

North Stratfield Elementary School

190 Putting Green Road
Fairfield, CT 06825



Fairfield Public Schools Recommissioning (RCx) and Testing, Adjusting, & Balancing (TAB) Study van Zelm Project # 2020102.00 (12-NSES) November 04, 2022

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North Stratfield Elementary School

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

EXECUTIVE SUMMARY

North Stratfield Elementary School was deemed to be school priority number twelve by Fairfield Public Schools. 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.

The School is located at 190 Putting Green Road Fairfield, CT and serves as an educational facility for approximately 413 students as of the May 2022 census and up to 83 faculty and staff. North Stratfield School was originally constructed in 1961. The building remained largely unchanged until 1996 when the gymnasium, media center, and nine additional classrooms were added on.

The school ventilation systems for most occupied spaces comprise mainly of exhaust fans, particularly for classrooms. There are some classrooms served with fan coil units within the newer addition, however these are mainly for heating/cooling purposes only. As such, the majority of the building relies on open windows to provide the makeup ventilation air while the exhaust is operating. Otherwise, there are AC units that serve the Media Center, Computer Room, Math Resource room and offices within the newer addition, and HV units that serve the gym, kitchen, and “cafetorium”. Since the classrooms are only served by exhaust fans, this building would need to qualify under the IMC 2015 402/403 code sections that allow for exhaust in lieu of direct ventilation, but this will be expanded on later. The Building Automation (BAS) control system consists of an older JCI DDC system with space pneumatic controls and limited functionality, compounded by the age of the devices.

We performed our on-site RCx inspection starting in April 2022, and TAB review starting August 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 poor, largely due to classrooms not being provided with their own outside air. Even utilizing the alternative ventilation compliance path with exhaust, the building still only met code within just less than half of the spaces. Findings from the Retro-Commissioning (RCx) and air-side Testing Adjusting and Balancing (TAB) process found significant issues that should be addressed immediately to improve building environmental control, reduce energy usage, and improve 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, many of the individual occupied spaces at this school do not fully comply with the applicable building codes or guidelines regarding indoor air quality and outdoor ventilation. The measured ventilation air being delivered into each occupied space would be considered a worst-case scenario only, and even at such, there are some areas within the building that do meet and exceed these ventilation requirements by a significant amount.

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.

As an alternative to providing outside air mechanically to occupied spaces, IMC 2015 also allows for outside air to enter occupied areas naturally through operable windows, doors, or other means but there are caveats. The area of operable windows for an occupied space needs to be at least 4% of the space’s floor area in order for mechanical ventilation for that space to not be required by code. However, although spaces with sufficient operable window area may satisfy code requirements, this is not a realistic way of providing adequate ventilation during periods of cold or hot weather, and this often adversely affects the temperature and humidity levels within the building. Few occupants would be willing to keep the windows open year-round due to these comfort concerns, and energy consumption would be increased if the heating or cooling equipment is used in an attempt to condition the space appropriately. Additionally, even if the windows can be used at all times, none of the air introduced into the building this way is filtered, so exterior contaminants such as pollen, dust, and other allergens will have easy paths of infiltration directly into occupied zones. One final point regarding opening of windows would be a security concern for building occupants or for school property.

There are a few sections within IMC 2015 that address this issue specifically, and referenced below:

- **402.1 Natural Ventilation:** *Natural Ventilation* of an occupied space shall be through windows, doors, louvers, or other openings to the outdoors. The operating mechanism for such openings

shall be provided with ready access so that openings are readily controllable by the building occupants.

- Although many classrooms in this building have exterior doors, for security reasons it is highly inadvisable that doors be propped open in any way to allow their use as part of the ventilation system. Some of these doors open into a courtyard and conceivably could be used for this purpose but it's still inadvisable.
- **402.2 Ventilation Area Required:** The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.
 - Each of the major classrooms comes with large windows with an accompanying openable, smaller section towards the bottom (about 3 feet A.F.F.) that, if opened fully, would account for approximately 3.2 ft² area *per window*, totaling to 16 ft² openable area to the outside per standard classroom. There were notes on some windows indicating that they must remain open at all times while school is in session. This is highly advisable to continue this policy while this remains the only means of ventilation, but it persists as a long term issue, and security concern.
 - The standard classroom comprises approximately 730 ft² floor area, which puts the percentage of openable area at a little more than 2.5% per space. Although there are exceptions in both directions, these are minor and no space in this building has the necessary 4% openable area as required by this section of code. These findings do *not* account for windows that are inaccessible, locked, broken, etc., though these would definitely have an impact on the performance of the building.
- **402.3 Adjoining Spaces:** Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the opening to the adjoining rooms shall be unobstructed and shall have an area not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet. The minimum openable area to the outdoors shall be based on the total floor area being ventilated.
 - Should the windows for any particular space be closed, the air is drawn through from the corridor and potentially from other classrooms. The corridors are *not* provided with outside air either except for what might be incidentally drawn into the building via negative pressure. In this case, the corridor would not count as an “adjoining space” for purposes of satisfying this component of the code.
- **403.3.1.2 Exhaust Ventilation:** Exhaust airflow rate shall be provided in accordance with the requirements of Table 403.3.1.1. Outdoor air introduced into a space by an exhaust system shall be considered as contributing to the outdoor airflow required by Table 403.3.1.1 (Note: this table was used to determine the airflow requirements used to develop the Ventilation Calculation spreadsheets included within Appendix 2)
 - A supplemental ventilation calculation spreadsheet that includes the exhaust rates is provided as part of this appendix. Although these exhaust fans run during occupied modes, the natural ventilation numbers are not considered as part of the “worst case” scenario for this report. The data is promising that it *could* be used, since the total airflow available operates in a deficit but less than 10% of the total required, however it fully relies on the windows in each space being fully accessible (some of which are partially or completely blocked by school supplies) and opened at all times during occupancy (for which there is no guarantee since this relies on individual occupant action with no automation).

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. 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 **18,475 CFM**. The following additional data will be broken out into purely filtered ventilation and accounting for exhaust:

- **For discounting the exhaust air (worst case):** The TAB process revealed that only **5,965 CFM** of outside air is delivered to the spaces, resulting in a **12,510 CFM** deficit or **32.3%** of the required minimum flow. Additionally, the ventilation calculations reveal that only **18.4%** of the occupied zones actually met the requirements (9 out of 49). A significant quantity of spaces received little or no ventilation, either because the associated operable window was closed, simply nonoperational, or because the space is served only by exhaust fans that do not provide direct ventilation air per the space requirements.
- **For including the exhaust air (potential consideration, but not suggested for Natural Ventilation code compliance through IMC 2015 section 402 & 403):** The TAB process revealed that **16,680 CFM** of outside air is delivered to the spaces or is exhausted from the spaces, resulting in a **1,795 CFM** deficit or **90.3%** of the required minimum flow. **49.0%** of the occupied zones (24 out of 49) met the flow requirements based on this setup, which means that even during the best consideration for code compliance 25 of the rooms, mostly classrooms, still do not provide adequate ventilation, though with some rebalancing it *might* be possible to bring more of these in line. However, this exhaust component requires the openings of windows or doors in each space used to provide ventilation be of sufficient area equal to a minimum of 4% of the total space floor area. As mentioned in the note within the executive summary regarding IMC 2015 section 402.2, none of these spaces had sufficient window opening *potential* to meet code, most of which having only about **2.5%** openable area. While each classroom has an exterior door, adding this into the openable area would bring most rooms above the minimum 4% *if* the doors were all propped completely open, which is a bad decision for security and safety reasons, as well as leading to potential humidity issues throughout the building. For a functioning natural

ventilation system and associated protocol, these windows all need to be in good condition and easily accessible, with occupants opening them during occupied periods. Adverse weather conditions that would dissuade the occupant from opening the windows (e.g., heat, cold, humidity, rain, etc.) are not exceptions to the requirements. A well-designed natural ventilation system either accounts for these conditions at the openings or has a backup purely mechanical system that can handle the entire building, neither of which are implemented here.

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 2.872 ACH. This is close to the recommended 3 Total ACH, and with some changes to the way systems are controlled there is potential for the building to increase outside air where there is too little in order to meet some of the code requirements. This 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 0.404; for spaces that at least met or exceeded code, the outside air ACH was 4.177; the combined outside air ACH for the entire building was 0.702. Special rooms such as a nurse's suite do require an outside air ACH of at least 2 and total ACH of 6, which actually was met in this building, largely because this space is served by one of the AC units (AC-1). However, additional recommendations or requirements such as negative pressure relative to adjacent spaces, extra filtration requirements for recirculated air, space pressure profiles for nurse suite spaces, etc., are not necessarily provided. In general, since the rest of the building operates under negative pressure, the corridors will pull air from this space.

| IMC Code Type | Total ACH (RA + OA) | Total OACH (OA/EA) | OACH for zones that do <u>not</u> meet code | OACH for zones that meet Code |
|--|------------------------|-----------------------|---|----------------------------------|
| Excluding Exhaust per IMC 2015 section 401 | 2.872 | 0.702 | 0.404 | 4.177 |
| Including Exhaust per IMC 2015 section 402 & 403 | 2.872 | 1.964 | 1.224 | 4.097 |

Outside Air Flow Improvement Recommendations

Immediate action should be taken for spaces receiving 0 CFM direct outside air, particularly many of the classrooms. The HVAC systems should holistically be evaluated, redesigned with systems that can deliver required outside air, and then have the BAS control system updated to monitor and control individual space temperatures and ventilation rates with sequences of operation optimization and commissioned. This is especially important since the latest major building revision was over two decades ago.

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 ventilation summary reports previously provided to Fairfield Public Schools. ASHRAE also gave a presentation on June 16, 2020, regarding Recommendations and Activities for re-opening 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. Their recommendations for reducing the transmission of infectious aerosols through HVAC systems as they apply to schools are as follows, but only can be achieved after major mechanical HVAC improvements are made:

- Increase outdoor ventilation rates (Dilution) for all zones with deficit minimum outside air by adjusting the outside air damper minimum position of 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. The filters had been scheduled to be changed at the time of inspection as the last change recorded was October 2021, and almost all of them were very dirty, which decreases the filter’s efficiency and forces the unit fans to run at higher speeds (more energy consumption) or to deliver less outdoor ventilation air to the space. Some units have poor filter access and should be modified to allow for better replacement. This will encourage filter changes and reduce the risk of damaging filters during the installation process.
- 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.
- While all units appear to have MERV 13 filters now installed, units that have both final and pre-filters have MERV 13 filters in both positions. Having two of the same efficiency filters in series does not significantly improve the filtration efficiency and mostly just reduces total airflow. MERV 8 pre-filters can be used in double bank racks to act as an inexpensive shield for the more expensive MERV 13 or 14 filters.

- For any new units, consider providing dehumidification sequences in the summer to maintain room RH below 60%.
- Supplement poorly or un-ventilated areas with portable HEPA filtration units in classrooms until such time as proper ventilation can be delivered to the space.
- Add low return / high supply airflow paths or utilize displacement ventilation where possible.
- Increase restroom exhaust where possible while maintaining a positive building pressurization to the exterior.
- Perform duct cleaning for existing systems.

Control Sequence Update Recommendations

Without a specific retro-commissioning of the BAS control system itself, it is not possible to tell exactly what systems and components of the BAS needs repair or upgrade, but a cursory review of what was available indicates great need to:

- Repair or replace any faulty equipment controllers and end Input/Output devices.
- Look to program units to provide 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 after HVAC systems are updated. Decreasing air to some locations might seem counterintuitive but some zones are being supplied with significantly more than 100% of what is required, so backing these down will help move air to where it needs to go. This item should not be addressed without a certified TAB contractor to verify flow adjustments are correct.
- Increase the minimum OA damper position for each unit, where possible, including repairing any broken dampers.
- Confirm that trending and alarms have been set up for all units and establish alarm points for units operating below required minimum ventilation levels during occupied modes
- Existing and post HVAC retrofit, implement CO₂ and Demand Control Ventilation (DCV) sequences for units to adjust ventilation air being delivered automatically and efficiently based on actual individual space occupancy. Not only will these sequences save a substantial amount of money in energy costs, but they remove the guesswork for facilities and control personnel for how much air each space needs, and code/guidelines incorporate these capabilities into exceptions for blanket minimum outside air flow rates. The implementation of this control strategy is especially vital since increased ventilation to the building will increase all energy costs as it has a direct impact on the heating and cooling systems as well.

Equipment Upgrade or Replacement Recommendations

Where any building areas, especially classroom spaces, are not meeting ventilation requirements due to a lack of mechanical ventilation, undersized units or those that are otherwise are in a state of disrepair, or for any units that need to be replaced, we recommend considering Energy Recovery Ventilators (ERV). These do not need to be directly associated with a nearby unit, however, and can often come standalone with additional coils for heating and cooling. Energy Recovery Ventilators are packaged heat recovery

units that mostly utilize an air to air heat exchanger to recover waste heat from the exhaust air and transfer it to the outside air, powered by supply and exhaust air fans. ERVs require ducted outside and exhaust air to the outside of the building; the inlet and exhaust air openings should be at least 10 feet apart to comply with the Building Code. Depending on the location, general exhaust fan ductwork could be repurposed for these units. There are two main types of air-to-air energy recovery units: energy wheel and cross-flow heat exchangers. Energy wheel units tend to be more expensive and have some additional operating costs due to the wheel motor, but they have higher heat transfer efficiency than cross-flow units. Both styles of units require filters to protect the heat exchanger media and operate best during peak load conditions. Sometimes an existing unit can be retro-fit with some form of heat recovery system, but it is highly dependent on the unit configuration and requires engineering calculations to determine sizing, including if the current unit fans can accommodate the increased static pressure losses that would be incurred.

Generally, the more outside air that can be supplied to occupied areas, the better. Each existing air handler 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.

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%. If possible, 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.

In order to best confirm that the implementation of the above recommendations is met as well as other improvements, we recommend performing Recommissioning of the school. This is an extensive procedure that will help with fully documenting the building systems, their capabilities, and optimizes the control system to maintain the best performance while conserving the most energy. In general, Recommissioning should be performed approximately once every five years to keep the buildings operating smoothly.

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. This will allow for fan energy savings and increased ventilation without sacrificing indoor air quality. Where any of these units need to be replaced, we recommend considering a unit with some form of energy recovery (either a wheel or cross-flow heat exchanger). This will conserve additional energy and will still allow for systems to operate with more outside air.

Most units allow for some amount of recirculation, so the following are recommendations for upgrading the air handling units:

- Where any unit has a two filter racks where the first has room for 2" filters and the second has room for 4" or greater filters, the 2" filters can be MERV 8 for pre-filtering, but the larger filters should remain MERV 13.

- Consider investigating the potential of increasing the ventilation air flow rate wherever possible without providing a huge impact on energy use, or security.
- For any defunct units or disabled units needing serious repair or replacement, consider replacing with a unit that has energy recovery (either a wheel or cross-flow heat exchanger). This might require changes to the ductwork or balance of the air system since replacing a mixed air unit with a 100% OA unit might result in less total airflow required.
- 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. While these lists are not a substitute for a full-building commissioning service, these corrections contain many of the significant issues that will quickly improve indoor air quality and energy consumption rates. Some typical issues include, but are not limited to:
 - Exhaust and HVAC Damper cleaning and lubrication: All unit dampers should be cleaned and lubricated and tested throughout their movement range from the BAS. As dampers age, lubrication fails and dirt builds up causing the actuator to need to push harder to move the damper. Too much build-up can result in control actuators failures or broken damper hardware, which would need to be replaced.
 - General Unit Cleanliness: All units should be cleaned to remove any dirt or debris that has accumulated. Units with loose paper, cardboard, and other materials inside can become a breeding ground for bacteria and molds should those materials absorb moisture. Sections of units that have developed rust or corrosion should be kept dry and cleaned with appropriate chemicals for removing the build-up before repainting or repairs tasks.
 - Fan Belt Tension and Wheel Alignment: All fan motor pulley's, sheaves and belts should be reviewed for proper alignment and tension. Some motors might need to be repositioned in the unit to fix the tension or adjust for alignment. Some fan wheels also wobble or pulleys could be misaligned. Consider adjust motor positions if out of alignment and installing belt tensioners where possible to extend intervals between belt changes without compromising unit efficiency as the belt wears.

CONCLUSIONS

Though Fairfield Public Schools has likely taken measures in the past to address identified deficiencies regarding the recommended proper filtration upgrades for indoor air quality (IAQ) improvements, this study found that the North Stratfield Elementary School is challenged to fully meet the current minimum ventilation requirements per 2015 IMC mainly due to the lack of direct ventilation. 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.

While some recommendations will help improve performance, there are a number of key recommendations that should be implemented immediately since the school is currently occupied. These include installing new energy recovery ventilator units for all classroom and occupied spaces, bringing into proper operation the outside air dampers for all existing units, adding dedicated paths of ventilation to all classrooms as needed, replacing or adding controls and devices that will help to maintain good

indoor air quality and ventilation rates, and generally increasing outside airflow throughout the building without adversely affecting the previous items. Given the results of this survey, we highly recommend further evaluation to be performed including whole-building Recommissioning, BAS controls upgrade and rebalancing, possibly including engineered ventilation calculations/modifications aid in code compliance and generally better working order.

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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 Spring of 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. 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 (49) |
|--------------|--------|-----------------------------|-------------------|---|
| | Open | 01 Kindergarten | Airflow | No Supply Air is supplied to this space |
| | Open | 02 Kindergarten | Airflow | No Supply Air is supplied to this space |
| | Open | 03 Kindergarten | Airflow | No Supply Air is supplied to this space |
| | Open | 04 Kindergarten | Airflow | No Supply Air is supplied to this space |
| | Open | 05 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 06 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 07 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 08 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 09 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 10 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 11 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 12 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 14 Band/Orchestra Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 16 Classroom | Airflow | No Supply Air is supplied to this space |

| Action Taken | Status | Unit/Zone | Serving/Room Name | Indoor Air Quality And Ventilation Issue (49) |
|--------------|--------|--------------|-------------------|---|
| | Open | 17 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 18 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 19 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 20 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 21 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 22 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 22 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |
| | Open | 23 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 23 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |
| | Open | 24 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 24 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |
| | Open | 25 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 25 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |
| | Open | 26 Classroom | Airflow | No Supply Air is supplied to this space |
| | Open | 26 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |

| Action Taken | Status | Unit/Zone | Serving/Room Name | Indoor Air Quality And Ventilation Issue (49) |
|--------------|--------|-----------------|-------------------|---|
| | Open | 27 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |
| | Open | 28 Classroom | Airflow | EF-8 Not Running. Since this is the only form of ventilation for this space, this is an IAQ concern |
| | Open | 33 Conference | Airflow | No Supply Air is supplied to this space |
| | Open | 34 Office | Airflow | No Supply Air is supplied to this space |
| | Open | 35 Office | Airflow | No Supply Air is supplied to this space |
| | Open | 38 Waiting Area | Airflow | No Supply Air is supplied to this space |
| | Open | 38 Waiting Area | Airflow | No Ventilation is provided to this space |
| | Open | 39 Main Office | Airflow | No Supply Air is supplied to this space |
| | Open | AC-1 | Cleaning | The unit interior is dirty and should be cleaned |
| | Open | AC-4 | Dampers | The flapper on the return air side changed to side and if connected will not move freely, nor does it close off more than 60% RA opening. |
| | Open | AC-4 | Operation | This unit did not run |
| | Open | C02 Platform | Airflow | No Ventilation is provided to this space |
| | Open | FCUs | Coils | Exterior coils for the FCUs in the administrative space are dirty |
| | Open | G01 Gymnasium | Operation | Units not accessible or running |
| | Open | HV-1 | Coils | The coil is dirty and needs to be cleaned |

| Action Taken | Status | Unit/Zone | Serving/Room Name | Indoor Air Quality And Ventilation Issue (49) |
|--------------|--------|-----------------------------|-------------------|--|
| | Open | HV-1 | Dampers | The outside air damper was closed with the pneumatic tube disconnected |
| | Open | HV-2 | Operation | This unit was not running at the time of inspection |
| | Open | HV-3 | Operation | This unit was not running at the time of inspection |
| | Open | K01 Kitchen | Airflow | Based on Hood MUA. Hood is not running. |
| | Open | M01 Maintenance Cust Office | Airflow | No Ventilation is provided to this space |

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 (28) |
|--------------|--------|-------------------------|-------------------|---|
| | Open | 02 Kindergarten | Noise | Return air is noticeably loud |
| | Open | 10 Classroom | Ceiling | Ceiling tiles are buckling in this space |
| | Open | 15 Music Classroom | Noise | Return air was noticeably loud |
| | Open | 16 Classroom | Temperature | This space is noticeably warm |
| | Open | 26 Classroom | Temperature | This space is noticeably warm |
| | Open | 29A Computer Lab Office | Temperature | This room is noticeably cold, < 65 °F |
| | Open | 30 Media Center | Noise | The Return Air was noticeably loud in this space |
| | Open | 30B Office | Temperature | There is no supplemental heating in this space with big bay windows |
| | Open | 32A Work Room | Temperature | This space is noticeably warm |
| | Open | AC-1 | Cleaning | The dampers were very dirty and should be cleaned |
| | Open | AC-2 | Condensate | The condensate trap for this unit had fallen off |
| | Open | AC-2 | Operation | This unit did not have power |

| Action Taken | Status | Unit/Zone | Serving/Room Name | Maintenance Issue (28) |
|--------------|--------|----------------|-------------------|--|
| | Open | AC-3 | Access | Unit accessibility is difficult and discourages proper maintenance, particularly the filter section |
| | Open | AC-4 | Access | Unit accessibility is difficult and discourages proper maintenance, particularly the filter section |
| | Open | AC-4 | Condensate | Condensate trap not connected tightly and is between SA/RA side duct |
| | Open | AC-4 | Dampers | The bottom return air safe-off at the side panel was not sealed and was impeding RA Flapper |
| | Open | ACs | Filters | The only way to remove some of the unit filters is to remove the top of these units or to try to access the filter racks through the economizer section by bending metal tabs out of the way. Not only does this discourage or hamper frequent filter changes, but abnormal requirements could lead to filter damage during the installation process. The units should be modified to allow for easier filter changing procedures. |
| | Open | C02 Platform | Noise | Loud rumbling fan in this space |
| | Open | EF-5 | Operation | This exhaust fan associated with the kitchen hood requires a new belt and was found non-operational |
| | Open | EF-8 | Operation | This unit did not run |
| | Open | G01 Gymnasium | Cleaning | The gym unit return air inlets are noticeably dirty and should be cleaned. Accessing these units is generally very difficult and a thorough cleaning should be considered. |
| | Open | G02 Gym Office | Temperature | This space was noticeably warm |
| | Open | HV-1 | Access | Unit accessibility is unsafe and discourages proper maintenance |

| Action Taken | Status | Unit/Zone | Serving/Room Name | Maintenance Issue (28) |
|--------------|--------|----------------------------|-------------------|---|
| | Open | HV-1 | Age | The unit is at the end of its useful life and should be considered for replacement |
| | Open | HV-1 | Cleaning | The dampers were very dirty and should be cleaned |
| | Open | HV-2 | Access | The unit was inaccessible at the time of inspection, so there is limited information about its status |
| | Open | HV-3 | Access | The unit was inaccessible at the time of inspection, so there is limited information about its status |
| | Open | K01A Kitchen Storage | Ceiling | Broken ceiling tiles in this space |

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 (07) |
|--------------|--------|-----------------|-------------------|---|
| | Open | 30 Media Center | Dampers | The associated outside air damper for this space was closed at the time of inspection |
| | Open | 31 Reading | Dampers | The associated outside air damper for this space was closed at the time of inspection |
| | Open | AC-1 | Dampers | The return air damper linkage for this unit has been disconnected |
| | Open | AC-1 | Dampers | The outside air damper was not wired |
| | Open | AC-2 | Dampers | The return air damper only closes to a minimum of 80% open |
| | Open | BAS | General | This existing control system is a JCI direct digital control with space pneumatic controls and limited functionality otherwise. This school should be considered for controls updates alongside potential mechanical unit upgrades to better serve the occupants. |
| | Open | HV-1 | Dampers | The actuators need to be replaced |

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 (18) |
|--------------|-----------|-----------------------------|-------------------|---|
| | Info Only | 13A Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | 36A Principal Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | AC-1 | Unit Info | The supply fan motor nameplate was missing |
| | Info Only | C01A Cafetorium Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | C02A Small Platform Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | C02B Large Platform Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | G01A Gym Storage | Exhaust | This space is exhaust only |
| | Info Only | G02 Gym Office | Exhaust | This space is exhaust only |
| | Info Only | G03 Exterior Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | HV-1 | Airflow | The recorded values for this unit are with the outside air damper at approximately 20% open |
| | Info Only | HV-2 | Access | This unit is suspended from the gym ceiling and is only accessible with a lift |

| Action Taken | Status | Unit/Zone | Serving/Room Name | Information Only Findings (18) |
|--------------|-----------|-------------------------|-------------------|--|
| | Info Only | HV-3 | Access | This unit is suspended from the gym ceiling and is only accessible with a lift |
| | Info Only | K01A Kitchen Storage | Airflow | No Ventilation is provided to this space |
| | Info Only | K01B Kitchen Toilet | Exhaust | This space is exhaust only |
| | Info Only | K02 Kitchen Office | Exhaust | This space is exhaust only |
| | Info Only | M01A Maintenance Toilet | Exhaust | This space is exhaust only |
| | Info Only | M02 Boiler Room | Airflow | No Ventilation is provided to this space |
| | Info Only | N01A Nurse Toilet | Exhaust | This space is exhaust only |

APPENDIX 2 – Ventilation Data Calculations

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx & TAB Study |
| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2A - Exhaust Excluded



| 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) |
| 1 | 01 | Kindergarten | Education | Classroom (ages 5-8) | 657 | --- | --- | Exhaust | 1075 | 9.3 | 9998 | 25 | 10.0 | 0.12 | 25 | 379 | 0 | -379 | -100.0% | Fails | 0.000 |
| 1 | 01A | Toilet | Public Spaces | Toilet rooms - public | 59 | --- | --- | Exhaust | 43 | 8 | 344 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 01B | Storage | None | None | 33 | --- | --- | Exhaust | 55 | 8 | 440 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 02 | Kindergarten | Education | Classroom (ages 5-8) | 710 | --- | --- | Exhaust | 1075 | 9.3 | 9998 | 25 | 10.0 | 0.12 | 25 | 379 | 0 | -379 | -100.0% | Fails | 0.000 |
| 1 | 02A | Toilet | Public Spaces | Toilet rooms - public | 28 | --- | --- | Exhaust | 43 | 8 | 344 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 02B | Storage | None | None | 44 | --- | --- | Exhaust | 55 | 8 | 440 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 03 | Kindergarten | Education | Classroom (ages 5-8) | 260 | --- | --- | Exhaust | 900 | 9.3 | 8370 | 25 | 10.0 | 0.12 | 25 | 358 | 0 | -358 | -100.0% | Fails | 0.000 |
| 1 | 03A | Toilet | Public Spaces | Toilet rooms - public | 65 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 03B | Storage | None | None | 73 | --- | --- | Exhaust | 40 | 8 | 320 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 04 | Kindergarten | Education | Classroom (ages 5-8) | 296 | --- | --- | Exhaust | 900 | 9.3 | 8370 | 25 | 10.0 | 0.12 | 25 | 358 | 0 | -358 | -100.0% | Fails | 0.000 |
| 1 | 04A | Toilet | Public Spaces | Toilet rooms - public | 50 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 04B | Storage | None | None | 65 | --- | --- | Exhaust | 40 | 8 | 320 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 05 | Classroom | Education | Classroom (ages 5-8) | 234 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 25 | 10.0 | 0.12 | 25 | 338 | 0 | -338 | -100.0% | Fails | 0.000 |
| 1 | 05A | Toilet | Public Spaces | Toilet rooms - public | 62 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 06 | Classroom | Education | Classroom (ages 5-8) | 233 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 25 | 10.0 | 0.12 | 25 | 338 | 0 | -338 | -100.0% | Fails | 0.000 |
| 1 | 06A | Toilet | Public Spaces | Toilet rooms - public | 79 | --- | --- | Exhaust | 43 | 8 | 344 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 07 | Classroom | Education | Classroom (ages 5-8) | 229 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 17 | 10.0 | 0.12 | 25 | 258 | 0 | -258 | -100.0% | Fails | 0.000 |
| 1 | 07A | Toilet | Public Spaces | Toilet rooms - public | 56 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 08 | Classroom | Education | Classroom (ages 5-8) | 151 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 12 | 10.0 | 0.12 | 25 | 208 | 0 | -208 | -100.0% | Fails | 0.000 |
| 1 | 08A | Toilet | Public Spaces | Toilet rooms - public | 44 | --- | --- | Exhaust | 14 | 8 | 112 | 0 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 09 | Classroom | Education | Classroom (ages 5-8) | 323 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 0 | 10.0 | 0.12 | 25 | 270 | 0 | -270 | -100.0% | Fails | 0.000 |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx & TAB Study |
| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2A - Exhaust Excluded



| 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) |
| 1 | 09A | Toilet | Public Spaces | Toilet rooms - public | 153 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 10 | Classroom | Education | Classroom (ages 5-8) | 375 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 28 | 10.0 | 0.12 | 25 | 368 | 0 | -368 | -100.0% | Fails | 0.000 |
| 1 | 10A | Toilet | Public Spaces | Toilet rooms - public | 160 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 11 | Classroom | Education | Classroom (ages 5-8) | 215 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 2 | 10.0 | 0.12 | 25 | 108 | 0 | -108 | -100.0% | Fails | 0.000 |
| 1 | 11A | Toilet | Public Spaces | Toilet rooms - public | 192 | --- | --- | Exhaust | 43 | 8 | 344 | 0 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 12 | Classroom | Education | Classroom (ages 5-8) | 175 | --- | --- | Exhaust | 690 | 9.3 | 6417 | 30 | 10.0 | 0.12 | 25 | 383 | 0 | -383 | -100.0% | Fails | 0.000 |
| 1 | 12A | Toilet | Public Spaces | Toilet rooms - public | 169 | --- | --- | Exhaust | 14 | 8 | 112 | 2 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 13 | Conference/Faculty | Offices | Conference rooms | 428 | --- | --- | Exhaust | 550 | 9.3 | 5115 | 12 | 5.0 | 0.06 | 50 | 93 | 0 | -93 | -100.0% | Fails | 0.000 |
| 1 | 13A | Storage | None | None | --- | --- | --- | --- | 20 | 8 | 160 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 13B | Storage | None | None | --- | --- | --- | --- | 20 | 8 | 160 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 13C | Faculty Storage | None | None | 0 | --- | --- | Exhaust | 145 | 9.3 | 1349 | 0 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 14 | Band/Orchestra Classroom | Education | Music/theater/dance | 196 | --- | --- | Exhaust | 440 | 9.3 | 4092 | 20 | 10.0 | 0.06 | 35 | 226 | 0 | -226 | -100.0% | Fails | 0.000 |
| 1 | 14.1 | Corridor Storage | None | None | --- | --- | --- | --- | 60 | 8 | 480 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 15 | Music Classroom | Education | Music/theater/dance | 671 | --- | --- | Exhaust | 1075 | 9.3 | 9998 | 28 | 10.0 | 0.06 | 35 | 345 | 0 | -345 | -100.0% | Fails | 0.000 |
| 1 | 15.1 | Men | Public Spaces | Toilet rooms - public | 229 | --- | --- | Exhaust | 133 | 8 | 1064 | 3 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 15.2 | Toilet | Public Spaces | Toilet rooms - public | 72 | --- | --- | Exhaust | 68 | 8 | 544 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 15.3 | Women | Public Spaces | Toilet rooms - public | 110 | --- | --- | Exhaust | 143 | 8 | 1144 | 3 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 16 | Classroom | Education | Classroom (ages 5-8) | 253 | --- | --- | Exhaust | 800 | 9.3 | 7440 | 25 | 10.0 | 0.12 | 25 | 346 | 0 | -346 | -100.0% | Fails | 0.000 |
| 1 | 17 | Classroom | Education | Classroom (ages 5-8) | 208 | --- | --- | Exhaust | 760 | 9.3 | 7068 | 25 | 10.0 | 0.12 | 25 | 341 | 0 | -341 | -100.0% | Fails | 0.000 |
| 1 | 18 | Classroom | Education | Classroom (ages 5-8) | 275 | --- | --- | Exhaust | 760 | 9.3 | 7068 | 25 | 10.0 | 0.12 | 25 | 341 | 0 | -341 | -100.0% | Fails | 0.000 |
| 1 | 19 | Classroom | Education | Classroom (ages 5-8) | 244 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 12 | 10.0 | 0.12 | 25 | 208 | 0 | -208 | -100.0% | Fails | 0.000 |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx & TAB Study |
| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2A - Exhaust Excluded



| 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) |
| 1 | 20 | Classroom | Education | Classroom (ages 5-8) | 581 | --- | --- | Exhaust | 850 | 9.3 | 7905 | 25 | 10.0 | 0.12 | 25 | 352 | 0 | -352 | -100.0% | Fails | 0.000 |
| 1 | 21 | Classroom | Education | Classroom (ages 5-8) | 285 | --- | --- | Exhaust | 750 | 9.3 | 6975 | 25 | 10.0 | 0.12 | 25 | 340 | 0 | -340 | -100.0% | Fails | 0.000 |
| 1 | 21A | Toilet | Public Spaces | Toilet rooms - public | 45 | --- | --- | Exhaust | 47 | 8 | 376 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 22 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 1000 | 9.3 | 9300 | 20 | 10.0 | 0.12 | 25 | 320 | 0 | -320 | -100.0% | Fails | 0.000 |
| 1 | 23 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 700 | 9.3 | 6510 | 25 | 10.0 | 0.12 | 25 | 334 | 0 | -334 | -100.0% | Fails | 0.000 |
| 1 | 24 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 770 | 9.3 | 7161 | 25 | 10.0 | 0.12 | 25 | 342 | 0 | -342 | -100.0% | Fails | 0.000 |
| 1 | 25 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 735 | 9.3 | 6836 | 25 | 10.0 | 0.12 | 25 | 338 | 0 | -338 | -100.0% | Fails | 0.000 |
| 1 | 26 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 735 | 9.3 | 6836 | 25 | 10.0 | 0.12 | 25 | 338 | 0 | -338 | -100.0% | Fails | 0.000 |
| 1 | 27 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 770 | 9.3 | 7161 | 25 | 10.0 | 0.12 | 25 | 342 | 0 | -342 | -100.0% | Fails | 0.000 |
| 1 | 28 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 700 | 9.3 | 6510 | 25 | 10.0 | 0.12 | 25 | 334 | 0 | -334 | -100.0% | Fails | 0.000 |
| 1 | 29 | Computer Lab | Education | Computer lab | 1478 | 30% | 20% | AC-4 | 730 | 9.3 | 6789 | 28 | 10.0 | 0.12 | 25 | 368 | 443 | 75 | 20.5% | Meets | 3.915 |
| 1 | 29A | Computer Lab Office | Offices | Office spaces | 59 | 30% | 20% | AC-4 | 80 | 8.7 | 696 | 1 | 5.0 | 0.06 | 5 | 10 | 18 | 8 | 83.7% | Meets | 1.552 |
| 1 | 29B | Computer Lab Storage | None | None | 51 | 30% | 20% | AC-4 | 30 | 8 | 240 | 0 | 0.0 | 0.00 | 0 | 0 | 15 | 15 | 0.0% | N/A | 3.750 |
| 1 | 30 | Media Center | Education | Media Center | 1962 | 0% | 0% | AC-2 | 3000 | 9.6 | 28800 | 50 | 10.0 | 0.12 | 25 | 860 | 0 | -860 | -100.0% | Fails | 0.000 |
| 1 | 30A | Story Center | Education | Media Center | 106 | 0% | 0% | AC-2 | 250 | 11.5 | 2875 | 25 | 10.0 | 0.12 | 25 | 280 | 0 | -280 | -100.0% | Fails | 0.000 |
| 1 | 30B | Office | Offices | Office spaces | 174 | 0% | 0% | AC-2 | 200 | 8.8 | 1760 | 3 | 5.0 | 0.06 | 5 | 27 | 0 | -27 | -100.0% | Fails | 0.000 |
| 1 | 31 | Reading | Education | Classroom (ages 5-8) | 335 | 0% | 0% | AC-2 | 400 | 8.8 | 3520 | 12 | 10.0 | 0.12 | 25 | 168 | 0 | -168 | -100.0% | Fails | 0.000 |
| 1 | 32 | Math/Teachers Room | Education | Classroom (ages 5-8) | 675 | 44% | 20% | AC-3 | 400 | 8.7 | 3480 | 10 | 10.0 | 0.12 | 25 | 148 | 295 | 147 | 99.3% | Meets | 5.086 |
| 1 | 32.1 | Toilet | Public Spaces | Toilet rooms - public | 54 | --- | --- | Exhaust | 56 | 8 | 448 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 32.2 | Girls | Public Spaces | Toilet rooms - public | 147 | --- | --- | Exhaust | 130 | 8 | 1040 | 2 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 32.3 | Boys | Public Spaces | Toilet rooms - public | 156 | --- | --- | Exhaust | 100 | 8 | 800 | 2 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |

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|-----------------|--|
| Project Name: | Fairfield Public Schools RCx & TAB Study |
| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2A - Exhaust Excluded



| 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) |
| 1 | 32.4 | Cust | Storage | Warehouses | 69 | --- | --- | Exhaust | 35 | 8 | 280 | 1 | 0.0 | 0.06 | 0 | 2 | 0 | -2 | -100.0% | Fails | 0.000 |
| 1 | 32A | Work Room | Workrooms | Copy, printing rooms | 168 | 4360% | --- | AC-3 | 130 | 8.7 | 1131 | 2 | 5.0 | 0.06 | 4 | 18 | 73 | 55 | 310.1% | Meets | 3.873 |
| 1 | 33 | Conference | Offices | Conference rooms | 281 | --- | --- | Exhaust | 230 | 9 | 2070 | 9 | 5.0 | 0.06 | 50 | 59 | 0 | -59 | -100.0% | Fails | 0.000 |
| 1 | 34 | Office | Offices | Office spaces | 235 | --- | --- | FCU | 170 | 9 | 1530 | 5 | 5.0 | 0.06 | 5 | 35 | --- | N/A | | N/A | |
| 1 | 35 | Office | Offices | Office spaces | 225 | --- | --- | FCU | 177 | 9 | 1593 | 5 | 5.0 | 0.06 | 5 | 36 | --- | N/A | | N/A | |
| 1 | 36 | Principal | Offices | Office spaces | 235 | --- | --- | FCU | 190 | 9 | 1710 | 6 | 5.0 | 0.06 | 5 | 41 | --- | N/A | | N/A | |
| 1 | 36A | Principal Storage | None | None | --- | --- | --- | --- | 25 | 8 | 200 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 37 | Work Room | Workrooms | Copy, printing rooms | 455 | --- | --- | Exhaust | 170 | 8.5 | 1445 | 2 | 5.0 | 0.06 | 4 | 20 | 0 | -20 | -100.0% | Fails | 0.000 |
| 1 | 38 | Waiting Area | Offices | Reception Areas | --- | --- | --- | --- | 330 | 9 | 2970 | 5 | 5.0 | 0.06 | 30 | 45 | --- | N/A | | N/A | |
| 1 | 39 | Main Office | Offices | Reception Areas | 203 | --- | --- | FCU | 285 | 9 | 2565 | 4 | 5.0 | 0.06 | 30 | 37 | --- | N/A | | N/A | |
| 1 | A01 | Art Classroom | Education | Art Classroom | 27 | --- | --- | Exhaust | 630 | 9.3 | 5859 | 28 | 10.0 | 0.18 | 20 | 393 | 0 | -393 | -100.0% | Fails | 0.000 |
| 1 | A01A | Kiln/Storage | Storage | Warehouses | 53 | --- | --- | Exhaust | 73 | 8 | 584 | 1 | 0.0 | 0.06 | 0 | 4 | 0 | -4 | -100.0% | Fails | 0.000 |
| 1 | A01B | Art Storage | None | None | 106 | --- | --- | Exhaust | 100 | 8 | 800 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | C01 | Cafetorium | Food and beverage service | Cafeteria, fast food | 4207 | 5130% | 20% | HV-1 | 3350 | 20.3 | 68005 | 634 | 7.5 | 0.18 | 100 | 5358 | 2157 | -3201 | -59.7% | Fails | 1.903 |
| 1 | C01A | Cafetorium Storage | None | None | --- | --- | --- | --- | 175 | 10.5 | 1838 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | C02 | Platform | Education | Music/theater/dance | --- | --- | --- | --- | 950 | 17.3 | 16435 | 30 | 10.0 | 0.06 | 35 | 357 | --- | N/A | | N/A | |
| 1 | C02A | Small Platform Storage | None | None | --- | --- | --- | --- | 75 | 8 | 600 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | C02B | Large Platform Storage | None | None | --- | --- | --- | --- | 90 | 8 | 720 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | G01 | Gymnasium | Sports and amusement | Gym, stadium, arena (play area) | --- | --- | --- | HV-2 & 3 | 4100 | 23 | 94300 | 30 | 0.0 | 0.30 | 0 | 1230 | --- | N/A | | N/A | |
| 1 | G01A | Gym Toilet | Public Spaces | Toilet rooms - public | 73 | --- | --- | Exhaust | 44 | 8 | 352 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | G01A | Gym Storage | None | None | 158 | --- | --- | Exhaust | 311 | 12.6 | 3919 | 2 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |

| | |
|-----------------|--|
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| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2A - Exhaust Excluded



| 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) |
| 1 | G02 | Gym Office | Offices | Office spaces | 85 | --- | --- | Exhaust | 105 | 8 | 840 | 2 | 5.0 | 0.06 | 5 | 16 | 0 | -16 | -100.0% | Fails | 0.000 |
| 1 | G03 | Exterior Storage | None | None | --- | --- | --- | --- | 400 | 11.3 | 4520 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | K01 | Kitchen | Food and beverage service | Kitchens (cooking) | 2552 | 100% | 100% | HV-4 | 1050 | 8.5 | 8925 | 20 | 0.0 | 0.00 | 0 | 0 | 2552 | 2552 | 0.0% | N/A | 17.156 |
| 1 | K01A | Kitchen Storage | None | None | --- | --- | --- | --- | 95 | 8.6 | 817 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | K01B | Kitchen Toilet | Public Spaces | Toilet rooms - public | 73 | --- | --- | Exhaust | 58 | 9 | 522 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | K02 | Kitchen Office | Offices | Office spaces | 60 | --- | --- | Exhaust | 130 | 9.3 | 1209 | 3 | 5.0 | 0.06 | 5 | 23 | 0 | -23 | -100.0% | Fails | 0.000 |
| 1 | M01 | Maintenance Cust Office | Offices | Office spaces | --- | --- | --- | --- | 235 | 9.3 | 2186 | 3 | 5.0 | 0.06 | 5 | 29 | --- | N/A | | N/A | |
| 1 | M01A | Maintenance Toilet | Public Spaces | Toilet rooms - public | 66 | --- | --- | Exhaust | 70 | 8 | 560 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | M02 | Boiler Room | None | None | --- | --- | --- | --- | 890 | 13.5 | 12015 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | N01 | Nurse | Hospitals nursing and convalescent homes | Patient rooms | 420 | 40% | 25% | AC-1 | 325 | 8 | 2600 | 6 | 25.0 | 0.00 | 10 | 150 | 172 | 22 | 14.7% | Meets | 3.969 |
| 1 | N01A | Nurse Toilet | Public Spaces | Toilet rooms - public | 65 | --- | --- | Exhaust | 41 | 8 | 328 | 1 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | N01B | Office, Southwest | Offices | Office spaces | 209 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 2 | 5.0 | 0.06 | 5 | 15 | 85 | 70 | 451.9% | Meets | 6.513 |
| 1 | N01C | Office, Northwest | Offices | Office spaces | 110 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 4 | 5.0 | 0.06 | 5 | 25 | 45 | 20 | 77.2% | Meets | 3.448 |
| 1 | N01D | Office, Northeast | Offices | Office spaces | 99 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 2 | 5.0 | 0.06 | 5 | 15 | 40 | 25 | 159.7% | Meets | 3.065 |
| 1 | N01E | Office, Southeast | Offices | Office spaces | 171 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 3 | 5.0 | 0.06 | 5 | 20 | 70 | 50 | 243.1% | Meets | 5.364 |

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North Stratfield Elementary School

2B - Exhaust Included



| 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) |
| 1 | 01 | Kindergarten | Education | Classroom (ages 5-8) | 657 | --- | --- | Exhaust | 1075 | 9.3 | 9998 | 25 | 10.0 | 0.12 | 25 | 379 | 657 | 278 | 73.4% | Meets | 3.943 |
| 1 | 01A | Toilet | Public Spaces | Toilet rooms - public | 59 | --- | --- | Exhaust | 43 | 8 | 344 | 1 | 0.0 | 0.00 | 0 | 0 | 59 | 59 | 0.0% | N/A | 10.291 |
| 1 | 01B | Storage | None | None | 33 | --- | --- | Exhaust | 55 | 8 | 440 | 1 | 0.0 | 0.00 | 0 | 0 | 33 | 33 | 0.0% | N/A | 4.500 |
| 1 | 02 | Kindergarten | Education | Classroom (ages 5-8) | 710 | --- | --- | Exhaust | 1075 | 9.3 | 9998 | 25 | 10.0 | 0.12 | 25 | 379 | 710 | 331 | 87.3% | Meets | 4.261 |
| 1 | 02A | Toilet | Public Spaces | Toilet rooms - public | 28 | --- | --- | Exhaust | 43 | 8 | 344 | 1 | 0.0 | 0.00 | 0 | 0 | 28 | 28 | 0.0% | N/A | 4.884 |
| 1 | 02B | Storage | None | None | 44 | --- | --- | Exhaust | 55 | 8 | 440 | 1 | 0.0 | 0.00 | 0 | 0 | 44 | 44 | 0.0% | N/A | 6.000 |
| 1 | 03 | Kindergarten | Education | Classroom (ages 5-8) | 260 | --- | --- | Exhaust | 900 | 9.3 | 8370 | 25 | 10.0 | 0.12 | 25 | 358 | 260 | -98 | -27.4% | Fails | 1.864 |
| 1 | 03A | Toilet | Public Spaces | Toilet rooms - public | 65 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 65 | 65 | 0.0% | N/A | 34.821 |
| 1 | 03B | Storage | None | None | 73 | --- | --- | Exhaust | 40 | 8 | 320 | 1 | 0.0 | 0.00 | 0 | 0 | 73 | 73 | 0.0% | N/A | 13.688 |
| 1 | 04 | Kindergarten | Education | Classroom (ages 5-8) | 296 | --- | --- | Exhaust | 900 | 9.3 | 8370 | 25 | 10.0 | 0.12 | 25 | 358 | 296 | -62 | -17.3% | Fails | 2.122 |
| 1 | 04A | Toilet | Public Spaces | Toilet rooms - public | 50 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 50 | 50 | 0.0% | N/A | 26.786 |
| 1 | 04B | Storage | None | None | 65 | --- | --- | Exhaust | 40 | 8 | 320 | 1 | 0.0 | 0.00 | 0 | 0 | 65 | 65 | 0.0% | N/A | 12.188 |
| 1 | 05 | Classroom | Education | Classroom (ages 5-8) | 234 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 25 | 10.0 | 0.12 | 25 | 338 | 234 | -104 | -30.7% | Fails | 2.068 |
| 1 | 05A | Toilet | Public Spaces | Toilet rooms - public | 62 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 62 | 62 | 0.0% | N/A | 33.214 |
| 1 | 06 | Classroom | Education | Classroom (ages 5-8) | 233 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 25 | 10.0 | 0.12 | 25 | 338 | 233 | -105 | -31.0% | Fails | 2.059 |
| 1 | 06A | Toilet | Public Spaces | Toilet rooms - public | 79 | --- | --- | Exhaust | 43 | 8 | 344 | 1 | 0.0 | 0.00 | 0 | 0 | 79 | 79 | 0.0% | N/A | 13.779 |
| 1 | 07 | Classroom | Education | Classroom (ages 5-8) | 229 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 17 | 10.0 | 0.12 | 25 | 258 | 229 | -29 | -11.1% | Fails | 2.024 |
| 1 | 07A | Toilet | Public Spaces | Toilet rooms - public | 56 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 56 | 56 | 0.0% | N/A | 30.000 |
| 1 | 08 | Classroom | Education | Classroom (ages 5-8) | 151 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 12 | 10.0 | 0.12 | 25 | 208 | 151 | -57 | -27.3% | Fails | 1.335 |
| 1 | 08A | Toilet | Public Spaces | Toilet rooms - public | 44 | --- | --- | Exhaust | 14 | 8 | 112 | 0 | 0.0 | 0.00 | 0 | 0 | 44 | 44 | 0.0% | N/A | 23.571 |
| 1 | 09 | Classroom | Education | Classroom (ages 5-8) | 323 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 0 | 10.0 | 0.12 | 25 | 270 | 323 | 53 | 19.6% | Meets | 2.855 |

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North Stratfield Elementary School

2B - Exhaust Included



| 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) |
| 1 | 09A | Toilet | Public Spaces | Toilet rooms - public | 153 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 153 | 153 | 0.0% | N/A | 81.964 |
| 1 | 10 | Classroom | Education | Classroom (ages 5-8) | 375 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 28 | 10.0 | 0.12 | 25 | 368 | 375 | 7 | 2.0% | Meets | 3.314 |
| 1 | 10A | Toilet | Public Spaces | Toilet rooms - public | 160 | --- | --- | Exhaust | 14 | 8 | 112 | 1 | 0.0 | 0.00 | 0 | 0 | 160 | 160 | 0.0% | N/A | 85.714 |
| 1 | 11 | Classroom | Education | Classroom (ages 5-8) | 215 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 2 | 10.0 | 0.12 | 25 | 108 | 215 | 107 | 99.8% | Meets | 1.900 |
| 1 | 11A | Toilet | Public Spaces | Toilet rooms - public | 192 | --- | --- | Exhaust | 43 | 8 | 344 | 0 | 0.0 | 0.00 | 0 | 0 | 192 | 192 | 0.0% | N/A | 33.488 |
| 1 | 12 | Classroom | Education | Classroom (ages 5-8) | 175 | --- | --- | Exhaust | 690 | 9.3 | 6417 | 30 | 10.0 | 0.12 | 25 | 383 | 175 | -208 | -54.3% | Fails | 1.636 |
| 1 | 12A | Toilet | Public Spaces | Toilet rooms - public | 169 | --- | --- | Exhaust | 14 | 8 | 112 | 2 | 0.0 | 0.00 | 0 | 0 | 169 | 169 | 0.0% | N/A | 90.536 |
| 1 | 13 | Conference/Faculty | Offices | Conference rooms | 428 | --- | --- | Exhaust | 550 | 9.3 | 5115 | 12 | 5.0 | 0.06 | 50 | 93 | 428 | 335 | 360.2% | Meets | 5.021 |
| 1 | 13A | Storage | None | None | --- | --- | --- | --- | 20 | 8 | 160 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 13B | Storage | None | None | --- | --- | --- | --- | 20 | 8 | 160 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 13C | Faculty Storage | None | None | 0 | --- | --- | Exhaust | 145 | 9.3 | 1349 | 0 | 0.0 | 0.00 | 0 | 0 | 0 | 0 | 0.0% | N/A | 0.000 |
| 1 | 14 | Band/Orchestra Classroom | Education | Music/theater/dance | 196 | --- | --- | Exhaust | 440 | 9.3 | 4092 | 20 | 10.0 | 0.06 | 35 | 226 | 196 | -30 | -13.4% | Fails | 2.874 |
| 1 | 14.1 | Corridor Storage | None | None | --- | --- | --- | --- | 60 | 8 | 480 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 15 | Music Classroom | Education | Music/theater/dance | 671 | --- | --- | Exhaust | 1075 | 9.3 | 9998 | 28 | 10.0 | 0.06 | 35 | 345 | 671 | 327 | 94.8% | Meets | 4.027 |
| 1 | 15.1 | Men | Public Spaces | Toilet rooms - public | 229 | --- | --- | Exhaust | 133 | 8 | 1064 | 3 | 0.0 | 0.00 | 0 | 0 | 229 | 229 | 0.0% | N/A | 12.914 |
| 1 | 15.2 | Toilet | Public Spaces | Toilet rooms - public | 72 | --- | --- | Exhaust | 68 | 8 | 544 | 1 | 0.0 | 0.00 | 0 | 0 | 72 | 72 | 0.0% | N/A | 7.941 |
| 1 | 15.3 | Women | Public Spaces | Toilet rooms - public | 110 | --- | --- | Exhaust | 143 | 8 | 1144 | 3 | 0.0 | 0.00 | 0 | 0 | 110 | 110 | 0.0% | N/A | 5.769 |
| 1 | 16 | Classroom | Education | Classroom (ages 5-8) | 253 | --- | --- | Exhaust | 800 | 9.3 | 7440 | 25 | 10.0 | 0.12 | 25 | 346 | 253 | -93 | -26.9% | Fails | 2.040 |
| 1 | 17 | Classroom | Education | Classroom (ages 5-8) | 208 | --- | --- | Exhaust | 760 | 9.3 | 7068 | 25 | 10.0 | 0.12 | 25 | 341 | 208 | -133 | -39.0% | Fails | 1.766 |
| 1 | 18 | Classroom | Education | Classroom (ages 5-8) | 275 | --- | --- | Exhaust | 760 | 9.3 | 7068 | 25 | 10.0 | 0.12 | 25 | 341 | 275 | -66 | -19.4% | Fails | 2.334 |
| 1 | 19 | Classroom | Education | Classroom (ages 5-8) | 244 | --- | --- | Exhaust | 730 | 9.3 | 6789 | 12 | 10.0 | 0.12 | 25 | 208 | 244 | 36 | 17.5% | Meets | 2.156 |

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North Stratfield Elementary School

2B - Exhaust Included



| 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) |
| 1 | 20 | Classroom | Education | Classroom (ages 5-8) | 581 | --- | --- | Exhaust | 850 | 9.3 | 7905 | 25 | 10.0 | 0.12 | 25 | 352 | 581 | 229 | 65.1% | Meets | 4.410 |
| 1 | 21 | Classroom | Education | Classroom (ages 5-8) | 285 | --- | --- | Exhaust | 750 | 9.3 | 6975 | 25 | 10.0 | 0.12 | 25 | 340 | 285 | -55 | -16.2% | Fails | 2.452 |
| 1 | 21A | Toilet | Public Spaces | Toilet rooms - public | 45 | --- | --- | Exhaust | 47 | 8 | 376 | 1 | 0.0 | 0.00 | 0 | 0 | 45 | 45 | 0.0% | N/A | 7.181 |
| 1 | 22 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 1000 | 9.3 | 9300 | 20 | 10.0 | 0.12 | 25 | 320 | 0 | -320 | -100.0% | Fails | 0.000 |
| 1 | 23 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 700 | 9.3 | 6510 | 25 | 10.0 | 0.12 | 25 | 334 | 0 | -334 | -100.0% | Fails | 0.000 |
| 1 | 24 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 770 | 9.3 | 7161 | 25 | 10.0 | 0.12 | 25 | 342 | 0 | -342 | -100.0% | Fails | 0.000 |
| 1 | 25 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 735 | 9.3 | 6836 | 25 | 10.0 | 0.12 | 25 | 338 | 0 | -338 | -100.0% | Fails | 0.000 |
| 1 | 26 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 735 | 9.3 | 6836 | 25 | 10.0 | 0.12 | 25 | 338 | 0 | -338 | -100.0% | Fails | 0.000 |
| 1 | 27 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 770 | 9.3 | 7161 | 25 | 10.0 | 0.12 | 25 | 342 | 0 | -342 | -100.0% | Fails | 0.000 |
| 1 | 28 | Classroom | Education | Classroom (ages 5-8) | 0 | --- | --- | Exhaust | 700 | 9.3 | 6510 | 25 | 10.0 | 0.12 | 25 | 334 | 0 | -334 | -100.0% | Fails | 0.000 |
| 1 | 29 | Computer Lab | Education | Computer lab | 1478 | 30% | 20% | AC-4 | 730 | 9.3 | 6789 | 28 | 10.0 | 0.12 | 25 | 368 | 443 | 75 | 20.5% | Meets | 3.915 |
| 1 | 29A | Computer Lab Office | Offices | Office spaces | 59 | 30% | 20% | AC-4 | 80 | 8.7 | 696 | 1 | 5.0 | 0.06 | 5 | 10 | 18 | 8 | 83.7% | Meets | 1.552 |
| 1 | 29B | Computer Lab Storage | None | None | 51 | 30% | 20% | AC-4 | 30 | 8 | 240 | 0 | 0.0 | 0.00 | 0 | 0 | 15 | 15 | 0.0% | N/A | 3.750 |
| 1 | 30 | Media Center | Education | Media Center | 1962 | 0% | 0% | AC-2 | 3000 | 9.6 | 28800 | 50 | 10.0 | 0.12 | 25 | 860 | 0 | -860 | -100.0% | Fails | 0.000 |
| 1 | 30A | Story Center | Education | Media Center | 106 | 0% | 0% | AC-2 | 250 | 11.5 | 2875 | 25 | 10.0 | 0.12 | 25 | 280 | 0 | -280 | -100.0% | Fails | 0.000 |
| 1 | 30B | Office | Offices | Office spaces | 174 | 0% | 0% | AC-2 | 200 | 8.8 | 1760 | 3 | 5.0 | 0.06 | 5 | 27 | 0 | -27 | -100.0% | Fails | 0.000 |
| 1 | 31 | Reading | Education | Classroom (ages 5-8) | 335 | 0% | 0% | AC-2 | 400 | 8.8 | 3520 | 12 | 10.0 | 0.12 | 25 | 168 | 0 | -168 | -100.0% | Fails | 0.000 |
| 1 | 32 | Math/Teachers Room | Education | Classroom (ages 5-8) | 675 | 44% | 20% | AC-3 | 400 | 8.7 | 3480 | 10 | 10.0 | 0.12 | 25 | 148 | 295 | 147 | 99.3% | Meets | 5.086 |
| 1 | 32.1 | Toilet | Public Spaces | Toilet rooms - public | 54 | --- | --- | Exhaust | 56 | 8 | 448 | 1 | 0.0 | 0.00 | 0 | 0 | 54 | 54 | 0.0% | N/A | 7.232 |
| 1 | 32.2 | Girls | Public Spaces | Toilet rooms - public | 147 | --- | --- | Exhaust | 130 | 8 | 1040 | 2 | 0.0 | 0.00 | 0 | 0 | 147 | 147 | 0.0% | N/A | 8.481 |
| 1 | 32.3 | Boys | Public Spaces | Toilet rooms - public | 156 | --- | --- | Exhaust | 100 | 8 | 800 | 2 | 0.0 | 0.00 | 0 | 0 | 156 | 156 | 0.0% | N/A | 11.700 |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx & TAB Study |
| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2B - Exhaust Included



| 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) |
| 1 | 32.4 | Cust | Storage | Warehouses | 69 | --- | --- | Exhaust | 35 | 8 | 280 | 1 | 0.0 | 0.06 | 0 | 2 | 69 | 67 | 3185.7% | Meets | 14.786 |
| 1 | 32A | Work Room | Workrooms | Copy, printing rooms | 168 | 4360% | --- | AC-3 | 130 | 8.7 | 1131 | 2 | 5.0 | 0.06 | 4 | 18 | 73 | 55 | 310.1% | Meets | 3.873 |
| 1 | 33 | Conference | Offices | Conference rooms | 281 | --- | --- | Exhaust | 230 | 9 | 2070 | 9 | 5.0 | 0.06 | 50 | 59 | 281 | 222 | 377.9% | Meets | 8.145 |
| 1 | 34 | Office | Offices | Office spaces | 235 | --- | --- | FCU | 170 | 9 | 1530 | 5 | 5.0 | 0.06 | 5 | 35 | --- | N/A | | N/A | |
| 1 | 35 | Office | Offices | Office spaces | 225 | --- | --- | FCU | 177 | 9 | 1593 | 5 | 5.0 | 0.06 | 5 | 36 | --- | N/A | | N/A | |
| 1 | 36 | Principal | Offices | Office spaces | 235 | --- | --- | FCU | 190 | 9 | 1710 | 6 | 5.0 | 0.06 | 5 | 41 | --- | N/A | | N/A | |
| 1 | 36A | Principal Storage | None | None | --- | --- | --- | --- | 25 | 8 | 200 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | 37 | Work Room | Workrooms | Copy, printing rooms | 455 | --- | --- | Exhaust | 170 | 8.5 | 1445 | 2 | 5.0 | 0.06 | 4 | 20 | 455 | 435 | 2152.5% | Meets | 18.893 |
| 1 | 38 | Waiting Area | Offices | Reception Areas | --- | --- | --- | --- | 330 | 9 | 2970 | 5 | 5.0 | 0.06 | 30 | 45 | --- | N/A | | N/A | |
| 1 | 39 | Main Office | Offices | Reception Areas | 203 | --- | --- | FCU | 285 | 9 | 2565 | 4 | 5.0 | 0.06 | 30 | 37 | --- | N/A | | N/A | |
| 1 | A01 | Art Classroom | Education | Art Classroom | 27 | --- | --- | Exhaust | 630 | 9.3 | 5859 | 28 | 10.0 | 0.18 | 20 | 393 | 27 | -366 | -93.1% | Fails | 0.276 |
| 1 | A01A | Kiln/Storage | Storage | Warehouses | 53 | --- | --- | Exhaust | 73 | 8 | 584 | 1 | 0.0 | 0.06 | 0 | 4 | 53 | 49 | 1110.0% | Meets | 5.445 |
| 1 | A01B | Art Storage | None | None | 106 | --- | --- | Exhaust | 100 | 8 | 800 | 1 | 0.0 | 0.00 | 0 | 0 | 106 | 106 | 0.0% | N/A | 7.950 |
| 1 | C01 | Cafetorium | Food and beverage service | Cafeteria, fast food | 4207 | 5130% | 20% | HV-1 | 3350 | 20.3 | 68005 | 634 | 7.5 | 0.18 | 100 | 5358 | 2157 | -3201 | -59.7% | Fails | 1.903 |
| 1 | C01A | Cafetorium Storage | None | None | --- | --- | --- | --- | 175 | 10.5 | 1838 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | C02 | Platform | Education | Music/theater/dance | --- | --- | --- | --- | 950 | 17.3 | 16435 | 30 | 10.0 | 0.06 | 35 | 357 | --- | N/A | | N/A | |
| 1 | C02A | Small Platform Storage | None | None | --- | --- | --- | --- | 75 | 8 | 600 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | C02B | Large Platform Storage | None | None | --- | --- | --- | --- | 90 | 8 | 720 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | G01 | Gymnasium | Sports and amusement | Gym, stadium, arena (play area) | --- | --- | --- | HV-2 & 3 | 4100 | 23 | 94300 | 30 | 0.0 | 0.30 | 0 | 1230 | --- | N/A | | N/A | |
| 1 | G01A | Gym Toilet | Public Spaces | Toilet rooms - public | 73 | --- | --- | Exhaust | 44 | 8 | 352 | 1 | 0.0 | 0.00 | 0 | 0 | 73 | 73 | 0.0% | N/A | 12.443 |
| 1 | G01A | Gym Storage | None | None | 158 | --- | --- | Exhaust | 311 | 12.6 | 3919 | 2 | 0.0 | 0.00 | 0 | 0 | 158 | 158 | 0.0% | N/A | 2.419 |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx & TAB Study |
| Project Number: | 2020102.00.12 |
| Scope | Ventilation Calculation by Building |
| Date | November 4, 2022 |

North Stratfield Elementary School

2B - Exhaust Included



| 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) |
| 1 | G02 | Gym Office | Offices | Office spaces | 85 | --- | --- | Exhaust | 105 | 8 | 840 | 2 | 5.0 | 0.06 | 5 | 16 | 85 | 69 | 421.5% | Meets | 6.071 |
| 1 | G03 | Exterior Storage | None | None | --- | --- | --- | --- | 400 | 11.3 | 4520 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | K01 | Kitchen | Food and beverage service | Kitchens (cooking) | 2552 | 100% | 100% | HV-4 | 1050 | 8.5 | 8925 | 20 | 0.0 | 0.00 | 0 | 0 | 2552 | 2552 | 0.0% | N/A | 17.156 |
| 1 | K01A | Kitchen Storage | None | None | --- | --- | --- | --- | 95 | 8.6 | 817 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | K01B | Kitchen Toilet | Public Spaces | Toilet rooms - public | 73 | --- | --- | Exhaust | 58 | 9 | 522 | 1 | 0.0 | 0.00 | 0 | 0 | 73 | 73 | 0.0% | N/A | 8.391 |
| 1 | K02 | Kitchen Office | Offices | Office spaces | 60 | --- | --- | Exhaust | 130 | 9.3 | 1209 | 3 | 5.0 | 0.06 | 5 | 23 | 60 | 37 | 163.2% | Meets | 2.978 |
| 1 | M01 | Maintenance Cust Office | Offices | Office spaces | --- | --- | --- | --- | 235 | 9.3 | 2186 | 3 | 5.0 | 0.06 | 5 | 29 | --- | N/A | | N/A | |
| 1 | M01A | Maintenance Toilet | Public Spaces | Toilet rooms - public | 66 | --- | --- | Exhaust | 70 | 8 | 560 | 1 | 0.0 | 0.00 | 0 | 0 | 66 | 66 | 0.0% | N/A | 7.071 |
| 1 | M02 | Boiler Room | None | None | --- | --- | --- | --- | 890 | 13.5 | 12015 | 0 | 0.0 | 0.00 | 0 | 0 | --- | N/A | 0.0% | N/A | |
| 1 | N01 | Nurse | Hospitals nursing and convalescent homes | Patient rooms | 420 | 40% | 25% | AC-1 | 325 | 8 | 2600 | 6 | 25.0 | 0.00 | 10 | 150 | 172 | 22 | 14.7% | Meets | 3.969 |
| 1 | N01A | Nurse Toilet | Public Spaces | Toilet rooms - public | 65 | --- | --- | Exhaust | 41 | 8 | 328 | 1 | 0.0 | 0.00 | 0 | 0 | 65 | 65 | 0.0% | N/A | 11.890 |
| 1 | N01B | Office, Southwest | Offices | Office spaces | 209 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 2 | 5.0 | 0.06 | 5 | 15 | 85 | 70 | 451.9% | Meets | 6.513 |
| 1 | N01C | Office, Northwest | Offices | Office spaces | 110 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 4 | 5.0 | 0.06 | 5 | 25 | 45 | 20 | 77.2% | Meets | 3.448 |
| 1 | N01D | Office, Northeast | Offices | Office spaces | 99 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 2 | 5.0 | 0.06 | 5 | 15 | 40 | 25 | 159.7% | Meets | 3.065 |
| 1 | N01E | Office, Southeast | Offices | Office spaces | 171 | 40% | 25% | AC-1 | 90 | 8.7 | 783 | 3 | 5.0 | 0.06 | 5 | 20 | 70 | 50 | 243.1% | Meets | 5.364 |

APPENDIX 3 – Roof Map



AC-2

AC-3

AC-1

AC-4

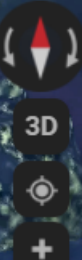
HV-3

HV-1
(Inside)

HV-4
(Missing?)

HV-2

MAU-1



APPENDIX 4 – TAB Airflow Survey Data



WING'S TESTING & BALANCING CO., INC.

Fairfield Public Schools

North Stratfield Elementary School

* * * *

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

August 25, 2022



WING'S TESTING & BALANCING CO., INC.

August 25, 2022

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

Re: North Stratfield Elementary School

Dear Bill,

The HVAC survey for the above referenced facility has been completed. Air flow measurements for all requested rooms has been completed as noted on the following data sheets. The following are our results:

- Exterior coils for the FCU's in the Administrative space are dirty.
- R.A. damper linkage for AC-1 has been disconnected.
- EF-8 did not run.
- Kitchen Hood EF-5 requires a new belt. Currently does not run.
- HV- 2 & 3 serving the gymnasium was not running. Units were not accessible for inspection. A lift is required for access.

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

John Flanagan

Certified TABB Supervisor TB950107S

CT SM-2 License #771

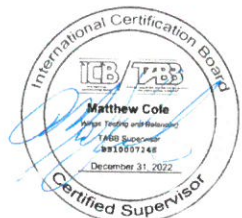
MA Sheetmetal Journeyperson License #6913

TABB Sound & Vibration Supervisor SV060109S

Indoor Air Quality Technician IAQ950107T

HVAC Fire Life Safety Level 1 Tech FLS1950107T

Fume Hood Performance Testing Tech FHP950107T



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

SM-1 License #6803

www.wingstesting.com

AIR DEVICE REPORT

PROJECT: FPS- North Stratfield Elementary School **DATE:** 8/23/2022
SYSTEM / AREA: Existing / Kitchen **TECH:** JF

| LOCATION | NO. | SIZE | A K | DESIGN | | TEST | | FINAL | | NOTES |
|-----------------------|-----|---------------|------|--------|-----|------|-------------|-------|-----|-------|
| | | | | FPM | CFM | FPM | CFM | FPM | CFM | |
| Kitchen Hood 1 | | | | | | | | | | (1) |
| Kitchen Hood 1 | 1 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 2 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 3 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 4 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 5 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 6 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 7 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 8 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 1 | 9 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Kitchen Hood 2 | | | | | | | | | | (1) |
| Extractor | 1 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 2 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 3 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 4 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 5 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 6 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 7 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| Extractor | 8 | 18" x 13 3/4" | 1.72 | --- | ND | | | | | |
| MUA Hood 1 | | 154"x5 1/4" | 5.05 | --- | ND | 265 | 1338 | | | |
| MUA Hood 2 | | 154"x5 1/4" | 5.05 | --- | ND | 240 | <u>1212</u> | | | |
| | | | | | | | 2550 | | | |
| FC-1 | | | | | | | | | | |
| Total | | 22" x 4" | .49 | --- | ND | 510 | 249 | | | |
| FC-2 | | | | | | | | | | |
| Total | | 22" x 4" | .49 | --- | ND | 480 | 235 | | | |
| FC-3 | | | | | | | | | | |
| Total | | 22" x 4" | .49 | --- | ND | 460 | 225 | | | |
| FC-4 | | | | | | | | | | |
| Total | | 22" x 4" | .49 | --- | ND | 480 | 235 | | | |
| FC-5 | | | | | | | | | | |
| Total | | 22" x 4" | .49 | --- | ND | 415 | 203 | | | |

(1) Fan not running. Requires a nw belt.

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

[illegible]

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx: North Stratfield Elementary School |
| Project Number: | 2020102.00.12 |
| Scope | TAB Data |
| Date | 8/23/2022 & 8/24/2022 |

| Zone Identification | | | | | | | | |
|---------------------|-------|--------------|----------------------|---------------------------|---------------------------------|-----------------------------|------------------------------|-------|
| Floor | Room# | Room Name | Design Min 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 |
| 1 | 01 | Kindergarten | 657 | --- | --- | --- | Exhaust | |
| 1 | 01A | Toilet | 59 | --- | --- | --- | Exhaust | |
| 1 | 01B | Storage | 33 | --- | --- | --- | Exhaust | |
| 1 | 02 | Kindergarten | 710 | --- | --- | --- | Exhaust | |
| 1 | 02A | Toilet | 28 | --- | --- | --- | Exhaust | |
| 1 | 02B | Storage | 44 | --- | --- | --- | Exhaust | |
| 1 | 03 | Kindergarten | 260 | --- | --- | --- | Exhaust | |
| 1 | 03A | Toilet | 65 | --- | --- | --- | Exhaust | |
| 1 | 03B | Storage | 73 | --- | --- | --- | Exhaust | |
| 1 | 04 | Kindergarten | 296 | --- | --- | --- | Exhaust | |
| 1 | 04A | Toilet | 50 | --- | --- | --- | Exhaust | |
| 1 | 04B | Storage | 65 | --- | --- | --- | Exhaust | |
| 1 | 05 | Classroom | 234 | --- | --- | --- | Exhaust | |
| 1 | 05A | Toilet | 62 | --- | --- | --- | Exhaust | |
| 1 | 06 | Classroom | 233 | --- | --- | --- | Exhaust | |
| 1 | 06A | Toilet | 79 | --- | --- | --- | Exhaust | |
| 1 | 07 | Classroom | 229 | --- | --- | --- | Exhaust | |
| 1 | 07A | Toilet | 56 | --- | --- | --- | Exhaust | |
| 1 | 08 | Classroom | 151 | --- | --- | --- | Exhaust | |
| 1 | 08A | Toilet | 44 | --- | --- | --- | Exhaust | |
| 1 | 09 | Classroom | 323 | --- | --- | --- | Exhaust | |
| 1 | 09A | Toilet | 153 | --- | --- | --- | Exhaust | |
| 1 | 10 | Classroom | 375 | --- | --- | --- | Exhaust | |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx: North Stratfield Elementary School |
| Project Number: | 2020102.00.12 |
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| Date | 8/23/2022 & 8/24/2022 |

| Zone Identification | | | | | | | | |
|---------------------|-------|-----------|----------------------------|---------------------------------|------------------------------------|-----------------------------------|---------------------------------|-------|
| Floor | Room# | Room Name | Design Min 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 |
| 1 | 10A | Toilet | 160 | --- | --- | --- | Exhaust | |
| 1 | 11 | Classroom | 215 | --- | --- | --- | Exhaust | |
| 1 | 11A | Toilet | 192 | --- | --- | --- | Exhaust | |
| 1 | 12 | Classroom | 175 | --- | --- | --- | Exhaust | |
| 1 | 12A | Toilet | 169 | --- | --- | --- | Exhaust | |
| 1 | 13 | Faculty | 428 | --- | --- | --- | Exhaust | |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx: North Stratfield Elementary School |
| Project Number: | 2020102.00.12 |
| Scope | TAB Data |
| Date | 8/23/2022 & 8/24/2022 |

| Zone Identification | | | | | | | | |
|---------------------|-------|--------------------------|----------------------|---------------------------|---------------------------------|-----------------------------|------------------------------|------------------|
| Floor | Room# | Room Name | Design Min 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 |
| 1 | 13A | Storage | --- | --- | --- | --- | --- | No Ventilation |
| 1 | 13B | Storage | --- | --- | --- | --- | --- | |
| 1 | 13C | Faculty Storage | 0 | --- | --- | --- | Exhaust | |
| 1 | 14 | Band/Orchestra Classroom | 196 | --- | --- | --- | Exhaust | |
| 1 | 14.1 | Corridor Storage | --- | --- | --- | --- | --- | |
| 1 | 15 | Music Classroom | 671 | --- | --- | --- | Exhaust | |
| 1 | 15.1 | Men | 229 | --- | --- | --- | Exhaust | |
| 1 | 15.2 | Toilet | 72 | --- | --- | --- | Exhaust | |
| 1 | 15.3 | Women | 110 | --- | --- | --- | Exhaust | |
| 1 | 16 | Classroom | 253 | --- | --- | --- | Exhaust | |
| 1 | 17 | Classroom | 208 | --- | --- | --- | Exhaust | |
| 1 | 18 | Classroom | 275 | --- | --- | --- | Exhaust | |
| 1 | 19 | Classroom | 244 | --- | --- | --- | Exhaust | |
| 1 | 20 | Classroom | 581 | --- | --- | --- | Exhaust | |
| 1 | 21 | Classroom | 285 | --- | --- | --- | Exhaust | |
| 1 | 21A | Toilet | 45 | --- | --- | --- | Exhaust | |
| 1 | 22 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |
| 1 | 23 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |
| 1 | 24 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |
| 1 | 25 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |
| 1 | 26 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |
| 1 | 27 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |
| 1 | 28 | Classroom | 0 | --- | --- | --- | Exhaust | EF-8 Not Running |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx: North Stratfield Elementary School |
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| Zone Identification | | | | | | | | |
|---------------------|-------|----------------------|----------------------|---------------------------|---------------------------------|-----------------------------|------------------------------|--------------------|
| Floor | Room# | Room Name | Design Min 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 |
| 1 | 29 | Computer Lab | 1478 | 443 | 29.6 | 20% | AC-4 | |
| 1 | 29A | Computer Lab Office | 59 | 18 | 29.6 | 20% | AC-4 | |
| 1 | 29B | Computer Lab Storage | 51 | 15 | 29.6 | 20% | AC-4 | |
| 1 | 30 | Media Center | 1962 | 0 | 0 | 0 | AC-2 | O.A. Damper closed |
| 1 | 30A | Story Center | 106 | 0 | 0 | 0 | AC-2 | |
| 1 | 30B | Office | 174 | 0 | 0 | 0 | AC-2 | |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx: North Stratfield Elementary School |
| Project Number: | 2020102.00.12 |
| Scope | TAB Data |
| Date | 8/23/2022 & 8/24/2022 |

| Zone Identification | | | | | | | | |
|---------------------|-------|------------------------|----------------------|---------------------------|---------------------------------|-----------------------------|------------------------------|------------------|
| Floor | Room# | Room Name | Design Min 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 |
| 1 | 31 | Reading | 335 | 0 | 0 | 0 | AC-2 | OA Damper closed |
| 1 | 32 | Math/Teachers Room | 675 | 295 | 43.6 | 20% | AC-3 | |
| 1 | 32.1 | Toilet | 54 | --- | --- | --- | Exhaust | |
| 1 | 32.2 | Girls | 147 | --- | --- | --- | Exhaust | |
| 1 | 32.3 | Boys | 156 | --- | --- | --- | Exhaust | |
| 1 | 32.4 | Cust | 69 | --- | --- | --- | Exhaust | |
| 1 | 32A | Work Room | 168 | 73 | 43.6 | | AC-3 | |
| 1 | 33 | Conference | 281 | --- | --- | --- | Exhaust | |
| 1 | 34 | Office | 235 | --- | --- | --- | FCU | |
| 1 | 35 | Office | 225 | --- | --- | --- | FCU | |
| 1 | 36 | Principal | 235 | --- | --- | --- | FCU | |
| 1 | 36A | Principal Storage | --- | --- | --- | --- | --- | No Ventilation |
| 1 | 37 | Work Room | 455 | --- | --- | --- | Exhaust | |
| 1 | 38 | Waiting Area | --- | --- | --- | --- | --- | No Ventilation |
| 1 | 39 | Main Office | 203 | --- | --- | --- | FCU | |
| 1 | A01 | Art Classroom | 27 | --- | --- | --- | Exhaust | |
| 1 | A01A | Kiln/Storage | 53 | --- | --- | --- | Exhaust | |
| 1 | A01B | Art Storage | 106 | --- | --- | --- | Exhaust | |
| 1 | C01 | Cafetorium | 4207 | 2157 | 51.3 | 20% | HV-1 | |
| 1 | C01A | Cafetorium Storage | --- | --- | --- | --- | --- | No Ventilation |
| 1 | C02 | Platform | --- | --- | --- | --- | --- | No Ventilation |
| 1 | C02A | Small Platform Storage | --- | --- | --- | --- | --- | No Ventilation |
| 1 | C02B | Large Platform Storage | --- | --- | --- | --- | --- | No Ventilation |

| | |
|-----------------|--|
| Project Name: | Fairfield Public Schools RCx: North Stratfield Elementary School |
| Project Number: | 2020102.00.12 |
| Scope | TAB Data |
| Date | 8/23/2022 & 8/24/2022 |

| Zone Identification | | | | | | | | |
|---------------------|-------|-------------------------|----------------------|---------------------------|---------------------------------|-----------------------------|------------------------------|---|
| Floor | Room# | Room Name | Design Min 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 |
| 1 | G01 | Gymnasium | --- | --- | --- | --- | HV-2 & 3 | Units not accessible or running |
| 1 | G01A | Gym Toilet | 73 | --- | --- | --- | Exhaust | |
| 1 | G01A | Gym Storage | 158 | --- | --- | --- | --- | Exhaust |
| 1 | G02 | Gym Office | 85 | --- | --- | --- | --- | Exhaust |
| 1 | G03 | Exterior Storage | --- | --- | --- | --- | --- | No Ventilation |
| 1 | K01 | Kitchen | 2552 | 100% | 100% | 100% | HV-4 | Based on Hood MUA. Hood is not running. |
| 1 | K01A | Kitchen Storage | --- | --- | --- | --- | --- | No Ventilation |
| 1 | K01B | Kitchen Toilet | 73 | --- | --- | --- | --- | Exhaust |
| 1 | K02 | Kitchen Office | 60 | --- | --- | --- | --- | Exhaust |
| 1 | M01 | Maintenance Cust Office | --- | --- | --- | --- | --- | No Ventilation |
| 1 | M01A | Maintenance Toilet | 66 | --- | --- | --- | --- | Exhaust |
| 1 | M02 | Boiler Room | --- | --- | --- | --- | --- | No Ventilation |
| 1 | N01 | Nurse | 420 | 172 | 40.08 | 25% | AC-1 | |
| 1 | N01A | Nurse Toilet | 65 | --- | --- | --- | --- | Exhaust |
| 1 | N01B | Office, Southwest | 209 | 85 | 40.08 | 25% | AC-1 | |
| 1 | N01C | Office, Northwest | 110 | 45 | 40.08 | 25% | AC-1 | |
| 1 | N01D | Office, Northeast | 99 | 40 | 40.08 | 25% | AC-1 | |
| 1 | N01E | Office, Southeast | 171 | 70 | 40.08 | 25% | AC-1 | |

APPENDIX 5 – RCx Unit and Room Take-Off Data

| | | | |
|-----------------|------------------------------------|--------------|--|
| Project Name: | Fairfield Public Schools RCx | | |
| Project Number: | 2020102.00.12 | RCM, RA, JRK | |
| Scope | Room Take-Off Data | | |
| Date | April 20, 2022 | | |
| | North Stratfield Elementary School | | |

| Zone Identification | | | | | | | | | |
|---------------------|-------|--------------|-----------|----------------|--------|--------|---|--|----------|
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | | | | | Y /N | |
| 1 | 01 | Kindergarten | 1075 | 9.3 | 9997.5 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 01A | Toilet | 43 | 8 | 344 | 1 | 1 EA | | |
| 1 | 01B | Storage | 55 | 8 | 440 | 1 | 1 RA | | |
| 1 | 02 | Kindergarten | 1075 | 9.3 | 9997.5 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air, Return air is noticeably loud | |
| 1 | 02A | Toilet | 43 | 8 | 344 | 1 | 1 EA | | |
| 1 | 02B | Storage | 55 | 8 | 440 | 1 | 1 RA | | |
| 1 | 03 | Kindergarten | 900 | 9.3 | 8370 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 03A | Toilet | 14 | 8 | 112 | 1 | 1 EA | | |
| 1 | 03B | Storage | 40 | 8 | 320 | 1 | 1 RA | | |
| 1 | 04 | Kindergarten | 900 | 9.3 | 8370 | 25 | 1 RA FTR, 1x Mitsubishi Split AC, Operable windows presumably for | No Supply Air | |
| 1 | 04A | Toilet | 14 | 8 | 112 | 1 | 1 EA | | |
| 1 | 04B | Storage | 40 | 8 | 320 | 1 | 1 RA | | |
| 1 | 05 | Classroom | 730 | 9.3 | 6789 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 05A | Toilet | 14 | 8 | 112 | 1 | 1 EA | | |
| 1 | 06 | Classroom | 730 | 9.3 | 6789 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 06A | Toilet | 43 | 8 | 344 | 1 | 1 EA | | |
| 1 | 07 | Classroom | 730 | 9.3 | 6789 | 17 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |

| | | | |
|------------------------------------|------------------------------|--------------|--|
| Project Name: | Fairfield Public Schools RCx | | |
| Project Number: | 2020102.00.12 | RCM, RA, JRK | |
| Scope | Room Take-Off Data | | |
| Date | April 20, 2022 | | |
| North Stratfield Elementary School | | | |

| Zone Identification | | | | | | | | | |
|---------------------|-------|--------------------------|-----------|----------------|--------|--------|---|---|----------|
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | | | | | | Y /N |
| 1 | 07A | Toilet | 14 | 8 | 112 | 1 | 1 EA | | |
| 1 | 08 | Classroom | 730 | 9.3 | 6789 | 12 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 08A | Toilet | 14 | 8 | 112 | 0 | 1 EA | | |
| 1 | 09 | Classroom | 730 | 9.3 | 6789 | 0 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 09A | Toilet | 14 | 8 | 112 | 1 | 1 EA | | |
| 1 | 10 | Classroom | 730 | 9.3 | 6789 | 28 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air, Ceiling tiles are buckling in this space | |
| 1 | 10A | Toilet | 14 | 8 | 112 | 1 | 1 EA | | |
| 1 | 11 | Classroom | 730 | 9.3 | 6789 | 2 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 11A | Toilet | 43 | 8 | 344 | 0 | 1 EA | | |
| 1 | 12 | Classroom | 690 | 9.3 | 6417 | 30 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 12A | Toilet | 14 | 8 | 112 | 2 | 1 EA | | |
| 1 | 13 | Conference/Faculty | 550 | 9.3 | 5115 | 12 | 1 RA FTR, 1x Wall-mounted AC | | |
| 1 | 13A | Storage | 20 | 8 | 160 | 0 | Nothing | | |
| 1 | 13B | Storage | 20 | 8 | 160 | 0 | Nothing | | |
| 1 | 13C | Faculty Storage | 145 | 9.3 | 1348.5 | 0 | Nothing | | |
| 1 | 14 | Band/Orchestra Classroom | 440 | 9.3 | 4092 | 20 | 1 RA FTR | No Supply Air | |
| 1 | 14.1 | Corridor Storage | 60 | 8 | 480 | 0 | 1 RA | | |

| | | | |
|-----------------|------------------------------------|--------------|--|
| Project Name: | Fairfield Public Schools RCx | | |
| Project Number: | 2020102.00.12 | RCM, RA, JRK | |
| Scope | Room Take-Off Data | | |
| Date | April 20, 2022 | | |
| | North Stratfield Elementary School | | |

| Zone Identification | | | | | | | | | |
|---------------------|-------|-----------------|-----------|----------------|--------|--------|---|--|----------|
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | | | | | | Y /N |
| 1 | 15 | Music Classroom | 1075 | 9.3 | 9997.5 | 28 | 2 SA 1 RA FTR | Return air was noticeably loud | |
| 1 | 15.1 | Men | 133 | 8 | 1064 | 3 | 2 EA | | |
| 1 | 15.2 | Toilet | 68 | 8 | 544 | 1 | 1 EA | | |
| 1 | 15.3 | Women | 143 | 8 | 1144 | 3 | 2 EA | | |
| 1 | 16 | Classroom | 800 | 9.3 | 7440 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air, this space is noticeably warm | |
| 1 | 17 | Classroom | 760 | 9.3 | 7068 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 18 | Classroom | 760 | 9.3 | 7068 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 19 | Classroom | 730 | 9.3 | 6789 | 12 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 20 | Classroom | 850 | 9.3 | 7905 | 25 | 2 RA FTR, 1x Fujitsu Split AC, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 21 | Classroom | 750 | 9.3 | 6975 | 25 | 1 RA FTR, Operable windows presumably for ventilation | No Supply Air | |
| 1 | 21A | Toilet | 47 | 8 | 376 | 1 | 1 EA | | |
| 1 | 22 | Classroom | 1000 | 9.3 | 9300 | 20 | 1 RA FTR, 1x Mitsubishi Ceiling Cassette Operable windows presumably for | No Supply Air | |
| 1 | 23 | Classroom | 700 | 9.3 | 6510 | 25 | 1 RA FTR, 1x Mitsubishi Ceiling Cassette, Foldable partition (closed) shared with | No Supply Air | |
| 1 | 24 | Classroom | 770 | 9.3 | 7161 | 25 | 1 RA FTR, 1x Mitsubishi Ceiling Cassette, Foldable partition (closed) shared with | No Supply Air | |
| 1 | 25 | Classroom | 735 | 9.3 | 6835.5 | 25 | 1 RA FTR, 1x Mitsubishi Ceiling Cassette, Foldable partition (closed) shared with | No Supply Air | |
| 1 | 26 | Classroom | 735 | 9.3 | 6835.5 | 25 | 1 RA FTR, 1x Mitsubishi Ceiling Cassette, Foldable partition (closed) shared with | No Supply Air, This space is noticeably warm | |
| 1 | 27 | Classroom | 770 | 9.3 | 7161 | 25 | 1 RA FTR, 1x Mitsubishi Ceiling Cassette, Foldable partition (closed) shared with | | |

| | | | |
|------------------------------------|------------------------------|--------------|--|
| Project Name: | Fairfield Public Schools RCx | | |
| Project Number: | 2020102.00.12 | RCM, RA, JRK | |
| Scope | Room Take-Off Data | | |
| Date | April 20, 2022 | | |
| North Stratfield Elementary School | | | |

| Zone Identification | | | | | | | | | |
|---------------------|-------|----------------------|-----------|----------------|--------|--------|--|---|----------|
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | | | | | | Y /N |
| 1 | 28 | Classroom | 700 | 9.3 | 6510 | 25 | 1 RA FTR, 1x Mitsubishi Ceiling Casette, Foldable partition (closed) shared with | | |
| 1 | 29 | Computer Lab | 730 | 9.3 | 6789 | 28 | 7 SA 2 RA, 28x Computers, 1x Dehumidifier | | |
| 1 | 29A | Computer Lab Office | 80 | 8.7 | 696 | 1 | 1 SA, 1x Mitsubishi Split AC, Data Room | This room is noticeably cold, < 65 °F | |
| 1 | 29B | Computer Lab Storage | 30 | 8 | 240 | 0 | 1 SA, Semi-Electrical Closet | | |
| 1 | 30 | Media Center | 3000 | 9.6 | 28800 | 50 | 19 SA 2 RA | The Return Air was noticeably loud in this space | |
| 1 | 30A | Story Center | 250 | 11.5 | 2875 | 25 | 1 SA FTR, open to the Media Center | | |
| 1 | 30B | Office | 200 | 8.8 | 1760 | 3 | 1 SA | There is no supplemental heating in this space with big bay windows | |
| 1 | 31 | Reading | 400 | 8.8 | 3520 | 12 | 2 SA 1 RA FTR | | |
| 1 | 32 | Math/Teachers Room | 400 | 8.7 | 3480 | 10 | 6 SA 2 RA | | |
| 1 | 32.1 | Toilet | 56 | 8 | 448 | 1 | 1 EA | | |
| 1 | 32.2 | Girls | 130 | 8 | 1040 | 2 | 1 EA | | |
| 1 | 32.3 | Boys | 100 | 8 | 800 | 2 | 1 EA | | |
| 1 | 32.4 | Cust | 35 | 8 | 280 | 1 | 1 EA | | |
| 1 | 32A | Work Room | 130 | 8.7 | 1131 | 2 | 1 SA 1 RA | This space is noticeably warm | |
| 1 | 33 | Conference | 230 | 9 | 2070 | 9 | 1 RA, 1x CUH | No Supply Air | |
| 1 | 34 | Office | 170 | 9 | 1530 | 5 | 1x CUH | No Supply Air | |
| 1 | 35 | Office | 177 | 9 | 1593 | 5 | 1x CUH | No Supply Air | |

| | | | |
|-----------------|------------------------------------|--------------|--|
| Project Name: | Fairfield Public Schools RCx | | |
| Project Number: | 2020102.00.12 | RCM, RA, JRK | |
| Scope | Room Take-Off Data | | |
| Date | April 20, 2022 | | |
| | North Stratfield Elementary School | | |

| Zone Identification | | | | | | | | | |
|---------------------|-------|------------------------|-----------|----------------|--------|--------|---|---------------------------------|----------|
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | | | | | | Y /N |
| 1 | 36 | Principal | 190 | 9 | 1710 | 6 | 1x CUH, Transfer grille to Main Office | | |
| 1 | 36A | Principal Storage | 25 | 8 | 200 | 0 | Nothing | | |
| 1 | 37 | Work Room | 170 | 8.5 | 1445 | 2 | 1 RA, 1x Wall-mounted manual quartz heater on corridor wall, 2x copiers | | |
| 1 | 38 | Waiting Area | 330 | 9 | 2970 | 5 | 2 RA, Continuous with Main Office 39 | No Supply Air | |
| 1 | 39 | Main Office | 285 | 9 | 2565 | 4 | 1x CUH, continuous with Waiting Area 38 | No Supply Air | |
| 1 | A01 | Art Classroom | 630 | 9.3 | 5859 | 28 | 2 SA FTR, 1x Fujitsu Split AC | | |
| 1 | A01A | Kiln/Storage | 73 | 8 | 584 | 1 | 1 RA, 1x Kiln | | |
| 1 | A01B | Art Storage | 100 | 8 | 800 | 1 | 1 RA | | |
| 1 | C01 | Cafetorium | 3350 | 20.3 | 68005 | 634 | 6x Ceiling Fans, FTR, 300 chairs counter, 634 per Fire Marshal sign, | | |
| 1 | C01A | Cafetorium Storage | 175 | 10.5 | 1837.5 | 0 | Nothing | | |
| 1 | C02 | Platform | 950 | 17.3 | 16435 | 30 | FTR, unclear what else | Loud rumbling fan in this space | |
| 1 | C02A | Small Platform Storage | 75 | 8 | 600 | 0 | Nothing | | |
| 1 | C02B | Large Platform Storage | 90 | 8 | 720 | 0 | Nothing | | |
| 1 | G01 | Gymnasium | 4100 | 23 | 94300 | 30 | 8 SA 2 RA, 2x Dedic. AHU susp. from ceiling, Elevated FTR ~halfway to | | |
| 1 | G01A | Gym Toilet | 44 | 8 | 352 | 1 | 1 EA FTR | | |
| 1 | G01A | Gym Storage | 311 | 12.6 | 3918.6 | 2 | 2 SA, JCI Controller | | |
| 1 | G02 | Gym Office | 105 | 8 | 840 | 2 | 1 SA FTR | This space was noticeably warm | |

| | | | |
|------------------------------------|------------------------------|--------------|--|
| Project Name: | Fairfield Public Schools RCx | | |
| Project Number: | 2020102.00.12 | RCM, RA, JRK | |
| Scope | Room Take-Off Data | | |
| Date | April 20, 2022 | | |
| North Stratfield Elementary School | | | |

| Zone Identification | | | | | | | | | |
|---------------------|-------|-------------------------|-----------|----------------|--------|--------|---|------------------------------------|----------|
| Floor | Room# | Room Name | Area (SF) | Ceiling Height | Volume | People | Notes | Identified Deficiencies | Pictures |
| | | | | | | | | | Y /N |
| 1 | G03 | Exterior Storage | 400 | 11.3 | 4520 | 0 | 1x Elec. UH | | |
| 1 | K01 | Kitchen | 1050 | 8.5 | 8925 | 20 | 2x Range Hood, 1x CUH, 2x Transfer grilles from Cafetorium, 4x Fridge, 1x | | |
| 1 | K01A | Kitchen Storage | 95 | 8.6 | 817 | 0 | Nothing | Broken ceiling tiles in this space | |
| 1 | K01B | Kitchen Toilet | 58 | 9 | 522 | 1 | 1 EA | | |
| 1 | K02 | Kitchen Office | 130 | 9.3 | 1209 | 3 | 1x EF | | |
| 1 | M01 | Maintenance Cust Office | 235 | 9.3 | 2185.5 | 3 | FTR | | |
| 1 | M01A | Maintenance Toilet | 70 | 8 | 560 | 1 | 1 EA | | |
| 1 | M02 | Boiler Room | 890 | 13.5 | 12015 | 0 | Nothing | | |
| 1 | N01 | Nurse | 325 | 8 | 2600 | 6 | 2 SA 1 RA FTR | | |
| 1 | N01A | Nurse Toilet | 41 | 8 | 328 | 1 | 1 EA | | |
| 1 | N01B | Office, Southwest | 90 | 8.7 | 783 | 2 | 1 SA 2 RA FTR | | |
| 1 | N01C | Office, Northwest | 90 | 8.7 | 783 | 4 | 1 SA 2 RA FTR | | |
| 1 | N01D | Office, Northeast | 90 | 8.7 | 783 | 2 | 1 SA 1 RA FTR | | |
| 1 | N01E | Office, Southeast | 90 | 8.7 | 783 | 3 | 1 SA 1 RA FTR | | |

**PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET**

| <u>Unit Tag</u> | <u>AC-1</u> | <u>Addition comments descriptions</u> |
|-----------------------------|---|--|
| Date: 5-10-22 | Auditor: RCM | |
| Location | Main East Roof | |
| Serving | Media Center | |
| Config/Style | Air Conditioning Unit | |
| Mfr. | Carrier | |
| Model # | 50HC-D09A25A0A0A0 | |
| Serial # | 3014P31997 | |
| Age (years) | +10 | |
| System CFM | | |
| Max OA CFM | | |
| V/Hz/Ph | 208-230V/60HX/3PH | |
| SF Qty/HP | No motor Info but 1-3 HP | Belt AX48 |
| SF VFD Data | | |
| RF Qty/HP | | |
| RF VFD Data | | |
| Filter Data (Size Quantity) | (4) 20 X 20 X2 Main with (2) 16 X 22 X .5 Metal prefilter | |
| Filter Status | Clean 4-11-22 | |
| Controls Type | Pneumatic to DDC Conventional | |
| Controls Mfr. | Carrier / JCI | |
| Economizer | Capable of but ODA Damper not wired | OA Damper closed |
| CO ₂ DCV | No | |
| Damper Styles | Opposed Blade Gear Driven | |
| Damper Status | Very dirty | |
| Heating Type | | |
| Heating Coil Condition | | |
| Cooling Type | | |
| Cooling Coil Condition | Fair but Condenser coil needs cleaning | |
| Drain Pan Status | | |
| Notes: | Internal cleaning suggested | |

PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET

Photos



PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET



**PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET**

| <u>Unit Tag</u> | <u>AC-2</u> | <u>Addition comments descriptions</u> |
|-----------------------------|--|--|
| Location | Northeast Roof | |
| Serving | Media Center?? Room 24 on Breaker | |
| Config/Style | Air Conditioning Unit | |
| Mfr. | Trane | |
| Model # | EBC060A3E0B0000 | |
| Serial # | 20133024PA | |
| Age (years) | 2020 | |
| System CFM | 2000 | |
| Max OA CFM | | |
| V/Hz/Ph | 208-230/60HZ/3PH | |
| SF Qty/HP | 1 HP | AX40 Belt |
| SF VFD Data | NA | |
| RF Qty/HP | NA | |
| RF VFD Data | NA | |
| Filter Data (Size Quantity) | (4) 16 X 16 X2 | Filter change access nearly impossible without removal of entire top of unit. Accessed panel over Econo Hood but had to bend tabs and brackets to remove |
| Filter Status | Clean 4-11-22 changed | |
| Controls Type | Pneumatic to DDC | |
| Controls Mfr. | Trane / JCI | |
| Economizer | Yes, Package with flapper damper. RA damper only closes of 80% of RA opening | |
| CO ₂ DCV | No | |
| Damper Styles | 1 actuator with two flappers linked | |
| Damper Status | | |
| Heating Type | NA in unit | |
| Heating Coil Condition | | |
| Cooling Type | DX Y1 and Y2 | |
| Cooling Coil Condition | | |
| Drain Pan Status | Clean | |
| Notes: | | |

PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET

Photos



PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET



PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET



PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET

**PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET**

| <u>Unit Tag</u> | <u>AC-3</u> | <u>Addition comments descriptions</u> |
|-----------------------------|--|--|
| Location | Northeast Roof | |
| Serving | Teacher Work Room and Conference Room | |
| Config/Style | Air Conditioning Unit | |
| Mfr. | Trane Foundation | |
| Model # | EBC036A3E0A000 | |
| Serial # | 18411203PA | |
| Age (years) | 10/2018 | |
| System CFM | | |
| Max OA CFM | | |
| V/Hz/Ph | 208-230/60/3 | |
| SF Qty/HP | 1.0 (1) AX-40 | |
| SF VFD Data | N/A | |
| RF Qty/HP | N/A | |
| RF VFD Data | N/A | |
| Filter Data (Size Quantity) | (4) 16x16x2 | Awful accessibility |
| Filter Status | Clean | |
| Controls Type | Packaged with DDC interface | |
| Controls Mfr. | CTC BAS Vendor | |
| Economizer | Yes | |
| CO ₂ DCV | Wires connected to unit CO2 terminals, will need to explore BAS drawings | |
| Damper Styles | Trane Flap | |
| Damper Status | OK | |
| Heating Type | N/A | |
| Heating Coil Condition | N/A | |
| Cooling Type | DX R-410A SINGLE CIRCUIT | |
| Cooling Coil Condition | OK | |
| Drain Pan Status | Clean | |
| Notes: | Filter change requires top removal | |

PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET

Photos



PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET



PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET



**PROJECT: 2020102.12 FAIRFIELD PUBLIC SCHOOLS – NORTH STRATFIELD ELEMENTARY SCHOOL
EQUIPMENT DATA SHEET**

| <u>Unit Tag</u> | <u>AC-4</u> | <u>Addition comments descriptions</u> |
|-----------------------------|--|--|
| 5-10-22 | Auditor RCM | |
| Location | Northeast Roof | |
| Serving | Computer Room | |
| Config/Style | Air Conditioning Unit | |
| Mfr. | Trane | |
| Model # | EBC036A3E0 | |
| Serial # | 18411202PA | |
| Age (years) | 2018 | |
| System CFM | 1200 | |
| Max OA CFM | | |
| V/Hz/Ph | 208-230/60HZ/3PH | |
| SF Qty/HP | 2 HP | AX-40 |
| SF VFD Data | NA | |
| RF Qty/HP | NA | |
| RF VFD Data | | |
| Filter Data (Size Quantity) | (4) 16 X 16 X 2 | Access for service extremely difficult to limited access points |
| Filter Status | Clean 4-11-22 | |
| Controls Type | Pneumatic to DDC interface | |
| Controls Mfr. | JCI | |
| Economizer | Capable but RA Damper linkage not connected | |
| CO ₂ DCV | | |
| Damper Styles | Flapper on RA changed to side and if connected will not move freely, nor does it close off more than 60% RA opening. | Bottom RA Safe off was side panel not sealed and impeding RA Flapper |
| Damper Status | | |
| Heating Type | | |
| Heating Coil Condition | | |
| Cooling Type | | |
| Cooling Coil Condition | Ok | |
| Drain Pan Status | | |
| Notes: | Unit not running nor having Power. Condensate trap not connected tightly and is between SA/RA side duct | |

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EQUIPMENT DATA SHEET

Photos



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| <u>Unit Tag</u> | <u>HV-1 / EF-9</u> | <u>Addition comments descriptions</u> |
|-----------------------------|--|---------------------------------------|
| Location | Auditorium/Cafeteria Roof | |
| Serving | Auditorium/Cafeteria | |
| Config/Style | Heating and Ventilation Unit | |
| Mfr. | Trane | |
| Model # | Torivent T-7 | |
| Serial # | K-54111 | |
| Age (years) | Very Old Original | |
| System CFM | | |
| Max OA CFM | EF-9 CFM 4620 | |
| V/Hz/Ph | 208-230V/60HZ/3PH | |
| SF Qty/HP | Access not safe | A80 |
| SF VFD Data | | |
| RF Qty/HP | EF-9 3HP | |
| RF VFD Data | Fan Bayley 640150-6 Size 270 | |
| Filter Data (Size Quantity) | (10) 16 X 25 X 2 | |
| Filter Status | Clean | |
| Controls Type | Pneumatic DDC | |
| Controls Mfr. | JCI | |
| Economizer | No, ODA damper closed with Air Line Off | |
| CO ₂ DCV | | |
| Damper Styles | Opposed | |
| Damper Status | Very dirty and need new actuators and cleaning | |
| Heating Type | HW | |
| Heating Coil Condition | Not accessible and assumed very dirty | |
| Cooling Type | NA | |
| Notes: | Very old and should be replaced | |

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| <u>Unit Tag</u> | <u>HV-2 / HV-3</u> | <u>Addition comments descriptions</u> |
|--------------------------------|---------------------------------------|---------------------------------------|
| Date: 5-10-22 | Auditor: RCM | |
| Location | Below Gym Roof, South in Space | |
| Serving | Gymnasium | |
| Config/Style | Heating and Ventilation Unit | |
| Mfr. | Carrier Weather Master | |
| Model # | | |
| Serial # | | |
| Age (years) | | |
| System CFM | | |
| Max OA CFM | | |
| V/Hz/Ph | | |
| SF Qty/HP | | |
| SF VFD Data | | |
| RF Qty/HP | | |
| RF VFD Data | | |
| Filter Data (Size Quantity) | | |
| Filter Status | | |
| Controls Type | | |
| Controls Mfr. | | |
| Economizer | | |
| CO ₂ DCV | | |
| Damper Styles | | |
| Damper Status | | |
| Heating Type | | |
| Heating Coil Condition | | |
| Cooling Type | | |
| Cooling Coil Condition | | |
| Drain Pan Status | | |
| Notes: | Units not accessible without Man-Lift | |

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