

Mill Hill Elementary School

635 Mill Hill Terrace Southport, CT 06890



Fairfield Public Schools Recommissioning (RCx) and Testing, Adjusting, & Balancing (TAB) Study van Zelm Project # 2020102.00 (16-MHES)

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TABLE OF CONTENTS

| EXECUTIVE SUMMARY | 1 |
|---|---|
| EVALUATION | 2 |
| 2015 International Mechanical Code (IMC) Compliance | 2 |
| Outside Air Flow and Air Change Rate Findings | 3 |
| Outside Air Flow Improvement Recommendations | 4 |
| Control Sequence Update Recommendations | 5 |
| Equipment Upgrade or Replacement Recommendations | 5 |
| CONCLUSIONS | 6 |

APPENDICES

- APPENDIX 2 Ventilation Data Calculations
- APPENDIX 3 Roof Map
- APPENDIX 4 TAB Airflow Survey Data
- APPENDIX 5 RCx Unit and Room Take-Off Data



Mill Hill Elementary School

FAIRFIELD PUBLIC SCHOOLS RECOMMISSIONING (RCX) AND TESTING, ADJUSTING, & BALANCING (TAB) STUDY

EXECUTIVE SUMMARY

Mill Hill Elementary School was deemed to be school priority number sixteen by Fairfield Public Schools; the last on the list of the original scope provided to van Zelm. This is primarily due to the fact that this school had recently underwent construction and commissioning, where the building was found to be operating in generally good condition. The following report will indicate the compliance or non-compliance of this school with current International Mechanical Code (2015 IMC) regarding Ventilation for Acceptable Indoor Air Quality.

Mill Hill Elementary School is located at 635 Mill Hill Terrace in Southport, CT, which is a censusdesignated place in the town of Fairfield. This school serves as an educational facility for approximately 366 students as of the May 2022 census (though this could be as high as 441 based on construction estimate) and up to 82 faculty and staff. The school was established in 1956 and closed in 1980/81. It remained vacant until 1990/91 when it was added on to and reopened. The school was expanded through portable classrooms up until the recent renovation. This iteration of the school makes it the newest building within the district with construction concluding during 2022. This major renovation eliminated the use of five (5) portable classroom buildings; added 21 classrooms including providing for specialized programming; expanded the size of core areas such as the library/media center, the cafeteria, music/band space, administrative areas, and a new stage; and made significant improvements to the building air quality and HVAC systems. The project closeout was scheduled for July 2022, furnishing all HVAC systems and Controls as new and covered under a warranty.

The school ventilation systems comprises four (4) Trane Rooftop Air Handling Units (RTU-1 – 4) two of which have energy recovery capability with these units serving the Gym, Gym Stage, Café and Media Center; six (6) natural gas Dedicated Outside Air Systems (DOAS-1 – 6) serving groups of rooms decoupled from VRFs in the spaces used for cooling and perimeter fintube radiation/radiant panel heat; a kitchen Makeup Air Unit with Kitchen Exhaust Fans (MAU-1, KEF-1 & 2), and other exhaust fans for various purposes including, but not limited to, toilet exhaust, mechanical/electrical space ventilation, etc., Daikin VRFs with nine (9) 9 Condensing Unit (CU) systems mostly heat pump with two of the Energy Recovery style; miscellaneous CUH, UH, FTR and RP; and natural gas-fired DHW Heater and two primary/secondary hot water boilers with primary and secondary pumps all in a Lead/Lag configuration. The upgraded control system was provided by Automated Logic with their WebCTRL BAS throughout, SPA was the engineer and vZH&S commissioned the building with a fully operational and efficient set of control sequences.

We performed our on-site RCx inspection and TAB review in June of 2022. The goal of this study is primarily focused towards addressing the outside air and outside air change rates of the occupied spaces. Although there are code exhaust air requirements for spaces like storage rooms, electrical rooms, mechanical rooms, etc., these spaces are often not directly ventilated with outside air, nor are they required to be since they typically have occupancy totals of zero (actual or expected). These spaces typically do not affect building occupants since they are typically provided with some form of exhaust which drives these spaces negative to the surrounding area. At worst, improper levels of exhaust would drive a negative building further negative, but it does not introduce air from these locations to classroom



or office spaces. Should the district pursue additional work for the building including recommissioning, balancing, and controls upgrades, these spaces would be addressed as a component of that process.

Overall, the performance of the building with regard to ventilation was found to be exceptional with few ventilation issues for occupied spaces. Where there were issues, they were generally indicative of slightly less than code-required quantities of ventilation rather than outright missing ventilation, however there were two occupied spaces that did not receive any airflow according to the TAB readings. Findings from the Retro-Commissioning (RCx) and air-side Testing Adjusting and Balancing (TAB) process confirmed the successful implementation and commissioning of the controls system and equipment, which will be beneficial to the district when it comes to reducing energy usage and improving building ventilation compliance with the 2015 version of the International Mechanical Code (2015 IMC).

Although there are additional guidelines and recommendations put forward by organizations dedicated to the research and implementation of healthy buildings that have plenty of overlap with IMC 2015, these were not the driving factors for this assessment. Please be aware that many of these changes on their own will not reduce energy consumption, but rather will increase it; in some cases, this increase could be significant. Measures should be considered that offset this additional energy use with control upgrades that adjust ventilation systems based on use and measured values. The remainder of this report will address these concerns directly and provide a path forward for Fairfield Public Schools.

EVALUATION

For the purposes of this study, the Fairfield Public Schools district had five primary questions about the capability and performance of each of the school buildings. Based on our findings, we have some insight into each of these below.

2015 International Mechanical Code (IMC) Compliance

As the accompanying spreadsheet indicates, most of the individual occupied spaces at this school comply with the applicable building codes and guidelines regarding indoor air quality and outdoor ventilation. The measured ventilation air being delivered into each occupied space is also considered to be a worst-case scenario, so it is possible that the spaces that did not comply with code could be improved. However, a majority of the spaces are served by DOAS units, already operating at 100% outside air as designed and controlled. If the fan speeds for these units are incapable of being increased to offset the minor discrepancies, there might need to be additional investigation into the precise level of balancing at the terminal units to make up the difference.

The supply of outside air to interior occupied spaces is governed by the 2018 Connecticut Building Code, which is based on the 2015 International Mechanical Code. This code prescribes the flow rate of outside air that must be supplied mechanically to occupied areas based on occupancy classifications. Depending on the type of use of a space, outdoor air flow rates in cubic feet per minute (CFM) per person are defined when the number of occupants within a space is known. When total occupants per space are unknown, the code defines occupant density for each classification type in number of occupants per space floor area. The final flow rate in CFM for every occupied space can thus be calculated. Please note that, although this is a school, some spaces like an office will not be indicated as being part of an "education" occupancy classification because the IMC does not distinguish between an office in an office building, a school, or anywhere else. This applies to nearly every space that is not considered a space for traditional classroom activities including, but not limited to, nurse and healthcare offices, gymnasium, assembly halls, etc.



The amount of outside air supplied to occupied spaces is important for occupant comfort and health because contaminants generated by people and materials in the space must be removed or they will build up to unhealthy levels. Diluting interior air with outside air reduces the concentration of various airborne contaminants, including viral particles that carry the COVID-19 virus and other viral and bacterial contaminants.

Outside Air Flow and Air Change Rate Findings

The "Ventilation Data Calculations" Appendix contains the data from all RCx findings and TAB measurements regarding ventilation within occupied spaces. This data conforms to the requirements within IMC 2015 and the results are calculated based on individual space classification and category. Additionally, these readings rely on the "worst case" scenario, whereby each space is considered fully occupied and the associated air handling units are operating with minimum outside air to satisfy the controlled parameters (for DOAS units there is no change to outside air dampers, rather fan speed if applicable). The reason for using this method is to ensure that if a building is capable of maintaining required outside air flow in this minimum ventilation mode, it will definitely maintain them when more outside air is introduced. It does not necessarily mean that the units will handle thermal or humidity regulation in maximum ventilation modes. As a caveat, it is important to understand that forcing the worst case is not necessarily typical building operation but is necessary to discover root issues behind the ventilation control of the building. It is possible that correcting certain issues regarding outside airflow will cause different issues to be revealed, which in turn would need to be addressed.

For the occupied zones within this building, the total minimum required ventilation airflow came out to **13,936 CFM**. The TAB process revealed that **24,368 CFM** of outside air is delivered to these spaces, resulting in a **10,432 CFM** surplus or **174.9%** of the required minimum flow. The ventilation calculations reveal that **87.3%** of the occupied zones met the requirements. As a reminder, the remaining 12.7% of spaces (9 in total) only failed to meet code by relatively small amounts of typically 20-50 CFM. This means that the building is being more than adequately supplied with ventilation airflow, in some cases it could actually be turned down to save energy. There does not appear to be any particular correlation between which rooms did not meet code and their associated unit, further indicating potential benefit for spot-adjustments through a balancing procedure.

A common calculation used for measuring the amount of air flushed through the space every hour is the Air Change Rate (ACH), and for this analysis specifically we are concerned with the Outside Air Change Rate (OACH). At its core, this is a ratio of the volume of air that can theoretically completely fill the volume of each space and how many times it can do that every hour. For example, a 1000 ft² room with 10 ft ceilings will have a volume of 10,000 ft³ If 250 CFM is delivered to this space, that results in 15,000 ft³ of air. Every hour, the space will be flushed with that much air, resulting in an ACH of 1.5. This number on its own will not determine if a space satisfies code requirements and it does not mean that every molecule of the air in that space has been replaced after the hour, but it helps to give an idea into the type of performance that could be expected and there are guidelines for many space regarding the OACH. While general spaces like classrooms and offices are among the space categories that do not have outside air ACH requirements, these rates help to give some insight into overall performance. Current recommendations prescribe a total ACH of at least 3 throughout the building, without falling below the minimum outside air CFM. Taking the entire building volume and air delivered cycled through the building, which includes outside air and filtered, return air, this building was capable of achieving 3.962 **ACH**; this is beyond the recommended 3 ACH. The calculation can be further broken out by spaces that meet or fail to meet code. Among the spaces that failed to meet code, the outside air ACH was 2.063; for spaces that at least met or exceeded code, the outside air ACH was 3.021; the combined outside air ACH for the entire building was **2.897**. Special rooms such as a nurse's suite do require an outside air ACH of



at least 2 and total ACH of 6, the first of which was met but the total ACH was not since the system utilizes the reduced flow 100% OA. However, given the ACH for the rooms that did not meet code being over 2.000, this further demonstrates how close they come.

| Total ACH | Total OACH | OACH for zones that | OACH for zones that | | | |
|-----------|------------|-------------------------|---------------------|--|--|--|
| (RA + OA) | (OA/EA) | do <u>not</u> meet code | meet code | | | |
| 3.962 | 2.897 | 2.063 | 3.021 | | | |

Outside Air Flow Improvement Recommendations

It is suggested that the district review the spaces indicated as not meeting code and adjust dampers for those spaces to increase minimum ventilation levels. For the two spaces that did not receive any airflow (151A Gym Office and 152A Media Office), these spaces should be reviewed a bit further to discover why they are not supplied with air. Given the small quantity of spaces affected by these investigations, this task could be considered "low-hanging fruit" for the district even if it requires some adjustments to the ductwork. The district could benefit from planning for either ongoing commissioning (OCx) or periodic recommissioning approximately 5 years after the conclusion of the renovation. Though the building is working well now, over time the sensors and sequences will need to be rechecked to confirm proper operation, making adjustments or repairs where needed to satisfy the performance requirements of the building.

Aside from the above, since the emergence of the COVID-19 virus in December 2019, the specific requirements and precautions taken regarding outside air have become more stringent. For example, ASHRAE has been continuously investigating the transmission of COVID-19 through HVAC systems and has made recommendations on how to adapt existing HVAC systems to minimize transmission of COVID-19. Changes to building systems to address the virus also positively improve the performance of the ventilation systems with handling the filtration of other particulate that directly impacts building air quality. On April 14, 2020, ASHRAE released a document "ASHRAE Position Document on Infectious Aerosols". This report was provided in an Appendix to the FPS high school ventilation summary reports. ASHRAE also gave a presentation on June 16, 2020, regarding Recommendations and Activities for reopening schools for the fall 2020 academic semester. These recommendations remain relevant as COVID and other contaminants that impact indoor air quality continue to remain a concern. Although this report is primarily concerned with meeting 2015 IMC for compliance, ASHRAE's insight into addressing the code is invaluable. The recommendations they put forward relevant to this building for reducing the transmission of infectious aerosols through HVAC systems as they apply to schools are as follows:

• Further increase outdoor ventilation rates (Dilution) for all zones with deficit minimum outside air by adjusting the outside air damper minimum positions or increasing fan speeds where the damper is at full open for the associated air handling equipment. Generally, more is better, but any changes should follow ASHRAE Standard 62.1 as a minimum and should not overpower the capability of the heating or cooling equipment so as to maintain temperature and humidity requirements in the occupied spaces.



- Filter changes should become more frequent. Current policy indicates a twice-annual filter change at all schools. Dirty filters decrease the filter efficiency and forces the unit fans to run at higher speeds (more energy consumption) or to deliver less outdoor ventilation air to the space.
- Increase total air change rates to between 3 and 6 ACH where possible while still satisfying minimum OA ventilation.
- Flush or purge building before and after occupancy for at least two (2) hours, if possible.
- Consider installation of UV-C or bi-polar ionization to recirculating air systems where installation of these systems do not interfere with the unit construction or operation.
- Provide humidification to maintain 40% RH during the heating seasons, if possible.
- Provide dehumidification in the summer to maintain room RH below 60%.
- Supplement poorly or un-ventilated areas with portable HEPA filtration units until such time as proper ventilation can be delivered to the space.
- Increase restroom exhaust where possible while maintaining a positive building pressurization to the exterior.

Control Sequence Update Recommendations

Due to the recent renovation, the control system was one of the major system overhauls. It has recently been commissioned and confirmed to be working well with full system visibility and control. Over time, some of these systems might start to function less efficiently and would need to be reviewed. Some recommendations include:

- Better utilize features of the BAS to group zone schedules based upon real use occupancy hours including overrides such as holidays, snow days, etc..
- Look to program units to optimize a pre and post-occupancy purge for all occupied spaces.
- Generally, increase airflow to each space or decrease if the supplied air is *significantly* beyond necessary levels. Decreasing air to some locations might seem counterintuitive but for zones supplied with significantly more than 100% of what is required will allow other zones in the system with less air to benefit.
- Increase the minimum OA damper position for each rooftop unit, where possible.
- Continue to review trending and alarms for all units and optimize alarm points for if units are found operating below required minimum ventilation levels during occupied modes

Equipment Upgrade or Replacement Recommendations

Since most of the building systems are new, there is little to recommend for additional new equipment, replacements or upgrades. However, should any unit be required to be replaced, it is recommended to continue to utilize air handling equipment with energy recovery capability.

Generally, the more outside air that can be supplied to occupied areas, the better. Each existing air handler excluding the DOAS units should have outside air flow rates increased above current setpoints if they can



be obtained. Even units that currently meet code requirements for ventilation flow rates could be increased, but should not be increased beyond the capacity of the unit to heat or cool the air. Total space air change rates should also be increased to the extent possible along with increases in outside air flow to better remove contaminants from the air. If a unit at maximum fan speeds is still incapable of providing at least the minimum ventilation or ACH required, then the system should be evaluated further to determine the best solution such a total system modification, or the installation of a self-contained HEPA filtration unit in areas where increasing fresh air is limited.

Supplemental air cleaning technology, such as ultraviolet-C (UV-C) light or bi-polar ionization, is available could be considered if additional disinfection measures are desired. UV-C is short wavelength ultraviolet light that has been found to effectively kill COVID-19 particles. UV-C systems are already used in other HVAC systems where they are installed in air streams to kill bacteria and other harmful living organisms. These systems can be installed relatively easily in already constructed system ductwork or air handlers without major modifications. Bi-polar ionization systems are also installed in ductwork or air handlers and use an electric charge to create a concentration of positively and negatively charged particles in an airstream. These particles cause pathogens to stick to each other and become larger, thus increasing the probability of them being captured by air filters. The charged particles come in contact with pathogens in the occupied space, the charge removes hydrogen from the pathogen so that it is no longer able to sustain itself. For this reason, bi-polar ionization is preferred to UV-C air cleaning because bi-polar ionization has the ability to decontaminate pathogens outside of the ductwork whereas UV-C only decontaminates pathogens that enter the ducts.

ASHRAE recommends relative humidity values between 40 and 65% as these values have been shown to hamper the ability of COVID-19 and other pathogens to travel and thrive. When cooling systems are in operation, ensure dehumidification is adequate to keep relative humidity below 65%. During heating system operation, relative humidity values are typically less than 40%. Adding humidification to the existing HVAC systems is often exceedingly difficult and costly; additionally, humidification for HVAC systems can be problematic if not well maintained and adds to operating costs. For this reason, recommendations discussed above should be enacted before humidification is considered.

For any unit that operates *only* with 100% outside air (e.g., makeup air units, dedicated outside air units, etc.) MERV 8 filters can be used instead of MERV 13s, allowing for fan energy savings and increased ventilation without sacrificing indoor air quality.

In general, this building had few issues but there were some. All of the items noted within the RCx and TAB field finding appendices should be addressed by the facilities personnel. These items are separated by category: IAQ/Ventilation items, Maintenance items, Control items, and Information Only.

CONCLUSIONS

Fairfield Public Schools has taken measures in the past to address identified deficiencies regarding the recommended proper filtration upgrades for indoor air quality (IAQ) improvements, and this study found that the Mill Hill Elementary School largely succeeded in meeting the current minimum ventilation requirements per 2015 IMC. The van Zelm, Wings, and Fairfield Public Schools team will collectively discuss options and estimate costs for correcting issues and code deficiencies discovered as part of this study. The cost analysis portion will be a continual process, though for this school it is expected to be a relatively small burden.

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APPENDICES

APPENDIX 1 – Issues List



ISSUES LIST

Issue List General Discussion

The following sections within this appendix include observations we made as a part of the study. Some of these items directly impact Indoor Air Quality (IAQ) or Ventilation and, since this is the primary concern of the study, are recommended to be addressed immediately. Other items are overdue/improper maintenance, control system issues, or general observations. Just because an issue is not included in the IAQ/Ventilation sections does not necessarily mean that it will have no effect on improving the building environment, but it is more likely that the effects are minimal or would only indirectly address a concern. In some cases, these could potentially *reduce* overall building outside airflow, even if in such instances it would keep the associated spaces within code compliance. While this might seem counterintuitive, given the concerns, it is a way to manage a healthy, code-compliant building environment while also saving energy.

The nature of this process being one that affects almost the entire building means that a response to this issue list should be through a holistic approach. Any one issue correction on its own might locally improve the condition of the served areas, but if an adjacent, non-functioning unit is also not corrected then the positive effects will be diminished. The interconnectivity of the issues cannot be easily indicated due to the complexity of the built environment, but a thorough review of all issues and an implementation plan will provide better results overall for the building and its stakeholders.

It should be noted that the inspections we performed as part of this study were undertaken during the month of June 2022, so it is possible that some noted concerns, particularly maintenance items or issues already known about could have been addressed prior to the distribution of this report. Some specific issues that were expected to have been addressed include filters within the air handling equipment were anticipated to be changed within a few weeks of the initial inspections. Ongoing discussions with Fairfield Public Schools will allow us to update these items as we continue through other schools and into the implementation phase later in the year.

To aid in the process of addressing and tracking these issues, we have included a column indicating when action has been taken by Fairfield Public Schools or a hired contractor to address any individual issues, and will allow the district to document and timestamp issues that have been corrected since the initial inspection.



Indoor Air Quality And Ventilation Issue Findings

Below is a compilation of findings from our commissioning indoor space evaluation, TAB verification effort, and the air handling equipment analysis that relate to indoor air quality or ventilation status of the building. These findings should be considered as a high priority for budgeting and action steps. Many of the listed issues might lend clarity as to why the ventilation findings of throughout were found to be deficient. Addressing these issues individually will not correct any systemic, unit, or building-wide issues related to the IAQ or ventilation of the building.

| Action Taken | Status | Unit/Zone | Serving/Room Name | Indoor Air Quality And Ventilation Issue (14) |
|-----------------|--------|-----------|---------------------|---|
| | Closed | Building | General | Filters, Coils and Belts Overview: All are clean and new |
| | Open | 107 | 3rd Grade Classroom | This space did not meet ventilation requirements at the time of testing. Only 324 CFM was provided but 358 CFM was required. |
| | Open | 098 | Secure Lobby | No ventilation has been provided to this space |
| | Open | 100B | Nurse Suite | This space did not meet ventilation requirements at the time of testing. Only 110 CFM was provided but 125 CFM was required. |
| | Open | 100B | Nurse Suite | This space did not meet special space ventilation ACH requirements at the time of testing. The ventilation ACH was 3.588, which exceeded the 2.000 requirement however total airflow did not meet the required 6.000 since this is a DOAS system. In addition to at least meeting the flow requirements based on floor area, the air should be further increased until 6.000 ACH is achieved, which is equivalent to 184 CFM. |
| | Open | 100B* | Nurse Office | This space did not meet special space ventilation ACH requirements at the time of testing. The ventilation ACH was 4.118, which exceeded the 2.000 requirement however total airflow did not meet the required 6.000 since this is a DOAS system. The air should be further increased until 6.000 ACH is achieved, which is equivalent to 94 CFM. |
| | Open | 121A | Toilet | Exhaust flow in this space measured at 0 CFM |



| Action Taken | Status | Unit/Zone | Serving/Room Name | Indoor Air Quality And Ventilation Issue (14) |
|-----------------|--------|-----------|---------------------|--|
| | Open | 122 | 1st Grade Classroom | This space did not meet ventilation requirements at the time of testing. Only 335 CFM was provided but 356 CFM was required. |
| | Open | 140B | Staff Dining | This space did not meet ventilation requirements at the time of testing. Only 167 CFM was provided but 194 CFM was required. |
| | Open | 14sA | Math/Science | This space did not meet ventilation requirements at the time of testing. Only 59 CFM was provided but 76 CFM was required. |
| | Open | 151A | Gym Office | No ventilation has been provided to this space. Given the size and occupancy, this only requires 25 CFM. |
| | Open | 151B | Platform | This space did not meet ventilation requirements at the time of testing. Only 233 CFM was provided but 341 CFM was required. |
| | Open | 152A | Media Office | No ventilation has been provided to this space. Given the size and occupancy, this only requires 20 CFM. |
| | Open | 153 | OT/PT | This space did not meet ventilation requirements at the time of testing. Only 47 CFM was provided but 90 CFM was required. |



Maintenance Issue Findings

Below is a compilation of findings from our commissioning indoor space evaluation, TAB verification effort, and the air handling equipment analysis that relate to indoor air quality or ventilation status of the building. The priority level of these findings will vary, and correcting any of them could improve the associated unit's performance, which might have an incidental effect on the indoor air quality or ventilation in the spaces. These issues do not necessarily explain reasons why the ventilation findings of the associated spaces were found to be deficient but should be corrected, nonetheless.

| Action Taken | Status | Unit/Zone | Serving/Room Name | Maintenance Issue (7) |
|-----------------|--------|-----------|-------------------|---|
| | Open | 110 | IDF | No ventilation or exhaust has been provided to this space. This space could potentially heat up and should have means of dispersing the heat. |
| | Open | 133 | MDF | No ventilation or exhaust has been provided to this space. This space could potentially heat up and should have means of dispersing the heat. |
| | Open | 138 | Electric Room | No ventilation or exhaust has been provided to this space. This space could potentially heat up and should have means of dispersing the heat. |
| | Open | 149 | IDF | No ventilation or exhaust has been provided to this space. This space could potentially heat up and should have means of dispersing the heat. |
| | Open | 103E | Boiler Room | No ventilation or exhaust has been provided to this space. This space could potentially heat up and should have means of dispersing the heat. |
| | Open | 118A | Music Storage | This space was noticeably hotter than nearby rooms |
| | Open | 151B | Platform | We observed water staining on the tiles, indicating a potential roof leak here. |



Control Issue Findings

Below is a compilation of findings from our commissioning indoor space evaluation, TAB verification effort, and the air handling equipment analysis that relate to the status of the control system within the building. The priority level of these findings will vary, and correcting any of them could improve the associated unit's performance, which might have an incidental effect on the indoor air quality or ventilation in the spaces. Some control issues do affect whether or not facilities or maintenance personnel are informed of issues at systems or equipment, which can result in delays to maintenance or repairs that would otherwise have been quick to correct. These issues do not necessarily explain reasons why the ventilation findings of the associated spaces were found to be deficient but should be corrected, nonetheless.

| Action Taken | Status | Unit/Zone | Serving/Room Name | Control Issue (01) |
|-----------------|--------|-----------|-------------------|--|
| | Open | Equipment | Schedules | Energy Savings Potential: Utilize features of BAS to group schedule based upon real occupancy hours and over-rides such as Holiday's, snow days, etc. |



Information Only Findings

Below is a list of the general "information only" findings from the room take-off measurements, TAB verification effort, and the air handling equipment analysis. If a correction can be made to these items, it will not affect improving the indoor air quality or ventilation for occupied spaces. Some of these items might actually speak to *reducing* outside airflow, particularly if a space is significantly overventilated or has inconsistent/large swings in occupancy, in which case their status has been indicated as "Energy Savings".

| Action Taken | Status | Unit/Zone | Serving/Room Name | Information Only Findings (12) |
|-----------------|--------|-----------|-------------------|---|
| | Open | 103 | Corridor | No ventilation has been provided to this space |
| | Open | 112 | Sprinkler Room | No ventilation has been provided to this space |
| | Open | 117 | C Corridor | No ventilation has been provided to this space |
| | Open | 140 | Hall | No ventilation has been provided to this space |
| | Open | 142 | Hall | No ventilation has been provided to this space |
| | Open | 100E | Hall Storage | No ventilation has been provided to this space |
| | Open | 149A | Ground Storage | No ventilation has been provided to this space |
| | Open | 151B | Platform | The Platform and Ramp are counted as separate zones for this study but they share the same room number |
| | Open | 151E | Storage w/ExD | No ventilation has been provided to this space |
| | Open | Building | General | Overall High-Level Summary Related to Building Ventilation and Equipment Condition: School recently undergone major renovation and addition and scheduled project closeout July 2022. With that, all HVAC systems and Controls are new and covered under a warranty. |
| | Open | Building | General | Combination of decoupled DOAS (6) units to VRF's, perimeter/RP heat and RTU's for larger dedicated areas. |
| | Open | Building | General | Controls and BAS Systems Information including Type, Brand, and General Condition: Automated Logic WebCTRL BAS throughout. |



| Action Taken | Status | Unit/Zone | Serving/Room Name | Information Only Findings (12) |
|-----------------|--------|-----------|-------------------|--|
| | | | | SPA was the engineer and vZHS commissioned with fully operational and efficient control sequences. |

APPENDIX 2 – Ventilation Data Calculations

| Project Name: | Fairfield Public Schools RCx & TAB Study | Mill Hill Elementary School |
|-----------------|--|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | Ventilation Calculation by Building | |
| Date | August 3, 2022 | |

| | Zone Identification | | | | | | | | IMC 2015 Ventilation Calculations | | | | | | | | | | | | |
|-------|---------------------|---------------------|---|-----------------------|------------------|------------------------|--------------------------|-----------|-----------------------------------|-------------------|----------------------|--|--|---|--------------------------------|--|---|---|--|-----------|--------------------|
| Floor | Room# | Room Name | Occupancy Classification | Category | Total Airflow | Unit Actual OA % | BAS OA Damper Cond | Served By | Zone Area, Az, per space | Ceiling Height | Volume, per space | Zone Population , Pz, per space | People OA Rate in Breathing Zone, Rp | Area OA Rate in Breathing Zone, Ra | Default Occupant Density | Min. Required Ventilation Airflow | ACTUAL MEASURED VENTILATION AIR FLOW | Excess Ventilation Air (negative indicates deficit) | Excess Ventilation Air Percentage | PASS/FAIL | Ventilation ACH |
| | | | | | (cfm) | (%) | (%) | | (sq.ft) | (ft) | (cu.ft) | Adult | (cfm/ person) | (cfm/sf) | (#/1000sf) | (cfm) | (cfm) | (cfm) | (%) | | (AC/hr) |
| 1A | 098 | Secure Lobby | Storage | Warehouses | | 100% | 100% | DOAS-3 | 432 | 9.6 | 4147 | 5 | 0.0 | 0.06 | 0 | 26 | | N/A | | N/A | |
| 1A | 100 | Waiting Room | Storage | Warehouses | 147 | 100% | 100% | DOAS-3 | 877 | 9.3 | 8156 | 7 | 0.0 | 0.06 | 0 | 53 | 147 | 94 | 179.4% | Meets | 1.081 |
| 1A | 100A | Equipment | Storage | Warehouses | 44 | 100% | 100% | DOAS-3 | 100 | 8.4 | 840 | 0 | 0.0 | 0.06 | 0 | 6 | 44 | 38 | 633.3% | Meets | 3.143 |
| 1A | 100B | Cott Room | Hospitals nursing and convalescent homes | Patient Rooms | 119 | 100% | 100% | DOAS-3 | 110 | 8.4 | 924 | 3 | 25.0 | 0.00 | 10 | 75 | 119 | 44 | 58.7% | Meets | 7.727 |
| 1A | 100B | Nurse Suite | Hospitals nursing and convalescent homes | Patient Rooms | 110 | 100% | 100% | DOAS-3 | 219 | 8.4 | 1840 | 5 | 25.0 | 0.00 | 10 | 125 | 110 | -15 | -12.0% | Fails | 3.588 |
| 1A | 100B | Storage | Storage | Warehouses | 32 | 100% | 100% | DOAS-3 | 69 | 8.6 | 593 | 0 | 0.0 | 0.06 | 0 | 4 | 32 | 28 | 672.9% | Meets | 3.236 |
| 1A | 100B | Toilet | Public Spaces | Toilet rooms - public | 45 | 100% | 100% | DOAS-3 | 52 | 8.6 | 447 | 1 | 0.0 | 0.00 | 0 | 0 | 45 | 45 | 0.0% | N/A | 6.038 |
| 1A | 100B* | Nurse Office | Hospitals nursing and convalescent homes | Patient Rooms | 64 | 100% | 100% | DOAS-3 | 111 | 8.4 | 932 | 2 | 25.0 | 0.00 | 10 | 50 | 64 | 14 | 28.0% | Meets | 4.118 |
| 1A | 100C | Records Storage | Storage | Warehouses | 65 | 100% | 100% | DOAS-3 | 174 | 8.6 | 1496 | 3 | 0.0 | 0.06 | 0 | 10 | 65 | 55 | 522.6% | Meets | 2.606 |
| 1A | 100D | Unisex Toilet | Public Spaces | Toilet rooms - public | 73 | 100% | 100% | DOAS-3 | 76 | 8.6 | 654 | 1 | 0.0 | 0.00 | 0 | 0 | 73 | 73 | 0.0% | N/A | 6.701 |
| 1A | 100E | Hall Storage | Storage | Warehouses | | | | | 35 | 8 | 280 | 0 | 0.0 | 0.06 | 0 | 2 | | N/A | | N/A | |
| 1A | 100E | Principal | Offices | Office spaces | 61 | 100% | 100% | DOAS-3 | 208 | 8.6 | 1789 | 7 | 5.0 | 0.06 | 5 | 47 | 61 | 14 | 28.5% | Meets | 2.046 |
| 1A | 100F | Social Worker | Offices | Office spaces | 54 | 100% | 100% | DOAS-3 | 107 | 8.6 | 920 | 1 | 5.0 | 0.06 | 5 | 11 | 54 | 43 | 372.9% | Meets | 3.521 |
| 1A | 100G | School Psychologist | Offices | Office spaces | 64 | 100% | 100% | DOAS-3 | 112 | 8.6 | 963 | 4 | 5.0 | 0.06 | 5 | 27 | 64 | 37 | 139.5% | Meets | 3.987 |
| 1A | 100H | Program Facilitator | Offices | Office spaces | 64 | 100% | 100% | DOAS-3 | 177 | 8.6 | 1522 | 4 | 5.0 | 0.06 | 5 | 31 | 64 | 33 | 109.0% | Meets | 2.523 |
| 1A | 100J | Speech/Language | Offices | Office spaces | 59 | 100% | 100% | DOAS-3 | 97 | 8.6 | 834 | 2 | 5.0 | 0.06 | 5 | 16 | 59 | 43 | 272.9% | Meets | 4.244 |
| 1A | 100K | Conference Room | Offices | Conference rooms | 108 | 100% | 100% | DOAS-3 | 305 | 10 | 3050 | 13 | 5.0 | 0.06 | 50 | 83 | 108 | 25 | 29.7% | Meets | 2.125 |
| 1A | 101 | Multipurpose/Café | Food and beverage service | Cafeteria, fast food | 5700 | 18% | 34% | RTU-3 | 2698 | 20 | 53960 | 64 | 7.5 | 0.18 | 100 | 966 | 1006 | 40 | 4.2% | Meets | 1.119 |
| 1A | 102 | 4th Grade Classroom | Education | Classroom (ages 5-8) | 499 | 100% | 100% | DOAS-4 | 816 | 8.6 | 7018 | 26 | 10.0 | 0.12 | 25 | 358 | 499 | 141 | 39.4% | Meets | 4.266 |
| 1A | 103A | IDF | Storage | Warehouses | 102 | 100% | 100% | DOAS-4 | 64 | 11.3 | 723 | 0 | 0.0 | 0.06 | 0 | 4 | 102 | 98 | 2556.3% | Meets | 8.462 |
| 1A | 103B | Women Staff Toilet | Public Spaces | Toilet rooms - public | 41 | 100% | 100% | DOAS-4 | 60 | 8.6 | 516 | 1 | 0.0 | 0.00 | 0 | 0 | 41 | 41 | 0.0% | N/A | 4.767 |



| Project Name: | Fairfield Public Schools RCx & TAB Study | Mill Hill Elementary School |
|-----------------|--|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | Ventilation Calculation by Building | |
| Date | August 3, 2022 | |
| | | |

| | Zone Identification | | | | | | | | | | | | | IMC 2015 Ventilation Calculations | | | | | | | | | | | |
|-------|---------------------|---------------------|--------------------------|-------------------------------|------------------|------------------------|--------------------------|-----------|-----------------------------------|-------------------|----------------------|--|--|---|--------------------------------|--|---|---|--|-----------|--------------------|--|--|--|--|
| Floor | Room# | Room Name | Occupancy Classification | Category | Total Airflow | Unit Actual OA % | BAS OA Damper Cond | Served By | Zone Area, Az, per space | Ceiling Height | Volume, per space | Zone Population , Pz, per space | People OA Rate in Breathing Zone, Rp | Area OA Rate in Breathing Zone, Ra | Default Occupant Density | Min. Required Ventilation Airflow | ACTUAL MEASURED VENTILATION AIR FLOW | Excess Ventilation Air (negative indicates deficit) | Excess Ventilation Air Percentage | PASS/FAIL | Ventilation ACH | | | | |
| | | | | | (cfm) | (%) | (%) | | (sq.ft) | (ft) | (cu.ft) | Adult | (cfm/ person) | (cfm/sf) | (#/1000sf) | (cfm) | (cfm) | (cfm) | (%) | | (AC/hr) | | | | |
| 1A | 103C | Men Staff Toilet | Public Spaces | Toilet rooms - public | 28 | 100% | 100% | DOAS-4 | 60 | 8.6 | 516 | 1 | 0.0 | 0.00 | 0 | 0 | 28 | 28 | 0.0% | N/A | 3.256 | | | | |
| 1A | 103D | Janitor | Storage | Warehouses | 32 | 100% | 100% | DOAS-4 | 90 | 8 | 720 | 1 | 0.0 | 0.06 | 0 | 5 | 32 | 27 | 492.6% | Meets | 2.667 | | | | |
| 1A | 103E | Boiler Room | Storage | Warehouses | | | | | 779 | 16 | 12464 | 0 | 0.0 | 0.06 | 0 | 47 | | N/A | | N/A | | | | | |
| 1A | 104 | 4th Grade Classroom | Education | Classroom (ages 5-8) | 494 | 100% | 100% | DOAS-4 | 897 | 8.4 | 7535 | 23 | 10.0 | 0.12 | 25 | 338 | 494 | 156 | 46.3% | Meets | 3.934 | | | | |
| 1A | 105 | Staff Work Room | Workrooms | Copy, printing rooms | 102 | 100% | 100% | DOAS-4 | 324 | 8.4 | 2722 | 6 | 5.0 | 0.06 | 4 | 49 | 102 | 53 | 106.3% | Meets | 2.249 | | | | |
| 1A | 106 | 3rd Grade Classroom | Education | Classroom (ages 5-8) | 567 | 100% | 100% | DOAS-4 | 902 | 8.4 | 7577 | 25 | 10.0 | 0.12 | 25 | 358 | 567 | 209 | 58.3% | Meets | 4.490 | | | | |
| 1A | 106A | Toilet | Public Spaces | Toilet rooms - public | -81 | 100% | 100% | DOAS-4 | 15 | 7.6 | 114 | 1 | 0.0 | 0.00 | 0 | 0 | -81 | -81 | 0.0% | N/A | -42.632 | | | | |
| 1A | 107 | 3rd Grade Classroom | Education | Classroom (ages 5-8) | 324 | 100% | 100% | DOAS-4 | 902 | 8.4 | 7577 | 25 | 10.0 | 0.12 | 25 | 358 | 324 | -34 | -9.6% | Fails | 2.566 | | | | |
| 1A | 107A | Toilet | Public Spaces | Toilet rooms - public | -58 | 100% | 100% | DOAS-4 | 15 | 7.6 | 114 | 1 | 0.0 | 0.00 | 0 | 0 | -58 | -58 | 0.0% | N/A | -30.526 | | | | |
| 1A | 108 | 3rd Grade Classroom | Education | Classroom (ages 5-8) | 516 | 100% | 100% | DOAS-4 | 899 | 8.4 | 7552 | 25 | 10.0 | 0.12 | 25 | 358 | 516 | 158 | 44.2% | Meets | 4.100 | | | | |
| 1A | 108A | Toilet | Public Spaces | Toilet rooms - public | | | | | 15 | 7.6 | 114 | 1 | 0.0 | 0.00 | 0 | 0 | -91 | -91 | 0.0% | N/A | -47.895 | | | | |
| 1A | 109 | Storage | Storage | Warehouses | | | | | 121 | 8 | 968 | 0 | 0.0 | 0.06 | 0 | 7 | | N/A | | N/A | | | | | |
| 1A | 110 | IDF | Storage | Warehouses | | | | | 86 | 11.6 | 998 | 0 | 0.0 | 0.06 | 0 | 5 | | N/A | | N/A | | | | | |
| 1A | 111 | 2nd Grade Classroom | Education | Classroom (ages 5-8) | 580 | 100% | 100% | DOAS-5 | 924 | 8.6 | 7946 | 25 | 10.0 | 0.12 | 25 | 361 | 580 | 219 | 60.7% | Meets | 4.379 | | | | |
| 1A | 112 | Sprinkler | Storage | Warehouses | | | | | 91 | 11.4 | 1037 | 0 | 0.0 | 0.06 | 0 | 5 | | N/A | | N/A | | | | | |
| 1A | 113 | Hall | Education | Corridors (see Public Spaces) | 185 | 100% | 100% | DOAS-5 | 1062 | 9.6 | 10195 | 0 | 0.0 | 0.00 | 0 | 0 | 185 | 185 | 0.0% | N/A | 1.089 | | | | |
| 1A | 113A | Unisex Toilet | Public Spaces | Toilet rooms - public | 61 | 100% | 100% | DOAS-5 | 58 | 8.6 | 499 | 1 | 0.0 | 0.00 | 0 | 0 | 61 | 61 | 0.0% | N/A | 7.338 | | | | |
| 1A | 113B | Storage | Storage | Warehouses | 77 | 100% | 100% | DOAS-5 | 75 | 8.6 | 645 | 0 | 0.0 | 0.06 | 0 | 5 | 77 | 73 | 1611.1% | Meets | 7.163 | | | | |
| 1A | 113C | Office | Offices | Office spaces | 166 | 100% | 100% | DOAS-5 | 201 | 8.6 | 1729 | 7 | 5.0 | 0.06 | 5 | 47 | 166 | 119 | 252.7% | Meets | 5.762 | | | | |
| 1A | 114 | Storage | Storage | Warehouses | 56 | 100% | 100% | DOAS-5 | 122 | 8.6 | 1049 | 0 | 0.0 | 0.06 | 0 | 7 | 56 | 49 | 665.0% | Meets | 3.202 | | | | |
| 1A | 115 | 2nd Grade Classroom | Education | Classroom (ages 5-8) | 536 | 100% | 100% | DOAS-5 | 968 | 8.6 | 8325 | 25 | 10.0 | 0.12 | 25 | 366 | 536 | 170 | 46.4% | Meets | 3.863 | | | | |



| Project Name: | Fairfield Public Schools RCx & TAB Study | Mill Hill Elementary School |
|-----------------|--|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | Ventilation Calculation by Building | |
| Date | August 3, 2022 | |
| | | |

| | Zone Identification | | | | | | | | | | | | | IMC 2015 Ventilation Calculations | | | | | | | | | | | |
|-------|---------------------|---------------------|--------------------------|-----------------------|------------------|------------------------|--------------------------|-----------|-----------------------------------|-------------------|----------------------|--|--|---|--------------------------------|--|---|---|--|-----------|--------------------|--|--|--|--|
| Floor | Room# | Room Name | Occupancy Classification | Category | Total Airflow | Unit Actual OA % | BAS OA Damper Cond | Served By | Zone Area, Az, per space | Ceiling Height | Volume, per space | Zone Population , Pz, per space | People OA Rate in Breathing Zone, Rp | Area OA Rate in Breathing Zone, Ra | Default Occupant Density | Min. Required Ventilation Airflow | ACTUAL MEASURED VENTILATION AIR FLOW | Excess Ventilation Air (negative indicates deficit) | Excess Ventilation Air Percentage | PASS/FAIL | Ventilation ACH | | | | |
| | | | | | (cfm) | (%) | (%) | | (sq.ft) | (ft) | (cu.ft) | Adult | (cfm/ person) | (cfm/sf) | (#/1000sf) | (cfm) | (cfm) | (cfm) | (%) | | (AC/hr) | | | | |
| 1A | 116 | Custodian/Work | Storage | Warehouses | 179 | 100% | 100% | DOAS-5 | 119 | 8.6 | 1023 | 4 | 0.0 | 0.06 | 0 | 7 | 179 | 172 | 2407.0% | Meets | 10.494 | | | | |
| 1A | 121 | 2nd Grade Classroom | Education | Classroom (ages 5-8) | 448 | 100% | 100% | DOAS-5 | 771 | 8.6 | 6631 | 22 | 10.0 | 0.12 | 25 | 313 | 448 | 135 | 43.4% | Meets | 4.054 | | | | |
| 1A | 121A | Toilet | Public Spaces | Toilet rooms - public | | | | | 16 | 8 | 128 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 | | | | |
| 1A | 122 | 1st Grade Classroom | Education | Classroom (ages 5-8) | 335 | 100% | 100% | DOAS-5 | 886 | 8.6 | 7620 | 25 | 10.0 | 0.12 | 25 | 356 | 335 | -21 | -6.0% | Fails | 2.638 | | | | |
| 1A | 122A | Toilet | Public Spaces | Toilet rooms - public | | | | | 16 | 8 | 128 | 1 | 0.0 | 0.00 | 0 | 0 | -62 | -62 | 0.0% | N/A | -29.063 | | | | |
| 1A | 123 | 2nd Grade Classroom | Education | Classroom (ages 5-8) | 456 | 100% | 100% | DOAS-5 | 841 | 8.6 | 7233 | 25 | 10.0 | 0.12 | 25 | 351 | 456 | 105 | 29.9% | Meets | 3.783 | | | | |
| 1A | 123A | Toilet | Public Spaces | Toilet rooms - public | | | | | 46 | 8 | 368 | 1 | 0.0 | 0.00 | 0 | 0 | -40 | -40 | 0.0% | N/A | -6.522 | | | | |
| 1A | 124 | Res. Room 2 | Offices | Office spaces | 85 | 100% | 100% | DOAS-5 | 243 | 8.6 | 2090 | 6 | 5.0 | 0.06 | 5 | 45 | 85 | 40 | 90.7% | Meets | 2.440 | | | | |
| 1A | 125 | 1st Grade Classroom | Education | Classroom (ages 5-8) | 485 | 100% | 100% | DOAS-5 | 986 | 8.6 | 8480 | 24 | 10.0 | 0.12 | 25 | 358 | 485 | 127 | 35.4% | Meets | 3.432 | | | | |
| 1A | 125A | Toilet | Public Spaces | Toilet rooms - public | | | | | 47 | 8 | 376 | 1 | 0.0 | 0.00 | 0 | 0 | -27 | -27 | 0.0% | N/A | -4.309 | | | | |
| 1A | 126 | Res. Room 1 | Offices | Office spaces | 82 | 100% | 100% | DOAS-5 | 264 | 8.6 | 2270 | 12 | 5.0 | 0.06 | 5 | 76 | 82 | 6 | 8.1% | Meets | 2.167 | | | | |
| 1A | 127 | 1st Grade Classroom | Education | Classroom (ages 5-8) | 504 | 100% | 100% | DOAS-5 | 1001 | 8.6 | 8609 | 27 | 10.0 | 0.12 | 25 | 390 | 504 | 114 | 29.2% | Meets | 3.513 | | | | |
| 1A | 127A | Toilet | Public Spaces | Toilet rooms - public | | | | | 40 | 8 | 320 | 1 | 0.0 | 0.00 | 0 | 0 | -33 | -33 | 0.0% | N/A | -6.188 | | | | |
| 1A | 128 | 1st Grade Classroom | Education | Classroom (ages 5-8) | 449 | 100% | 100% | DOAS-5 | 1000 | 8.6 | 8600 | 26 | 10.0 | 0.12 | 25 | 380 | 449 | 69 | 18.2% | Meets | 3.133 | | | | |
| 1A | 128A | Toilet | Public Spaces | Toilet rooms - public | 30 | 100% | 100% | DOAS-5 | 39 | 8.6 | 335 | 1 | 0.0 | 0.00 | 0 | 0 | 30 | 30 | 0.0% | N/A | 5.367 | | | | |
| 1A | 130 | Kindergarten | Education | Classroom (ages 5-8) | 486 | 100% | 100% | DOAS-6 | 1005 | 8.6 | 8643 | 25 | 10.0 | 0.12 | 25 | 371 | 486 | 115 | 31.1% | Meets | 3.374 | | | | |
| 1A | 130A | Toilet | Public Spaces | Toilet rooms - public | | | | | 41 | 8 | 328 | 1 | 0.0 | 0.00 | 0 | 0 | -39 | -39 | 0.0% | N/A | -7.134 | | | | |
| 1A | 131 | Janitor | Storage | Warehouses | 43 | 100% | 100% | DOAS-6 | 66 | 8 | 528 | 1 | 0.0 | 0.06 | 0 | 4 | 43 | 39 | 985.9% | Meets | 4.886 | | | | |
| 1A | 132 | Kindergarten | Education | Classroom (ages 5-8) | 503 | 100% | 100% | DOAS-6 | 1004 | 8.6 | 8634 | 25 | 10.0 | 0.12 | 25 | 370 | 503 | 133 | 35.8% | Meets | 3.495 | | | | |
| 1A | 132A | Toilet | Public Spaces | Toilet rooms - public | | | | | 41 | 8 | 328 | 1 | 0.0 | 0.00 | 0 | 0 | -33 | -33 | 0.0% | N/A | -6.037 | | | | |
| 1A | 133 | MDF | Storage | Warehouses | | | | | 162 | 12.8 | 2074 | 0 | 0.0 | 0.06 | 0 | 10 | | N/A | | N/A | | | | | |



| Project Name: | Fairfield Public Schools RCx & TAB Study | Mill Hill Elementary School |
|-----------------|--|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | Ventilation Calculation by Building | |
| Date | August 3, 2022 | |
| | | |

| | Zone Identification | | | | | | | | | | | | | IMC 2015 Ventilation Calculations | | | | | | | | | | | |
|-------|---------------------|---------------------|---------------------------|-----------------------|------------------|------------------------|--------------------------|-----------|-----------------------------------|-------------------|----------------------|--|--|---|--------------------------------|--|---|---|--|-----------|--------------------|--|--|--|--|
| Floor | Room# | Room Name | Occupancy Classification | Category | Total Airflow | Unit Actual OA % | BAS OA Damper Cond | Served By | Zone Area, Az, per space | Ceiling Height | Volume, per space | Zone Population , Pz, per space | People OA Rate in Breathing Zone, Rp | Area OA Rate in Breathing Zone, Ra | Default Occupant Density | Min. Required Ventilation Airflow | ACTUAL MEASURED VENTILATION AIR FLOW | Excess Ventilation Air (negative indicates deficit) | Excess Ventilation Air Percentage | PASS/FAIL | Ventilation ACH | | | | |
| | | | | | (cfm) | (%) | (%) | | (sq.ft) | (ft) | (cu.ft) | Adult | (cfm/ person) | (cfm/sf) | (#/1000sf) | (cfm) | (cfm) | (cfm) | (%) | | (AC/hr) | | | | |
| 1A | 134 | Kindergarten | Education | Classroom (ages 5-8) | 547 | 100% | 100% | DOAS-6 | 1004 | 8.6 | 8634 | 26 | 10.0 | 0.12 | 25 | 380 | 547 | 167 | 43.8% | Meets | 3.801 | | | | |
| 1A | 134A | Toilet | Public Spaces | Toilet rooms - public | | | | | 41 | 8 | 328 | 1 | 0.0 | 0.00 | 0 | 0 | -34 | -34 | 0.0% | N/A | -6.220 | | | | |
| 1A | 135 | Gifted Office | Offices | Office spaces | 155 | 100% | 100% | DOAS-6 | 240 | 8.6 | 2064 | 5 | 5.0 | 0.06 | 5 | 39 | 155 | 116 | 293.4% | Meets | 4.506 | | | | |
| 1A | 136 | Kindergarten | Education | Classroom (ages 5-8) | 615 | 100% | 100% | DOAS-6 | 1000 | 8.6 | 8600 | 26 | 10.0 | 0.12 | 25 | 380 | 615 | 235 | 61.8% | Meets | 4.291 | | | | |
| 1A | 136A | Toilet | Public Spaces | Toilet rooms - public | | | | | 41 | 8 | 328 | 1 | 0.0 | 0.00 | 0 | 0 | -38 | -38 | 0.0% | N/A | -6.951 | | | | |
| 1A | 137 | Speech/Language | Education | Classroom (ages 5-8) | 143 | 100% | 100% | DOAS-6 | 231 | 8.6 | 1987 | 5 | 10.0 | 0.12 | 25 | 78 | 143 | 65 | 84.0% | Meets | 4.319 | | | | |
| 1A | 139 | Language Arts | Education | Classroom (ages 5-8) | 130 | 100% | 100% | DOAS-6 | 310 | 8.6 | 2666 | 5 | 10.0 | 0.12 | 25 | 87 | 130 | 43 | 49.1% | Meets | 2.926 | | | | |
| 1B | 140A | Language Arts | Education | Classroom (ages 5-8) | 132 | 100% | 100% | DOAS-2 | 363 | 8.3 | 3013 | 7 | 10.0 | 0.12 | 25 | 114 | 132 | 18 | 16.2% | Meets | 2.629 | | | | |
| 1B | 140B | Staff Dining | Food and beverage service | Dining Rooms | 167 | 100% | 100% | DOAS-2 | 497 | 8.3 | 4125 | 14 | 7.5 | 0.18 | 70 | 194 | 167 | -27 | -14.1% | Fails | 2.429 | | | | |
| 1B | 141 | Servery | Food and beverage service | Kitchens (cooking) | 2042 | 100% | 100% | MAU-1 | 1161 | 8.3 | 9636 | 5 | 0.0 | 0.00 | 0 | 0 | 2042 | 2042 | 0.0% | N/A | 12.714 | | | | |
| 1B | 141A | Toilet | Public Spaces | Toilet rooms - public | 57 | 100% | 100% | DOAS-2 | 50 | 8 | 400 | 1 | 0.0 | 0.00 | 0 | 0 | 57 | 57 | 0.0% | N/A | 8.550 | | | | |
| 1B | 141B | Kitchen Office | Offices | Office spaces | 112 | 100% | 100% | DOAS-2 | 85 | 8.3 | 706 | 2 | 5.0 | 0.06 | 5 | 15 | 112 | 97 | 641.7% | Meets | 9.525 | | | | |
| 1B | 142A | Math/Science | Education | Classroom (ages 5-8) | 59 | 100% | 100% | DOAS-2 | 132 | 8.3 | 1096 | 6 | 10.0 | 0.12 | 25 | 76 | 59 | -17 | -22.2% | Fails | 3.231 | | | | |
| 1B | 142B | Res. Room 3 | Offices | Office spaces | 130 | 100% | 100% | DOAS-2 | 214 | 8.3 | 1776 | 7 | 5.0 | 0.06 | 5 | 48 | 130 | 82 | 171.7% | Meets | 4.391 | | | | |
| 1B | 142C | Res. Room 4 | Offices | Office spaces | 144 | 100% | 100% | DOAS-2 | 214 | 8.3 | 1776 | 7 | 5.0 | 0.06 | 5 | 48 | 144 | 96 | 201.0% | Meets | 4.864 | | | | |
| 1B | 142D | Span. Office | Offices | Office spaces | 81 | 100% | 100% | DOAS-2 | 155 | 8.3 | 1287 | 4 | 5.0 | 0.06 | 5 | 29 | 81 | 52 | 176.5% | Meets | 3.778 | | | | |
| 1B | 143A | Boys Toilet | Public Spaces | Toilet rooms - public | 211 | 100% | 100% | DOAS-2 | 223 | 8 | 1784 | 3 | 0.0 | 0.00 | 0 | 0 | 211 | 211 | 0.0% | N/A | 7.096 | | | | |
| 1B | 143B | Janitor | Storage | Warehouses | 82 | 100% | 100% | DOAS-1 | 61 | 8 | 488 | 1 | 0.0 | 0.06 | 0 | 4 | 82 | 78 | 2140.4% | Meets | 10.082 | | | | |
| 1B | 143C | Girls Toilet | Public Spaces | Toilet rooms - public | 306 | 100% | 100% | DOAS-1 | 232 | 8 | 1856 | 3 | 0.0 | 0.00 | 0 | 0 | 306 | 306 | 0.0% | N/A | 9.892 | | | | |
| 1B | 144 | 4th Grade Classroom | Education | Classroom (ages 5-8) | 375 | 100% | 100% | DOAS-1 | 892 | 8.3 | 7404 | 25 | 10.0 | 0.12 | 25 | 357 | 375 | 18 | 5.0% | Meets | 3.039 | | | | |
| 1B | 145 | 5th Grade Classroom | Education | Classroom (ages 5-8) | 355 | 100% | 100% | DOAS-1 | 815 | 8.3 | 6765 | 23 | 10.0 | 0.12 | 25 | 328 | 355 | 27 | 8.3% | Meets | 3.149 | | | | |



| Project Name: | Fairfield Public Schools RCx & TAB Study | Mill Hill Elementary School |
|-----------------|--|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | Ventilation Calculation by Building | |
| Date | August 3, 2022 | |
| | | |

| | | Zone Identification | | | | | | | | | | | | | IMC 2015 Ventilation Calculations | | | | | | | | | | | |
|-------|-------|----------------------|---|------------------------------------|------------------|------------------------|--------------------------|-----------|-----------------------------------|-------------------|----------------------|--|--|---|-----------------------------------|--|---|---|--|-----------|--------------------|--|--|--|--|--|
| Floor | Room# | Room Name | Occupancy Classification | Category | Total Airflow | Unit Actual OA % | BAS OA Damper Cond | Served By | Zone Area, Az, per space | Ceiling Height | Volume, per space | Zone Population , Pz, per space | People OA Rate in Breathing Zone, Rp | Area OA Rate in Breathing Zone, Ra | Default Occupant Density | Min. Required Ventilation Airflow | ACTUAL MEASURED VENTILATION AIR FLOW | Excess Ventilation Air (negative indicates deficit) | Excess Ventilation Air Percentage | PASS/FAIL | Ventilation ACH | | | | | |
| | | | | | (cfm) | (%) | (%) | | (sq.ft) | (ft) | (cu.ft) | Adult | (cfm/ person) | (cfm/sf) | (#/1000sf) | (cfm) | (cfm) | (cfm) | (%) | | (AC/hr) | | | | | |
| 1B | 146 | 5th Grade Classroom | Education | Classroom (ages 5-8) | 393 | 100% | 100% | DOAS-1 | 894 | 8.3 | 7420 | 22 | 10.0 | 0.12 | 25 | 327 | 393 | 66 | 20.1% | Meets | 3.178 | | | | | |
| 1B | 147 | 5th Grade Classroom | Education | Classroom (ages 5-8) | 477 | 100% | 100% | DOAS-1 | 902 | 8.3 | 7487 | 26 | 10.0 | 0.12 | 25 | 368 | 477 | 109 | 29.5% | Meets | 3.823 | | | | | |
| 1B | 148 | Computer Lab | Education | Computer lab | 340 | 100% | 100% | DOAS-1 | 671 | 8.3 | 5569 | 25 | 10.0 | 0.12 | 25 | 331 | 340 | 9 | 2.9% | Meets | 3.663 | | | | | |
| 1B | 149 | IDF | Storage | Warehouses | | | | | 103 | 11.4 | 1174 | 0 | 0.0 | 0.06 | 0 | 6 | | N/A | | N/A | | | | | | |
| 1B | 150A | Family Toilet | Public Spaces | Toilet rooms - public | 39 | 41% | 20% | RTU-2 | 100 | 8.3 | 830 | 2 | 0.0 | 0.00 | 0 | 0 | 16 | 16 | 0.0% | N/A | 1.157 | | | | | |
| 1B | 150B | Women Staff Toilet | Public Spaces | Toilet rooms - public | 20 | 41% | 20% | RTU-2 | 100 | 8.3 | 830 | 1 | 0.0 | 0.00 | 0 | 0 | 8 | 8 | 0.0% | N/A | 0.578 | | | | | |
| 1B | 150C | Men Staff Toilet | Public Spaces | Toilet rooms - public | 46 | 41% | 30% | RTU-2 | 150 | 8.3 | 1245 | 1 | 0.0 | 0.00 | 0 | 0 | 19 | 19 | 0.0% | N/A | 0.916 | | | | | |
| 1B | 151 | Gymnasium | Sports and amusement | Gym, stadium, arena (play area) | 6213 | 67% | 50% | RTU-1 | 4028 | 22.7 | 91436 | 40 | 0.0 | 0.30 | 0 | 1208 | 4163 | 2955 | 244.5% | Meets | 2.732 | | | | | |
| 1B | 151A | Gym Office | Offices | Office spaces | | | | | 249 | 10 | 2490 | 2 | 5.0 | 0.06 | 5 | 25 | 0 | -25 | -100.0% | Fails | 0.000 | | | | | |
| 1B | 151B | Ramp | Storage | Warehouses | 91 | 46% | 40% | RTU-4 | 194 | 10 | 1940 | 0 | 0.0 | 0.06 | 0 | 12 | 42 | 30 | 260.8% | Meets | 1.299 | | | | | |
| 1B | 151B* | Platform | Education | Music/theater/dance | 507 | 46% | 40% | RTU-4 | 688 | 11.3 | 7774 | 30 | 10.0 | 0.06 | 35 | 341 | 233 | -108 | -31.7% | Fails | 1.798 | | | | | |
| 1B | 151C | Closet | Storage | Warehouses | | | | RTU-4 | 31 | 10 | 310 | 0 | 0.0 | 0.06 | 0 | 2 | | N/A | | N/A | | | | | | |
| 1B | 151D | Gym Storage | Storage | Warehouses | | 46% | 40% | RTU-4 | 300 | 10 | 3000 | 0 | 0.0 | 0.06 | 0 | 18 | | N/A | | N/A | | | | | | |
| 1B | 151E | Storage w/ Ext. Door | Storage | Warehouses | | | | | 354 | 10 | 3540 | 0 | 0.0 | 0.06 | 0 | 21 | | N/A | | N/A | | | | | | |
| 1B | 152 | Media Center | Education | Media Center | 1800 | 41% | 30% | RTU-2 | 1875 | 10.6 | 19875 | 52 | 10.0 | 0.12 | 25 | 745 | 738 | -7 | -0.9% | Meets | 2.228 | | | | | |
| 1B | 152A | Media Office | Offices | Office spaces | 0 | 41% | 30% | RTU-2 | 166 | 8.6 | 1428 | 2 | 5.0 | 0.06 | 5 | 20 | 0 | -20 | -100.0% | Fails | 0.000 | | | | | |
| 1B | 153 | OT/PT | Hospitals nursing and convalescent homes | Physical Therapy | 115 | 41% | 30% | RTU-2 | 392 | 8 | 3136 | 6 | 15.0 | 0.00 | 20 | 90 | 47 | -43 | -47.8% | Fails | 0.899 | | | | | |
| 1C | 117A | Girls Toilet | Public Spaces | Toilet rooms - public | 204 | 100% | 100% | DOAS-5 | 296 | 8.6 | 2546 | 5 | 0.0 | 0.00 | 0 | 0 | 204 | 204 | 0.0% | N/A | 4.808 | | | | | |
| 1C | 117B | Janitor | Storage | Warehouses | 56 | 100% | 100% | DOAS-5 | 46 | 8 | 368 | 1 | 0.0 | 0.06 | 0 | 3 | 56 | 53 | 1929.0% | Meets | 9.130 | | | | | |
| 1C | 117C | Boys Toilet | Public Spaces | Toilet rooms - public | 187 | 100% | 100% | DOAS-5 | 332 | 8.6 | 2855 | 5 | 0.0 | 0.00 | 0 | 0 | 187 | 187 | 0.0% | N/A | 3.930 | | | | | |
| 1C | 118 | Music/Band | Education | Music/theater/dance | 440 | 100% | 100% | DOAS-5 | 891 | 8.6 | 7663 | 25 | 10.0 | 0.06 | 35 | 303 | 440 | 137 | 45.0% | Meets | 3.445 | | | | | |



| Project Name: | | Fairfield Public School | s RCx & TAB Study | Mill Hill Elementar | y Schoo | ol | | | | | | | | | | | | TTA | | 7 | | | | |
|---------------|---------------------|-------------------------|--------------------------|---------------------|------------------|------------------------|--------------------------|-----------|-----------------------------------|-------------------|----------------------|--|--|---|--------------------------------|--|---|---|--|-----------|--------------------|--|--|--|
| Projec | t Number: | 2020102.00.16 | | | | | | | | | | | | | | | | VA | | LE. | LIVI | | | |
| Scope | | Ventilation Calculation | n by Building | | | | | | | | | | | | | | | ΕN | GΙ | NEE | RS | | | |
| Date | | August 3, 2022 | | | | | | | | | | | | | | | | | | | | | | |
| | Zone Identification | | | | | | | | | | | IMC 2015 Ventilation Calculations | | | | | | | | | | | | |
| Floor | Room# | Room Name | Occupancy Classification | Category | Total Airflow | Unit Actual OA % | BAS OA Damper Cond | Served By | Zone Area, Az, per space | Ceiling Height | Volume, per space | Zone Population , Pz, per space | People OA Rate in Breathing Zone, Rp | Area OA Rate in Breathing Zone, Ra | Default Occupant Density | Min. Required Ventilation Airflow | ACTUAL MEASURED VENTILATION AIR FLOW | Excess Ventilation Air (negative indicates deficit) | Excess Ventilation Air Percentage | PASS/FAIL | Ventilation ACH | | | |
| | | | | | (cfm) | (%) | (%) | | (sq.ft) | (ft) | (cu.ft) | Adult | (cfm/ person) | (cfm/sf) | (#/1000sf) | (cfm) | (cfm) | (cfm) | (%) | | (AC/hr) | | | |
| 1C | 118A | Music Storage | Storage | Warehouses | 42 | 100% | 100% | DOAS-5 | 302 | 8.6 | 2597 | 4 | 0.0 | 0.06 | 0 | 18 | 42 | 24 | 131.8% | Meets | 0.970 | | | |
| 1C | 119 | Art | Education | Art Classroom | 612 | 100% | 100% | DOAS-5 | 892 | 8.6 | 7671 | 25 | 10.0 | 0.18 | 20 | 411 | 612 | 201 | 49.1% | Meets | 4.787 | | | |
| 1C | 119A | Kiln | Storage | Warehouses | 34 | 100% | 100% | DOAS-5 | 165 | 8 | 1320 | 4 | 0.0 | 0.06 | 0 | 10 | 34 | 24 | 243.4% | Meets | 1.545 | | | |
| 1C | 119B | Art Storage | Storage | Warehouses | 26 | 100% | 100% | DOAS-5 | 165 | 8 | 1320 | 0 | 0.0 | 0.06 | 0 | 10 | 26 | 16 | 162.6% | Meets | 1.182 | | | |
| 1C | 120 | Music/Vocal | Education | Music/theater/dance | 418 | 100% | 100% | DOAS-5 | 625 | 8.6 | 5375 | 21 | 10.0 | 0.06 | 35 | 248 | 418 | 171 | 68.9% | Meets | 4.666 | | | |



APPENDIX 3 – Roof Map



APPENDIX 4 – TAB Airflow Survey Data


Mill Hill Elementary HVAC Survey

* * * *

VanZelm Engineers Attn: Bill Donald 10 Talcott Notch Road Farmington, CT 06032

June 24, 2022

94 North Branford Road • Suite One • Branford, CT 06405 (203) 481-4988 • Fax (203) 488-5634 • wings@wingstesting.com



June 24, 2022

VanZelm Engineers Attn: Bill Donald 10 Talcott Notch Road Farmington, CT 06032

Re: Mill Hill Elementary School HVAC Survey

Dear Bill,

We have completed our HVAC survey for the above-referenced site. The following pages are a report of our findings. Through our testing, we found that:

- Rooms 151E, 151A, 149, and 149A have no ventilation
- Halls 142 and 140 have no ventilation
- Corridor 103 has no ventilation
- Hall Storage 1005 has no ventilation
- Secure Lobby 098 has no ventilation
- Boiler Room 1035 has no ventilation
- C Corridor 117 has no ventilation
- Sprinkler Room 112 has no ventilation
- IOF 110 has no ventilation
- Electric Room 138 has no ventilation
- MDF 133 has no ventilation

The following pages are your record of current operating conditions. If you have any questions, or if we can be of further service, 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



94 North Branford Road • Suite One • Branford, CT 06405 (203) 481-4988 • Fax (203) 488-5634 • wings@wingstesting.com Г

| | ١ | /ELOCITY | PRESS | URE RE | ADINGS | | | |
|--------------|-----------------|--------------|--------|--------|-------------|-------|---------|-----------|
| PROJECT: | Mill Hill Eleme | ntary School | | | | DATE: | 7/14/22 | |
| AREA SERVED: | Various | | | BS | | | | |
| TRAVERSE | | AREA | DES | IGN | CENT. STAT. | TE | ST | Constant. |
| LOCATIONS | DUCT SIZE " | SQ.FT. | FPM | CFM | PRESS." | FPM | CFM | NOTES |
| RTU-1 Total | 57"x36" | 14.25 | | 6000 | w/Velgrid | 136 | 6213 | |
| RTU-1 OA | 57"x36" | 14.25 | | 4000 | w/Velgrid | 292 | 4163 | 1 |
| RTU-1 Return | | | | 2000 | Calc | | 2050 | |
| | | | | | | | | |
| RTU-2 Total | 48"x14" | 4.67 | | 1,800 | w/Velgrid | 379 | 1770 | 1 |
| RTU-2 OA | 48"x14" | 4.67 | | 730 | w/Velgrid | 155 | 726 | |
| RTU-2 Return | | | | 1070 | Calc | | 1044 | |
| | | | | | | | | |
| RTU-3 Total | 57"x36" | 14.25 | | 5700 | w/Velgrid | 392 | 5586 | |
| RTU-3 OA | 57"x36" | 14.25 | | 2400 | w/Velgrid | 71 | 1006 | |
| RTU-3 Return | | | | 3300 | Calc | | 4580 | |
| | | | | | | | | |
| RTU-4 Total | 48"x14" | 4.67 | | 985 | w/Velgrid | 213 | 995 | |
| RTU-4 OA | 48"x14" | 4.67 | | 440 | w/Velgrid | 98 | 458 | |
| RTU-4 Return | | | | 545 | Calc | | 897 | |
| | | | | | | | | |
| DOAS-1 | 40"x16" | 4.44 | | 1800 | w/Velgrid | 414 | 1838 | |
| DOAS-1 EF | 20"x10" | 1.38 | | 1525 | w/Velgrid | 1088 | 1501 | |
| | | | | | | | | |
| DOAS-2 | 57"x36" | 14.25 | | 2200 | w/Velgrid | 151 | 2152 | |
| DOAS-2 EF | 22"x22" | 3.36 | | 2055 | w/Velgrid | 592 | 1989 | |
| | | | | ~ | | | | |
| DOAS-3 | 57"x36" | 14.25 | | 2430 | w/Velgrid | 175 | 2494 | |
| DOAS-3 EF | 22"x22" | 3.36 | | 2225 | w/Velgrid | 627 | 2107 | |
| | | | | | | | | |
| DOA S-4 | 40"x16" | 4.44 | | 1380 | w/Velgrid | 295 | 1310 | |
| DOAS-4 EF | 20"x10" | 1.38 | | 1200 | w/Velgrid | 854 | 1179 | |
| | | | | | | | | |
| DOAS-5 | 57"X36" | 14.25 | | 3900 | w/Velgrid | 266 | 3791 | |
| DOAS-5 EF | 22"X22" | 3.36 | | 3540 | w/Velgrid | 1001 | 3363 | |
| 10.75 M | | | | | | | | |
| DOAS-6 | 57"X36" | 14.25 | | 3950 | w/Velgrid | 279 | 3976 | |
| DOAS -6 EF | 22"x22" | 3.36 | | 3300 | w/Velgrid | 956 | 3212 | |
| | 4.010 + 4.011 | | ļ | | | | | |
| MAU-1 Total | 46"X18" | 5.75 | | 2180 | w/Velgrid | 355 | 2042 | |
| KEF-1 | 88"x11" | 8.06 | | 1240 | w/Velgrid | 163 | 1316 | |
| KEF-2 | 96"x11" | 8.8 | - | 1530 | w/Velgrid | 178 | 1568 | <u> </u> |
| | | | REIVIA | ARINO | | | | |

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

| Project Name: | Fairfield Public Schools RCx: | Mill Hill Elementary School |
|-----------------|-------------------------------|-----------------------------|
| Project Number: | 2020102.00.16 | - |
| Scope | TAB Data | - |
| Date | June 24, 2022 | - |

| | Zone Identification | | | | | | | |
|-------|---------------------|---------------------|-----------|---------------------|------------------|-----------------------|-----------------|--|
| Floor | Room# | Room Name | Total CFM | Actual OA at Min | Unit Actual OA % | BAS OA Damper Cond | Space Served By | |
| | | | (cfm) | (OA cfm) | (OA% of Total) | (pos. %) | RTU/AHU Unit | |
| 1A | 098 | Secure Lobby | N/A | N/A | 100% | 100% | DOAS-3 | |
| 1A | 100 | Waiting Room | N/A | 147 | 100% | 100% | DOAS-3 | |
| 1A | 100A | Equipment | N/A | 44 | 100% | 100% | DOAS-3 | |
| 1A | 100B | Nurse Suite | N/A | 110 | 100% | 100% | DOAS-3 | |
| 1A | 100B* | Nurse Office | N/A | 64 | 100% | 100% | DOAS-3 | |
| 1A | 100B | Storage | N/A | 32 | 100% | 100% | DOAS-3 | |
| 1A | 100B | Toilet | N/A | 45 | 100% | 100% | DOAS-3 | |
| 1A | 100B | Cott Room | N/A | 119 | 100% | 100% | DOAS-3 | |
| 1A | 100C | Records Storage | N/A | 65 | 100% | 100% | DOAS-3 | |
| 1A | 100D | Unisex Toilet | N/A | 73 | 100% | 100% | DOAS-3 | |
| 1A | 100E | Principal | N/A | 61 | 100% | 100% | DOAS-3 | |
| 1A | 100E | Hall Storage | N/A | N/A | | | | |
| 1A | 100F | Social Worker | N/A | 54 | 100% | 100% | DOAS-3 | |
| 1A | 100G | School Psychologist | N/A | 64 | 100% | 100% | DOAS-3 | |
| 1A | 100H | Program Facilitator | N/A | 64 | 100% | 100% | DOAS-3 | |
| 1A | 1001 | ??? | N/A | N/A | | | | |
| 1A | 100J | Speech/Language | N/A | 59 | 100% | 100% | DOAS-3 | |
| 1A | 100K | Conference Room | N/A | 108 | 100% | 100% | DOAS-3 | |
| 1A | 101 | Multipurpose/Café | N/A | 1006 | 18% | 34% | RTU-3 | |
| 1A | 102 | 4th Grade Classroom | N/A | 499 | 100% | 100% | DOAS-4 | |
| 1A | 103 | Corridor | N/A | 0 | | | | |
| 1A | 103A | IDF | N/A | 102 | 100% | 100% | DOAS-4 | |
| 1A | 103B | Women Staff Toilet | N/A | 41 | 100% | 100% | DOAS-4 | |

| | Notes |
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| | No ventilation to this space |
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| _ | No ventilation to this space |
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| Project Name: | Fairfield Public Schools RCx: | Mill Hill Elementary School |
|-----------------|-------------------------------|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | TAB Data | |
| Date | June 24, 2022 | - |

| | | | | Zone Identification | | | | | |
|-------|-------|---------------------|-----------|---------------------|------------------|-----------------------|-----------------|--|--|
| Floor | Room# | Room Name | Total CFM | Actual OA at Min | Unit Actual OA % | BAS OA Damper Cond | Space Served By | | |
| | | | (cfm) | (OA cfm) | (OA% of Total) | (pos. %) | RTU/AHU Unit | | |
| 1A | 103C | Men Staff Toilet | N/A | 28 | 100% | 100% | DOAS-4 | | |
| 1A | 103D | Janitor | N/A | 32 | 100% | 100% | DOAS-4 | | |
| 1A | 103E | Boiler Room | N/A | N/A | | | | | |
| 1A | 104 | 4th Grade Classroom | N/A | 494 | 100% | 100% | DOAS-4 | | |
| 1A | 105 | Staff Work Room | N/A | 102 | 100% | 100% | DOAS-4 | | |
| 1A | 106 | 3rd Grade Classroom | N/A | 567 | 100% | 100% | DOAS-4 | | |
| 1A | 106A | Toilet | N/A | -81 | 100% | 100% | DOAS-4 | | |
| 1A | 107 | 3rd Grade Classroom | N/A | 324 | 100% | 100% | DOAS-4 | | |
| 1A | 107A | Toilet | N/A | -58 | 100% | 100% | DOAS-4 | | |
| 1A | 108 | 3rd Grade Classroom | N/A | 516 | 100% | 100% | DOAS-4 | | |
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| d By | Notes | |
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| | No ventilation to this space | |
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| | Space only has exhaust | |
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| | Space only has exhaust | |

| Project Name: | Fairfield Public Schools RCx: | Mill Hill Elementary School |
|-----------------|-------------------------------|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | TAB Data | |
| Date | June 24, 2022 | |

| | Zone Identification | | | | | | | |
|-------|---------------------|---------------------|-----------|---------------------|------------------|-----------------------|-----------------|---|
| Floor | Room# | Room Name | Total CFM | Actual OA at Min | Unit Actual OA % | BAS OA Damper Cond | Space Served By | |
| | | | (cfm) | (OA cfm) | (OA% of Total) | (pos. %) | RTU/AHU Unit | |
| 1A | 108A | Toilet | N/A | -91 | | | | |
| 1A | 109 | Storage | N/A | -62 | | | | |
| 1A | 110 | IDF | N/A | N/A | | | | |
| 1A | 111 | 2nd Grade Classroom | N/A | 580 | 100% | 100% | DOAS-5 | |
| 1A | 112 | Sprinkler | N/A | N/A | | | | |
| 1A | 113 | Hall | N/A | 185 | 100% | 100% | DOAS-5 | |
| 1A | 113A | Unisex Toilet | N/A | 61 | 100% | 100% | DOAS-5 | |
| 1A | 113B | Storage | N/A | 77 | 100% | 100% | DOAS-5 | |
| 1A | 113B | Office | N/A | 166 | 100% | 100% | DOAS-5 | |
| 1A | 114 | Storage | N/A | 56 | 100% | 100% | DOAS-5 | |
| 1A | 115 | 2nd Grade Classroom | N/A | 536 | 100% | 100% | DOAS-5 | |
| 1A | 116 | Custodian/Work | N/A | 179 | 100% | 100% | DOAS-5 | - |
| 1C | 117 | C Corridor | N/A | N/A | | | | |
| 1C | 117A | Girls Toilet | N/A | 204 | 100% | 100% | DOAS-5 | |
| 1C | 117B | Janitor | N/A | 56 | 100% | 100% | DOAS-5 | |
| 1C | 117C | Boys Toilet | N/A | 187 | 100% | 100% | DOAS-5 | |
| 1C | 118 | Music/Band | N/A | 440 | 100% | 100% | DOAS-5 | |
| 1C | 118A | Music Storage | N/A | 42 | 100% | 100% | DOAS-5 | |
| 1C | 119 | Art | N/A | 612 | 100% | 100% | DOAS-5 | |
| 1C | 119A | Kiln | N/A | 34 | 100% | 100% | DOAS-5 | |
| 1C | 119B | Art Storage | N/A | 26 | 100% | 100% | DOAS-5 | |
| 1C | 120 | Music/Vocal | N/A | 418 | 100% | 100% | DOAS-5 | |
| 1A | 121 | 2nd Grade Classroom | N/A | 448 | 100% | 100% | DOAS-5 | |

| Notes |
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| Space only has exhaust |
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| Project Name: | Fairfield Public Schools RCx: | Mill Hill Elementary School |
|-----------------|-------------------------------|-----------------------------|
| Project Number: | 2020102.00.16 | - |
| Scope | TAB Data | - |
| Date | June 24, 2022 | - |

| Date | | une 24, 2022 | | | | | | | | |
|-------|-------|---------------------|--------------------|---------------------------------|------------------------------------|-----------------------------------|---------------------------------|---|--|--|
| | | | | | 7000 140 | ntification | | | | |
| Floor | Room# | Room Name | Total CFM (cfm) | Actual OA at Min (OA cfm) | Unit Actual OA % (OA% of Total) | BAS OA Damper Cond (pos. %) | Space Served By RTU/AHU Unit | Notes | | |
| 1A | 121A | Toilet | N/A | 0 | | | | 0 Exhaust CFM | | |
| 1A | 122 | 1st Grade Classroom | N/A | 335 | 100% | 100% | DOAS-5 | | | |
| 1A | 122A | Toilet | N/A | -62 | | | | Space only has exhuast | | |
| 1A | 123 | 2nd Grade Classroom | N/A | 456 | 100% | 100% | DOAS-5 | | | |
| 1A | 123A | Toilet | N/A | -40 | | | | Space only has exhuasst | | |
| 1A | 124 | Res. Room 2 | N/A | 85 | 100% | 100% | DOAS-5 | | | |
| 1A | 125 | 1st Grade Classroom | N/A | 485 | 100% | 100% | DOAS-5 | | | |
| 1A | 125A | Toilet | N/A | -27 | | | | Space only has exhuast | | |
| 1A | 126 | Res. Room 1 | N/A | 82 | 100% | 100% | DOAS-5 | | | |
| 1A | 127 | 1st Grade Classroom | N/A | 504 | 100% | 100% | DOAS-5 | | | |
| 1A | 127A | Toilet | N/A | -33 | | | | Space only has exhaust | | |
| 1A | 128 | 1st Grade Classroom | N/A | 449 | 100% | 100% | DOAS-5 | | | |
| 1A | 128A | Toilet | N/A | 30 | 100% | 100% | DOAS-5 | | | |
| 1A | 129 | Courtyard | N/A | | | | | This is a door leading into the courtyard, not a room | | |
| 1A | 130 | Kindergarten | N/A | 486 | 100% | 100% | DOAS-6 | | | |
| 1A | 130A | Toilet | N/A | -39 | | | | Space only has exhaust | | |
| 1A | 131 | Janitor | N/A | 43 | 100% | 100% | DOAS-6 | | | |
| 1A | 132 | Kindergarten | N/A | 503 | 100% | 100% | DOAS-6 | | | |
| 1A | 132A | Toilet | N/A | -33 | | | | Space only has exhaust | | |
| 1A | 133 | MDF | N/A | | | | | No ventilation to this space | | |
| 1A | 134 | Kindergarten | N/A | 547 | 100% | 100% | DOAS-6 | | | |
| 1A | 134A | Toilet | N/A | -34 | | | | Space only has exhaust | | |
| 1A | 135 | Gifted Office | N/A | 155 | 100% | 100% | DOAS-6 | | | |

| Project Name: | Fairfield Public Schools RCx: | Mill Hill Elementary School |
|-----------------|-------------------------------|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | TAB Data | |
| Date | June 24, 2022 | - |

| | | | | | Zone Ide | entification | | |
|-------|-------|---------------------|-----------|---------------------|------------------|-----------------------|-----------------|---------------|
| Floor | Room# | Room Name | Total CFM | Actual OA at Min | Unit Actual OA % | BAS OA Damper Cond | Space Served By | N |
| 1A | 136 | Kindergarten | N/A | 615 | 100% | 100% | | |
| 1A | 136A | Toilet | N/A | 20 | 100% | 100% | DOAS-0 | Space only |
| 1A | 137 | Speech/Language | N/A | 142 | 100% | 100% | | Space only |
| 1A | 138 | Electrical Room | N/A | N/A | 100% | 100% | DOAS-0 | No vontilatio |
| 1A | 139 | Language Arts | N/A | 130 | 100% | 100% | DOAS-6 | |
| 1B | 140 | Hall | N/A | N/A | | | | No ventilatio |
| 1B | 140A | Language Arts | N/A | 132 | 100% | 100% | DOAS-2 | |
| 18 | 140B | Staff Dining | N/A | 167 | 100% | 100% | DOAS-2 | |
| 1B | 141 | Servery | N/A | 2042 | 100% | 100% | MAU-1 | |
| 1B | 141A | Toilet | N/A | 57 | 100% | 100% | DOAS-2 | |
| 18 | 141B | Kitchen Office | N/A | 112 | 100% | 100% | DOAS-2 | |
| 18 | 142 | Hall | N/A | N/A | | | | No ventilatio |
| 18 | 142A | Math/Science | N/A | 59 | 100% | 100% | DOAS-2 | |
| 1B | 142B | Res. Room 3 | N/A | 130 | 100% | 100% | DOAS-2 | |
| 1B | 142C | Res. Room 4 | N/A | 144 | 100% | 100% | DOAS-2 | |
| 1B | 142D | Span. Office | N/A | 81 | 100% | 100% | DOAS-2 | |
| 18 | 143A | Boys Toilet | N/A | 211 | 100% | 100% | DOAS-2 | |
| 1B | 143B | Janitor | N/A | 82 | 100% | 100% | DOAS-1 | |
| 1B | 143C | Girls Toilet | N/A | 306 | 100% | 100% | DOAS-1 | |
| 1B | 144 | 4th Grade Classroom | N/A | 375 | 100% | 100% | DOAS-1 | |
| 1B | 145 | 5th Grade Classroom | N/A | 355 | 100% | 100% | DOAS-1 | |
| 1B | 146 | 5th Grade Classroom | N/A | 393 | 100% | 100% | DOAS-1 | |
| 1B | 147 | 5th Grade Classroom | N/A | 477 | 100% | 100% | DOAS-1 | |

| By | Notes |
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| | |
| | |
| | |
| | No ventilation to this space |
| S to all states the | |
| | |
| | |
| | |
| | |
| | |
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| | |
| | |
| | |

| Project Name: | Fairfield Public Schools RCx: | Mill Hill Elementary School |
|-----------------|-------------------------------|-----------------------------|
| Project Number: | 2020102.00.16 | |
| Scope | TAB Data | |
| Date | June 24, 2022 | - |

| | | | | | Zone Ide | entification | | |
|-------|-------|----------------------|-----------|---------------------|------------------|-----------------------|-----------------|-----------|
| Floor | Room# | Room Name | Total CFM | Actual OA at Min | Unit Actual OA % | BAS OA Damper Cond | Space Served By | |
| | | | (cfm) | (OA cfm) | (OA% of Total) | (pos. %) | RTU/AHU Unit | |
| 1B | 148 | Computer Lab | N/A | 340 | 100% | 100% | DOAS-1 | |
| 1B | 149 | IDF | N/A | N/A | | | | No ventil |
| 1B | 149A | Ground Storage | N/A | N/A | | | | No ventil |
| 1B | 150 | Corridor | N/A | 33 | 41% | 20% | RTU-2 | |
| 1B | 150A | Family Toilet | N/A | 16 | 41% | 20% | RTU-2 | |
| 1B | 150B | Women Staff Toilet | N/A | 8 | 41% | 20% | RTU-2 | |
| 1B | 150C | Men Staff Toilet | N/A | 19 | 41% | 30% | RTU-2 | |
| 1B | 151 | Gymnasium | N/A | 4163 | 67% | 50% | RTU-1 | |
| 1B | 151A | Gym Office | N/A | N/A | | | | No ventil |
| 1B | 151B | Ramp | N/A | 42 | 46% | 40% | RTU-4 | |
| 1B | 151B* | Platform | N/A | 233 | 46% | 40% | RTU-4 | |
| 1B | 151C | Closet | N/A | -40 | | | RTU-4 | Space of |
| 1B | 151D | Gym Storage | N/A | 43 | 46% | 40% | RTH-4 | |
| 1B | 151E | Storage w/ Ext. Door | N/A | N/A | | | | No ventia |
| 1B | 152 | Media Center | N/A | 1818 | 41% | 30% | RTU-2 | |
| 1B | 152A | Media Office | N/A | 0 | 41% | 30% | RTU-2 | |
| 1B | 153 | OT/PT | N/A | 47 | 41% | 30% | RTU-2 | |

| Notes |
|------------------------------|
| |
| |
| No ventilation to this space |
| No ventilation to this space |
| |
| |
| |
| |
| |
| No ventilation to this space |
| |
| |
| Space only has exhaust |
| |
| No ventialtion to this space |
| |
| |
| |
| |

APPENDIX 5 – RCx Unit and Room Take-Off Data

| Proje | ect Name: | Fairfield Public Sch | ools RCx | | | | | | |
|-------|------------|----------------------|-----------|--------------|--------|----------|--------------------------------|-------------------------|----------|
| Proje | ct Number: | 2020102.00.16 | | | RCM, R | A, JRK | | | |
| Scop | е | Room Take-Off Data | а | | | | | | |
| Date | | May 26, 2022 | | | | | | | |
| | | Mill Hill Elementary | School | | | | | | |
| | | | | A 111 | | Zone Ide | entification | | - |
| Floor | Room# | Room Name | Area (SF) | Ceiling | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | Height | | | | | Y /N |
| 1A | 098 | Secure Lobby | 432 | 9.6 | 4147 | 5 | VRF, CUH | | |
| 1A | 100 | Waiting Room | 877 | 9.3 | 8156 | 7 | VRF, SA, RA | *Avg Ceiling Height | |
| 1A | 100A | Equipment | 100 | 8.4 | 840 | 0 | 1 SA, 1 RA | | |
| 1A | 100B | Nurse Suite | 219 | 8.4 | 1840 | 5 | VRF, 1 SA, 1 RA | | |
| 1A | 100B* | Nurse Office | 111 | 8.4 | 932 | 2 | VRF, 1 SA, 1 RA | | |
| 1A | 100B | Storage | 69 | 8.6 | 593 | 0 | 1 SA | | |
| 1A | 100B | Toilet | 52 | 8.6 | 447 | 1 | Exh | | |
| 1A | 100B | Cot Room | 110 | 8.4 | 924 | 3 | 2 SA, 1 RA | | |
| 1A | 100C | Records Storage | 174 | 8.6 | 1496 | 3 | VRF, 1 SA, 1 RA | | |
| 1A | 100D | Unisex Toilet | 76 | 8.6 | 654 | 1 | 1 SA, 1 RA | | |
| 1A | 100E | Principal | 208 | 8.6 | 1789 | 7 | VRF, 1 SA, 1 RA | | |
| 1A | 100E | Hall Storage | 35 | 8 | 280 | 0 | | | |
| 1A | 100F | Social Worker | 107 | 8.6 | 920 | 1 | VRF, 1 SA, 1 RA | | |
| 1A | 100G | School Psychologist | 112 | 8.6 | 963 | 4 | VRF, 1 SA, 1 RA | | |
| 1A | 100H | Program Facilitator | 177 | 8.6 | 1522 | 4 | VRF, 1 SA, 1 RA | | |
| 1A | 100J | Speech/Language | 97 | 8.6 | 834 | 2 | VRF, 1 SA, 1 RA | | |
| 1A | 100K | Conference Room | 305 | 10 | 3050 | 13 | 2 VFR, 1 Sa, 1 RA, RP | | |
| 1A | 101 | Multipurpose/Café | 2698 | 20 | 53960 | 64 | along 67 Wall Slope 18.3 - 23" | Avg Ceiling Height | |
| 1A | 102 | 4th Grade Classroom | 816 | 8.6 | 7018 | 26 | | | |

| Proje | ct Name: | Fairfield Public Sch | ools RCx | _ | | | | | |
|-------|------------|----------------------|------------|---------|--------|----------|------------------------|-------------------------|----------|
| Proje | ct Number: | 2020102.00.16 | | | RCM, R | A, JRK | | | |
| Scop | е | Room Take-Off Dat | а | | | | | | |
| Date | | May 26, 2022 | | | | | | | |
| | | Mill Hill Elementary | School | | | | | | |
| | | | | | | Zone Ide | entification | | - |
| Floor | Room# | Room Name | Area (SE) | Ceiling | Volume | People | Notes | Identified Deficiencies | Pictures |
| 11001 | Roomin | Room Name | 71100 (51) | Height | | | | | Y /N |
| 1A | 103 | Corridor | 539 | 9.6 | 5174 | 0 | | | |
| 1A | 103A | IDF | 64 | 11.3 | 723 | 0 | PCAT Daikin | | х |
| 1A | 103B | Women Staff Toilet | 60 | 8.6 | 516 | 1 | | | |
| 1A | 103C | Men Staff Toilet | 60 | 8.6 | 516 | 1 | | | |
| 1A | 103D | Janitor | 90 | 8 | 720 | 1 | | | |
| 1A | 103E | Boiler Room | 779 | 16 | 12464 | 0 | | | |
| 1A | 104 | 4th Grade Classroom | 897 | 8.4 | 7535 | 23 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 105 | Staff Work Room | 324 | 8.4 | 2722 | 6 | 1 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 106 | 3rd Grade Classroom | 902 | 8.4 | 7577 | 25 | | | |
| 1A | 106A | Toilet | 15 | 7.6 | 114 | 1 | Exh | | |
| 1A | 107 | 3rd Grade Classroom | 902 | 8.4 | 7577 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 107A | Toilet | 15 | 7.6 | 114 | 1 | Exh | | |
| 1A | 108 | 3rd Grade Classroom | 899 | 8.4 | 7552 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 108A | Toilet | 15 | 7.6 | 114 | 1 | Exh | | |
| 1A | 109 | Storage | 121 | 8 | 968 | 0 | | | |
| 1A | 110 | IDF | 86 | 11.6 | 998 | 0 | Daikin PCAT | | х |
| 1A | 111 | 2nd Grade Classroom | 924 | 8.6 | 7946 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 112 | Sprinkler | 91 | 11.4 | 1037 | 0 | Conv | | |
| 1A | 113 | Hall | 1062 | 9.6 | 10195 | 0 | | | |
| 1A | 113A | Unisex Toilet | 58 | 8.6 | 499 | 1 | 1 Sa, 1 RA | | |

| Proje | ct Name: | Fairfield Public Sch | ools RCx | _ | | | | | |
|-------|------------|----------------------|-----------|---------|--------|----------|-------------------------------|-------------------------|----------|
| Proje | ct Number: | 2020102.00.16 | | | RCM, R | A, JRK | | | |
| Scop | е | Room Take-Off Data | a | | | | | | |
| Date | | May 26, 2022 | | | | | | | |
| | | Mill Hill Elementary | School | | | | | | |
| | | | | | | Zone Ide | entification | | _ |
| Floor | Room# | Room Name | Area (SF) | Ceiling | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | Room Raine | | Height | | | | | Y/N |
| 1A | 113B | Storage | 75 | 8.6 | 645 | 0 | 1 RA | | |
| 1A | 113C | Office | 201 | 8.6 | 1729 | 7 | 1 SA, FTR | | |
| 1A | 114 | Storage | 122 | 8.6 | 1049 | 0 | 1 SA, 1 RA | | |
| 1A | 115 | 2nd Grade Classroom | 968 | 8.6 | 8325 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 116 | Custodian/Work | 119 | 8.6 | 1023 | 4 | 1 SA, 1 RA, FTR | | |
| 1C | 117 | C Corridor | 1083 | 9.6 | 10397 | 0 | | | |
| 1C | 117A | Girls Toilet | 296 | 8.6 | 2546 | 5 | 1 SA, 1 RA | | |
| 1C | 117B | Janitor | 46 | 8 | 368 | 1 | TMV and Rinnai DHW | | |
| 1C | 117C | Boys Toilet | 332 | 8.6 | 2855 | 5 | 1 AS, 1 RA | | |
| 1C | 118 | Music/Band | 891 | 8.6 | 7663 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1C | 118A | Music Storage | 302 | 8.6 | 2597 | 4 | 1 SA, CUH | Very Hot in space | |
| 1C | 119 | Art | 892 | 8.6 | 7671 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1C | 119A | Kiln | 165 | 8 | 1320 | 4 | (2) Kiln Exh, 1 SA, 1 RA, FTR | | |
| 1C | 119B | Art Storage | 165 | 8 | 1320 | 0 | 1 SA, 1 RA | | |
| 1C | 120 | Music/Vocal | 625 | 8.6 | 5375 | 21 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 121 | 2nd Grade Classroom | 771 | 8.6 | 6631 | 22 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 121A | Toilet | 16 | 8 | 128 | 1 | Exh | | |
| 1A | 122 | 1st Grade Classroom | 886 | 8.6 | 7620 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 122A | Toilet | 16 | 8 | 128 | 1 | Exh | | |
| 1A | 123 | 2nd Grade Classroom | 841 | 8.6 | 7233 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |

| Proje | ect Name: | Fairfield Public Sch | ools RCx | _ | | | | | |
|-------|------------|----------------------|-----------|---------|--------|---------|------------------------|-------------------------|----------|
| Proje | ct Number: | 2020102.00.16 | | | RCM, R | A, JRK | | | |
| Scop | е | Room Take-Off Data | a | | | | | | |
| Date | | May 26, 2022 | | | | | | | |
| | | Mill Hill Elementary | School | | | | | | |
| | | | | | | Zone Id | entification | - | |
| Floor | Room# | Room Name | Area (SE) | Ceiling | Volume | People | Notes | Identified Deficiencies | Pictures |
| | Roomin | Room Marie | | Height | | | | | Y/N |
| 1A | 123A | Toilet | 46 | 8 | 368 | 1 | Exh | | |
| 1A | 124 | Res. Room 2 | 243 | 8.6 | 2090 | 6 | 1 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 125 | 1st Grade Classroom | 986 | 8.6 | 8480 | 24 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 125A | Toilet | 47 | 8 | 376 | 1 | Exh | | |
| 1A | 126 | Res. Room 1 | 264 | 8.6 | 2270 | 12 | 1 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 127 | 1st Grade Classroom | 1001 | 8.6 | 8609 | 27 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 127A | Toilet | 40 | 8 | 320 | 1 | Exh | | |
| 1A | 128 | 1st Grade Classroom | 1000 | 8.6 | 8600 | 26 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 128A | Toilet | 39 | 8.6 | 335 | 1 | Exh | | |
| 1A | 130 | Kindergarten | 1005 | 8.6 | 8643 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 130A | Toilet | 41 | 8 | 328 | 1 | Exh | | |
| 1A | 131 | Janitor | 66 | 8 | 528 | 1 | 1 SA, 1 RA | | |
| 1A | 132 | Kindergarten | 1004 | 8.6 | 8634 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 132A | Toilet | 41 | 8 | 328 | 1 | Exh | | |
| 1A | 133 | MDF | 162 | 12.8 | 2074 | 0 | Daikin PCAT | | х |
| 1A | 134 | Kindergarten | 1004 | 8.6 | 8634 | 26 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 134A | Toilet | 41 | 8 | 328 | 1 | Exh | | |
| 1A | 135 | Gifted Office | 240 | 8.6 | 2064 | 5 | 1 VRF, 1 SA, 1 RA | | |
| 1A | 136 | Kindergarten | 1000 | 8.6 | 8600 | 26 | 2 VRF, 1 SA, 1 RA, FTR | | |
| 1A | 136A | Toilet | 41 | 8 | 328 | 1 | Exh | | |

| Project Name: Fairfield Public Schools RCx | | | | _ | | | | | | | | | |
|--|-------------|----------------------|-----------|---------|--------|----------|------------------------------------|-------------------------|----------|--|--|--|--|
| Proje | ect Number: | 2020102.00.16 | | | RCM, R | A, JRK | | | | | | | |
| Scop | e | Room Take-Off Dat | а | | | | | | | | | | |
| Date | | May 26, 2022 | | | | | | | | | | | |
| | | Mill Hill Elementary | School | | | | | | | | | | |
| | | | | | | Zone Ide | entification | | | | | | |
| Floor | Boom# | Room Name | Area (SE) | Ceiling | Volume | People | Notes | Identified Deficiencies | Pictures | | | | |
| | Reentin | Room Name | | Height | | | | | Y/N | | | | |
| 1A | 137 | Speech/Language | 231 | 8.6 | 1987 | 5 | 1 VRF, 1 SA,1 RA | | | | | | |
| 1A | 139 | Language Arts | 310 | 8.6 | 2666 | 5 | 1 VRF, 1 SA, 1 RA | | | | | | |
| 1B | 140 | Hall | 817 | 9.6 | 7843 | 0 | | | | | | | |
| 1B | 140A | Language Arts | 363 | 8.3 | 3013 | 7 | 1 VRF, 1 SA, 1 RA | | | | | | |
| 1B | 140B | Staff Dining | 497 | 8.3 | 4125 | 14 | 2 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 141 | Servery | 1161 | 8.3 | 9636 | 5 | 2 Hoods, MAU, CUH, 3 DOAS SA, 1 RA | | | | | | |
| 1B | 141A | Toilet | 50 | 8 | 400 | 1 | | | | | | | |
| 1B | 141B | Kitchen Office | 85 | 8.3 | 706 | 2 | 1 SA, 1 RA | | | | | | |
| 1B | 142A | Math/Science | 132 | 8.3 | 1096 | 6 | 1 VRF, 1 SA, 1 RA | | | | | | |
| 1B | 142B | Res. Room 3 | 214 | 8.3 | 1776 | 7 | 1 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 142C | Res. Room 4 | 214 | 8.3 | 1776 | 7 | 1 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 142D | Span. Office | 155 | 8.3 | 1287 | 4 | 1 VRF, 1 SA, 1 RA | | | | | | |
| 1B | 143A | Boys Toilet | 223 | 8 | 1784 | 3 | 1 SA, 1 RA, Conv. | | | | | | |
| 1B | 143B | Janitor | 61 | 8 | 488 | 1 | 1 SA, 1 RA | | | | | | |
| 1B | 143C | Girls Toilet | 232 | 8 | 1856 | 3 | 1 SA, 1 RA | | | | | | |
| 1B | 144 | 4th Grade Classroom | 892 | 8.3 | 7404 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 145 | 5th Grade Classroom | 815 | 8.3 | 6765 | 23 | 2 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 146 | 5th Grade Classroom | 894 | 8.3 | 7420 | 22 | 2 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 147 | 5th Grade Classroom | 902 | 8.3 | 7487 | 26 | 2 VRF, 1 SA, 1 RA, FTR | | | | | | |
| 1B | 148 | Computer Lab | 671 | 8.3 | 5569 | 25 | 2 VRF, 1 SA, 1 RA, FTR | | | | | | |

| Proje | ect Name: | Fairfield Public Sch | ools RCx | | | | | | |
|-------|-------------|----------------------|-----------|-------------------|---------|----------|------------------------|-------------------------|------------------|
| Proje | ect Number: | 2020102.00.16 | | | RCM, RA | A, JRK | | | |
| Scop | e | Room Take-Off Dat | a | | | | | | |
| Date | | May 26, 2022 | | | | | | | |
| | | Mill Hill Elementary | School | | | | | | |
| | | - | - | | | Zone Ide | entification | | - |
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures Y /N |
| 1B | 149 | IDF | 103 | 11.4 | 1174 | 0 | Daikin PCAT | | |
| 1B | 150A | Family Toilet | 100 | 8.3 | 830 | 2 | | | |
| 1B | 150B | Women Staff Toilet | 100 | 8.3 | 830 | 1 | | | |
| 1B | 150C | Men Staff Toilet | 150 | 8.3 | 1245 | 1 | | | |
| 1B | 151 | Gymnasium | 4028 | 22.7 | 91436 | 40 | RTU | | |
| 1B | 151A | Gym Office | 249 | 10 | 2490 | 2 | CUH 1 VRF | | |
| 1B | 151B | Ramp | 194 | 10 | 1940 | 0 | | | |
| 1B | 151B* | Platform | 688 | 11.3 | 7774 | 30 | 2 SA 1 RA | Stained Tile Roof Leak | |
| 1B | 151C | Closet | 31 | 10 | 310 | 0 | ex | | |
| 1B | 151D | Gym Storage | 300 | 10 | 3000 | 0 | 1 Sa, 1 RA, Exhaust | | |
| 1B | 151E | Storage w/ Ext. Door | 354 | 10 | 3540 | 0 | Exhaust & UH | | |
| 1B | 152 | Media Center | 1875 | 10.6 | 19875 | 52 | 12 Sa, 6 RA | | |
| 1B | 152A | Media Office | 166 | 8.6 | 1428 | 2 | 1 VRF, 1 SA, 1 RA | | |
| 1B | 153 | OT/PT | 392 | 8 | 3136 | 6 | 1 VRF, 1 SA, 1 RA, FTR | | |



| Date : | August 12, 2021 Cooling : October 14, 2021 Heating |
|----------------------|--|
| Job Name : | Mill Hill Elementary School |
| Address : | 635 Mill Hill Terrace |
| City, State: | Southport, CT |
| | |
| Tag: | DOAS-1 |
| Model #: | OABD108A4-D1B400AC-A1E05AF8AB2A22K0C4A0 |
| Serial Number: | 308156-1-1 |
| Startup Contractor : | Ferguson Mechanical |
| Address : | 112 Northwest Drive |
| City, State: | Plainville, CT 06062 |
| MC Technician : | Dana 860-982-8040 |

| Pre Startup Checklist | | | | |
|---|--------|--|--|--|
| Installing Contractor should verify the following items: | | | | |
| | Y/N/na | | | |
| 1. Is there any visible shipping damage? | Ν | | | |
| 2. Is the unit level? | Y | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | |
| 7. On 208/230V units, has transformer tap been checked? | N/A | | | |
| 8. Have the damper assemblies been inspected? | Y | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | |

| | 111615 | | | | | |
|----------|-------------------|---------|-------------|-------|--|--|
| Quantity | Location | Size | Orientation | Clean | | |
| 2 | 0/A | 20/24/2 | х | х | | |
| 4 | EVAP (Doubled Up) | 20/24/2 | х | х | | |
| 2 | ERV | 20/24/2 | х | х | | |
| | | | | | | |
| | | | | | | |

Filters

| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) |
|----------------|--------------------|----------------|--------------------|--------------------|
| Non Heat Pump: | | | | Х |
| Heat Pump: | | | | |

Program Control

| Compressors | | Voltage | | | Current | | | |
|-------------|------------------|-----------|-------|-------|---------|-------|-------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 2PD91KCE-TFD-498 | 21A2422AD | 488 | 490 | 488 | 12.6 | 12.8 | 12.6 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| | Supply Fan Assembly GD150-55-12AV4X | | | | |
|--------|-------------------------------------|-----------------|-------------|----------|----|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz |
| Fan 1: | Х | 4.7 | 4.6 | Х | 60 |
| Fan 2: | | | | | |

| Energy Recovery Wheel CAT#12600356A | | | | | |
|-------------------------------------|---|-----------------------|---|-----|-----|
| Wheel Spins Freely: | у | Check Rotation | Х | FLA | .44 |

| Voltage | | | | Current | | |
|---------|-------|-------|-------|---------|-------|----|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| 488 | 490 | 487 | | | | |

| | Power Exhaust Fan Assembly | | | | | |
|--------|---|-----|-----|---|----|--|
| | Alignment Name Plate Amps Actual Amps Rotation Hz | | | | | |
| Fan 1: | Х | 3.5 | 3.4 | Х | 60 | |

| Dampers | | | |
|----------------------------|-----------------|--|--|
| Modulating OR Two Position | Operation Check | | |
| X | X | | |

| Ambient Temperature | | | |
|---|----|--|--|
| Dry Bulb Temperature (°F) Wet Bulb Temperature (°F) | | | |
| 66.7 | 54 | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-1 |

Condensor Configuration

| N/A | |
|----------------|---|
| Inlet Pressure | |
| (PSI): | |
| Water Outlet | |
| Temp (°F): | |
| | |
| | N/A Inlet Pressure (PSI): Water Outlet Temp (°F): |

| | Air Cooled (Y/N): | | | | | |
|---|-------------------|---------|-------|-------|---------|-------|
| | | Voltage | | | Current | |
| # | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 488 | 490 | 488 | AMPS: | HP: | |
| T | | | | 2.10 | 1 | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | |
|----------------------------------|----------|---------------------------|-----------------|------------|------------|--|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | |
| Discharge | 396.5 | | | | | |
| Suction | 144 | 60 | | | 14 | |
| Liquid | 390 | 100 | | | | |
| | | | | | | |
| | | Refrigeration Syst | tem - Circuit 2 | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | |
| Discharge | | | | | | |
| Suction | | | | | | |
| Liquid | | | | | | |

Heat Section

| Gas Heat (Y/N): | | | | Y | |
|-----------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | N | Air purged from the line | Υ |
| | | | | | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | - | |

DOAS-1

| Hainville | 2 CT. 1- |
|---|---|
| <text><text><text><text><text></text></text></text></text></text> | <text><text><text><text><text></text></text></text></text></text> |
| ΓΑΝδ ΟΥ ΡΗ ΡΑ ΓΑΛΟΙΤ5 ΗΡ COND 1 3 0 210.400 100 PANE 1 3 0 470.400 100 PANE PANE 1 0 0.4440 0.17 PANE PANE 1 0 0.4440 0.17 PANE PANE 1 0.4440 0.17 PANE PANE 1 0.4440 0.17 PANE PANE PANE 1 0.100 0.100 PANE PA | FAN_ DUID OTY PH PT PLAUDITS PF PUMPIE 1 3 80 474-80 10 PUMPIE 1 3 80 474-80 12 PUMPIE 1000000000000000000000000000000000000 |







| Date : | August 12, 2021 Cooling : October 14, 2021 Heating | | | |
|----------------------|--|--|--|--|
| Job Name : | Mill Hill Elementary School | | | |
| Address : | 535 Mill Hill Terrace | | | |
| City, State: | Southport, CT | | | |
| | | | | |
| Tag: | DOAS-2 | | | |
| Model #: | OADG010C3-DAB10AE00-E1ACE1AC3-21D10B13BAB0C00A01- | | | |
| Serial Number: | 308156-2-1 | | | |
| Startup Contractor : | Ferguson Mechanical | | | |
| Address : | 112 Northwest Drive | | | |
| City, State: | Plainville, CT 06062 | | | |
| MC Technician : | Dana 860-982-8040 | | | |

| Pre Startup Checklist | | | |
|---|--------|--|--|
| Installing Contractor should verify the following items: | | | |
| | Y/N/na | | |
| 1. Is there any visible shipping damage? | Ν | | |
| 2. Is the unit level? | Y | | |
| 3. Are the unit clearances adequate for service and operation? | Υ | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | |
| 5. Have all electrical connections been tested for tightness? | Υ | | |
| 6. Does the electrical service correspond to the unit nameplate? | N/A | | |
| 7. On 208/230V units, has transformer tap been checked? | Х | | |
| 8. Have the damper assemblies been inspected? | Х | | |
| 9. Are the air filters installed with proper orientation? | Х | | |
| 10. Have condensate drain and p-trap been connected? | Х | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Х | | |

| 1 11 11 11 11 11 11 11 11 11 11 11 11 1 | | | | | | | | |
|---|---------------------------------|---------|-------------|-------|--|--|--|--|
| Quantity | Location | Size | Orientation | Clean | | | | |
| 12 | EVAP (Doubled Up) | 18/24/2 | X | Х | | | | |
| 6 | 0.A. | 20/20/2 | X | Х | | | | |
| 6 | ERV | 20/20/2 | X | Х | | | | |
| 6 | Metal Washable Mist Eliminators | 16/20/2 | X | Х | | | | |
| | | | | | | | | |

Filters

| | 5 | | | | | | | |
|----------------|--------------------|----------------|--------------------|--------------------|--|--|--|--|
| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) | | | | |
| Non Heat Pump: | | | Х | | | | | |
| Heat Pump: | | | | | | | | |

Program Control

| Compressors | | Voltage | | | Current | | | |
|-------------|-----------------|-----------|-------|-------|---------|-------|-------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | ZP61K5E-TFD-498 | 20LX0126N | 488 | 490 | 489 | 7.8 | 7.7 | 7.8 |
| 2 | ZPD42K5E-TFD | 20H973FT | 488 | 490 | 489 | 8.2 | 8.1 | 8.2 |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| Supply Fan Assembly UVN145TTDR6029AAB | | | | | | | |
|---------------------------------------|-----------|-----------------|-------------|----------|----|--|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | | |
| Fan 1: | Х | 2.9 | 2.8 | Х | 60 | | |
| Fan 2: | | | | | | | |

| Energy Recovery Wheel CAT#12600356A | | | | | | |
|-------------------------------------|---|-----------------------|---|-----|-----|--|
| Wheel Spins Freely: | у | Check Rotation | Х | FLA | .44 | |

| Voltage | | | | | | |
|---------|-------|-------|-------|-------|-----------|------|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| | | | | | AMPS: .43 | .125 |

| Power Exhaust Fan Assembly VN145TTDR6029AAB | | | | | | | |
|---|-----------|-----------------|-------------|----------|----|--|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | | |
| Fan 1: | Х | 2.90 | 2.8 | Х | 60 | | |

| Dampers | | | | |
|----------------------------|-----------------|--|--|--|
| Modulating OR Two Position | Operation Check | | | |
| Modulating | Х | | | |

| Ambient Temperature | | | | |
|---|----|--|--|--|
| Dry Bulb Temperature (°F) Wet Bulb Temperature (°F) | | | | |
| 82 | 62 | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-2 |

Condensor Configuration

| Water Cooled (Y/N): | N/A | |
|---------------------|----------------|--|
| Water Leaks | Inlet Pressure | |
| (Y/N): | (PSI): | |
| Water Inlet | Water Outlet | |
| Temp (°F): | Temp (°F): | |
| Water Flow(GPM): | | |
| | · | |

| | | Air Cool | | | | |
|---|---------|----------|-------|---------------|----------|-------|
| | Voltage | | | | Current | |
| # | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 488 | 490 | 488 | AMPS: 2.10 | HP: 1 | |
| 2 | 488 | 490 | 488 | AMPS: 2.10 | HP: 1 | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | |
|----------------------------------|----------|---------------------------|-----------------|------------|------------|--|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | |
| Discharge | 395.6 | 151 | | | | |
| Suction | 126 | 62 | | | 14 | |
| Liquid | 395.5 | 92 | | 5 | | |
| | | | | | | |
| | | Refrigeration Syst | tem - Circuit 2 | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | |
| Discharge | | | | | | |
| Suction | | | | | | |
| Liquid | | | | | | |

Heat Section

| Gas Heat (Y/N): | | | | Υ | |
|-----------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | Ν | Air purged from the line | Υ |
| | | | | _ | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | _ | |

DOAS-2







| Date : | August 12, 2021 Cooling : October 14, 2021 Heating |
|----------------------|--|
| Job Name : | Mill Hill Elementary School |
| Address : | 635 Mill Hill Terrace |
| City, State: | Southport, CT |
| | |
| Tag: | DOAS-3 |
| Model #: | OADG012C3-DAB10AE00-K1ACE1AC3-21D10B13BAB0C00A00- |
| Serial Number: | 308156-3-1 |
| Startup Contractor : | Ferguson Mechanical |
| Address : | 112 Northwest Drive |
| City, State: | Plainville, CT 06062 |
| MC Technician : | Dana 860-982-8040 |

| Pre Startup Checklist | | | | | |
|---|--------|--|--|--|--|
| Installing Contractor should verify the following items: | | | | | |
| | Y/N/na | | | | |
| 1. Is there any visible shipping damage? | Ν | | | | |
| 2. Is the unit level? | Y | | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | | |
| 7. On 208/230V units, has transformer tap been checked? | N/A | | | | |
| 8. Have the damper assemblies been inspected? | Y | | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | | |

| | The state of the s | | | | | | | |
|----------|--|------------------------|-------------|-------|--|--|--|--|
| Quantity | Location | Size | Orientation | Clean | | | | |
| 6 | O/A | 20/20/2 | X | Х | | | | |
| 6 | Bypass | 20/20/2 | X | Х | | | | |
| 12 | Coil | 18/24/2 Doubled Up | X | Х | | | | |
| 6 | OIA Mist Eliminators | 20/20/2 Metal Washable | | | | | | |
| | | | | | | | | |

Filters

| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) |
|----------------|--------------------|----------------|--------------------|--------------------|
| Non Heat Pump: | | | Y | |
| Heat Pump: | | | | |

Program Control

| Compressors | | | | Voltage | | | Current | |
|-------------|-----------------|-----------|-------|---------|-------|-------|---------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | ZPD61CE-TFD-498 | 21A2219AD | 486 | 483 | 482 | 9.6 | 9.7 | 9.6 |
| 2 | ZP61CE-TFD-498 | 20L9286AD | 485 | 482 | 482 | 9.6 | 9.7 | 9.6 |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| Supply Fan Assembly 182TTD86001 | | | | | | | | |
|---------------------------------|---|-----|-----|---|----|--|--|--|
| | Alignment Name Plate Amps Actual Amps Rotation Hz | | | | | | | |
| Fan 1: | Х | 5.9 | 5.8 | Х | 60 | | | |
| Fan 2: | | | | | | | | |

| Energy Recovery Wheel 12600356A | | | | | | |
|--|--|--|--|--|--|--|
| Wheel Spins Freely: y Check Rotation X FLA .44 | | | | | | |

| Voltage | | | | | | |
|---------|-------|-------|-------|-------|-----------|------|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| 484 | 483 | 481 | | | AMPS: .43 | .125 |

| Power Exhaust Fan Assembly VVD145TTDR6029AAB | | | | | | | |
|--|---|-----|-----|---|----|--|--|
| | Alignment Name Plate Amps Actual Amps Rotation Hz | | | | | | |
| Fan 1: | Х | 2.9 | 2.8 | Х | 60 | | |

| Dampers | | | | | |
|--|---|--|--|--|--|
| Modulating OR Two Position Operation Check | | | | | |
| X | X | | | | |

| Ambient Temperature | | | | |
|---------------------------|---------------------------|--|--|--|
| Dry Bulb Temperature (°F) | Wet Bulb Temperature (°F) | | | |
| 78 | 59 | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-3 |

Condensor Configuration

| Water Cooled (Y/N): | N/A | | |
|---------------------|----------------|--|--|
| Water Leaks | Inlet Pressure | | |
| (Y/N): | (PSI): | | |
| Water Inlet | Water Outlet | | |
| Temp (°F): | Temp (°F): | | |
| Water Flow(GPM): | | | |

| | Air Cooled (Y/N): | | | | | |
|---|-------------------|--|--|-------|---------|-------|
| | Voltage | | | | Current | |
| # | L1-L2 L2-L3 L1-L3 | | | L1-L2 | L2-L3 | L1-L3 |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | | |
|----------------------------------|----------|--------------------------|------------------|------------|------------|--|--|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | |
| Discharge | 388 | | | | | | |
| Suction | 141 | 53 | | | 14 | | |
| Liquid | 388 | 156 | 156 in/96 out | 6 | | | |
| | · | | | · | | | |
| | | Refrigeration Sys | stem - Circuit 2 | | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | |
| Discharge | | | | | | | |
| Suction | | | | | | | |
| Liquid | | | | | | | |

Heat Section

| | | Y | | | |
|-------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | N | Air purged from the line | Y |
| | | | | _ | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | - | |

DOAS-3







| Date : | Date : August 12, 2021 Cooling : October 14, 2021 Heating | | |
|--|---|--|--|
| Job Name : | Mill Hill Elementary School | | |
| Address : | 635 Mill Hill Terrace | | |
| City, State: | Southport, CT | | |
| | | | |
| Tag: | DOAS-4 | | |
| Model #: | OABD084A4-D1B400AD-A1C05AF8AD2A22K0C4A0 | | |
| Serial Number: 308156-4-1 | | | |
| Startup Contractor : Ferguson Mechanical | | | |
| Address : | 112 Northwest Drive | | |
| City, State: | Plainville, CT 06062 | | |
| MC Technician : | Dana 860-982-8040 | | |

| Pre Startup Checklist | | | | | |
|---|--------|--|--|--|--|
| Installing Contractor should verify the following items: | | | | | |
| | Y/N/na | | | | |
| 1. Is there any visible shipping damage? | Ν | | | | |
| 2. Is the unit level? | Y | | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | | |
| 7. On 208/230V units, has transformer tap been checked? | Y | | | | |
| 8. Have the damper assemblies been inspected? | Y | | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | | |

| 111015 | | | | | | |
|----------|----------|---------------------|-------------|-------|--|--|
| Quantity | Location | Size | Orientation | Clean | | |
| 2 | 0/A | 20/24/2 | х | х | | |
| 2 | ERV | 20/24/2 | х | х | | |
| 4 | EVAP | 20/24/2 (Double up) | х | х | | |
| | | | | | | |
| | | | | | | |

Filters

| | - 3 | 5 | | | | | |
|----------------|--------------------|----------------|--------------------|--------------------|--|--|--|
| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) | | | |
| Non Heat Pump: | | | | Х | | | |
| Heat Pump: | | | | | | | |

Program Control

| Compressors | | Voltage | | | Current | | | |
|-------------|------------------|-----------|-------|-------|---------|-------|-------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | ZFD72KCE-TFD-130 | 20L4982AD | 488 | 490 | 488 | 10.9 | 11.0 | 11.0 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| | Supply Fan Assembly | | | | | |
|--------|---------------------|-----------------|-------------|----------|----|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | |
| Fan 1: | Х | 3.5 | 3.4 | Х | 60 | |
| Fan 2: | | | | | | |

| Energy Recovery Wheel | | | | | |
|-----------------------|---|----------------|---|-----|------|
| Wheel Spins Freely: | Y | Check Rotation | Х | FLA | 0.43 |

| Voltage | | | | Current | | |
|---------|-------|-------|-------|---------|-------|----|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| 488 | 490 | 487 | | | | |

| Power Exhaust Fan Assembly | | | | | |
|----------------------------|---|-----|-----|---|----|
| | Alignment Name Plate Amps Actual Amps Rotation Hz | | | | |
| Fan 1: | Х | 3.5 | 3.4 | Х | 60 |

| Dampers | | | | |
|--|---|--|--|--|
| Modulating OR Two Position Operation Check | | | | |
| Modulating | Х | | | |

| Ambient Temperature | | | |
|---------------------------|---------------------------|--|--|
| Dry Bulb Temperature (°F) | Wet Bulb Temperature (°F) | | |
| 67 | 54 | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-4 |

Condensor Configuration

| Water Cooled (Y/N): | N/A | |
|---------------------|----------------|--|
| Water Leaks | Inlet Pressure | |
| (Y/N): | (PSI): | |
| Water Inlet | Water Outlet | |
| Temp (°F): | Temp (°F): | |
| Water Flow(GPM): | | |

| Air Cooled (Y/N): | | | | | | |
|-------------------|-------------------|-----|-------|-------------|-------|--|
| | Voltage | | | age Current | | |
| # | L1-L2 L2-L3 L1-L3 | | L1-L2 | L2-L3 | L1-L3 | |
| 1 | 488 | 490 | 488 | 2.10 A | 1 HP | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | | | |
|----------------------------------|----------|----------|-----------|------------|------------|--|--|--|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | | |
| Discharge | 393 | 115 | 160.6 | | | | | |
| Suction | 119 | 40.5 | 48.9 | | 10.9 | | | |
| Liquid | 377 | 115 | 130 | | | | | |
| | | | | | | | | |
| Refrigeration System - Circuit 2 | | | | | | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | | |
| Discharge | | | | | | | | |
| Suction | | | | | | | | |
| Liquid | | | | | | | | |

Heat Section

| Gas Heat (Y/N): | | | | Υ | |
|-----------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | N | Air purged from the line | Υ |
| | | | | _ | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | - | |

DOAS-4







| Date : | March 5, 2021 Heating : April 19, 2021 Cooling & Final Check | | | | |
|----------------------|--|--|--|--|--|
| Job Name : | Mill Hill Elementary School | | | | |
| Address : | 635 Mill Hill Terrace | | | | |
| City, State: | Southport, CT | | | | |
| | | | | | |
| Tag: | DOAS-5 | | | | |
| Model #: | OADG020C3-DAB10AG00-M1AEJ1AG3-21D10D13BAB0C00A01 | | | | |
| Serial Number: | 308156-5-1 | | | | |
| Startup Contractor : | Ferguson Mechanical | | | | |
| Address : | 112 Northwest Drive | | | | |
| City, State: | Plainville, CT 06062 | | | | |
| MC Technician : | Dana 860-982-8040 | | | | |

| Pre Startup Checklist | | | | |
|--|--------|--|--|--|
| Installing Contractor should verify the following items: | | | | |
| | Y/N/na | | | |
| Checked for visible shipping damage. | Y | | | |
| Unit is Level | Y | | | |
| All fans spin freely. | Y | | | |
| All electrical connections tight. | Y | | | |
| Interior cabinet inspected for damage or loose components. | Y | | | |
| All field installed devices are installed. | Y | | | |
| Clearances meet minimum requirements in IOM. | Y | | | |
| Condensate drains and P-Traps installed. | Y | | | |
| All doors open freely. | Y | | | |
| Wiring schematics installed on front door. | Y | | | |

Voltages

| Rated Voltage | Measured |
|------------------------|----------|
| Voltage L1-L2 | 486 |
| Voltage L1-L3 | 485 |
| Voltage L2-L3 | 483 |
| Voltage L1-G | 278.1 |
| Voltage L2-G | 279.5 |
| Voltage L3-G | 280.6 |
| TNS2 Secondary Voltage | 27.93 |
| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-5 |

Motor Data

| | | | | @50% | | |
|-----------------|----------------------------|-------------|-------|------|------------|------|
| | | Rated | Rated | | Running Fl | A |
| Motor | Model Number | HP/kW | FLA | L1 | L2 | L3 |
| Supply Fan 1 | | 7.5 / 5.6 | | 4.3 | 4.2 | 4.3 |
| Supply Fan 2 | VVF184TTDBD6001-000004-CB1 | | 9.2 | | | |
| Exhaust Fan 1 | | 5 / 3.70 | | 6.5 | 6.4 | 6.5 |
| Exhaust Fan 2 | VVF184TTDBD6026CBM | | 6.6 | | | |
| Condensor Fan 1 | | 1 HP | 2.10 | 2.0 | 2.10 | 2.0 |
| Condensor Fan 2 | VWK-56T11011582A | 1HP | 2.10 | 2.0 | 2.10 | 2.0 |
| Condensor Fan 3 | | | | | | |
| Condensor Fan 4 | | | | | | |
| Condensor Fan 5 | | | | | | |
| Condensor Fan 6 | | | | | | |
| ERV | 34J184R683G1 | .125 / .093 | 0.44 | 0.44 | 0.43 | 0.44 |

Compressor Data

| | Model Number | Serial Number | Rated Amps | Running Amps | | S |
|---|------------------------------|---------------|---------------|--------------|------|------|
| 1 | ZPD104KCE-TFD-455 | 20H34A72Z | 14.70 | 12.3 | 12.5 | 12.2 |
| 2 | ZPD104KCE-TFD-455 | 20LAA809L | 14.70 | 12.2 | 12.3 | 12.0 |
| 3 | These are both digital fixed | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |

Actuators

| Actuator Name | Control 2 Pos or 2-10 | Operation |
|--|--------------------------|-----------|
| | VDC | Verified |
| Outdoor Air Damper Actuator | 2 POSITION | Y |
| Return Air Damper Actuator | 2 POSITION | Y |
| Exhaust Air Damper Actuator | 2-Position | Y |
| Split EA/RA Damper Actuator | 2-Position | Y |
| Outdoor Air ERV Bypass Damper Actuator | 2-10 VDC | Y |
| Exhaust Air ERV Bypass Damper Actuator | 2-10 VDC | Y |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-5 |

REFRIGERATION STARTUP

Test Procedures

- 1. ***NOTE*** COOLING STARTUP CAN ONLY BE COMPLETED IF THE OA TEMP IS > 65°F OR < 105°F. HEATING STARTUP CAN ONLY BE COMPLETE IF OA TEMP IS < 90°
- 2. Test each circuit independently
- 3. Tandem or skip circuits must have all compressors on.
- 4. Set Digital Scroll/Variable Speed command to 100%
- 5. Outdoor Air Damper open, Return Air Damper closed.
- 6. Set hot gas reheat to 25%*, if installed.
- 7. Set outdoor air cool conditions
 - a. Air Source Heat Pump or Standard DX
 - i. Reduce condenser fan air flow until liquid line pressure is 3.75-4.00PSI
 - b. Water Source Heat Pump
 - i. Verify proper water flow through water coil.
- 8. Adjust charge until subcooling is 10-15.
- 9. Verify HGRH operational at 100%
- 10. Record all readings.
- 11. Heat Pumps: Switch reversing valve to heating, repeat steps 1-8 for heating mode except for hot gas reheat at 100%
- **12.** Repeat for Circuit 2. *****If saturated suction > 67°F, you can test both circuits at the same time.**

*Units with variable speed compressors must also be tested at 0% signal and 100% hot gas reheat.

| | | 021 | | | | |
|-----------------------------|---------------------------|---------|---------|-----------|---------|--------|
| Outdoor RH (%) | | 39% RH | | | @100%OA | |
| | | Circ | uit 1 | Circuit 2 | | VS |
| | | Cooling | Heating | Cooling | Heating | Test 2 |
| | Hot Gas Reheat Signal (%) | 25 | | 25 | | |
| Distance | Pressure (PSI) | N/A | | | | |
| Discharge | Sat. Temp (°F) | N/A | | | | |
| LITE | Temp (°F) | N/A | | | | |
| | Pressure (PSI) | 101.2 | | 76 PSIG | | |
| Suction Line | Sat. Temp (°F) | 30.8 | | 19.2 | | |
| | Temp (°F) | 36.6 | | 36.6 | | |
| | Pressure (PSI) | 265 | | 330 | | |
| Liquid Line | Sat. Temp (°F) | 87.4 | | 101.8 | | |
| | Temp (°F) | 92.2 | | 92 | | |
| Suction Line Superheat (°F) | | 8.6 | | 17.8 | | |
| Liquid Line Subcooling (°F) | | 2.8 | | 9.4 | | |

Outdoor Air Temp (°F) 62°F

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-5 |

INDIRECT FIRED GAS HEAT STARTUP

Furnace Data

| | Serial Number | Model Number |
|-----------|---------------|-------------------|
| Furnace 1 | H2053040 | HMG250HS-VSPG1NPA |
| Furnace 2 | | |
| Furnace 3 | | |

Gas Pressure Settings

| | Measured Pressure | Natural Gas Settings | Propane Settings | |
|------------------------------|----------------------|-------------------------|---------------------|--------|
| Incoming to Unit | Set @ 9" w.c. | 7 - 14 | 10 - 14 | in H20 |
| Between On/Off & Mod. Valve | Set @ 5" w.c. | 5 | 10 | in H20 |
| Stage 1 Manifold (Low Fire) | Set @ 0.4" w.c. | 0.3 | 1 | in H20 |
| Stage 1 Manifold (High Fire) | Set @ 3.5" w.c. | 3.5 | 8 | in H20 |
| Stage 2 Manifold | Set @ 3.5" w.c. | 3.5 | 8 | in H20 |
| Stage 3 Manifold | n/a | 3.5 | 8 | in H20 |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-5 |

PROGRAMMING AND COMMISSIONING

Program Control Type (MV-13)

BAS ControlYesStand Alone ControlTemporary

| Filters | | | | |
|----------|----------|---------|-------------|-------|
| Quantity | Location | Size | Orientation | Clean |
| 6 | EVAP | 18/24/2 | CORRECT | У |
| 6 | EVAP | 18/24/4 | CORRECT | Y |
| 6 | ERV/RTN | 20/20/2 | CORRECT | Y |
| 6 | ERV/OA | 20/20/2 | CORRECT | Y |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

NOTES: 3/15/21 - HAD BRIAN INSTALL U.V. LIGHTS (4) PER UNIT ON BOTH DOAS #5 & #6 UNITS, TESTED/OK.FOUND OVERSTROKE OF 2MM ON ERV BYPASS DAMPERS CAUSING RETAINING CICLIPS TO POP OUT, READJUSTED DAMPERS, FOUND AND REINSTALLED CLIPS. UNIT HAS A FROSTSAT ALARM PREVENTING COMPRESSOR ENGAGEMENT, CONFIRMED AUTO RESET FROSTSTAT IS CLOSED, CONFIRMED XM-30 MODULE IS RECOGNIZED BY UC-600 CONTROLLER, WILL ADDRESS AT COOLING STARTUP.

4/26/21 - S/F set @ 50% per specs - 3506 CFM

* Ductwork Incomplete

* 4/19/21 - Setup Unit Address & Instance #, Confirmed by ALS Tech. Baud Rate - 38,600

Reset 72° Htg SP during construction on 3/5/21 to 67° 4/19/21 per Tom Ferguson

NOTE - Boiler Perimeter heat & VRF units are primary HVAC source (w) KCC as O/A

Cleared -Frostat Alarm

DOAS-5







Trane[®] Horizon[™] Dedicated Outdoor Air Unit Startup Form

| Date : | March 5, 2021 Heating : April 19, 2021 Cooling & Final Check | | |
|----------------------|--|--|--|
| Job Name : | Aill Hill Elementary School | | |
| Address : | 635 Mill Hill Terrace | | |
| City, State: | Southport, CT | | |
| | | | |
| Tag: | DOAS-6 | | |
| Model #: | OADG020C3-DAB10AG00-M1AEG1AE3- | | |
| Serial Number: | 308156-6-1 | | |
| Startup Contractor : | Ferguson Mechanical | | |
| Address : | 112 Northwest Drive | | |
| City, State: | Plainville, CT 06062 | | |
| MC Technician : | Dana 860-982-8040 | | |

| Pre Startup Checklist | |
|--|--------|
| Installing Contractor should verify the following items: | |
| | Y/N/na |
| Checked for visible shipping damage. | Y |
| Unit is Level | Y |
| All fans spin freely. | Y |
| All electrical connections tight. | Y |
| Interior cabinet inspected for damage or loose components. | Y |
| All field installed devices are installed. | Y |
| Clearances meet minimum requirements in IOM. | Y |
| Condensate drains and P-Traps installed. | Y |
| All doors open freely. | Y |
| Wiring schematics installed on front door. | Y |

Voltages

| Rated Voltage | Measured |
|------------------------|----------|
| Voltage L1-L2 | 486 |
| Voltage L1-L3 | 485 |
| Voltage L2-L3 | 483 |
| Voltage L1-G | 278.1 |
| Voltage L2-G | 279.5 |
| Voltage L3-G | 280.6 |
| TNS2 Secondary Voltage | 27.93 |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-6 |

Motor Data

| | | | | @50% | | |
|-----------------|----------------------------|-----------|-------|------|------------|-----|
| | | Rated | Rated | | Running FL | A |
| Motor | Model Number | HP/kW | FLA | L1 | L2 | L3 |
| Supply Fan 1 | | 7.5/5.6 | | 4.3 | 4.1 | 4.2 |
| Supply Fan 2 | VVF184TTDBD6001-000004-CB1 | | 9.2 | | | |
| Exhaust Fan 1 | | 5/3.70 | | 6.4 | 6.2 | 6.3 |
| Exhaust Fan 2 | VVF184TTDBD6026CBM | | 6.6 | | | |
| Condensor Fan 1 | VWK56T11015582A | 1 HP | | 2.0 | 2.1 | 2.0 |
| Condensor Fan 2 | SAME | 1 HP | 2.10 | 2.0 | 2.1 | 2.0 |
| Condensor Fan 3 | | | 2.10 | | | |
| Condensor Fan 4 | | | | | | |
| Condensor Fan 5 | | | | | | |
| Condensor Fan 6 | | | | | | |
| ERV | 34J184R683G1 | .125/.093 | .44 | .43 | .42 | .44 |

Compressor Data

| | Model Number | Serial Number | Rated Amps | Running Amps | | S |
|---|-------------------|---------------|---------------|--------------|------|------|
| 1 | ZP104KCE-TFD-455 | 20KAF694L | 14.70 | 12.3 | 12.2 | 12.0 |
| 2 | ZPD104KCE-TFD-455 | 20H34A58Z | 14.70 | 12.3 | 12.2 | 12.0 |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |

Actuators

| Actuator Name | Control 2 Pos or 2-10 | Operation |
|--|--------------------------|-----------|
| | VDC | Verified |
| Outdoor Air Damper Actuator | 2 POSITION | Y |
| Return Air Damper Actuator | 2 POSITION | Y |
| Exhaust Air Damper Actuator | 2-Position | Y |
| Split EA/RA Damper Actuator | 2-Position | Y |
| Outdoor Air ERV Bypass Damper Actuator | 2-10 VDC | Y |
| Exhaust Air ERV Bypass Damper Actuator | 2-10 VDC | Y |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Taa : | DOAS-6 |

REFRIGERATION STARTUP

Test Procedures

- 1. ***NOTE*** COOLING STARTUP CAN ONLY BE COMPLETED IF THE OA TEMP IS > 65°F OR < 105°F. HEATING STARTUP CAN ONLY BE COMPLETE IF OA TEMP IS < 90°
- 2. Test each circuit independently
- 3. Tandem or skip circuits must have all compressors on.
- 4. Set Digital Scroll/Variable Speed command to 100%
- 5. Outdoor Air Damper open, Return Air Damper closed.
- 6. Set hot gas reheat to 25%*, if installed.
- 7. Set outdoor air cool conditions
 - a. Air Source Heat Pump or Standard DX
 - i. Reduce condenser fan air flow until liquid line pressure is 3.75-4.00PSI
 - b. Water Source Heat Pump
 - i. Verify proper water flow through water coil.
- 8. Adjust charge until subcooling is 10-15.
- 9. Verify HGRH operational at 100%
- 10. Record all readings.
- 11. Heat Pumps: Switch reversing valve to heating, repeat steps 1-8 for heating mode except for hot gas reheat at 100%
- 12. Repeat for Circuit 2. ***If saturated suction > 67°F, you can test both circuits at the same time.

*Units with variable speed compressors must also be tested at 0% signal and 100% hot gas reheat.

| | Outdoor Air Temp (°F) | 61 | | | | |
|------------------------------|-----------------------------|---------|---------|-----------|---------|--------|
| | Outdoor RH (%) | 45.1 | | | | |
| | | Circ | uit 1 | Circuit 2 | | VS |
| | | Cooling | Heating | Cooling | Heating | Test 2 |
| | Hot Gas Reheat Signal (%) | 25 | | 25 | | |
| Distance | Pressure (PSI) | N/A | | | | |
| Discharge | Sat. Temp (°F) | N/A | | | | |
| Line | Temp (°F) | N/A | | | | |
| | Pressure (PSI) | 107.2 | | 83 | | |
| Suction Line | Sat. Temp (°F) | 34.5 | | 22.3 | | |
| | Temp (°F) | 37.1 | | 35 | | |
| | Pressure (PSI) | 268 | | 331.5 | | |
| Liquid Line | Sat. Temp (°F) | 88 | | 102.5 | | |
| | Temp (°F) | 87.4 | | 98.9 | | |
| Suction Line Superheat (°F) | | 3.0 | | 14.5 | | |
| | Liquid Line Subcooling (°F) | 0.7 | | 3.8 | | |
| Evaporator Leaving Temp (°F) | | 37 | | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-6 |

INDIRECT FIRED GAS HEAT STARTUP

Furnace Data

| | Serial Number | Model Number |
|-----------|---------------|-------------------|
| Furnace 1 | H2102105 | HMG250HS-VSPG1NPA |
| Furnace 2 | | |
| Furnace 3 | | |

Gas Pressure Settings

| | Measured | Natural Gas | Propane | |
|------------------------------|----------|-------------|----------|--------|
| | Pressure | Settings | Settings | |
| Incoming to Unit | 9.0 | 7 - 14 | 10 - 14 | in H20 |
| Between On/Off & Mod. Valve | 5.0 | 5 | 10 | in H20 |
| Stage 1 Manifold (Low Fire) | 0.4 | 0.3 | 1 | in H20 |
| Stage 1 Manifold (High Fire) | 3.5 | 3.5 | 8 | in H20 |
| Stage 2 Manifold | 3.5 | 3.5 | 8 | in H20 |
| Stage 3 Manifold | N/A | 3.5 | 8 | in H20 |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | DOAS-6 |

PROGRAMMING AND COMMISSIONING

Program Control Type (MV-13)

| BAS Control | Yes |
|---------------------|-----------|
| Stand Alone Control | Temporary |

Filters

| Quantity | Location | Size | Orientation | Clean |
|----------|----------|---------|-------------|-------|
| 6 | EVAP | 18/24/2 | CORRECT | Y |
| 6 | EVAP | 18/24/4 | CORRECT | Y |
| 6 | ERV/RTN | 20/20/2 | CORRECT | Y |
| 6 | ERV/OA | 20/20/2 | CORRECT | Y |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

NOTES:

* 1/2 of ductwork Installed

* Set unit address & Instance # - confirmed by ALS Tech Baud Rate - 38,600

Per Tom Ferguson - Reset from 72° 3/4/21 during construction to 67° o 4/19/21

FINAL - Both comps on - CFM @ 25%

OA @ 100% Open, HGRH @ 25%, 328/84 @ 13.3 Amps avg @ comps, 11.6 Superheat, 4.3 Subcool, 56° DAT, 74° RAT, 0.457 Static S/F Pressure, ERV Bypass Damper 100% open, ERV E/F Bypass Damper 0% open, ERV Off

DOAS-6





MAU-1



Part#: SFIH-01MDF Sloped Filtered Intake for Size #1 Modular Heater. 21.813" Wide x 43.375" Long x 23.375" High. Includes 2" MV EZ Kleen Metal Mesh Filters.

Filters: 3 Of 9154 MV EZ Kleen Metal Mesh

MV EZ Kleen Metal Mesh Filter. 16"x 20"x 2" Used for heater and supply fan intakes. (3412)



























Trane[®] Horizon[™] Dedicated Outdoor Air Unit Startup Form

| Date : | August 12, 2021 Cooling : October 14, 2021 Heating | | | |
|----------------------|--|--|--|--|
| Job Name : | Mill Hill Elementary School | | | |
| Address : | 635 Mill Hill Terrace | | | |
| City, State: | Southport, CT | | | |
| | | | | |
| Tag: | RTU -1 Gym | | | |
| Model #: | OADG017C3-DAB10AH00-L1AJJ1AG3-00D10E13BA01C00A01- | | | |
| Serial Number: | 308156-7-1 | | | |
| Startup Contractor : | Ferguson Mechanical | | | |
| Address : | 112 Northwest Drive | | | |
| City, State: | Plainville, CT 06062 | | | |
| MC Technician : | Dana 860-982-8040 | | | |

| Pre Startup Checklist | | | | |
|---|--------|--|--|--|
| Installing Contractor should verify the following items: | | | | |
| | Y/N/na | | | |
| 1. Is there any visible shipping damage? | Ν | | | |
| 2. Is the unit level? | Y | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | |
| 7. On 208/230V units, has transformer tap been checked? | Y | | | |
| 8. Have the damper assemblies been inspected? | Y | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | |

| , | | | | | | | |
|----------|----------|----------------------|-------------|-------|--|--|--|
| Quantity | Location | Size | Orientation | Clean | | | |
| 6 | 0/A | 20/20/2 | Х | Х | | | |
| 6 | BYPASS | 20/20/2 | Х | Х | | | |
| 12 | EVAP | 18/24/2 (Doubled up) | Х | Х | | | |
| | | | | | | | |
| | | | | | | | |

Filters

| | 5 | | | | | | |
|----------------|--------------------|----------------|--------------------|--------------------|--|--|--|
| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) | | | |
| Non Heat Pump: | | | Y | | | | |
| Heat Pump: | | | | | | | |

Program Control

| Compressors | | Voltage | | Current | | | | |
|-------------|------------------|-----------|-------|---------|-------|-------|-------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | ZPD91KCE-TED-498 | 21A2425AD | 483 | 482 | 481 | 12.7 | 12.6 | 12.8 |
| 2 | ZP91KCE-TFD-498 | 20L9433AD | 483 | 482 | 481 | 12.7 | 12.6 | 12.8 |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| Supply Fan Assembly | | | | | | |
|---------------------|-----------|-----------------|-------------|----------|----|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | |
| Fan 1: | Х | 9.9 | 9.8 | Х | 60 | |
| Fan 2: | | | | | | |

| Energy Recovery Wheel | | | | | |
|-----------------------|---|----------------|--|-----|--|
| Wheel Spins Freely: | Y | Check Rotation | | FLA | |

| Voltage | | | | Current | | |
|---------|-------|-------|-------|---------|-------|----|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| 483 | 484 | 482 | | | | |

| Power Exhaust Fan Assembly M#VVE184TTDBD6026CBM | | | | | |
|--|---|------|-----|---|----|
| Alignment Name Plate Amps Actual Amps Rotation H | | | | | Hz |
| Fan 1: | Х | 6.36 | 6.5 | Х | 60 |

| Dampers | | | |
|--|---|--|--|
| Modulating OR Two Position Operation Check | | | |
| X | X | | |

| Ambient Temperature | | | | | |
|---------------------------|---------------------------|--|--|--|--|
| Dry Bulb Temperature (°F) | Wet Bulb Temperature (°F) | | | | |
| | | | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | RTU-1 |

Condensor Configuration

ſ

| Water Cooled (Y/N): | N/A | |
|---------------------|----------------|--|
| Water Leaks | Inlet Pressure | |
| (Y/N): | (PSI): | |
| Water Inlet | Water Outlet | |
| Temp (°F): | Temp (°F): | |
| Water Flow(GPM): | | |

| Air Cooled (Y/N): | | | | | | |
|-------------------|-------------|-----|-------|-----------|---------|-------|
| | Voltage | | | | Current | |
| # | L1-L2 L2-L3 | | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 483 | 484 | 482 | AMPS:2.10 | HP:1 | |
| 2 | 483 | 484 | 482 | AMPS:2.10 | HP:1 | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | | | | | |
|----------------------------------|---|-----------------------------|------------------|------------|------------|--|--|--|--|--|
| | Pressure SAT Temp Line Temp Subcooling Super Heat | | | | | | | | | |
| Discharge | 340 | 105 | 91 | | | | | | | |
| Suction | 168 | 61.2 | 61 | | 14 | | | | | |
| Liquid | 340 | 128 | 106 | | | | | | | |
| | • | | | | | | | | | |
| | | Refrigeration System | stem - Circuit 2 | | | | | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | | | | |
| Discharge | Discharge | | | | | | | | | |
| Suction | | | | | | | | | | |
| Liquid | | | | | | | | | | |

Heat Section

| Gas Heat (Y/N): | | | | | Y |
|-----------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | N | Air purged from the line | Υ |
| | | | | | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | - | |

RTU-1

| Plainville CT. 8- | 1 |
|---|---|
| $ \begin{array}{c} \label{eq:product} \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$ | |
| n_{1} n_{1} n_{2} < | |



Trane[®] Horizon[™] Dedicated Outdoor Air Unit Startup Form

| Date : | August 12, 2021 Cooling : October 14, 2021 Heating |
|----------------------|--|
| Job Name : | Mill Hill Elementary School |
| Address : | 635 Mill Hill Terrace |
| City, State: | Southport, CT |
| | |
| Tag: | RTU-2 Media Center/Library |
| Model #: | OABD084A4-D1B400AB-A1D00008AB2002K0C5A0 |
| Serial Number: | 308156-8-1 |
| Startup Contractor : | Ferguson Mechanical |
| Address : | 112 Northwest Drive |
| City, State: | Plainville, CT 06062 |
| MC Technician : | Dana 860-982-8040 |

| Pre Startup Checklist | | | | | |
|---|--------|--|--|--|--|
| Installing Contractor should verify the following items: | | | | | |
| | Y/N/na | | | | |
| 1. Is there any visible shipping damage? | Ν | | | | |
| 2. Is the unit level? | Y | | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | | |
| 7. On 208/230V units, has transformer tap been checked? | Y | | | | |
| 8. Have the damper assemblies been inspected? | N/A | | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | | |

| i neers | | | | | | | | |
|----------|----------|----------------------|-------------|-------|--|--|--|--|
| Quantity | Location | Size | Orientation | Clean | | | | |
| 4 | EVAP | 20/24/2 (Doubled up) | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Filters

| | <u> </u> | | | | | | | |
|----------------|--------------------|----------------|--------------------|--------------------|--|--|--|--|
| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) | | | | |
| Non Heat Pump: | | | Y | | | | | |
| Heat Pump: | | | | | | | | |

Program Control

| Compressors | | Voltage | | | Current | | | |
|-------------|------------------|-----------|-------|-------|---------|-------|-------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | ZPD72KCE-TED-130 | 20L4981AD | 488 | 490 | 488 | 11.0 | 11.2 | 11.0 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| | Supply Fan Assembly | | | | |
|--------|---------------------|-----------------|-------------|----------|----|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz |
| Fan 1: | Х | 9.9 | 9.8 | Х | 60 |
| Fan 2: | | | | | |

| Energy Recovery Wheel N/A | | | | | |
|---------------------------|--|-----------------------|--|-----|--|
| Wheel Spins Freely: | | Check Rotation | | FLA | |

| Voltage | | | | | | |
|---------|-------|-------|-------|-------|-------|----|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| | | | | | | |

| Power Exhaust Fan Assembly | | | | | |
|----------------------------|-----------|-----------------|-------------|----------|----|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz |
| Fan 1: | Х | 3.5 | 3.4 | Х | 60 |

| Dampers | |
|----------------------------|-----------------|
| Modulating OR Two Position | Operation Check |
| Modulating | Х |

| Ambient Temperature | | | |
|---------------------------|---------------------------|--|--|
| Dry Bulb Temperature (°F) | Wet Bulb Temperature (°F) | | |
| | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | RTU-2 |

Condensor Configuration

| Water Cooled (Y/N): | N/A | |
|---------------------|----------------|--|
| Water Leaks | Inlet Pressure | |
| (Y/N): | (PSI): | |
| Water Inlet | Water Outlet | |
| Temp (°F): | Temp (°F): | |
| Water Flow(GPM): | | |

| | Air Cooled (Y/N): | | | | | |
|---|-------------------|-------|-------|--------|---------|-------|
| | Voltage | | | | Current | |
| # | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 488 | 487 | 487 | 2.10 A | 1 HP | |
| 2 | 488 | 487 | 487 | 2.10 A | 1 HP | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | |
|----------------------------------|----------|--------------------------|-----------------|------------|------------|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat |
| Discharge | 340 | 105 | 91 | | |
| Suction | 168 | 61.2 | 60 | | 14 |
| Liquid | 340 | 127 | 106 | | |
| | | | | | |
| | | Refrigeration Sys | tem - Circuit 2 | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat |
| Discharge | | | | | |
| Suction | | | | | |
| Liquid | | | | | |

Heat Section

| | | Υ | | | |
|-------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | N | Air purged from the line | Υ |
| | | | | _ | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | - | |









Trane[®] Horizon[™] Dedicated Outdoor Air Unit Startup Form

| Date : | August 12, 2021 Cooling : October 14, 2021 Heating | | | |
|----------------------|---|--|--|--|
| Job Name : | Mill Hill Elementary School | | | |
| Address : | 635 Mill Hill Terrace | | | |
| City, State: | Southport, CT | | | |
| | | | | |
| Tag: | RTU-3 Cafeteria | | | |
| Model #: | Model #: OADG017F3-DAB10AG00-L1AJJ1AH3-00D10E13BA01C00A01 | | | |
| Serial Number: | 308156-9-1 | | | |
| Startup Contractor : | Ferguson Mechanical | | | |
| Address : | 112 Northwest Drive | | | |
| City, State: | Plainville, CT 06062 | | | |
| MC Technician : | Dana 860-982-8040 | | | |

| Pre Startup Checklist | | | | |
|---|--------|--|--|--|
| Installing Contractor should verify the following items: | | | | |
| | Y/N/na | | | |
| 1. Is there any visible shipping damage? | Ν | | | |
| 2. Is the unit level? | Y | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | |
| 7. On 208/230V units, has transformer tap been checked? | N/A | | | |
| 8. Have the damper assemblies been inspected? | Y | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | |

| i interio | | | | | | |
|-----------|----------|----------------------|-------------|-------|--|--|
| Quantity | Location | Size | Orientation | Clean | | |
| 6 | ERV | 20/20/2 | X | Х | | |
| 6 | O/A | 20/20/2 | X | Х | | |
| 12 | EVAP | 18/24/2 (Doubled Up) | X | Х | | |
| | | | | | | |
| | | | | | | |

Filters

| | 5 | | | |
|----------------|--------------------|----------------|--------------------|--------------------|
| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) |
| Non Heat Pump: | | | Y | |
| Heat Pump: | | | | |

Program Control

| | Compressors | | | Voltage | | | Current | |
|---|------------------|-----------|-------|---------|-------|-------|---------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | ZP1KCE-TED-498 | 20L9926AD | 488 | 490 | 488 | 12.8 | 12.6 | 12.8 |
| 2 | ZPD91KCE-TED-498 | 21A2416AD | 488 | 490 | 488 | 12.8 | 12.6 | 12.6 |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| Supply Fan Assembly VVH213TTDAD6026AAM | | | | | | |
|--|-----------|-----------------|-------------|----------|----|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | |
| Fan 1: | Х | 9.9 | 9.8 | x | 60 | |
| Fan 2: | | | | | | |

| Energy Recovery Wheel CAT#12600356A | | | | | | |
|-------------------------------------|---|-----------------------|---|-----|-----|--|
| Wheel Spins Freely: | у | Check Rotation | у | FLA | .44 | |

| Voltage | | | Current | | | |
|---------|-------|-------|---------|-------|-------|-------|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| 488 | 490 | 488 | 0.44 | | | 0.125 |

| | Power Exhaust Fan Assembly | | | | | | |
|--------|---|--|--|---|--|--|--|
| | Alignment Name Plate Amps Actual Amps Rotation Hz | | | | | | |
| Fan 1: | Х | | | Х | | | |

| Dampers | | | | |
|--|---|--|--|--|
| Modulating OR Two Position Operation Check | | | | |
| Modulating | Х | | | |

| Ambient Temperature | | | | |
|---|----|--|--|--|
| Dry Bulb Temperature (°F) Wet Bulb Temperature (°F) | | | | |
| 75 | 58 | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | RTU-3 |

Condensor Configuration

| 2 |
|----------|
| : |
| <u>;</u> |
| ; |
| |
| ?t): |

| Air Cooled (Y/N): | | | | | | |
|-------------------|-------|---------|-------|--------------|----------|-------|
| | | Voltage | | Current | | |
| # | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 488 | 490 | 488 | AMPS: 2.1 | HP: 1 | |
| 2 | 488 | 489 | 488 | AMPS: 2.0 | HP: 1 | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | | |
|----------------------------------|----------|-------------------------|------------------|------------|------------|--|--|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | |
| Discharge | 340 | 104 | 991 | | | | |
| Suction | 168 | 612 | 68 | | 13 | | |
| Liquid | 340 | 128 | 106 | | | | |
| | | | | | | | |
| | | Refrigeration Sy | stem - Circuit 2 | | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | | |
| Discharge | | | | | | | |
| Suction | | | | | | | |
| Liquid | | | | | | | |

Heat Section

| | | Υ | | | |
|-------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | Ν | Air purged from the line | Υ |
| | | | | _ | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | _ | |

RTU-3







Trane[®] Horizon[™] Dedicated Outdoor Air Unit Startup Form

| Date : | August 12, 2021 Cooling : October 14, 2021 Heating | | | | |
|----------------------|--|--|--|--|--|
| Job Name : | Mill Hill Elementary School | | | | |
| Address : | 635 Mill Hill Terrace | | | | |
| City, State: | Southport, CT | | | | |
| | | | | | |
| Tag: | RTU-4 Stage | | | | |
| Model #: | OABD048A4-C1B400AB-A1B00008AB2002K0C5A0 | | | | |
| Serial Number: | 308156-10-1 | | | | |
| Startup Contractor : | Ferguson Mechanical | | | | |
| Address : | 112 Northwest Drive | | | | |
| City, State: | Plainville, CT 06062 | | | | |
| MC Technician : | Dana 860-982-8040 | | | | |

| Pre Startup Checklist | | | | | |
|---|--------|--|--|--|--|
| Installing Contractor should verify the following items: | | | | | |
| | Y/N/na | | | | |
| 1. Is there any visible shipping damage? | Ν | | | | |
| 2. Is the unit level? | Y | | | | |
| 3. Are the unit clearances adequate for service and operation? | Y | | | | |
| 4. Do all access doors open freely and are the handles operational? | Y | | | | |
| 5. Have all electrical connections been tested for tightness? | Y | | | | |
| 6. Does the electrical service correspond to the unit nameplate? | Y | | | | |
| 7. On 208/230V units, has transformer tap been checked? | Y | | | | |
| 8. Have the damper assemblies been inspected? | Y | | | | |
| 9. Are the air filters installed with proper orientation? | Y | | | | |
| 10. Have condensate drain and p-trap been connected? | Y | | | | |
| 11. Have the crankcase heaters been on for 24 hrs? | Y | | | | |

| Quantity | Location | Size | Orientation | Clean | | | | | | |
|----------|----------|--------------------|-------------|-------|--|--|--|--|--|--|
| 4 | EVAP | 20/24/2 Doubled Up | Х | Х | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Filters

| | Discharge (Y/N) | Space (Y/N) | SZ VAV (Y/N) | MZ VAV (Y/N) | | | |
|----------------|--------------------|----------------|--------------------|--------------------|--|--|--|
| Non Heat Pump: | | | Y | | | | |
| Heat Pump: | | | | | | | |

Program Control

| Compressors | | | Voltage | | | Current | | |
|-------------|------------------|-----------|---------|-------|-------|---------|-------|-------|
| # | Model | Serial | L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 2PD42K5E-TFD-130 | 2012499DT | 487 | 488 | 487 | 7.5 | 7.4 | 7.5 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |

| Supply Fan Assembly | | | | | | | |
|---------------------|-----------|-----------------|-------------|----------|----|--|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | | |
| Fan 1: | Х | 9.9 | 9.7 | Х | 60 | | |
| Fan 2: | | | | | | | |

| Energy Recovery Wheel N/A | | | | | | | |
|---------------------------|--|-----------------------|--|-----|--|--|--|
| Wheel Spins Freely: | | Check Rotation | | FLA | | | |

| | Voltage | | | | | |
|-------|---------|-------|-------|-------|-------|----|
| L1-L2 | L2-L3 | L1-L3 | L1-L2 | L2-L3 | L1-L3 | HP |
| | | | | | | |

| Power Exhaust Fan Assembly | | | | | | | | |
|----------------------------|-----------|-----------------|-------------|----------|----|--|--|--|
| | Alignment | Name Plate Amps | Actual Amps | Rotation | Hz | | | |
| Fan 1: | | 3.5 | 3.4 | Х | Х | | | |

| Dampers | | | | | |
|----------------------------|-----------------|--|--|--|--|
| Modulating OR Two Position | Operation Check | | | | |
| Х | | | | | |

| Ambient Temperature | | | | |
|---------------------------|---------------------------|--|--|--|
| Dry Bulb Temperature (°F) | Wet Bulb Temperature (°F) | | | |
| | | | | |

| Trane Technician : | Bernie Castonguay |
|--------------------|-------------------|
| Tag : | RTU-4 |

Condensor Configuration

| Water Cooled (Y/N): | N/A | | |
|---------------------|----------------|--|--|
| Water Leaks | Inlet Pressure | | |
| (Y/N): | (PSI): | | |
| Water Inlet | Water Outlet | | |
| Temp (°F): | Temp (°F): | | |
| Water Flow(GPM): | | | |

| Air Cooled (Y/N): | | | | | | |
|-------------------|-------------------|---------|-------|---------|-------|-------|
| | | Voltage | | Current | | |
| # | L1-L2 L2-L3 L1-L3 | | L1-L3 | L1-L2 | L2-L3 | L1-L3 |
| 1 | 487 | 488 | 487 | 2.1 A | 1 HP | |
| 2 | 487 | 488 | 487 | 2.1 A | 1 HP | |
| 3 | | | | | | |
| 4 | | | | | | |

| Refrigeration System - Circuit 1 | | | | | | |
|----------------------------------|----------|--------------------------|-----------------|------------|------------|--|
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | |
| Discharge | 340 | 105 | 90 | | | |
| Suction | 167 | 60 | 60 | | 14 | |
| Liquid | 340 | 127 | 105 | | | |
| | | | | | | |
| | | Refrigeration Sys | tem - Circuit 2 | | | |
| | Pressure | SAT Temp | Line Temp | Subcooling | Super Heat | |
| Discharge | | | | | | |
| Suction | | | | | | |
| Liquid | | | | | | |

Heat Section

| Gas Heat (Y/N): | | | | | Υ |
|-----------------|--------|----------|-------------|--------------------------|-----|
| | Y/N | | Y/N | | Y/N |
| Natural Gas | Y | Propane | N | Air purged from the line | Υ |
| | | | | _ | |
| | | Low Fire | High Fire | | |
| | Heat 1 | 3.5 iwc | Inlet 8 iwc | | |
| | Heat 2 | | | | |
| | Heat 3 | | | | |
| | | | | - | |





12/21

| | | 3 | | | |
|---------|--|-------------------------|-------------------------|--------------------------------|------|
| RTU-1 | - MOD. OADGOITO - AADADOOA | C3- DAB 10 AHO |) - li aj jia 63.0 | 001021138-40100 | OADI |
| | SER, 0A308156. | 7-1 | | | |
| RTV-7 | MOR, OABDO #4A | 4-01 B 400 AB-AIDO | DOBABZODZKOCSA | | |
| | 5ER 0 A 304156 | - H (4) 20x24 | 1×2 3/15/27 | | |
| RTU-3 | Mill, O ADGO 17F3-9 SER O A 308 156-1 | 04B10A600-LIAJJ1 9-1 | 143-000 10E13B-A01co- | A01 A A O A DOD A A - 00 4 E 6 | 6000 |
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| | 5EC. 0 A308156-10-1 | | | 1.5 | ľ, |
| | 044-D184 | MAC ALE NS AFRABZ | AZZKACHAO | | |
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| | | 4.2 * 1 * 1 * . | | | |
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| DOAL | | * - | | | - |
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| | 0 A 308 156-14-1 | (4) 20×24×2 | (4) 20 / 24 /2 | | |
| VOAS-5 | MOD. 0 ADG07063 - 0 A810 | 1600 - MIAEJ 1943 | 5-21000 133 - ABOCOC | AOL-AAIAOOOAA-O | DAF |
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(3) 16×20×2 auminum Fills