Clinton District Court
Clinton, MA

HVAC SYSTEM EVALUATIONS COVID-19

Office of Court Management

April 26, 2022

Tighe&Bond

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Section 1
Existing Conditions and Site Observations

Tighe & Bond visited the Clinton District Courthouse on August 18, 2021. While on site we inspected the air handling equipment located in the mechanical rooms and toured the facility to determine if the spaces generally matched usages noted on the architectural plans. Tighe & Bond was provided with mechanical design plans from 1970 and 2004. Our analysis is based on these drawings and our one day on site.

Site Visit Attendees:

- *Office of Court Management:*
  - Courthouse Facilities Staff
- *Tighe & Bond*
  - Jason Urso, PE, Senior Mechanical Engineer
  - Olivia Robillard, Mechanical Intern

1.1 Existing Ventilation System

The Clinton District Courthouse was constructed in 1972 and is approximately 18,500 square feet in size. Two air handling units (AHU) located in the attic provide ventilation air to the two courtrooms. Each air handling unit contains a supply fan and a refrigerant (DX) cooling coil. AHU-1 contains a 1" filter without a MERV rating listed and AHU-2 contained a 2" MERV 8 filter. There are duct mounted electric heating coils on the outside air intake ducts and on the discharge supply duct for each unit. A dedicated return fan serves each air handling unit. AHU-1 serves Courtroom 201 and AHU-2 serves Courtroom 215. At some point, supply and return air ductwork was added to AHU-1 and routed to Lobby 200, on the second floor. The condensing unit for each air handler is located on the roof.

While on site, we could not confirm the age of the units, however the Office of Court Management provided us with invoices of the air handlers. The invoices had a date of 2013. The units appear to be in fair condition. The outdoor air, return, and exhaust dampers were not accessible. The electric damper actuators are in good to fair condition. The cooling coil in AHU-2 was dirty and the coil in AHU-1 appeared to be clean. The duct mounted electric heating coils were not accessible.

Both air handling units appear to be constant volume systems, which may have been designed to turn off when space temperature is satisfied. If this is the case, ventilation air is not being supplied to the courtrooms if there is no call for heating or cooling.

There are also packaged air terminal air conditioners (PTAC) located in the perimeter spaces that provide refrigerant based cooling and, according to the 1970 design drawings, were designed to provide ventilation air. The 1970 drawings also indicate each PTAC unit was designed to provide heating, however the label on the unit in Room 211, Adult Probation Officer, indicated the unit does not provide heat. Further field investigation is required to determine which units provide heating. The units contain mesh filters with no MERV rating. While all units were not inspected, the coils of the units that we did inspect were fairly clean. The outdoor air damper was not accessible, therefore it was unclear if the PTAC units provide outdoor air. The units are connected to a louver on the outside

wall. The louvers may be used to reject heat from the refrigeration cycle only, may be used to bring in outdoor air, or both. The units appear to be in fair condition. According to facilities staff, the PTAC units only operate when there is a call for space heating or cooling, and typically fail within seven to ten years. If some units do not provide heat, it's likely these units do not run during the winter and therefore do not provide ventilation air to the space during the heating season. Electric baseboard heaters provide additional heating to the perimeter spaces.

According to the plans, there are two toilet exhaust fans, labeled TX-1 and TX-2 per the design drawings, which appear to be original and are in fair to poor condition. Fan TX-1 (labeled "3" on the fan housing) serves toilet rooms on the north side of the building as well as the holding cells. TX-2 serves toilet rooms on the south side. While on site, TX-1 was running, however TX-2 (labeled "6" on the fan housing) was not. A third exhaust fan, labeled "7" on the fan housing, serves conference rooms and a vending machine room.

It appears that the detention area, first floor lobby, corridors, and interior conference rooms are not supplied with mechanical ventilation air.

Table 1 summarizes the air handling units' designed airflow rates, the MERV rating of the installed filters, and the condition of the units. Four different PTAC units were scheduled in the 1970 drawings, however there are multiple units of each type throughout the Courthouse.

TABLE 1
Existing Air Handling Units

Unit	Original Design Airflow (CFM)	Original Design Min. OA (CFM)	Pre/Final Filters	Condition
AC-1	2,000	1,150	1" MERV Unknown	Fair
AC-2	3,600	2,200	2" MERV 8	Fair
PTAC-1	Unknown	135	Mesh, no MERV	Fair
PTAC-2	Unknown	135	Mesh, no MERV	Fair
PTAC-3	Unknown	60	Mesh, no MERV	Fair
PTAC-4	Unknown	50	Mesh, no MERV	Fair

Photo 1 – Air Handler AHU-1

Photo 2 – Air Handler AHU-2

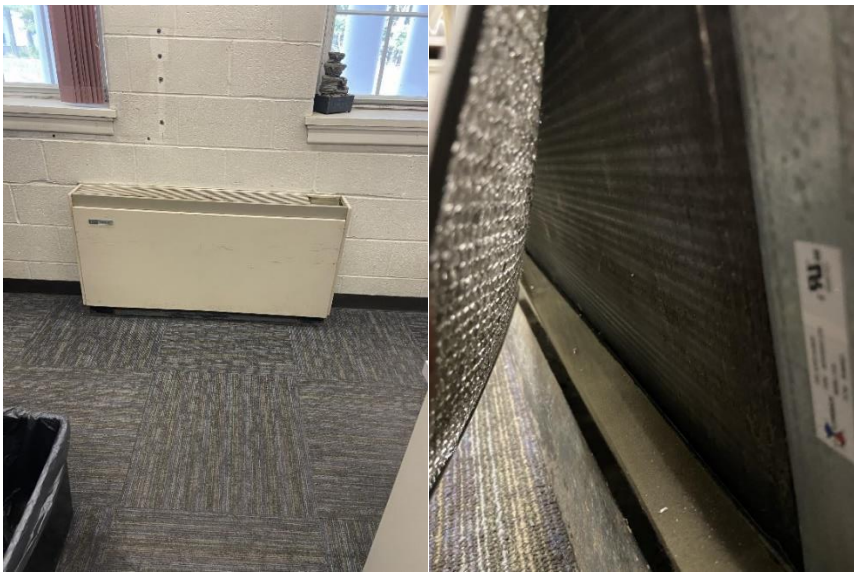

Photo 3 – Typical PTAC Unit

1.2 Existing Control System

Local thermostats control the existing HVAC air handling equipment. We did not see any evidence or components of a Building Management System (BMS) during our site visit. We are not aware of any demand control ventilation sequences in use at this courthouse.

Section 2
Recommendations

Below is a list of recommendations for the Clinton District Courthouse. Please refer to the "Overview of Recommendations" report for further explanation and requirements of the stated recommendations.

Building areas without adequate ventilation and filtration significantly increase the risk of spreading viruses like Coronavirus (SARS-CoV-2), especially areas with high occupant density and where people occupy the same space for relatively long periods of time. Consider significantly reducing occupancy or relocating occupants to other areas with adequate ventilation.

2.1 Filtration Efficiency Recommendations

We recommend the following measures be implemented for the existing air handling units:

RF-1: *Replace filters with MERV-13 filters.*

The TAB Contractor and/or Engineer shall verify that the air handlers can accommodate a MERV-13 filter per Appendix A in the overview of recommendations report. Filter racks should be inspected and adjusted to ensure that filters fit tightly and that end spacers are in place to minimize filter bypass.

It is likely that the PTAC units cannot be fitted with MERV 13 filters. Further investigation will be required to determine if this is possible.

RF-3: *Install a differential pressure sensor with a display across the filter bank.*

This recommendation applies to air handlers AHU-1 and AHU-2 only.

RF-3a: *Connect the pressure sensor to a local alarm.*

Maximum differential pressure should be set per manufacturer's recommendation to ensure filters are within their service lives. Typically, this is not more than 1.0" w.g.

2.2 Testing & Balancing Recommendations

It is unknown to Tighe & Bond when the last time the units were tested and balanced and the code requirements to determine the outdoor air flow rates that were used to design the original system may be different than the 2015 International Mechanical Code (IMC) and current ASHRAE Standard 62.1 requirements.

We recommend the following testing and balancing measures be implemented:

RTB-1: *Test and balance air handling unit supply air and minimum outdoor air flow rates.*

All air handler and PTAC unit outdoor air dampers were not accessible during our site visit, therefore we could not confirm if ventilation air is being provided by the equipment. We recommend testing and balancing the outdoor air flow rates for all air handling units to the recommended minimum OA rates listed in Table 2.

The 1970 design drawings indicate the PTAC units were designed to provide outdoor air, however these units have been replaced, possibly on several occasions in the past. Outdoor air connections may have been blocked off. We recommend verifying that the PTAC units are providing outdoor air, the outdoor air dampers are operating correctly, and balancing the units to the appropriate outdoor air flow rates. We can provide specific outdoor airflow rates for each space containing PTAC units when the units are balanced.

TABLE 2
Recommended Air Handler OA Flow Rates

Unit	Original Supply Airflow (CFM)	Original Design Min. OA (CFM)	Current Code Min. OA Requirements (CFM)	Recommended Minimum OA (CFM)
AHU-1	2,000	1,150	330	1,150
AHU-2	3,600	2,200	650	2,200
PTAC-1	Unknown	135	Varies by Room	Varies by Room
PTAC-2	Unknown	135	Varies by Room	Varies by Room
PTAC-3	Unknown	60	Varies by Room	Varies by Room
PTAC-4	Unknown	50	Varies by Room	Varies by Room

Note: Although the ASHRAE Position Document on Infectious Aerosols recommends using the latest published standards and codes as a baseline for minimum ventilation, the mechanical code in effect at the time the HVAC systems were designed and constructed is what governs the required outdoor air flowrate for the HVAC equipment, if there have been no additions, renovations, alterations or changes in occupancy to the building. The 2015 International Mechanical Code does not prevent the continued use of existing systems.

We recommend maintaining the outdoor airflows at the original designed values where they exceed the code minimums calculated by Tighe & Bond. Supplying more outdoor than required by code will provide better indoor air quality.

If the PTAC units are providing the outdoor airflow rates per the original design, it appears each room is receiving above code required outdoor air flow rates.

The average airflow rate per person is shown below in Table 3. These values are based on the original full design supply airflow rate and the recommended outdoor airflow rates shown in Table 2. The airflow rate per person assumes a diversity factor of 70%, meaning the maximum number of occupants assumed to be in all zones at all times equates to 70% of the code required occupancy. Since the supply airflow for the PTAC units are unknown we can only determine the data in the tables below for the Courtrooms.

TABLE 3
Average Airflow Rate per Person

	All Spaces	*Courtrooms*	*Non-Courtroom Spaces*
Total Occupancy (People)	259	152	107
Total Supply Air (CFM/Person)	Unknown	34	Unknown
Outdoor Air (CFM/Person)	Unknown	20	Unknown

The airflow rate per person for each Courtroom is shown below in Table 4. These values are based on full occupancy without taking diversity into account, the original full design supply airflow rate, and the recommended outdoor airflow rate. The airflow rates per person assumes the full supply and code minimum outdoor airflows are being delivered to the room. If the air handlers turn off after space temperature is satisfied, the outdoor airflow rate per person is zero.

The outdoor airflow rate in the Juvenile Hearing Room assumes all four PTAC units in the space are providing outdoor air, which should be verified.

TABLE 4
Airflow Rate per Person (Full Occupancy)

		Total Air		*Outdoor Air*	
Courtroom	*Total People*	*Supply Airflow (CFM)*	*Airflow Rate (CFM/Person)*	*Outdoor Airflow (CFM)*	*Airflow Rate (CFM/Person)*
Courtroom 201	56	2,000	36	1,150	21
Courtroom 215	109	3,600	33	2,200	20
Juvenile Hearing 102	52	Unknown	Unknown	540	10

Note: Courtroom occupant density is based on 70 people/1,000 square feet, per the 2015 International Mechanical Code

The airflow rate per person for each Courtroom, based on a reduced occupancy schedule determined by the Office of Court Management, is shown below in Table 4a. The airflow rate per person assumes the full supply airflow is being delivered to the room.

TABLE 4a
Airflow Rate per Person (Reduced Occupancy)

		Total Air		*Outdoor Air*	
Courtroom	*Total People*	*Supply Airflow (CFM)*	*Airflow Rate (CFM/Person)*	*Outdoor Airflow (CFM)*	*Airflow Rate (CFM/Person)*
Courtroom 201	24	2,000	83	1,150	48
Courtroom 215	30	3,600	120	2,200	73
Juvenile Hearing 102	10	Unknown	Unknown	540	54

Note: If occupancy is further reduced, the airflow rate per person will increase, assuming full airflow is being delivered to the space.

RTB-2: *Rebalance system return air flow rate.*

We recommend testing and balancing the return fan airflow rate to ensure the correct quantity of return air is being delivered to the air handler.

RTB-5: *Test and balance air inlets and outlets serving AHU-1.*

The lobby outside of Courtroom 201 was connected to AHU-1, however we were not provided with documents that indicate what this design entailed. We recommend testing the airflow rates for all supply diffusers serving AHU-1 to verify how much airflow the Courtroom and lobby is receiving.

We do not necessarily recommend testing the air inlets and outlets connected to AHU-2 since it only serves one space. Testing the inlets and outlets, as well as the airflow at the supply fan of AHU-2 would give an indication of duct leakage. Considering this system contains short duct runs and assuming there are no major holes or disconnected duct connections, duck leakage is likely minimal.

RTB-6: *Ensure refrigerant coils are fully charged with refrigerant.*

Confirm that the air handler's refrigerant system is operating correctly to ensure the DX coil is receiving full refrigerant flow. If there is a lack of cooling in spaces served by the PTAC units, we'd recommend testing the refrigerant charge of those units as well.

2.3 Equipment Maintenance & Upgrades

We recommend the following equipment maintenance and upgrades:

RE-1: *Test existing air handling system dampers and actuators for proper operation*.

Verify that the outdoor air and return air dampers for AHU-1, AHU-2, and all PTAC units are open and operating correctly. Replace dampers and actuators that are not functioning properly.

RE-2: *Clean air handler coils and drain pans.*

2.4 Control System Recommendations

We recommend the following for the control system:

RC-1: *Implement a pre and post-occupancy flush sequence.*

Additional controls will be required in order to program a pre and post occupancy flush.

2.5 Additional Filtration and Air Cleaning

We recommend the installation of the following air cleaning devices:

RFC-1: *Install portable HEPA filters.*

If the Courthouse is to operate at a high capacity (i.e. 50% occupancy or greater), we recommend installing portable HEPA filters in high traffic areas, such as entrance lobbies. They should also be considered for courtrooms, depending on the occupancy of the room and how much noise is generated from the filters. The noise levels will vary depending on the manufacturer. Refer to the "Overview of Recommendations" document for further guidance on installing portable HEPA filters.

Due to the lack of ventilation in the areas below, we recommend the use of portable HEPA filters or similar air purification approaches if these areas are to be occupied in the near term, until adequate ventilation is added to these areas. While all spaces benefit from additional air filtration, this measure is likely not necessary for single occupant offices.

- Lobby 107
- Conference Room 103
- Conference Room 136
- Conference Room 207

2.6 Humidity Control

Installing duct mounted or portable humidifiers can help maintain the relative humidity levels recommended by ASHRAE. The feasibility of adding active humidification is determined by the building envelope. Buildings that were not designed to operate with active humidification can potentially be damaged due to a lack of a vapor barrier, adequate insulation, and air tightness.

Duct mounted humidifiers must be engineered, integrated into the building control system, tested, and commissioned. They are available in many configurations but require substantial maintenance and additional controls. They also run the risk of adversely affecting IAQ from growing microorganisms, or leaking water through poorly sealed ductwork damaging insulation and ceilings. Portable humidifiers are easier to install and require less maintenance, but still have the potential to damage the building envelope.

While active humidification is not recommended as a whole building solution due to high installation costs, operational costs, potential to damage the building envelope and adversely affect poor IAQ, it may be warranted as a temporary solution in some areas.

2.7 Other Recommendations

2.7.1 Add a Ventilation System to serve the Detention Area

The detention area is exhausted, however there is no ventilation air supplied to the space. We recommend adding a ventilation system to supply code required outdoor air directly to the space.

2.7.2 Add Ventilation to All Occupied Areas

Some interior spaces are not mechanically ventilated. Consider adding a ventilation system to serve these areas.

2.7.3 Run Supply Fans Continuously During Occupied Hours

The air handlers and PTAC unit fans may only operate when there is a call for space heating or cooling. The operation of the fans should be verified. Supply fans should be set to run continuously in occupied mode, to supply ventilation air to the spaces. Note that this may cause comfort issues because supply air temperature can fluctuate as the heating and cooling are staged on and off, and the systems may not have been originally designed to operate in this manner.

2.7.4 HVAC System Replacement Study

The Clinton District Courthouse is heated and cooled with electricity. Electric resistance is a costly way to condition a building. To improve the building's energy efficiency and to help reduce operating costs, we recommend a study to investigate converting the building to heat pump style air handlers and PTAC units, or hydronic heating using high efficiency condensing boilers. This recommendation is an energy saving measure and does not affect the indoor air quality of the building.

Disclaimer

Tighe and Bond cannot in any way guarantee the effectiveness of the proposed recommendations to reduce the presence or transmission of viral infection. Our scope of work is intended to inform the Office of Court Management on recommendations for best practices based on the guidelines published by ASHRAE and the CDC. Please note that these recommendations are measures that may help reduce the risk of airborne exposure to COVID-19 but cannot eliminate the exposure or the threat of the virus. Implementing the proposed recommendations will not guarantee the safety of building occupants. Tighe & Bond will not be held responsible should building occupants contract the virus. The Office of Court Management should refer to other guidelines, published by the CDC and other governing entities, such as social distancing, wearing face masks, cleaning and disinfecting surfaces, etc. to help reduce the risk of exposure of COVID-19 to building occupants.

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2.8 Courthouse Name Recommendations Checklist

Recommended Immediate Actions

1. ☐ RF-1: Replace filters with MERV-13 filters
2. ☐ RTB-1: Test and balance air handling unit airflow rates
3. ☐ RTB-2: Rebalance system return airflow rate
4. ☐ RE-1: Test air handling system dampers and actuators for proper operation
5. ☐ RC-1: Implement and pre and post-occupancy flush sequence
6. ☐ Install portable HEPA filters
7. ☐ Run supply fans continuously during occupied hours

Recommended Actions

8. ☐ RF-3: Install DP sensor across AHU filters
9. ☐ RF-3a: Connect DP sensor to a local alarm
10. ☐ RTB-6: Verify refrigerant coils are fully charged
11. ☐ RE-2: Clean air handler coils
12. ☐ RC-4: Confirm economizer control sequence is operational
13. ☐ Add a ventilation system to serve the Detention Area
14. ☐ Add a ventilation system to serve unventilated occupied areas

Optional Actions

15. ☐ HVAC system replacement study

Section 3
Testing & Balancing Results

Wing's Testing & Balancing Co., Inc. visited the Clinton Courthouse on February 23, 2022 through February 25, 2022 to test the airflow rates of the air handling units and the exhaust fans. A summary of the tested airflow rates versus the design airflow rates are shown below in Tables 5 and 6. The full testing and balancing report is attached.

TABLE 5
Air Handler Testing & Balancing Results

	Design			Actual		
Unit	**Total Supply Fan Airflow (CFM)**	**Recommended Outdoor Airflow (CFM)**	**Return Airflow (CFM)**	**Supply Fan Airflow (CFM)**	**Outdoor Airflow (CFM)**	**Return Airflow (CFM)**
AC-1	2,000	1,150	850	1,422	0	1,422
AC-2	3,600	2,200	1,400	3,244	0	3,244
PTAC-1	Unknown	135	Unknown	165	0	165
PTAC-2	Unknown	135	Unknown	178	0	178
PTAC-3	Unknown	60	Unknown	213	0	213
PTAC-4	Unknown	50	Unknown	101	0	101

TABLE 6
Return & Exhaust Fan Testing & Balancing Results

Unit	**Serving**	**Design Return/Exhaust Airflow (CFM)**	**Actual Return/Exhaust Airflow (CFM)**
RF-1	AC-1	2,000	1,422
RF-2	AC-2	3,600	3,244
TX-1	Toilet & Lock Up	1,230	1,026
TX-2	Toilets	690	840
TX-3	Conf.	310	366

The typical balancing tolerance for air systems is ±10% of the design airflow.

In reviewing the airflow report data, the following should be noted:

1. AC-1 is not performing within acceptable range and is not providing any ventilation air.
2. AC-2 is providing total supply air within acceptable range, however it is not providing any ventilation air.
3. The control panels serving both AC-1 and AC-2 are not functional and are not allowing the outdoor air dampers to be adjusted. We recommend repairing or replacing the control panels and retesting the units and their return fans to set the proper ventilation airflow rates.
4. The PTAC units are not providing any ventilation air. We recommend investigating if these units can be connected to the outdoors and if they units can accommodate the added load of conditioning the outdoor air.
5. Toilet exhaust fan TX-1 is not performing within acceptable range. Due to the age and condition, we recommend replacing the fan.
6. Exhaust fan TX-2 appears to be operating above the designed airflow rate.
7. Exhaust fan TX-3 is operating within acceptable range.

WING'S TESTING & BALANCING CO., INC.

Clinton District Court
HVAC Survey

* * * *

Tighe & Bond
Attn: Jason Urso
53 Southampton Road
Westfield, MA 01085

February 28th, 2022

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SM-1 License #6803
www.wingstesting.com

WING'S TESTING & BALANCING CO., INC.

February 28th, 2022

Tighe & Bond
Attn: Jason Urso
53 Southampton Road
Westfield, MA 01085

Re: Clinton District Court / HVAC Ventilation Study

Dear Jason,

Wing's has completed the HVAC / Fresh Air Survey for the above referenced location. The results are as follows:

Initial Observations:

- Heating is electric reheat and cooling is DX. No water readings were taken.

Testing Observations:

- The control panel that serves AC-1 and AC-2 has been de-energized and is no longer functioning.
  - This cabinet commands the mixed air and outside air dampers, making it impossible to set the outside airs properly.

Recommendations:

- Have the above-mentioned cabinet repaired or replaced.

The following pages are your record of the tested conditions. If you have any questions or if we can be of further assistance, please do not hesitate to call.

Very truly yours,
Wing's Testing & Balancing Co., Inc.
ICB Certified Contractor for:
TABB—Commissioning—Fire/Life Safety L1&L2—Sound & Vibration

Barry Stratos
Certified TABB Technician
CT SM-2 License 6386
MA SM-2 13595

SUPPLY FAN REPORT

PROJECT: Clinton District Court **DATE:** 2/23/22

AREA SERVED: AC-1 & AC-2 **TECH:** BS

FAN DATA						
FAN NUMBER	AC-1		AC-2			
LOCATION	Attic		Attic			
AREA SERVED	Courtroom 2		Courtroom 1			
MANUFACTURER	Goodman Co.		Goodman Co.			
MODEL OR SIZE	ARUF60D14AB		DAR0904AB			
	DESIGN	**ACTUAL**	**DESIGN**	**ACTUAL**	**DESIGN**	**ACTUAL**
TOTAL CFM	2200	1422	3600	3244		
RETURN AIR	1050	1422	1400	3244		
OUTSIDE AIR	1150	0 (1)	2200	0 (1)		
DISCH. STATIC	---	+0.27''	---	+0.25''	---	
SUCTION STATIC	---	-0.73''	---	-0.34''	---	
TOTAL STATIC	NA	1.00''	NA	0.59''		
FAN RPM	NA	DD	NA	759		
PULLEY O.D.	DD		6.0'' x 1''			
ESP	0.48		0.41			
VFD SPEED	No VFD		No VFD			
O.A.D.MIN POS	0 (1)		1 (1)			
MOTOR DATA						
MANUFACTURER	US Motor		US Motor			
MODEL OR FR.	NA		NA			
HORSEPOWER	3/4	3/4	1.5	1.5		
MOTOR RPM	1725	1725	1725	1725		
VOLTAGE / PH.	208/3	208/3	208/3	208/3		
AMPS LEG 1	4.6	3.1	5.2	3.8		
AMPS LEG 2	---	3.1	---	3.8	---	
AMPS LEG 3	---	3.1	---	3.8	---	
SHEAVE O.D.	DD		3.25'' x 5/8''			
BELTS - QUANTITY / SIZE	DD		1/EX39			
SHEAVE POSITION	DD		3/4 closed			
C to C	DD		14.0			
SPEED	High		---			

REMARKS

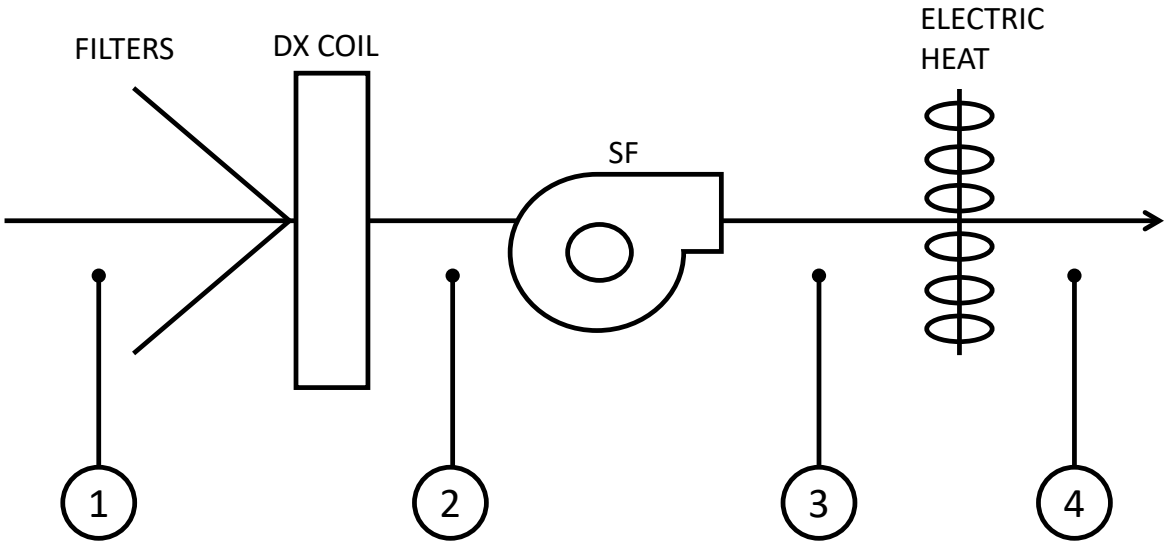
(1) The controls cabinet serving AC-1 and AC-2 has been deenergized and is no longer functional. This cabinet commands the O.A. and mix air dampers to the unit making it impossible to set the O.A.

NA Not Available | **ND** No Design | **DD** Direct Drive | **N/R** No Requirement

SYSTEM STATIC PRESSURE PROFILE

PROJECT: Clinton District Court **DATE:** 2/25/22

SYSTEM/AREA: AC-1 & AC-2 **TECH:** BS



UNIT	1	2	3	4	5	6	7	8	NOTES
AC-1	-0.23''	-0.73''	+0.27''	+0.25''					
AC-2	-0.18''	-0.34''	+0.25''	+0.23''					

REMARKS

NA Not Available | **ND** No Design | **DD** Direct Drive | **N/R** No Requirement

VELOCITY PRESSURE READINGS

PROJECT: Clinton District Court **DATE:** 2/25/22

AREA SERVED: Various **TECH:** BS

TRAVERSE LOCATIONS	DUCT SIZE "	AREA SQ.FT.	DESIGN		CENT. STAT. PRESS.''	TEST		NOTES
			FPM	CFM		FPM	CFM	
AC-1 Total	24'' x 12''	2.0	1100	2200	-0.29''	711	1422	(1)
AC-2 Total	34'' x 14''	3.31	1088	3600	-0.18''	980	3244	
RF-1 Total	24'' x 12''	2.0	1100	2200	-0.28''	711	1422	
RF-2 Total	34'' x 14''	3.31	1088	3600	-0.18''	980	3244	
TX-1	17'' x 12''	1.41	---	ND	-0.33''	728	1026	
F-1	12'' x 7''	0.58	---	ND	+0.08''	631	366	
TX-2	14'' x 4''	1.36	---	ND	+0.13''	618	840	

REMARKS

(1) AC-1 is already on its highest speed.

NA Not Available | **ND** No Design | **DD** Direct Drive | **N/R** No Requirement

EXHAUST FAN REPORT

PROJECT: Clinton District Court **DATE:** 2/24/22

AREA SERVED: RF-1 and RF-2 **TECH:** BS

FAN DATA				
FAN NUMBER		RF-1	RF-2	
LOCATION		Attic	Attic	
AREA SERVED		AC-1	AC-2	
MANUFACTURER		Barry Blower	Barry Blower	
MODEL OR SIZE		BVF-165	BVF-222	
TOTAL CFM	**DESIGN**	2200	3600	
	ACTUAL	1422	3244	
FAN RPM	**DESIGN**	NA	NA	
	ACTUAL	568	437	
PULLEY	**O.D.**	9.5'' x 1''	13.5'' x 1 7/16''	
SERVICE		1.25	1.25	
MOTOR DATA				
MANUFACTURER		Century	Baldor	
MODEL NUMBER		H56	56	
MOTOR HP	**DESIGN**	1/2	3/4	
	ACTUAL	1/2	3/4	
MOTOR RPM		1725	1725	
VOLTAGE/PHASE		208/3	208/3	
MOTOR AMPS	**DESIGN**	2.1	3.2	
	ACT. LEG 1	1.4	2.4	
	ACT. LEG 2	1.4	2.4	
	ACT. LEG 3	1.4	2.4	
SHEAVE		3.5'' x 5/8''	3.5'' x 5/8''	
BELTS - QUANTITY/SIZE		1/4L440	1/4L550	
SHEAVE POSITION		3/4 Closed	3/4 Closed	
C to C		12.0	13.0	

REMARKS

NA Not Available | **ND** No Design | **DD** Direct Drive | **N/R** No Requirement

EXHAUST FAN REPORT

PROJECT: Clinton District Court **DATE:** 2/24/22

AREA SERVED: TX-1, TX-2 & TX-3 **TECH:** BS

FAN DATA				
FAN NUMBER		TX-1	TX-2	TX-3
LOCATION		Attic	Attic	Attic
AREA SERVED		Toilet + Lock Up	Toilets	Conference
MANUFACTURER		Barry Blower	Barry Blower	Barry Blower
MODEL OR SIZE		BVF-135	BVF-105	BVF-90
TOTAL CFM	**DESIGN**	ND	ND	ND
	ACTUAL	1026	840	366
FAN RPM	**DESIGN**	NA	NA	NA
	ACTUAL	858	953	875
PULLEY	**O.D.**	6.25'' x 1''	5.75'' x 7/8''	4.5'' x 5/8''
SERVICE		1.25	1.35	1.25
MOTOR DATA				
MANUFACTURER		Dayton	Dayton	Emerson
MODEL NUMBER		48YZ	48YZ	NA
MOTOR HP	**DESIGN**	1/3	1/3	1/4
	ACTUAL	1/3	1/3	1/4
MOTOR RPM		1725	1725	1725
VOLTAGE/PHASE		208/1	115/1	115/1
MOTOR AMPS	**DESIGN**	6.6	6.6	4.4
	ACT. LEG 1	6.1	6.0	3.6
	ACT. LEG 2	---	---	---
	ACT. LEG 3	---	---	---
SHEAVE		3.25'' x 1/2''	3.0'' x 1/2''	3.0'' x 1/2''
BELTS - QUANTITY/SIZE		1/4L330	1/4L330	1/4L280
SHEAVE POSITION		Fully Closed	Fully Closed	Fully Closed
C to C		9.0	8.5	8.0

REMARKS

NA Not Available | **ND** No Design | **DD** Direct Drive | **N/R** No Requirement

EXHAUST FAN REPORT

PROJECT: Clinton District Court **DATE:** 2/24/22

AREA SERVED: PTACs **TECH:** BS

FAN DATA					
FAN NUMBER		PTAC-1	PTAC-2	PTAC-3	PTAC-4
LOCATION		Employee Lounge	Waiting Room	Conference Room	Probation
AREA SERVED		Employee Lounge	Waiting Room	Conference Room	Probation
MANUFACTURER		Island Aire	Island Aire	Island Aire	Island Aire
MODEL OR SIZE		EZ15C2N	(1)	EZ15C2N	EZ15C2N
TOTAL CFM	**DESIGN**	135	135	60	50
	ACTUAL	165	178	213	101
FAN RPM	**DESIGN**	DD	DD	DD	DD
	ACTUAL	DD	DD	DD	DD
PULLEY	**O.D.**	DD	DD	DD	DD
SERVICE		DD	DD	DD	DD
MOTOR DATA					
MANUFACTURER		NA	NA	NA (2)	NA
MODEL NUMBER		NA	NA	NA	NA
MOTOR HP	**DESIGN**	---	---	---	NA
	ACTUAL	1835W	(1)	1/3	NA
MOTOR RPM		NA	NA	NA	NA
VOLTAGE/PHASE		208/1	208/1	208/1	208/1
MOTOR AMPS	**DESIGN**	1/3	1.3	1.8	1.3
	ACT. LEG 1	0.6	0.4	0.5	0.3
	ACT. LEG 2	---	---	---	---
	ACT. LEG 3	---	---	---	---
SHEAVE		DD	DD	DD	DD
BELTS - QUANTITY/SIZE		DD	DD	DD	DD
SHEAVE POSITION		DD	DD	DD	DD
SPEED		High	Low	Low	Low

REMARKS

(1) Unit missing tag.

(2) Unit has brand new motor.

NA Not Available | **ND** No Design | **DD** Direct Drive | **N/R** No Requirement