation or energy saving opportunity.
	Equipment that is at or near the end of the rated life cycle or showing excessive signs of wear and tear, corrosion, has known operational issues or has failed.

4. CONCLUSION

The life expectancy of a VAV terminal units can vary depending on several factors, such as the quality of the initial installation, the level of maintenance provided over time, and the operating conditions of the system. According to ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers), the typical life expectancy of a VAV system is around 15 to 20 years. However, with proper maintenance and regular retro-commissioning, a VAV system can last longer and continue to operate at peak performance. It's important to note that the life expectancy of a VAV system can also be affected by changes in building use or occupancy, which may require modifications or upgrades to the system to accommodate new requirements.

The VAV terminal units at the La Plata Police Barrack H building is now past its life expectancy, and it is no longer functioning as efficiently as it should. This can lead to issues with occupant comfort and increased energy costs. DGS has identified the need to address this issue as part of its renovation efforts for the building. One option that DGS could consider is retrofitting the existing VAVs with new control valves, damper actuators, and control systems. This would involve replacing the existing components with newer, more efficient ones that are compatible with an open protocol building automation system (BAS). With this type of system, the building controls could be accessed remotely or by desktop, making it easier to monitor and adjust the system as needed. However, it's important to note that retrofitting the VAVs with new components could end up being similar in price to a full replacement. This is because the cost of new components and the labor required to install them can add up quickly. Additionally, the existing VAVs may not be compatible with newer components, which could limit the effectiveness of the retrofit.

Another option that DGS could consider is a full replacement of the VAVs with new control valves, damper actuators, thermostats, and other components. This would involve removing the existing VAVs and installing new ones that are designed to work with an open protocol BAS system. The new system could also integrate the existing perimeter finned tubed heat via control valves for improved thermal comfort and energy savings and address the observed heating water coil corrosion. While a full replacement may be more expensive initially, it could provide a longer-term solution with greater energy savings and improved occupant comfort. Additionally, the new components would likely be more reliable and require less maintenance, which could lead to additional cost savings over time.

In conclusion, DGS has several options to consider when addressing the outdated VAV terminal units at the La Plata Police Barrack H building. Ultimately, the decision will depend on factors such as the cost, compatibility, and long-term effectiveness of each option. Regardless of the decision, integrating an open protocol BAS system could provide significant energy savings and improved occupant comfort for the building.

5. APPENDIX 1 – FPTS VAV TERMINAL UNITS

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-1
		Location/Room:	Outside Room 133
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v transformed to 24v control connection to 3 way valve
Model Number:	A30RW-6	Supply CFM (min/max):	100/210
Serial Number:	112180	Heating Valve GPM:	0.6

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	72 °F	
2	Set point of thermostat at time of survey.	68 °F	
3	Discharge air temperature at time of survey	75 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	16.8 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	No	
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Valve not stroking
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Not acessable, may need to demolish ceiling to access

Meeting setpoint

Perimeter heat off, 620 ppm

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents,

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-2
		Location/Room:	Room 135
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v transformed to 24v control connection to 3 way valve
Model Number:	A30RW-7	Supply CFM (min/max):	100/240
Serial Number:	112180-2	Heating Valve GPM:	0.7

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	72.4 °F	
2	Set point of thermostat at time of survey.	70-75 °F	
3	Discharge air temperature at time of survey	76.6 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	0 %	
6	Humidity reading at time of survey	16.5 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Not observable
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve working, discharge air increased to 95F
9	Is the thermostat located in an acceptable location?	Yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

557 ppm,

Thermostat not calibrated

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents, please sign

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-3
		Location/Room:	Room 167
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v transformed to 24v control connection to 3 way valve
Model Number:	A30RW-5	Supply CFM (min/max):	140/320
Serial Number:	112180	Heating Valve GPM:	0.9

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	73.8 °F	73.8
2	Set point of thermostat at time of survey.	60-65 °F	60-65
3	Discharge air temperature at time of survey	76.6 °F	76.6
4	Damper position at time of survey.	%	Not observed
5	Heating water control valve postion at time of survey.	3 way %	
6	Humidity reading at time of survey	17.7 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Not observed
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve working
9	Is the thermostat located in an acceptable location?	Yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

589 ppm

Unit inlet size is observed to be less than design

Humidity issues, moisture stain observed on ceiling tile below unit

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents, please sign

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-4
		Location/Room:	Room 101
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v transformed to 24v control connection to 3 way valve
Model Number:	Not observed	Supply CFM (min/max):	Not observed
Serial Number:	Not observed	Heating Valve GPM:	Not observed

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	74.9 °F	
2	Set point of thermostat at time of survey.	55-60 °F	
3	Discharge air temperature at time of survey	75 °F	
4	Damper position at time of survey.	N/A %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	%	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	N/A	
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?	N/A	
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

VAV box not observed due to location above hard ceiling
Space heater in office
Humidity issues, moisture stain observed on ceiling tile below unit

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents, please sign

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	5
		Location/Room:	Evidence Room 160
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v transformed to 24v control connection to 3 way valve
Model Number:	A30RW-6	Supply CFM (min/max):	145/390
Serial Number:	112180	Heating Valve GPM:	1.1

Line Item	Description	Value /		Comments
1	Space temperature at time of survey	73.3	°F	
2	Set point of thermostat at time of survey.		°F	NA
3	Discharge air temperature at time of survey	80	°F	
4	Damper position at time of survey.	100	%	
5	Heating water control valve postion at time of survey.	N/A	%	
6	Humidity reading at time of survey	17	%	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	No		
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?	N/A		
9	Is the thermostat located in an acceptable location?			No Thermostat
10	Approximate age of the VAV?	23	Years	

Additional Comments/Notes:

No Thermostat Observed, Constant Volume

606 ppm

windows are operable, double paned, wood framed (Typical for all exterior rooms)

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Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-6
		Location/Room:	Room 133
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v transformed to 24v control connection to 3 way valve
Model Number:	A30RW-7	Supply CFM (min/max):	145/420
Serial Number:	112180	Heating Valve GPM:	1.1

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	72.1 °F	
2	Set point of thermostat at time of survey.	63-66 °F	
3	Discharge air temperature at time of survey	76 °F	
4	Damper position at time of survey.	45 %	
5	Heating water control valve postion at time of survey.	%	Initially closed
6	Humidity reading at time of survey	16.3 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Not observed
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control Valve working
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Thermostate not calibrated, Unit inlet size is observed to be less than design

Humidity issues in summer, moisture observed below ceiling tile.

642 ppm

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents, please sign

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-7
		Location/Room:	Room 162
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 2 way valve
Model Number:	A30RW-7	Supply CFM (min/max):	145/470
Serial Number:	112180	Heating Valve GPM:	1.3

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	71.4 °F	
2	Set point of thermostat at time of survey.	75 °F	
3	Discharge air temperature at time of survey	72.8 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	16.3 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Appears to be no damper, consant volume
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		HW control working, discahrge air temp increased to 83F
9	Is the thermostat located in an acceptable location?	Yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Thermostat not calibrated

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Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-8
		Location/Room:	Room 115
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-9	Supply CFM (min/max):	145/480
Serial Number:	112180	Heating Valve GPM:	1.3

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	74.8 °F	
2	Set point of thermostat at time of survey.	55 °F	
3	Discharge air temperature at time of survey	77.2 °F	
4	Damper position at time of survey.	%	Not observed
5	Heating water control valve postion at time of survey.	%	Not observed
6	Humidity reading at time of survey	20 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Not observed
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve working
9	Is the thermostat located in an acceptable location?		Not located in service space
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Not accessable due to fire wall

Thermostat not calibrated

630 ppm

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents,

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-9
		Location/Room:	Room 114
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-9	Supply CFM (min/max):	145/490
Serial Number:	112180	Heating Valve GPM:	1.3

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	74.8 °F	
2	Set point of thermostat at time of survey.	55 °F	
3	Discharge air temperature at time of survey	88 °F	
4	Damper position at time of survey.	%	Not oberseved
5	Heating water control valve postion at time of survey.	%	Not oberseved
6	Humidity reading at time of survey	15.5 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	No	
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?	No	
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Thermostat broken

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Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-10
		Location/Room:	Room 136
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-7	Supply CFM (min/max):	145/570
Serial Number:	112180	Heating Valve GPM:	1.5

Line Item	Description	Value / Yes or No		Comments
1	Space temperature at time of survey	72.7	°F	
2	Set point of thermostat at time of survey.	60s	°F	
3	Discharge air temperature at time of survey	75	°F	
4	Damper position at time of survey.	100	%	
5	Heating water control valve postion at time of survey.	N/A	%	
6	Humidity reading at time of survey	17.2	%	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?			No, located outside occupied area
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?			Control Valve working
9	Is the thermostat located in an acceptable location?			No, located outside occupied area
10	Approximate age of the VAV?	23	Years	

Additional Comments/Notes:

TStat located outside of the occupied area, Unit inlet size is observed to be less than design

621 ppm

Electric plug in heater A10in room

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents,

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-11
		Location/Room:	Room 108
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-9	Supply CFM (min/max):	145/490
Serial Number:	112180	Heating Valve GPM:	1.3

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	75 °F	
2	Set point of thermostat at time of survey.	70-75 °F	
3	Discharge air temperature at time of survey	76.6 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	%	Not observed
6	Humidity reading at time of survey	15.1 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	No	
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve working, discharge air 100F
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Humidity problem on all southside units, drain pan observed under VAVs

623 ppm, thermostate not calibrated (reading 68)

Unit size is observed to be less than design

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents, please sign

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-12
		Location/Room:	Room 143
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-9	Supply CFM (min/max):	250/580
Serial Number:	112180	Heating Valve GPM:	1.6

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	70.9 °F	
2	Set point of thermostat at time of survey.	80 °F	
3	Discharge air temperature at time of survey	78.8 °F	
4	Damper position at time of survey.	20% %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	17.5 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	No	
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve working
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

525 ppm, mositure present on tile under VAV box

Unit inlet duct size is observed to be less than design, thermostat not functioning

Serving fitness center, possible infiltration observed

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents,

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-13
		Location/Room:	Room 107
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-9	Supply CFM (min/max):	
Serial Number:	112180	Heating Valve GPM:	

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	75.8 °F	
2	Set point of thermostat at time of survey.	55 °F	
3	Discharge air temperature at time of survey	78.4 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	14.9 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	No	
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Slight rise is temp due to boiler tripping off
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Condensate drain pan under VAV, major rust, 566 ppm

Serves large area and inlet duct is likely undersized

Thermostat not calibrated

I hereby certify that the above is accurate and truthful to the best of my knowledge and that the above system(s) are ready for functional testing in accordance with the requirements of the contract documents,

Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-14
		Location/Room:	Room 105
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-9	Supply CFM (min/max):	200/640
Serial Number:	112180	Heating Valve GPM:	1.8

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	75.5 °F	
2	Set point of thermostat at time of survey.	63 °F	
3	Discharge air temperature at time of survey	76.6 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	15.1 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		No, damper at 100%
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Slight rise is temp due to boiler tripping off
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Humidity issue, thermostat not calibrated, Unit inlet size is observed to be less than design

Duct inlet design is 10 in.

630 ppm

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Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-15
		Location/Room:	Room 120/121
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-10	Supply CFM (min/max):	100/150
Serial Number:	112180	Heating Valve GPM:	0.4

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	73.7 °F	
2	Set point of thermostat at time of survey.	50-60 °F	
3	Discharge air temperature at time of survey	°F	Not observed
4	Damper position at time of survey.	%	Not observed
5	Heating water control valve postion at time of survey.	%	Not observed
6	Humidity reading at time of survey	14 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Not observed
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Not observed
9	Is the thermostat located in an acceptable location?		yes
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Serves holding cell, thermostat outside of cell

632 ppm

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Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-16
		Location/Room:	Room 113
Name Plate Data:			
			120v to 24V control connection,
Manufacturer:	Nailor	Control Type:	3 way valve
		Supply CFM	
Model Number:	A30RW-10	(min/max):	240/720
Serial Number:	112180	Heating Valve GPM:	1.9

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	75.3 °F	
2	Set point of thermostat at time of survey.	55-70 °F	
3	Discharge air temperature at time of survey	78.6 °F	
4	Damper position at time of survey.	100 %	
5	Heating water control valve postion at time of survey.	%	Not oberved
6	Humidity reading at time of survey	15.6 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		No, damper does not change position
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve working
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

595 ppm,
Heating coil observed to have debris/corrosion, may be obstructing the airflow
Thermostat not calibrated (Reading 70F)

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Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-17
		Location/Room:	Room 130
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-10	Supply CFM (min/max):	240/800
Serial Number:	112180	Heating Valve GPM:	2.2

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	69 °F	
2	Set point of thermostat at time of survey.	75-80 °F	
3	Discharge air temperature at time of survey	80 °F	
4	Damper position at time of survey.	N/A %	
5	Heating water control valve postion at time of survey.	N/A %	
6	Humidity reading at time of survey	17 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Damper not working
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve is working
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Cooling humidity issues, Unit size is observed to be less than design

Schedule inlet design is 12 in, rust on heating coil

530 ppm

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Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-18
		Location/Room:	Outside Room 151
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-10	Supply CFM (min/max):	240/820
Serial Number:	N/A	Heating Valve GPM:	2.3

Line Item	Description	Value / Yes or No		Comments
1	Space temperature at time of survey	73.1	°F	
2	Set point of thermostat at time of survey.	68	°F	
3	Discharge air temperature at time of survey	88	°F	
4	Damper position at time of survey.	100	%	
5	Heating water control valve postion at time of survey.	N/A	%	
6	Humidity reading at time of survey	15.1	%	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?			Damper not moving
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?			Heating water valve appears to be working
9	Is the thermostat located in an acceptable location?	yes		
10	Approximate age of the VAV?	23	Years	

Additional Comments/Notes:

Corrosion on heating coil

541 ppm

Thermostat is not calibrated

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Responsible Company	Print Name	Signature	

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-19
		Location/Room:	Room 130
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-12	Supply CFM (min/max):	240/860
Serial Number:	112180	Heating Valve GPM:	2.3

Line Item	Description	Value / Yes or No		Comments
1	Space temperature at time of survey	72.6	°F	
2	Set point of thermostat at time of survey.	75-80	°F	
3	Discharge air temperature at time of survey	80	°F	
4	Damper position at time of survey.	N/A	%	
5	Heating water control valve postion at time of survey.	N/A	%	
6	Humidity reading at time of survey	15.5	%	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?	N/A		
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?	N/A		
9	Is the thermostat located in an acceptable location?			No thermostat in this room
10	Approximate age of the VAV?	23	Years	

Additional Comments/Notes:

Thermostat connected to VAV-17, 595 ppm
Increased heat load due to vending machines
VAV box not observed due to access panel

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Global Facility Solutions, LLC.	Justin Tunzi, PE	JT
Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-20
		Location/Room:	Room 138
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-12	Supply CFM (min/max):	240/890
Serial Number:	112180	Heating Valve GPM:	2.4

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	73.7 °F	
2	Set point of thermostat at time of survey.	60-65 °F	
3	Discharge air temperature at time of survey	103 °F	
4	Damper position at time of survey.	30 %	
5	Heating water control valve postion at time of survey.	%	Control valve not responding to Tstat
6	Humidity reading at time of survey	16.1 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Damper not functioning
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?		Control valve not responding to Tstat
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

Thermostat appears to not be calibrated

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Responsible Company	Print Name	Signature

FPT VAV Terminal Units

Project Title:	**La Plata, VAV Review**	**Document Date:**	3/30/2023
Owner/Clients Name:	**DGS**	**Document Version:**	Rev 0
		GFS Project Number:	23-137
Equipment System / Type:	Terminal Units	Equipment Tag(s):	VAV-21
		Location/Room:	Room 127
Name Plate Data:			
Manufacturer:	Nailor	Control Type:	120v to 24V control connection, 3 way valve
Model Number:	A30RW-10	Supply CFM (min/max):	140/320
Serial Number:	112180	Heating Valve GPM:	0.9

Line Item	Description	Value / Yes or No	Comments
1	Space temperature at time of survey	73.7 °F	
2	Set point of thermostat at time of survey.	55 °F	
3	Discharge air temperature at time of survey	75.8 °F	
4	Damper position at time of survey.	%	Not observed
5	Heating water control valve postion at time of survey.	%	Not observed
6	Humidity reading at time of survey	15 %	
7	Change thermostat setpoint +/- 10°F, Does the damper position change?		Not observed
8	Change thermostat setpoint +/- 10°F, Does the HW Control valve position change?	No	
9	Is the thermostat located in an acceptable location?	yes	
10	Approximate age of the VAV?	23 Years	

Additional Comments/Notes:

600 ppm

Supplemental cooling observed in room

Thermostate reading 75F

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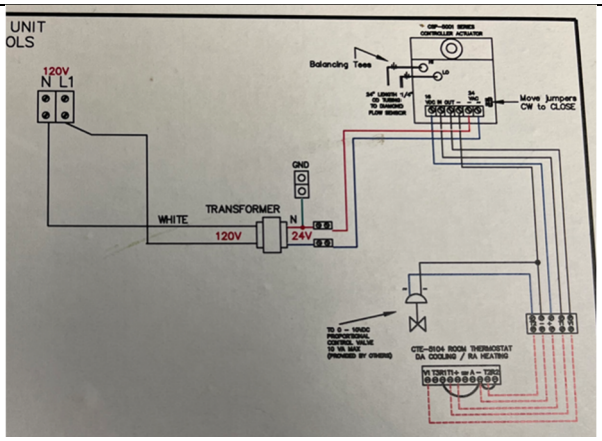
Responsible Company	Print Name	Signature

6. APPENDIX 2 – DEFICIENCY PHOTOS

1. Corroded heating water coil

2. Typical localized T-stat for control, No BAS control



3. 120v to 24v controls power connection, shop drawing

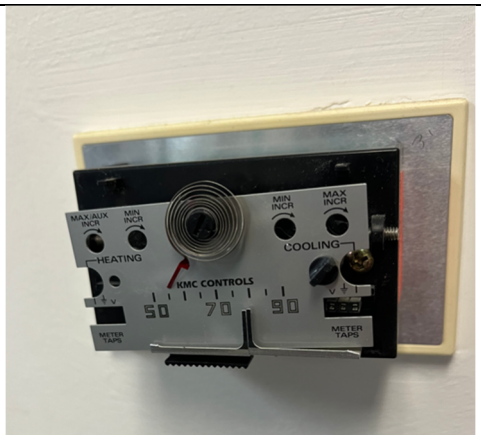
4. Typical control valve from 1999

5. Cover removed off 1999 control valve.

6. Malfunctioned VAV actuator

7. Typical VAV from 1999

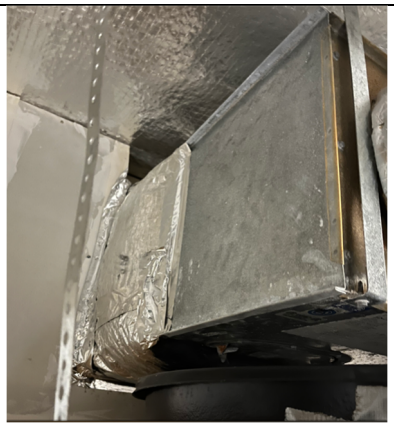
8. Supplemental cooling observed in dispatch



9. Broken T-stat

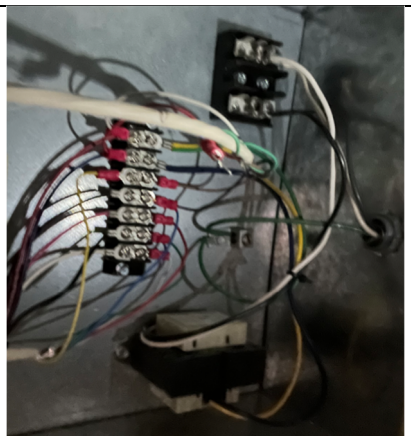
10. Corroded heating water coil

11. Operable Window

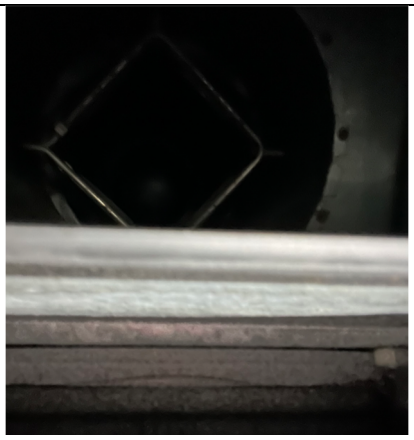


12. Condensate Pan underneath VAV

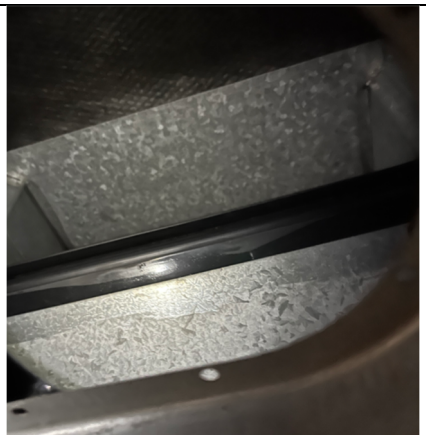
13. Observed supplemental heating



14. 120v transformed to 24v power



15. Fully open damper, no modulation



16. Partially open damper, no modulation

17. Typ control valve nameplate

18. Typ VAV nameplate and access door