



## ***Town of Littleton School Committee***

33 Shattuck St. \* P.O. Box 1486 \* Littleton, MA 01460-4486 \*  
Phone: (978) 540-2500 \* Fax: (978) 486-9581 \* Website: [www.littletonps.org](http://www.littletonps.org)

MATTHEW HUNT, Vice Chair  
BRAD AUSTIN, Member

MIKE FONTANELLA, Chair

TIMALYN RASSIAS, Secretary  
JUSTIN MCCARTHY, Member

### **SCHOOL COMMITTEE MEETING**

**November 5, 2020**

**7:00 p.m.**

**You are invited to a Zoom webinar.**

**When: Nov 5, 2020 07:00 PM Eastern Time (US and Canada)**

**Topic: School Committee meeting of Nov 5th, 7pm**

**Please click the link below to join the webinar:**

**<https://littletonma.zoom.us/j/98725934088?pwd=MDBGc3cvclUUM2FuMFBHSEhzMXgyQT09>**

**Passcode: 565182**

**Or iPhone one-tap :**

**US: +13017158592,,98725934088# or +13126266799,,98725934088#**

**Or Telephone:**

**Dial(for higher quality, dial a number based on your current location):**

**US: +1 301 715 8592 or +1 312 626 6799 or +1 929 205 6099 or +1 253 215 8782 or +1 346 248 7799  
or +1 669 900 6833**

**Webinar ID: 987 2593 4088**

**International numbers available: <https://littletonma.zoom.us/j/98725934088?pwd=MDBGc3cvclUUM2FuMFBHSEhzMXgyQT09>**

**VIDEO OR CALL WILL BE MUTED UPON JOINING MEETING.**

**Please use the "RAISE YOUR HAND" feature in the zoom meeting to ask to speak.**

**PARTICIPANTS/ATTENDEES ARE REMINDED THAT BY JOINING THIS MEETING THAT YOU CONSENT TO YOUR  
LIKENESS AND AUDIO BEING USED AND REBROADCAST BY LCTV**

**This LIVE meeting can be viewed online at LCTV On-Demand at <https://littleton.vod.castus.tv/vod>**

### **\*\* \*A G E N D A\* \* \***

*Our mission is to foster a community of learners who strive for excellence and prepare each student to be a successful, contributing citizen in a global society.*

#### **7:00 I. ORGANIZATION**

##### **1. Call to Order**

##### **2. Consent Agenda**

**-Minutes – October 29, 2020**

**-Oath to Bills -  
and Payroll**

#### **7:05 II. INTERESTED CITIZENS**

*It is the policy of the Littleton Public Schools not to discriminate on the basis of race, gender, religion, national origin, color, homelessness, sexual orientation, gender identity age or disability in its educational programs, services, activities or employment practices. Further information may be obtained by contacting Lyn Snow,, District Equity Coordinator at 978-540-2500, [lsnow@littletonps.org](mailto:lsnow@littletonps.org) or 33 Shattuck Street, P.O. Box 1486, Littleton, MA 01460.*

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**7:10 III. RECOGNITION**

**7:15 IV. PRESENTATION**

1. **Financial Report:** *Business Manager, Steve Mark will give an updated Financial Report.*
2. **HVAC Air Ventilation:** *Chair, Mike Fontanella will give a presentation on the completed report on the HVAC Air Ventilation.*
3. **Public Health Metrics:** *Chair, Mike Fontanella will give an update on the most recent Public Health Metrics.*

**7:25 V. NEW BUSINESS**

1. **Thanksgiving break** - *Discussion regarding families potentially submitting an attestation that they will limit travel and social gatherings.*

**7:30 VI. INTERESTED CITIZENS**

**7:45 VII. SUBCOMMITTEE REPORTS**

1. **PMBC**
2. **Budget Subcommittee**
3. **Policy Subcommittee:** (see LPS website to view all policies)  
<http://www.littletonps.org/school-committee/school-committee-polices>

**7:50 VIII. ADJOURNMENT/EXECUTIVE SESSION**

**Motion to move into Executive Session for the purpose of contract negotiations with no intention to return to Open Session.**

**NEXT SCHOOL COMMITTEE MEETING**

**November 19, 2020**

**7:00 PM**

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JUSTIN MCCARTHY, Member

## SCHOOL COMMITTEE MINUTES October 29, 2020 7:00PM

**PRESENT:** Mike Fontanella  
Matthew Hunt  
Timalyn Rassias  
Brad Austin  
Justin McCarthy

**ALSO PRESENT:** Kelly Clenchy  
Steve Mark  
Dorothy Mulone  
Bettina Corrow

### NOT PRESENT:

### CALL TO ORDER

Mike Fontanella called the meeting to order at 7:00p.m.

On a motion by Matthew Hunt, and seconded by Timalyn Rassias, it was voted to approve the Oct. 22, 2020 consent agenda as presented. (AYE: Unanimous). Motion carried. Roll Call Vote: Matthew Hunt, AYE; Brad Austin, AYE; Justin McCarthy, AYE; Timalyn Rassias, AYE; and Mike Fontanella, AYE.

### INTERESTED CITIZENS

None

### RECOGNITION

1. Superintendent Clenchy thanked Mike Lynn, the student athletics and coaches for a great fall season.

### PRESENTATION:

1. **Public Health Metrics:** Chair Mike Fontanella gave a brief update of the Public Health Metrics and Katrina Wilcox-Hagberg joined and gave her health metric overview.  
Littleton is trending higher than our other regional communities. We have 12 positive cases at this point.  
The state is red, Middlesex County is in red, and Littleton is in red at this point.

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Calculation:

Average Daily Incidence Rate = (number of cases diagnosed in last 14 days / 14 days) / population)  
\*100,000

### Test Positivity

- Data Source: <https://www.mass.gov/info-details/covid-19-response-reporting>
- Percent Positivity = total positive tests / total number of tests conducted
- This measure includes people who are tested more than one time, such as for surveillance testing for colleges, healthcare workers, and businesses

### Contact tracing and clusters:

- DPH started to publish details of contact tracing in the weekly report
- **80%** of the clusters connected to **household transmission**
- Other exposure settings include social gatherings, restaurants/food establishments, retail & services, long term care facilities/senior living
- Gov. Baker indicated (10/27/20) that cases identified in schools were mainly arising from exposures outside of the school
- Littleton is trending higher than our surrounding communities
- **What can we as individuals do to slow Littleton's rising rates and help protect our schools to keep them open?**

Mike Fontanella – He thanked Katrina and appreciated her quick turn-around.

Justin McCarthy – You used a number I am not familiar with? Katrina Wilcox-Hagberg – the number you could affect would be 2.5 which means you could affect 2.5 people with the virus. That is the number that CDC is currently using. It is close to one positive case per day in Littleton at this rate.

Mike Fontanella – If you behave in good faith and stay home and keep your family home if you feel sick, the number might be able to change quickly. Social gathering is another point to keep in mind.

Brad Austin – Case percentile rate is going up.

Katrina Wilcox-Hagberg – We are using Harvard's 3% metric – our trend is going up. We must do everything we can to keep in-person learning in school.

Matthew Hunt – We all want to keep the schools open and we all need to do what is right to keep them open. We must change our habits if we want the schools to stay open.

Katrina Wilcox-Hagberg – I do not want to shut anything down. I am doing this data work to inform everyone and hope that the community will do the right thing so we can stay open.

### NEW BUSINESS

1. **Update on Fall and Winter Sport season** – Athletic Director Mike Lynn gave a brief update on the fall and winter sport seasons. Our participation rate was consistent as pre-Covid.

Winter Sports Update – Current start date is Nov. 30, 2020 but Mr. Lynn would not be surprised if that date gets moved back.

Closing point – High School athletics have never been more vital to kids’ overall physical/mental/emotional social health than right now. We see evidence of this every day. The LHS Athletic department will do everything they can to make the lives of our student-athletes as normal as possible this school year. We are willing to do “whatever it takes” to get the job done. Unfortunately, there are no “do-overs” for our student-athletes.

Brad Austin – Can we get more specific on safety guidelines? Mike Lynn – I do not have an update at this point but would be happy to come back with an update later.

Justin McCarthy – If towns are in red, they cannot play games? If we can come to an agreement, we are using safe behaviors as possible, I do not see any concerns.

Mike Lynn – the dialogue has turned more to look at where the cases fall.

Timalyn Rassias – Which communities are in our pods? Mike Lynn – Our pods include Tyngsboro, Groton-Dunstable, Lunenburg, North Middlesex, and Parker School.

Mike Fontanella – We do not have enough information about the winter yet to determine whether it is right or not to have a winter season currently. We will have Mr. Lynn back later to discuss.

2. **Snow Days 2020-2021** – Superintendent Clenchy discussed how snow days would be implemented this school year. The Commissioner of Education has given the “green light” to use a snow day as a fully remote day instead.

Mike Fontanella – Are we assuming that most snow days will be remote days or would there be a day we would have a snow day? Kelly Clenchy – If we end up having a snow day, we will need to add on a day at the end of June to make the 170 school days.

Public Comments:

Eileen Wedegartner – What happens if families lose power during a storm and we have a remote day instead of a snow day? Would the student be penalized? Would there be any snow packets for students?

Kelly Clenchy – if some families do lose power but most other students are able to log on, we would continue with the remote day. Students without power would not be penalized. We still have resources from last year that could be used as snow packets if needed.

Tracy Tecce – I think it is great with the technology we can move to a remote learning day. But I am concerned that internet connection could be affected by a snowstorm. Kelly Clenchy – We will monitor how connection is going on remote days during a storm.

3. **Dates for families to review their decision requesting change of remote or hybrid learning plan and Review of Learning model:** Superintendent Clenchy and Curriculum Director Elizabeth Steele discussed the review process of the learning models. We will create a survey which will include learning environment, academics, engagement, health (social, emotional, mental, and physical), communication, cultural awareness, and action. Topics we have all been talking about for a while now. We have partnered with Panorama Education, which is a platform for surveys, support, and content creation.

## Timeline of Request to Change Learning Model Form

- Trimester:
  - Grades T-8 - Form emailed December 1, due back December 11 → Goal is to start January 4
- Semester
  - Grades PreK/K - Form emailed January 11, due back January 22 → Goal is to start February 8
  - Grades 9-12 - Forms emailed January 19, due back January 29 → Goal is to start February 8

We have had a few requests to switch a few students' learning model already.

Brad Austin – Can we include technology questions within the survey. Elizabeth Steele – we do have some tech questions on the survey, but we will double check to ensure they are included.

Justin McCarthy – If we end up in fully remote, would you still send the survey out? If we continue to move between yellow and red, I am wondering if we could send this request out again later. When does the third semester and trimester start? Kelly Clenchy – we will be sending this survey out no matter what. Elizabeth Steele - Second trimester ends March 19<sup>th</sup> (mid-March).

Mike Fontanella – This seem reasonable if things flow normally. We need to stay flexible.

Brad Austin – I think having the students included in the survey is great. Last Friday was spent debriefing. Can you elaborate? Kelly Clenchy – One of the teachers' concerns is time. Having a hard time to separate their personal life from their professional lives.

John Harrington – The teachers are happy with the schedules. They like the smaller class sizes and able to social distance. Stress is higher for sure. Teachers are spending so much time planning. Screen time is more. But they are happy to have collaborative time with their students in the classroom.

Jason Everhart – Teachers are impressing us with the hybrid model instruction. They are finding the joy of seeing their students again. Attendance is still a struggle. Students are remote one day and hybrid the next. We have had staffing issues. Technology issues have happened, which was to be expected.

Cheryl Temple – One thing that came up was teachers feel that they cannot take a leave day. Moving forward it is a good document that we can continue to work with.

Michelle Kane – I feel we have come more together than before. The students are so great. The live streaming is still a challenge. Parents are so great at helping out at home but also trying to do their own work while supporting their child.

Timalyn Rassias – Have we been auditing how the instruction is going? John Harrington – no doubt there have been complains/concerns from parents. We do know that we have had some technology issues. Kelly Clenchy – It is a good question to ask. At first, we felt we were intruding but I have been amazed on how much our teachers are doing. Our students are so tech savvy.

## Public Comments:

Kelli Harte – A comment about the hybrid model. It is a little bit different in every grade. When we talk about making a switch after this first semester, I have a lot of concern, especially for the younger students. Mike Fontanella – it is our last resort, and our goal is to avoid that, but we might not have a chance to avoid it in these circumstances.

Eileen Wedegartner– As a parent we were asked to commit for this semester, which we did. When would we be able to switch students to another learning model if we are fully remote? I do see how much everyone is working to make all this work.

Mike Fontanella – Depending on which learning plan we are in, when it is time to switch, we will have to determine what options we have available for everyone.

Lyn Snow – If a student on an IEP is having trouble with remote learning, you can always reach out to the Special Education department. We can get the special education team together to discuss other options.

Justin McCarthy – Even if we are in remote, I would encourage the district to send out a second survey, because I want the parents to get a chance to reevaluate their needs no matter what the circumstances are.

Cathy Olson – Curriculum in Middle School. I believe that MAP testing is starting. How fast will we get the results of the assessment?

Elizabeth Steele – within 24 hours of taking the assessment, the teacher can pull the assessment results. It then takes time for the teachers to review, analyze and put new targeted instruction into place.

- 4. Update on Air Flow Balancer work** – Business manager Steve Mark gave a brief update on the air flow balance work. Those reports are available, and it will be up to the school committee when they want to release the reports.

Mike Fontanella – There will be a presentation on this at the next meeting.

#### **INTERESTED CITIZENS**

None

#### **SUB-COMMITTEE**

**1. PMBC** – No update

**2. Budget** – No update

**3. Policy** - No update

**4. School Committee meeting in Nov.** We plan on meeting next week Nov. 5, we will not meet on Nov. 12 but will meet on Nov. 19th

#### **ADJOURNMENT**

On a motion by Matthew Hunt, and seconded by Timalyn Rassias, it was voted to adjourn at 9:14PM. Roll Call Vote: Matthew Hunt, AYE; Brad Austin, AYE; Justine McCarthy, AYE; Timalyn Rassias, AYE; and Mike Fontanella, AYE.

#### **NEXT MEETING DATE**

**School Committee**

**Nov. 5, 2020**

**7:00PM**

**Zoom Meeting**

#### **DOCUMENTS AS PART OF MEETING**

Public Health Metrics for Covid-19

Fall and Winter Sport Season



# LITTLETON Massachusetts

11/02/2020 10:43  
4083smark

Town of Littleton  
YEAR-TO-DATE BUDGET REPORT FY 2021  
YEAR TO DATE THROUGH OCTOBER - 2020

P 1  
glytdbud

FOR 2021 04

	ORIGINAL APPROP	TRANSFERS/ ADJUSTMENTS	REVISED BUDGET	YTD EXPENDED	ENCUMBRANCES	AVAILABLE BUDGET	PCT USED
310 Regular Education	8,630,064	0	8,630,064	1,331,011.32	91,192.73	7,207,859.95	16.5%
311 Special Education	6,284,615	0	6,284,615	727,466.05	1,525.59	5,555,623.36	11.6%
312 Student & Support Staff	1,310,321	0	1,310,321	249,681.80	35,578.64	1,025,060.56	21.8%
313 Other Instruction	295,425	0	295,425	18,480.16	7,142.15	269,802.69	8.7%
314 System Administration	1,371,194	0	1,371,194	416,696.17	26,757.42	927,740.41	32.3%
315 School Administration	1,172,640	0	1,172,640	354,431.00	1,798.72	816,410.28	30.4%
316 Transportation and Busing	1,215,260	0	1,215,260	56,686.02	.00	1,158,573.98	4.7%
317 Facility & Maintenance	1,690,243	0	1,690,243	396,445.17	132,566.14	1,161,231.69	31.3%
GRAND TOTAL	21,969,762	0	21,969,762	3,550,897.69	296,561.39	18,122,302.92	17.5%

\*\* END OF REPORT - Generated by Steven Mark \*\*



**Prior to school starting ENE Systems, our HVAC contractor, went through all four schools, servicing all rooftop and classroom HVAC units, including replacing and upgrading filters, to ensure they were in full working condition.**

- ***“Littleton’s HVAC systems, in all their buildings, are in the top 10% of all the school districts we service”***

**In September, we hired BLW Engineering to determine if our HVAC systems, as designed, met industry standards.**

- ***Based on applicable guidelines (ASHRAE, State of Massachusetts Re-opening Guidelines, Massachusetts Teachers Association, etc.) Littleton schools are safe to occupy***

**In October, as part of the MOA with the LEA, we hired NETB Associations to measure current actual performance levels for all rooftop and classroom HVAC units in all four schools. NETB spent weeks in our buildings measuring and recording the outside airflow and ventilation rates for all classrooms and offices in the schools.**

- ***ALL HVAC UNITS TESTED MEET OR EXCEED THE MINIMUM VENTILATION RATES AS DEFINED IN ASHRAE 6.2.2.1.***

# **CERTIFIED AIR EXCHANGE REPORT**

**DATE: OCTOBER 28, 2020**

**PROJECT:  
LITTLETON SCHOOL SYSTEM  
HIGH SCHOOL  
55 KING STREET  
LITTLETON, MA 01460**

**CERTIFIED BALANCING FIRM:  
NETB ASSOCIATES, LLC  
18 HAMPTON ROAD; UNIT 1B  
EXETER, NH 03833**

**TAB CERTIFICATION NUMBER: 15-041-11  
SUPERVISOR: FRANK COLLAMORE**

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>	<b>SHEET: 2</b>
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

### INSTRUMENT LIST

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Calibration Due Date</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90551005</b>	<b>05/14/21</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90808010</b>	<b>10/14/21</b>
<b>Rot. Vane Anem.</b>	<b>Testo</b>	<b>417</b>	<b>61436921</b>	<b>04/01/21</b>
<b>Clamp Meter</b>	<b>Fluke</b>	<b>365</b>	<b>15240145</b>	<b>10/14/21</b>
<b>Multi Meter w/ Temp.</b>	<b>Fluke</b>	<b>116</b>	<b>94380621</b>	<b>05/14/21</b>
<b>Tachometer</b>	<b>Stitch</b>	<b>MT-200</b>	<b>B3CB3002</b>	<b>10/14/21</b>
<b>Tachometer</b>	<b>Extech</b>	<b>461995</b>	<b>Q383708</b>	<b>05/14/21</b>
<b>Hydronic Manometer</b>	<b>Alnor</b>	<b>HM670</b>	<b>70734152</b>	<b>05/14/21</b>

Calibration certificates available upon request.

This report is hereby certified to be true & accurate.

Sincerely,

*Frank T. Collamore*

Frank T. Collamore

President

NETB Associates, LLC

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>	<b>SHEET: 3</b>
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

## **REPORT SUMMARY**

### **OBJECTIVE:**

PERFORM OUTSIDE AIRFLOW TESTING ON EXISTING HVAC EQUIPMENT SERVING THE LITTLETON, MA HIGH SCHOOL. DETERMINE OUTSIDE AIRFLOW AND VENTILATION RATES OF AREAS.

### **TEST CONDITIONS:**

TESTING PERFORMED DURING NORMAL HOURS. ENE CONTROLS HAVE MAJORITY OF OUTSIDE AIR DAMPERS COMMANDED BETWEEN 40-60% OPEN.

FACILITIES INDICATED THAT FILTERS HAD RECENTLY BEEN REPLACED.

### **SUMMATION:**

ALL HVAC UNITS TESTED HAVE PASSED THE MINIMUM VENTILATION RATES AS DEFINED IN ASHRAE 6.2.2.1.

### **ZONE OUTDOOR AIR QUANTITIES (CFM/ZONE)**

American Society of Heating, Refrigeration and air-conditioning Engineers published a standard known as ASHRAE 6.2.2.1 to specify minimum ventilation rates and air quality that will be acceptable to human occupants.

The minimum outdoor air (Vbz) required is defined as Breathing Zone Outdoor Airflow and can be calculated. See Ashrae Table 6.2.2.1 Table below for additional info:

$V_{bz} = R_p P_z + R_a A_z$  (Eq.1), where:

Vbz: Breathing Zone Outdoor Airflow (CFM),

Rp: Outdoor air required by person (CFM/Person).

Can be found in Table-1

Pz: The maximum number of people expected to occupy the zone.

Ra: Outdoor air required by unit area (CFM/ft<sup>2</sup>). Can be found in Table-1

Az: The zone area (ft<sup>2</sup>)

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>	<b>SHEET: 4</b>
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

**TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone**  
(This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate $R_p$		Area Outdoor Air Rate $R_a$		Notes	Default Values			Air Class
	cfm/person	L/s/person	cfm/ft <sup>2</sup>	L/s-m <sup>2</sup>		Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)		
						#/1000 ft <sup>2</sup> or #/100 m <sup>2</sup>	cfm/person	L/s-person	
Correctional Facilities									
Cell	5	2.5	0.12	0.6		25	10	4.9	2
Dayroom	5	2.5	0.06	0.3		30	7	3.5	1
Guard stations	5	2.5	0.06	0.3		15	9	4.5	1
Booking/waiting	7.5	3.8	0.06	0.3		50	9	4.4	2
Educational Facilities									
Daycare (through age 4)	10	5	0.18	0.9		25	17	8.6	2
Daycare sickroom	10	5	0.18	0.9		25	17	8.6	3
Classrooms (ages 5–8)	10	5	0.12	0.6		25	15	7.4	1
Classrooms (age 9 plus)	10	5	0.12	0.6		35	13	6.7	1
Lecture classroom	7.5	3.8	0.06	0.3		65	8	4.3	1
Lecture hall (fixed seats)	7.5	3.8	0.06	0.3		150	8	4.0	1
Art classroom	10	5	0.18	0.9		20	19	9.5	2
Science laboratories	10	5	0.18	0.9		25	17	8.6	2
University/college laboratories	10	5	0.18	0.9		25	17	8.6	2
Wood/metal shop	10	5	0.18	0.9		20	19	9.5	2
Computer lab	10	5	0.12	0.6		25	15	7.4	1
Media center	10	5	0.12	0.6	A	25	15	7.4	1
Music/theater/dance	10	5	0.06	0.3		35	12	5.9	1
Multiuse assembly	7.5	3.8	0.06	0.3		100	8	4.1	1

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 5</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>PACKAGED ROOF TOP AC UNIT OUTSIDE AIR SUPPLY</b>									
RTAC-1	1	FIA	72X72	25.92	114	2945	120	3110	H
RTAC-2	2	FIA	116X108	31.3	362	11325	411	12864	-
RTAC-3	3	WMS	51.5X25.5	8.21	122	1000	130	1067	-
RTAC-4	4	WMS	51.5X25.5	8.21	91	750	102	837	-
RTAC-5	5	FIA	72X72	25.92	164	4250	175	4536	H
RTAC-6	6	FIA	72X72	25.92	50	1300	57	1477	H



# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 6</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP HEAT/VENT UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>PACKAGED ROOF TOP HEAT/VENT UNIT OUTSIDE AIR SUPPLY</b>									
RTHV-1	1	FIA	72X72	25.92	270	7000	258	6688	H
RTHV-2	2	WMS	39.5X19.5	4.8	833	4000	779	3739	-
RTHV-3A	3	WMS	84X24	12.6	185	2325	190	2394	-
RTHV-3B	3	WMS	39.5X19.5	4.8	484	2325	523	2510	-
RTHV-4	4	FIA	72X72	25.92	116	3000	125	3240	-
RTHV-5	5	FIA	72X72	25.92	116	3000	122	3162	H
RTHV-6	6	WMS	39.5X19.5	4.8	156	750	167	802	-
RTHV-7	7	WMS	39.5X19.5	4.8	156	750	164	787	-
RTHV-8	8	WMS	39.5X19.5	4.8	313	1500	336	1613	

# OUTSIDE AIR TEST SHEET

PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION								SHEET: 7	
PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460								DATE: 10/28/20	
SYSTEM: EXISTING UNIT VENTILATOR									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
MAIN LEVEL UNIT VENTILATOR OUTSIDE AIR SUPPLY									
201	1	FAI	44X22	4.84	124	600	130	629	-
203	2	FAI	52X22	5.72	79	450	825	469	-
205	3	FAI	44X22	4.84	93	450	94	405	-
206	4	FAI	44X22	4.84	103	500	105	508	-
210	5	FAI	44X22	4.84	68	300	74	358	-
207	6	FAI	52X22	5.72	79	450	82	469	-
209	7	FAI	44X22	4.84	93	450	98	474	-
211	8	FAI	52X22	5.72	79	450	82	469	-
213	9	FAI	44X22	4.84	93	450	97	469	-
222	10	FAI	44X22	4.84	62	300	66	319	-
214	11	FAI	44X22	4.84	93	450	98	474	-
215	12	FAI	52X22	5.72	79	450	81	463	-
216	13	FAI	44X22	4.84	68	300	72	349	-
217	14	FAI	44X22	4.84	68	300	75	363	-
218	15	FAI	44X22	4.84	68	300	74	358	-
219	16	FAI	44X22	4.84	68	300	72	348	-
220	17	FAI	52X22	5.72	79	450	80	458	-
221	18	FAI	52X22	5.72	79	450	83	475	-
208	19	WMS	16X16	1.6	188	300	195	312	-

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 8</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>TYPE</b>	<b>SIZE (INCHES)</b>	<b>FLOW FACTOR</b>	<b>DESIGN VELOCITY</b>	<b>DESIGN OA CFM</b>	<b>ACTUAL VELOCITY</b>	<b>ACTUAL OA CFM</b>	<b>REMARK CODE</b>
<b>LOWER LEVEL UNIT VENTILATOR OUTSIDE AIR SUPPLY</b>									
107	20	FAI	60X30	9.0	33	300	39	351	-
109	21	FAI	60X30	9.0	67	600	74	666	-
109	22	FAI	60X30	9.0	75	600	73	657	-
113	23	WMS	40X36	10.0	75	750	72	720	-
115	24	WMS	40X36	10.0	60	60	64	640	-
117	25	WMS	40X36	10.0	60	60	62	620	-
119	26	WMS	40X36	10.0	60	60	65	650	-
121	27	FAI	60X30	9.0	50	450	51	459	-
123	28	FAI	60X30	9.0	50	450	53	477	-
125	29	FAI	60X30	9.0	50	450	55	495	-
127	30	FAI	60X30	9.0	50	450	52	468	-
129	31	FAI	60X30	9.0	50	450	54	486	-
131	32	FAI	44X30	6.6	68	450	72	475	-

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 9</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED ROOF TOP AC UNITS</b>									
LIBRARY	RTAC-1	10	25	0.12	6240	1100	3110	2.14	PASS
AUDITORIUM	RTAC-2	7.5	100	0.06	8670	1270	12864	2.97	PASS
KIVA	RTAC-3	7.5	35	0.06	1200	335	1067	4.44	PASS
TV STUDIO	RTAC-4	10	25	0.12	660	329	837	7.6	PASS
ADMIN/LL	RTAC-5	10	25	0.12	6400	1020	4536	4.73	PASS
BAND	RTAC-6	10	35	0.06	3950	590	1477	7.51	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 10</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT/VENT UNITS</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED ROOF TOP HEAT/VENT UNITS</b>									
LOCKER RM	RTHV-1	10	25	0.12	3990	720	6688	10.1	PASS
ATHLETICS	RTHV-2	10	25	0.12	2770	585	3739	9.0	PASS
CAFÉ	RTHV-3A	7.5	50	0.18	1850	875	2394	3.11	PASS
CAFÉ	RTHV-3B	7.5	50	0.18	2210	670	2510	3.4	PASS
GYM	RTHV-4	10	25	0.12	3750	700	3240	2.02	PASS
GYM	RTHV-5	10	25	0.12	3750	700	3162	2.61	PASS
GRAND STAIR	RTHV-6	10	25	0.12	2075	500	802	1.93	PASS
MAIN LOBBY	RTHV-7	10	25	0.12	2080	500	787	1.9	PASS
AUX. GYM	RTHV-8	10	25	0.12	3375	655	1613	2.05	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 11</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>MAIN LEVEL UNIT VENTILATORS</b>									
201	1	10	25	0.12	1055	377	629	3.97	PASS
203	2	10	25	0.12	800	346	469	3.9	PASS
205	3	10	25	0.12	800	346	405	3.38	PASS
206	4	10	25	0.12	950	364	508	3.56	PASS
210	5	10	25	0.12	540	315	358	4.42	PASS
207	6	10	25	0.12	800	346	469	3.9	PASS
209	7	10	25	0.12	800	346	474	3.95	PASS
211	8	10	25	0.12	800	346	469	3.9	PASS
213	9	10	25	0.12	800	346	469	3.9	PASS
222	10	10	25	0.12	260	281	319	8.18	PASS
214	11	10	25	0.12	720	336	474	4.39	PASS
215	12	10	25	0.12	870	354	463	3.55	PASS
216	13	10	25	0.12	540	315	349	4.31	PASS
217	14	10	25	0.12	540	315	363	4.48	PASS
218	15	10	25	0.12	540	315	358	4.42	PASS
219	16	10	25	0.12	540	315	348	4.3	PASS
220	17	10	25	0.12	870	354	458	3.51	PASS
221	18	10	25	0.12	870	354	475	3.64	PASS
208	19	10	25	0.12	260	281	312	8.0	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON HIGH SCHOOL HVAC VENTILATION</b>								<b>SHEET: 12</b>	
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>LOWER LEVEL UNIT VENTILATORS</b>									
107	20	10	25	0.12	600	322	351	3.9	PASS
109	21	10	25	0.12	1080	379	666	4.1	PASS
109	22	10	25	0.12	1080	379	657	4.06	PASS
113	23	10	25	0.18	1075	445	720	4.47	PASS
115	24	10	25	0.18	1650	550	640	2.59	PASS
117	25	10	25	0.18	1650	550	620	2.5	PASS
119	26	10	25	0.18	1370	500	650	3.16	PASS
121	27	10	25	0.12	870	354	459	3.52	PASS
123	28	10	25	0.12	870	354	477	3.66	PASS
125	29	10	25	0.12	870	354	495	3.79	PASS
127	30	10	25	0.12	870	354	468	3.59	PASS
129	31	10	25	0.12	870	354	486	3.72	PASS
131	32	10	25	0.12	870	354	475	3.64	PASS

## **SYSTEM NOTE SHEET**

- A. VOLUME DAMPER LEFT OPEN**
- B. VOLUME DAMPER ADJUSTED**
- C. REGISTER OR GRILLE DAMPER OPEN**
- D. REGISTER OR GRILLE DAMPER ADJUSTED**
- E. NO VOLUME DAMPER**
- F. NO REGISTER OR GRILLE DAMPER**
- G. DIFFUSER, REGISTER OR GRILLE MISSING**
- H. UNABLE TO ADJUST MIXED AIR DAMPER SETPOINT THROUGH BMS OR LOCAL CONTROL AT UNIT. MIXED AIR DAMPERS MANUALLY OPENED FOR TESTING.**

**OA: OUTSIDE AIR**

**RG: RETURN GRILLE**

**WMS: WIRE MESH SCREEN**

**FAI: UNIT FRESH AIR INTLET**

**OAD: OUTSIDE AIR DUCT**

**RGD: REGISTER, GRILLE, DIFFUSER**

**FH: READINGS TAKEN WITH FLOW HOOD**

**I.A.: INACCESSABLE**

**N.A: NOT APPLICABLE**

**N.I.: NOT INSTALLED**

**N.S.: NOT SPECIFIED, NO DESIGN CRITERIA PROVIDED**

**%: PERCENT OF UNIT DESIGN**

**IWC: INCHES OF WATER COLUMN**



# **CERTIFIED HVAC VENTILATION REPORT**

**DATE: OCTOBER 28, 2020**

**PROJECT:**

**LITTLETON SCHOOL SYSTEM  
MIDDLE SCHOOL  
55 RUSSELL STREET  
LITTLETON, MA 01460**

**CERTIFIED BALANCING FIRM:**

**NETB ASSOCIATES, LLC  
18 HAMPTON ROAD; UNIT 1B  
EXETER, NH 03833**

**TAB CERTIFICATION NUMBER: 15-041-11  
SUPERVISOR: FRANK COLLAMORE**

<b>PROJECT NAME: LITTLETON SCHOOL HVAC VENTILATION</b>	<b>SHEET: 2</b>
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

### INSTRUMENT LIST

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Calibration Due Date</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90551005</b>	<b>05/14/21</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90808010</b>	<b>10/14/21</b>
<b>Rot. Vane Anem.</b>	<b>Testo</b>	<b>417</b>	<b>61436921</b>	<b>04/01/21</b>
<b>Clamp Meter</b>	<b>Fluke</b>	<b>365</b>	<b>15240145</b>	<b>10/14/21</b>
<b>Multi Meter w/ Temp.</b>	<b>Fluke</b>	<b>116</b>	<b>94380621</b>	<b>05/14/21</b>
<b>Tachometer</b>	<b>Stitch</b>	<b>MT-200</b>	<b>B3CB3002</b>	<b>10/14/21</b>
<b>Tachometer</b>	<b>Extech</b>	<b>461995</b>	<b>Q383708</b>	<b>05/14/21</b>
<b>Hydronic Manometer</b>	<b>Alnor</b>	<b>HM670</b>	<b>70734152</b>	<b>05/14/21</b>

Calibration certificates available upon request.

This report is hereby certified to be true & accurate.

Sincerely,

*Frank T. Collamore*

**Frank T. Collamore**

**President**

**NETB Associates, LLC**

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>	<b>SHEET: 3</b>
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

## **REPORT SUMMARY**

### **OBJECTIVE:**

PERFORM OUTSIDE AIRFLOW TESTING ON EXISTING HVAC EQUIPMENT SERVING THE MIDDLE SCHOOL. DETERMINE OUTSIDE AIRFLOW AND VENTILATION RATES OF AREAS.

### **TEST CONDITIONS:**

TESTING PERFORMED DURING NORMAL HOURS. ENE CONTROLS HAVE MAJORITY OF OUTSIDE AIR DAMPERS COMMANDED BETWEEN 40-60% OPEN.

FACILITIES INDICATED THAT FILTERS HAD RECENTLY BEEN REPLACED.

### **SUMMATION:**

ALL HVAC UNITS TESTED HAVE PASSED THE MINIMUM VENTILATION RATES AS DEFINED IN ASHRAE 6.2.2.1.

### **ZONE OUTDOOR AIR QUANTITIES (CFM/ZONE)**

American Society of Heating, Refrigeration and air-conditioning Engineers published a standard known as ASHRAE 6.2.2.1 to specify minimum ventilation rates and air quality that will be acceptable to human occupants.

The minimum outdoor air (Vbz) required is defined as Breathing Zone Outdoor Airflow and can be calculated. See Ashrae Table 6.2.2.1 Table below for additional info:

$Vbz = R_p P_z + R_a A_z$  (Eq.1), where:

Vbz: Breathing Zone Outdoor Airflow (CFM),

Rp: Outdoor air required by person (CFM/Person).

Can be found in Table-1

Pz: The maximum number of people expected to occupy the zone.

Ra: Outdoor air required by unit area (CFM/ft<sup>2</sup>). Can be found in Table-1

Az: The zone area (ft)

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>	<b>SHEET: 4</b>
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

**TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone**  
(This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate $R_p$		Area Outdoor Air Rate $R_a$		Notes	Default Values			Air Class
	cfm/person	L/s person	cfm/ft <sup>2</sup>	L/s·m <sup>2</sup>		Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)		
						#/1000 ft <sup>2</sup> or #/100 m <sup>2</sup>	cfm/person	L/s·person	
Correctional Facilities									
Cell	5	2.5	0.12	0.6		25	10	4.9	2
Dayroom	5	2.5	0.06	0.3		30	7	3.5	1
Guard stations	5	2.5	0.06	0.3		15	9	4.5	1
Booking/waiting	7.5	3.8	0.06	0.3		50	9	4.4	2
Educational Facilities									
Daycare (through age 4)	10	5	0.18	0.9		25	17	8.6	2
Daycare sickroom	10	5	0.18	0.9		25	17	8.6	3
Classrooms (ages 5–8)	10	5	0.12	0.6		25	15	7.4	1
Classrooms (age 9 plus)	10	5	0.12	0.6		35	13	6.7	1
Lecture classroom	7.5	3.8	0.06	0.3		65	8	4.3	1
Lecture hall (fixed seats)	7.5	3.8	0.06	0.3		150	8	4.0	1
Art classroom	10	5	0.18	0.9		20	19	9.5	2
Science laboratories	10	5	0.18	0.9		25	17	8.6	2
University/college laboratories	10	5	0.18	0.9		25	17	8.6	2
Wood/metal shop	10	5	0.18	0.9		20	19	9.5	2
Computer lab	10	5	0.12	0.6		25	15	7.4	1
Media center	10	5	0.12	0.6	A	25	15	7.4	1
Music/theater/dance	10	5	0.06	0.3		35	12	5.9	1
Multiuse assembly	7.5	3.8	0.06	0.3		100	8	4.1	1

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 5</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>TYPE</b>	<b>SIZE (INCHES)</b>	<b>FLOW FACTOR</b>	<b>DESIGN VELOCITY</b>	<b>DESIGN OA CFM</b>	<b>ACTUAL VELOCITY</b>	<b>ACTUAL OA CFM</b>	<b>REMARK CODE</b>
<b>PACKAGED ROOF TOP OUTSIDE AIR SUPPLY</b>									
RTU-1	1	WMS	40X18.5	4.625	195	900	416	1924	-
RTU-2	2	WMS	35X11.5	2.52	228	575	294	741	-

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 6</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT &amp; VENTILATION UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>PACKAGED HEAT/VENT OUTSIDE AIR SUPPLY</b>									
HV-2	1	FAI	33.5X30.5	5.11	157	800	165	843	-
HV-3	2	FAI	52X40	10.4	635	6600	653	6791	-
HV-4	3	FAI	33.5X30.5	5.11	294	1500	300	1533	-
HV-5	4	FAI	33.5X30.5	5.11	294	1500	305	1559	-

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 7</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT &amp; VENTILATION ERV UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>TYPE</b>	<b>SIZE (INCHES)</b>	<b>FLOW FACTOR</b>	<b>DESIGN VELOCITY</b>	<b>DESIGN OA CFM</b>	<b>ACTUAL VELOCITY</b>	<b>ACTUAL OA CFM</b>	<b>REMARK CODE</b>
<b>HEAT/VENT ENERGY RECOVERY UNIT OUTSIDE AIR SUPPLY</b>									
HVERV-1	1	FAI	74.5X31.5	38.0	105	4000	110	4180	-
HVERV-2	2	FAI	74.5X31.5	38.0	105	4000	109	4142	-

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 8</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>UNIT VENTILATOR OUTSIDE AIR SUPPLY</b>									
112	UV-1	FAI	70X15	5.25	95	500	100	525	-
101	UV-2	FAI	70X15	5.25	71	375	76	399	-
102	UV-3	FAI	70X15	5.25	71	375	71	373	-
110	UV-4	FAI	70X15	5.25	71	375	75	394	-
122	UV-5	FAI	70X15	5.25	48	250	51	268	-
165	UV-6	FAI	70X15	5.25	71	375	73	383	-
150	UV-7	FAI	70X15	5.25	95	500	92	483	-
113	UV-8	FAI	70X15	5.25	43	225	45	236	-
111	UV-9	FAI	70X15	5.25	71	375	72	378	-
104	UV-10	FAI	70X15	5.25	95	500	99	520	-
103	UV-11	FAI	70X15	5.25	71	375	74	389	-
161	UV-12	OAD	16X8	0.89	157	140	175	156	-
202	UV-13	FAI	70X15	5.25	71	375	70	368	-
210	UV-14	FAI	70X15	5.25	71	375	75	394	-
212	UV-15	FAI	70X15	5.25	71	375	76	399	-
219	UV-16	FAI	70X15	5.25	43	225	46	242	-
230	UV-17	FAI	70X15	5.25	71	375	72	378	-
231	UV-18	FAI	70X15	5.25	71	375	75	394	-
232	UV-19	FAI	70X15	5.25	71	375	73	383	-
235	UV-20	FAI	70X15	5.25	71	375	70	368	-
256	UV-21	FAI	70X15	5.25	71	375	78	410	-
242	UV-22	FAI	70X15	5.25	95	500	98	515	-
240	UV-23	OAD	20X10	1.4	357	500	372	521	-
209	UV-24	FAI	70X15	5.25	71	375	74	389	-
204	UV-25	OAD	20X10	1.4	357	500	376	526	-



# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 9</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>TYPE</b>	<b>SIZE (INCHES)</b>	<b>FLOW FACTOR</b>	<b>DESIGN VELOCITY</b>	<b>DESIGN OA CFM</b>	<b>ACTUAL VELOCITY</b>	<b>ACTUAL OA CFM</b>	<b>REMARK CODE</b>
<b>UNIT VENTILATOR OUTSIDE AIR SUPPLY</b>									
203	UV-26	FAI	70X15	5.25	71	375	74	389	-
201	UV-27	FAI	70X15	5.25	71	375	77	404	-
244	UV-28	FAI	70X15	5.25	38	200	42	221	-
139	UV-29	OAD	20X10	1.4	286	400	305	427	-
139	UV-30	OAD	20X10	1.4	286	400	302	423	-
171	UV-31	OAD	20X10	1.4	286	400	298	417	-
204	UV-32	FAI	70X15	5.25	71	375	74	389	-
223	UV-33	FAI	70X15	5.25	71	375	76	399	-

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 10</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED ROOF TOP UNITS</b>									
RTU-1	1	5	25	0.12	2625	440	1924	3.67	PASS
RTU-2	2	5	25	0.12	1850	347	741	2.67	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 11</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT &amp; VENTILATION UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED HEAT/VENT UNITS</b>									
HV-2	1	10	25	0.12	1342	411	843	3.77	PASS
HV-3	2	7.5	25	0.18	4588	1014	6791	4.44	PASS
HV-4	3	20	25	0.18	1150	707	1553	8.1	PASS
HV-5	4	20	25	0.18	1150	707	1559	8.13	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 12</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT/VENT ENERGY RECOVERY UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>HEAT/VENT ENERGY RECOVERY UNITS</b>									
HVERV-1	1	7.5	25	0.18	3950	899	4180	2.11	PASS
HVERV-2	2	7.5	25	0.18	3950	899	4142	2.1	PASS

# ROOM VENTILATION TEST SHEET

PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION								SHEET: 13	
PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460								DATE: 10/28/20	
SYSTEM: EXISTING UNIT VENTILATOR									
LOCATION	CODE #	Rp	Pz	Ra	Az	DESIGN Vbz	ACTUAL Vbz	ACTUAL OSA ACH	PASS/ FAIL
UNIT VENTILATORS									
112	UV-1	10	25	0.12	935	362	525	3.74	PASS
101	UV-2	10	25	0.12	970	366	399	2.74	PASS
102	UV-3	10	25	0.12	965	366	373	2.6	PASS
110	UV-4	10	25	0.12	935	362	394	2.8	PASS
122	UV-5	10	25	0.12	460	305	268	3.9	PASS
165	UV-6	10	25	0.12	1000	370	383	2.55	PASS
150	UV-7	10	25	0.12	1295	405	483	2.5	PASS
113	UV-8	5	10	0.12	535	114	236	2.94	PASS
111	UV-9	10	25	0.12	980	367	378	2.57	PASS
104	UV-10	10	25	0.12	1215	396	520	2.85	PASS
103	UV-11	10	25	0.12	985	368	389	2.63	PASS
161	UV-12	10	5	0.12	715	136	156	1.45	PASS
202	UV-13	10	25	0.12	870	354	368	2.82	PASS
210	UV-14	10	25	0.12	800	346	394	3.28	PASS
212	UV-15	10	25	0.12	900	358	399	2.96	PASS
219	UV-16	7.5	10	0.12	900	183	242	1.8	PASS
230	UV-17	10	25	0.12	910	359	378	2.77	PASS
231	UV-18	10	25	0.12	910	359	394	2.88	PASS
232	UV-19	10	25	0.12	875	355	383	2.91	PASS
235	UV-20	10	25	0.12	875	355	368	2.8	PASS
256	UV-21	10	25	0.12	1155	359	410	2.37	PASS
242	UV-22	10	25	0.12	1370	414	515	2.5	PASS
240	UV-23	10	25	0.12	1295	405	521	2.68	PASS
209	UV-24	10	25	0.12	800	346	389	3.24	PASS
204	UV-25	10	25	0.12	1120	384	526	3.13	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: LITTLETON MIDDLE SCHOOL HVAC VENTILATION</b>								<b>SHEET: 14</b>	
<b>PROJECT LOCATION: 55 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>UNIT VENTILATORS</b>									
203	UV-26	10	25	0.12	870	354	389	2.98	PASS
201	UV-27	10	25	0.12	935	362	404	2.88	PASS
244	UV-28	10	10	0.12	575	169	221	2.56	PASS
139	UV-29	10	25	0.12	900	358	427	3.16	PASS
139	UV-30	10	25	0.12	900	358	423	3.13	PASS
171	UV-31	10	25	0.12	990	370	417	2.8	PASS
204	UV-32	10	25	0.12	1050	376	389	2.47	PASS
223	UV-33	10	25	0.12	1050	376	399	2.53	PASS

# **SYSTEM NOTE SHEET**

- A. VOLUME DAMPER LEFT OPEN**
- B. VOLUME DAMPER ADJUSTED**
- C. REGISTER OR GRILLE DAMPER OPEN**
- D. REGISTER OR GRILLE DAMPER ADJUSTED**
- E. NO VOLUME DAMPER**
- F. NO REGISTER OR GRILLE DAMPER**
- G. DIFFUSER, REGISTER OR GRILLE MISSING**
- H. AHU OUTSIDE AIR DAMPER COMMANDED TO 40% OPEN**

**OA: OUTSIDE AIR**

**FAI: UNIT FRESH AIR INLET**

**OAD: OUTSIDE AIR DUCT**

**EIF: ECONOMIZER INLET FILTER**

**RGD: REGISTER, GRILLE, DIFFUSER**

**FH: READINGS TAKEN WITH FLOW HOOD**

**I.A.: INACCESSABLE**

**N.A: NOT APPLICABLE**

**N.I.: NOT INSTALLED**

**N.S.: NOT SPECIFIED, NO DESIGN CRITERIA PROVIDED**

**%: PERCENT OF UNIT DESIGN**

**IWC: INCHES OF WATER COLUMN**

# **CERTIFIED HVAC VENTILATION REPORT**

**DATE: OCTOBER 28, 2020**

**PROJECT:**

**LITTLETON SCHOOL SYSTEM  
RUSSELL STREET ELEMENTARY  
57 RUSSELL STREET  
LITTLETON, MA 01460**

**CERTIFIED BALANCING FIRM:**

**NETB ASSOCIATES, LLC  
18 HAMPTON ROAD; UNIT 1B  
EXETER, NH 03833**

**TAB CERTIFICATION NUMBER: 15-041-11  
SUPERVISOR: FRANK COLLAMORE**



<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>	<b>SHEET: 2</b>
<b>PROJECT LOCATION: 55 KING ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

### INSTRUMENT LIST

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Calibration Due Date</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90551005</b>	<b>05/14/21</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90808010</b>	<b>10/14/21</b>
<b>Rot. Vane Anem.</b>	<b>Testo</b>	<b>417</b>	<b>61436921</b>	<b>04/01/21</b>
<b>Clamp Meter</b>	<b>Fluke</b>	<b>365</b>	<b>15240145</b>	<b>10/14/21</b>
<b>Multi Meter w/ Temp.</b>	<b>Fluke</b>	<b>116</b>	<b>94380621</b>	<b>05/14/21</b>
<b>Tachometer</b>	<b>Stitch</b>	<b>MT-200</b>	<b>B3CB3002</b>	<b>10/14/21</b>
<b>Tachometer</b>	<b>Extech</b>	<b>461995</b>	<b>Q383708</b>	<b>05/14/21</b>
<b>Hydronic Manometer</b>	<b>Alnor</b>	<b>HM670</b>	<b>70734152</b>	<b>05/14/21</b>

Calibration certificates available upon request.

This report is hereby certified to be true & accurate.

Sincerely,

*Frank T. Collamore*

Frank T. Collamore

President

NETB Associates, LLC

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>	<b>SHEET: 3</b>
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

## **REPORT SUMMARY**

### **OBJECTIVE:**

PERFORM OUTSIDE AIRFLOW TESTING ON EXISTING HVAC EQUIPMENT SERVING THE RUSSELL STREET SCHOOL. DETERMINE OUTSIDE AIRFLOW AND VENTILATION RATES OF AREAS.

### **TEST CONDITIONS:**

TESTING PERFORMED DURING NORMAL HOURS. ENE CONTROLS HAVE MAJORITY OF OUTSIDE AIR DAMPERS COMMANDED BETWEEN 40-60% OPEN.

FACILITIES INDICATED THAT FILTERS HAD RECENTLY BEEN REPLACED.

### **SUMMATION:**

ALL HVAC UNITS TESTED HAVE PASSED THE MINIMUM VENTILATION RATES AS DEFINED IN ASHRAE 6.2.2.1.

### **ZONE OUTDOOR AIR QUANTITIES (CFM/ZONE)**

American Society of Heating, Refrigeration and air-conditioning Engineers published a standard known as ASHRAE 6.2.2.1 to specify minimum ventilation rates and air quality that will be acceptable to human occupants.

The minimum outdoor air (Vbz) required is defined as Breathing Zone Outdoor Airflow and can be calculated. See Ashrae Table 6.2.2.1 Table below for additional info:

$V_{bz} = R_p P_z + R_a A_z$  (Eq.1), where:

Vbz: Breathing Zone Outdoor Airflow (CFM),

Rp: Outdoor air required by person (CFM/Person).

Can be found in Table-1

Pz: The maximum number of people expected to occupy the zone.

Ra: Outdoor air required by unit area (CFM/ft<sup>2</sup>). Can be found in Table-1

Az: The zone area (ft)

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>	<b>SHEET: 4</b>
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

**TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone**  
(This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate $R_p$		Area Outdoor Air Rate $R_a$		Notes	Default Values			Air Class
	cfm/person	L/s/person	cfm/ft <sup>2</sup>	L/s-m <sup>2</sup>		Occupant Density (see Note 4)  #/1000 ft <sup>2</sup> or #/100 m <sup>2</sup>	Combined Outdoor Air Rate (see Note 5)		
							cfm/person	L/s/person	
<b>Correctional Facilities</b>									
Cell	5	2.5	0.12	0.6		25	10	4.9	2
Dayroom	5	2.5	0.06	0.3		30	7	3.5	1
Guard stations	5	2.5	0.06	0.3		15	9	4.5	1
Booking/waiting	7.5	3.8	0.06	0.3		50	9	4.4	2
<b>Educational Facilities</b>									
Daycare (through age 4)	10	5	0.18	0.9		25	17	8.6	2
Daycare sickroom	10	5	0.18	0.9		25	17	8.6	3
Classrooms (ages 5–8)	10	5	0.12	0.6		25	15	7.4	1
Classrooms (age 9 plus)	10	5	0.12	0.6		35	13	6.7	1
Lecture classroom	7.5	3.8	0.06	0.3		65	8	4.3	1
Lecture hall (fixed seats)	7.5	3.8	0.06	0.3		150	8	4.0	1
Art classroom	10	5	0.18	0.9		20	19	9.5	2
Science laboratories	10	5	0.18	0.9		25	17	8.6	2
University/college laboratories	10	5	0.18	0.9		25	17	8.6	2
Wood/metal shop	10	5	0.18	0.9		20	19	9.5	2
Computer lab	10	5	0.12	0.6		25	15	7.4	1
Media center	10	5	0.12	0.6	A	25	15	7.4	1
Music/theater/dance	10	5	0.06	0.3		35	12	5.9	1
Multiuse assembly	7.5	3.8	0.06	0.3		100	8	4.1	1

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 5</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>AHU-1 OUTSIDE AIR SUPPLY</b>									
ROOF	1	FAI	46X14	4.6	NS	NS	607	2792	-
ROOF	2	FAI	46X14	4.6	NS	NS	594	2732	-
				TOTAL		4900		5524	
<b>AHU-2 OUTSIDE AIR SUPPLY</b>									
ROOF	1	FAI	46X14	4.6	NS	NS	686	3156	-
ROOF	2	FAI	46X14	4.6	NS	NS	691	3179	-
				TOTAL		6000		6335	

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 6</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT/VENT UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>HV-1 OUTSIDE AIR SUPPLY</b>									
B131	1	FAI	56X28	7.84	306	2400	320	2509	-
				TOTAL		2400		2509	
<b>HV-2 OUTSIDE AIR SUPPLY</b>									
B131	1	FAI	56X28	7.84	306	2400	325	2548	-
				TOTAL		2400		2548	

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 7</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>FIRST FLOOR UNIT VENTILATORS</b>									
101	1	FAI	56X12	3.36	149	500	155	521	-
102	2	FAI	56X12	3.36	149	500	159	534	-
103	3	FAI	56X12	3.36	149	500	151	507	-
104	4	FAI	56X12	3.36	179	600	190	638	-
105	5	FAI	56X12	3.36	179	600	186	625	-
106	6	FAI	56X12	3.36	89	300	94	316	-
108	7	FAI	56X12	3.36	179	600	185	622	-
109	8	FAI	56X12	3.36	149	500	156	524	-
113	9	FAI	56X12	3.36	112	375	120	403	-
123	10	FAI	56X12	3.36	112	375	117	393	-
125	11	FAI	56X12	3.36	112	375	114	383	-
111	12	FAI	56X12	3.36	179	600	185	622	-
127	13	FAI	56X12	3.36	112	375	119	400	-
128	14	FAI	56X12	3.36	112	375	121	407	-
130	15	FAI	56X12	3.36	149	500	156	524	-
140C	16	FAI	56X12	3.36	89	300	95	319	-
135	17	FAI	56X12	3.36	179	600	182	612	-
139	18	FAI	56X12	3.36	179	600	186	625	-

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 8</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>SECOND FLOOR UNIT VENTILATORS</b>									
201	19	FAI	56X12	3.36	149	500	155	521	-
202	20	FAI	56X12	3.36	149	500	158	531	-
203	21	FAI	56X12	3.36	89	300	95	319	-
203	22	FAI	56X12	3.36	89	300	93	313	-
204	23	FAI	56X12	3.36	89	300	92	309	-
204	24	FAI	56X12	3.36	89	300	94	316	-
205	25	FAI	56X12	3.36	89	300	95	319	-
205	26	FAI	56X12	3.36	89	300	96	323	-
206	27	FAI	56X12	3.36	89	300	94	316	-
206	28	FAI	56X12	3.36	89	300	94	316	-
208	29	FAI	56X12	3.36	89	300	93	313	-
208	30	FAI	56X12	3.36	89	300	92	309	-
209	31	FAI	56X12	3.36	149	500	152	511	-
214	32	FAI	56X12	3.36	149	500	157	528	-
216	33	FAI	56X12	3.36	149	500	156	524	-
218	34	FAI	56X12	3.36	149	500	159	534	-
216	35	FAI	56X12	3.36	89	300	95	319	-
217	36	FAI	56X12	3.36	119	400	125	420	-
219	37	FAI	56X12	3.36	149	500	156	524	-
221	38	FAI	56X12	3.36	149	500	159	534	-
220	39	FAI	56X12	3.36	149	500	155	521	-
222	40	FAI	56X12	3.36	149	500	152	511	-
223	41	FAI	56X12	3.36	89	300	93	315	-

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 9</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED ROOF TOP AC UNITS</b>									
ROOF	AHU-1	10	25	0.12	6675	1050	5524	5.51	PASS
ROOF	AHU-2	7.5	100	0.18	3120	1125	6335	3.0	PASS



# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 10</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT/VENT UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED HEAT/VENT UNITS</b>									
GYM	HV-1	20	25	0.18	3330	1100	2509	2.26	PASS
GYM	HV-2	20	25	0.18	3330	1100	2548	2.3	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 11</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>FIRST FLOOR UNIT VENTILATORS</b>									
101	1	10	25	0.12	900	358	521	3.86	PASS
102	2	10	25	0.12	900	358	534	3.96	PASS
103	3	10	25	0.12	900	358	507	3.76	PASS
104	4	10	25	0.12	900	358	638	4.73	PASS
105	5	10	25	0.12	900	358	625	4.63	PASS
106	6	10	25	0.12	450	304	316	4.68	PASS
108	7	10	25	0.12	900	358	622	4.61	PASS
109	8	10	25	0.12	900	358	524	3.88	PASS
113	9	10	25	0.12	900	358	403	2.99	PASS
123	10	10	25	0.12	900	358	393	2.91	PASS
125	11	10	25	0.12	900	358	383	2.84	PASS
111	12	10	25	0.12	900	358	622	4.61	PASS
127	13	10	25	0.12	900	358	400	2.96	PASS
128	14	10	25	0.12	900	358	407	3.01	PASS
130	15	10	25	0.12	900	358	524	3.88	PASS
140C	16	10	25	0.12	450	304	319	4.73	PASS
135	17	10	25	0.12	900	358	612	4.53	PASS
139	18	10	25	0.12	900	358	625	4.63	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: RUSSELL STREET HVAC VENTILATION</b>								<b>SHEET: 12</b>	
<b>PROJECT LOCATION: 57 RUSSELL ST.; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>SECOND LEVEL UNIT VENTILATORS</b>									
201	19	10	25	0.12	905	359	521	3.84	PASS
202	20	10	25	0.12	905	359	531	3.91	PASS
203	21	10	25	0.12	900	358	632	4.68	PASS
204	22	10	25	0.12	900	358	625	4.63	PASS
205	23	10	25	0.12	900	358	642	4.76	PASS
206	24	10	25	0.12	900	358	632	4.68	PASS
208	25	10	25	0.12	900	358	622	4.61	PASS
209	26	10	25	0.12	1025	373	511	3.32	PASS
214	27	10	25	0.12	905	359	528	3.89	PASS
216	28	10	25	0.12	905	359	524	3.86	PASS
218	29	10	25	0.12	905	359	534	3.93	PASS
216A	30	10	25	0.12	450	304	319	4.73	PASS
217	31	10	25	0.12	900	358	420	3.11	PASS
219	32	10	25	0.12	900	358	524	3.88	PASS
221	33	10	25	0.12	900	358	534	3.96	PASS
220	34	10	25	0.12	900	358	521	3.86	PASS
222	35	10	25	0.12	900	358	511	3.79	PASS
223	36	10	25	0.12	450	304	315	4.67	PASS

# **SYSTEM NOTE SHEET**

- A. VOLUME DAMPER LEFT OPEN**
- B. VOLUME DAMPER ADJUSTED**
- C. REGISTER OR GRILLE DAMPER OPEN**
- D. REGISTER OR GRILLE DAMPER ADJUSTED**
- E. NO VOLUME DAMPER**
- F. NO REGISTER OR GRILLE DAMPER**
- G. DIFFUSER, REGISTER OR GRILLE MISSING**
- H.**

**OA: OUTSIDE AIR**

**RG: RETURN GRILLE**

**SAD: SUPPLY AIR DUCT**

**FAI: UNIT FRESH AIR INTLET**

**WMS: WIRE MESH SCREEN**

**OAD: OUTSIDE AIR DUCT**

**RGD: REGISTER, GRILLE, DIFFUSER**

**FH: READINGS TAKEN WITH FLOW HOOD**

**I.A.: INACCESSABLE**

**N.A: NOT APPLICABLE**

**N.I.: NOT INSTALLED**

**N.S.: NOT SPECIFIED, NO DESIGN CRITERIA PROVIDED**

**%. PERCENT OF UNIT DESIGN**

**IWC: INCHES OF WATER COLUMN**

# **CERTIFIED HVAC VENTILATION REPORT**

**DATE: OCTOBER 28, 2020**

**PROJECT:**

**LITTLETON SCHOOL SYSTEM  
SHAKER LANE ELEMENTARY  
35 SHAKER LANE  
LITTLETON, MA 01460**

**CERTIFIED BALANCING FIRM:**

**NETB ASSOCIATES, LLC  
18 HAMPTON ROAD; UNIT 1B  
EXETER, NH 03833**

**TAB CERTIFICATION NUMBER: 15-041-11  
SUPERVISOR: FRANK COLLAMORE**

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>	<b>SHEET: 2</b>
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

### INSTRUMENT LIST

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Calibration Due Date</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90551005</b>	<b>05/14/21</b>
<b>Balometer</b>	<b>Alnor</b>	<b>EBT-721</b>	<b>90808010</b>	<b>10/14/21</b>
<b>Rot. Vane Anem.</b>	<b>Testo</b>	<b>417</b>	<b>61436921</b>	<b>04/01/21</b>
<b>Clamp Meter</b>	<b>Fluke</b>	<b>365</b>	<b>15240145</b>	<b>10/14/21</b>
<b>Multi Meter w/ Temp.</b>	<b>Fluke</b>	<b>116</b>	<b>94380621</b>	<b>05/14/21</b>
<b>Tachometer</b>	<b>Stitch</b>	<b>MT-200</b>	<b>B3CB3002</b>	<b>10/14/21</b>
<b>Tachometer</b>	<b>Extech</b>	<b>461995</b>	<b>Q383708</b>	<b>05/14/21</b>
<b>Hydronic Manometer</b>	<b>Alnor</b>	<b>HM670</b>	<b>70734152</b>	<b>05/14/21</b>

Calibration certificates available upon request.

This report is hereby certified to be true & accurate.

Sincerely,

*Frank T. Collamore*

**Frank T. Collamore**

**President**

**NETB Associates, LLC**

PROJECT NAME: SHAKER LANE HVAC VENTILATION	SHEET: 3
PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460	DATE: 10/28/20

## REPORT SUMMARY

### **OBJECTIVE:**

PERFORM OUTSIDE AIRFLOW TESTING ON EXISTING HVAC EQUIPMENT SERVING THE SHAKER LANE ELEMENTARY SCHOOL. DETERMINE OUTSIDE AIRFLOW AND VENTILATION RATES OF AREAS.

### **TEST CONDITIONS:**

TESTING PERFORMED DURING NORMAL HOURS. ENE CONTROLS HAVE MAJORITY OF OUTSIDE AIR DAMPERS COMMANDED BETWEEN 40-60% OPEN.

FACILITIES INDICATED THAT FILTERS HAD RECENTLY BEEN REPLACED.

### **SUMMATION:**

ALL HVAC UNITS TESTED HAVE PASSED THE MINIMUM VENTILATION RATES AS DEFINED IN ASHRAE 6.2.2.1.

### ZONE OUTDOOR AIR QUANTITIES (CFM/ZONE)

American Society of Heating, Refrigeration and air-conditioning Engineers published a standard known as ASHRAE 6.2.2.1 to specify minimum ventilation rates and air quality that will be acceptable to human occupants.

The minimum outdoor air (Vbz) required is defined as Breathing Zone Outdoor Airflow and can be calculated. See Ashrae Table 6.2.2.1 Table below for additional info:

$V_{bz} = R_p P_z + R_a A_z$  (Eq.1), where:

Vbz: Breathing Zone Outdoor Airflow (CFM),

Rp: Outdoor air required by person (CFM/Person).

Can be found in Table-1

Pz: The maximum number of people expected to occupy the zone.

Ra: Outdoor air required by unit area (CFM/ft<sup>2</sup>). Can be found in Table-1

Az: The zone area (ft)

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>	<b>SHEET: 4</b>
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>	<b>DATE: 10/28/20</b>

**TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone**  
(This table is not valid in isolation; it must be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate $R_p$		Area Outdoor Air Rate $R_a$		Notes	Default Values			Air Class
	cfm/person	L/s-person	cfm/ft <sup>2</sup>	L/s-m <sup>2</sup>		Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)		
						#/1000 ft <sup>2</sup> or #/100 m <sup>2</sup>	cfm/person	L/s/person	
Correctional Facilities									
Cell	5	2.5	0.12	0.6		25	10	4.9	2
Dayroom	5	2.5	0.06	0.3		30	7	3.5	1
Guard stations	5	2.5	0.06	0.3		15	9	4.5	1
Booking/waiting	7.5	3.8	0.06	0.3		50	9	4.4	2
Educational Facilities									
Daycare (through age 4)	10	5	0.18	0.9		25	17	8.6	2
Daycare sickroom	10	5	0.18	0.9		25	17	8.6	3
Classrooms (ages 5–8)	10	5	0.12	0.6		25	15	7.4	1
Classrooms (age 9 plus)	10	5	0.12	0.6		35	13	6.7	1
Lecture classroom	7.5	3.8	0.06	0.3		65	8	4.3	1
Lecture hall (fixed seats)	7.5	3.8	0.06	0.3		150	8	4.0	1
Art classroom	10	5	0.18	0.9		20	19	9.5	2
Science laboratories	10	5	0.18	0.9		25	17	8.6	2
University/college laboratories	10	5	0.18	0.9		25	17	8.6	2
Wood/metal shop	10	5	0.18	0.9		20	19	9.5	2
Computer lab	10	5	0.12	0.6		25	15	7.4	1
Media center	10	5	0.12	0.6	A	25	15	7.4	1
Music/theater/dance	10	5	0.06	0.3		35	12	5.9	1
Multiuse assembly	7.5	3.8	0.06	0.3		100	8	4.1	1



# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 5</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>RTU-1 OUTSIDE AIR SUPPLY</b>									
ROOF	1	FAI	40X30	6.0	NS	NS	528	3168	H
ROOF	2	FAI	40X30	6.0	NS	NS	498	2988	H
				TOTAL		6000		6256	
<b>RTU-2 OUTSIDE AIR SUPPLY</b>									
ROOF	1	FAI	58X40	11.6	NS	640	72	835	-
				TOTAL		640		835	

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 6</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT/VENT UNIT</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>HUV-1 OUTSIDE AIR SUPPLY</b>									
GYM	1	WMS	74X18	1.0	NS	NS	FH	1816	H
				TOTAL		NS		1816	
<b>HUV-2 OUTSIDE AIR SUPPLY</b>									
NURSE	1	OAD	24X3	0.5	240	120	778	389	H
				TOTAL		120		389	
<b>HUV-3 OUTSIDE AIR SUPPLY</b>									
116	1	FAI	16X10	1.0	250	250	FH	384	H
				TOTAL		250		384	
<b>HUV-4 OUTSIDE AIR SUPPLY</b>									
117/118	1	FAI	16X10	1.0	250	250	FH	398	H
				TOTAL		250		398	

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 7</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>FIRST FLOOR UNIT VENTILATOR OUTSIDE AIR SUPPLY</b>									
100	1	FAI	60X10	1.0	450	450	FH	524	H
101	2	FAI	60X10	1.0	450	450	FH	518	H
102	3	FAI	60X10	1.0	450	450	FH	475	H
103	4	FAI	60X10	1.0	450	450	FH	523	-
104	5	FAI	60X10	1.0	450	450	FH	533	-
105	6	FAI	46X10	1.0	450	450	FH	561	-
106	7	FAI	46X10	1.0	450	450	FH	542	-
107	8	FAI	46X10	1.0	450	450	FH	497	-
108	9	FAI	46X10	1.0	450	450	FH	506	-
109	10	FAI	46X10	1.0	450	450	FH	528	-
110	11	FAI	46X10	1.0	450	450	FH	563	-
111	12	FAI	46X10	1.0	450	450	FH	540	-
112	13	FAI	46X10	1.0	450	450	FH	562	-
113	14	FAI	46X10	1.0	450	450	FH	497	-
114	15	FAI	46X10	1.0	450	450	FH	523	-
115	16	FAI	46X10	1.0	450	450	FH	538	-
FACULTY	17	FAI	36X10	1.0	250	250	FH	333	H

# OUTSIDE AIR TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 8</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
LOCATION	CODE #	TYPE	SIZE (INCHES)	FLOW FACTOR	DESIGN VELOCITY	DESIGN OA CFM	ACTUAL VELOCITY	ACTUAL OA CFM	REMARK CODE
<b>SECOND LEVEL UNIT VENTILATOR OUTSIDE AIR SUPPLY</b>									
201	18	FAI	46X10	1.0	450	450	FH	488	H
202	19	FAI	46X10	1.0	450	450	FH	525	-
203	20	FAI	46X10	1.0	450	450	FH	512	-
204	21	FAI	46X10	1.0	450	450	FH	543	-
205	22	FAI	46X10	1.0	450	450	FH	489	-
206	23	FAI	46X10	1.0	450	450	FH	497	-
207	24	FAI	46X10	1.0	450	450	FH	516	-
208	25	FAI	46X10	1.0	450	450	FH	552	-
209	26	FAI	46X10	1.0	450	450	FH	537	-
210	27	FAI	46X10	1.0	450	450	FH	521	-
211	28	FAI	46X10	1.0	450	450	FH	504	-
212	29	FAI	46X10	1.0	450	450	FH	496	-
213	30	FAI	60X10	1.0	450	450	FH	519	-
CONF. RM	31	FAI	24X10	1.0	300	300	FH	354	H

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 9</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING ROOF TOP UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>PACKAGED ROOF TOP AC UNITS</b>									
ROOF	RTU-1	7.5	100	0.18	3860	1445	6256	7.3	PASS
ROOF	RTU-2	7.5	25	0.18	1625	480	835	2.71	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 10</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING HEAT/VENT UNIT</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>HEAT/VENT UNITS</b>									
GYM	HUV-1	20	25	0.18	2560	961	1816	2.13	PASS
NURSE	HUV-2	10	25	0.12	625	325	389	4.15	PASS
116	HUV-3	10	25	0.12	900	358	384	2.84	PASS
117/118	HUV-4	10	25	0.12	650	330	398	4.08	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 11</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>FIRST FLOOR UNIT VENTILATORS</b>									
100	1	10	25	0.12	1200	394	524	2.91	PASS
101	2	10	25	0.12	1335	410	518	2.59	PASS
102	3	10	25	0.12	1200	394	475	2.64	PASS
103	4	10	25	0.12	1200	394	523	2.91	PASS
104	5	10	25	0.12	1335	410	533	2.67	PASS
105	6	10	25	0.12	1200	394	561	3.11	PASS
106	7	10	25	0.12	900	358	542	4.01	PASS
107	8	10	25	0.12	900	358	497	3.68	PASS
108	9	10	25	0.12	900	358	506	3.75	PASS
109	10	10	25	0.12	900	358	528	3.91	PASS
110	11	10	25	0.12	900	358	563	4.14	PASS
111	12	10	25	0.12	900	358	540	4.0	PASS
112	13	10	25	0.12	900	358	562	4.16	PASS
113	14	10	25	0.12	900	358	497	3.68	PASS
114	15	10	25	0.12	900	358	523	3.87	PASS
115	16	10	25	0.12	900	358	538	3.99	PASS
FACULTY	17	10	25	0.12	450	304	333	4.93	PASS

# ROOM VENTILATION TEST SHEET

<b>PROJECT NAME: SHAKER LANE HVAC VENTILATION</b>								<b>SHEET: 12</b>	
<b>PROJECT LOCATION: 35 SHAKER LANE; LITTLETON, MA 01460</b>								<b>DATE: 10/28/20</b>	
<b>SYSTEM: EXISTING UNIT VENTILATOR</b>									
<b>LOCATION</b>	<b>CODE #</b>	<b>Rp</b>	<b>Pz</b>	<b>Ra</b>	<b>Az</b>	<b>DESIGN Vbz</b>	<b>ACTUAL Vbz</b>	<b>ACTUAL OSA ACH</b>	<b>PASS/ FAIL</b>
<b>SECOND LEVEL UNIT VENTILATORS</b>									
201	18	10	25	0.06	750	340	488	4.34	PASS
202	19	10	25	0.12	900	358	525	3.89	PASS
203	20	10	25	0.12	900	358	512	3.79	PASS
204	21	10	25	0.12	900	358	543	4.02	PASS
205	22	10	25	0.12	900	358	489	3.62	PASS
206	23	10	25	0.12	900	358	497	3.68	PASS
207	24	10	25	0.12	900	358	516	3.82	PASS
208	25	10	25	0.12	900	358	552	4.09	PASS
209	26	10	25	0.12	900	358	537	3.98	PASS
210	27	10	25	0.12	900	358	521	3.86	PASS
211	28	10	25	0.12	900	358	504	3.73	PASS
212	29	10	25	0.12	900	358	496	3.67	PASS
213	30	10	25	0.12	900	358	519	3.84	PASS
CONF. RM	31	10	25	0.12	450	304	354	5.24	PASS



## **SYSTEM NOTE SHEET**

- A. VOLUME DAMPER LEFT OPEN**
- B. VOLUME DAMPER ADJUSTED**
- C. REGISTER OR GRILLE DAMPER OPEN**
- D. REGISTER OR GRILLE DAMPER ADJUSTED**
- E. NO VOLUME DAMPER**
- F. NO REGISTER OR GRILLE DAMPER**
- G. DIFFUSER, REGISTER OR GRILLE MISSING**
- H. UNABLE TO ADJUST MIXED AIR DAMPER SETPOINT THROUGH BMS OR LOCAL CONTROL AT UNIT. MIXED AIR DAMPERS MANUALLY OPENED FOR TESTING.**

**OA: OUTSIDE AIR**

**RG: RETURN GRILLE**

**SAD: SUPPLY AIR DUCT**

**FAI: UNIT FRESH AIR INTLET**

**WMS: WIRE MESH SCREEN**

**OAD: OUTSIDE AIR DUCT**

**RGD: REGISTER, GRILLE, DIFFUSER**

**FH: READINGS TAKEN WITH FLOW HOOD**

**I.A.: INACCESSABLE**

**N.A: NOT APPLICABLE**

**N.I.: NOT INSTALLED**

**N.S.: NOT SPECIFIED, NO DESIGN CRITERIA PROVIDED**

**%: PERCENT OF UNIT DESIGN**

**IWC: INCHES OF WATER COLUMN**

# Policy For Returning to In-person Learning After Thanksgiving Break

Prior to the Thanksgiving break the District will ask all families of hybrid/onsite learners to complete and submit an online or paper form attesting to the following:

During the break individuals residing in the household will avoid travel to locations other than low-risk states. (Low-risk states are defined per Massachusetts guidelines found at <https://www.mass.gov/info-details/covid-19-travel-order#lower-risk-states->.)

During the break, individuals residing in the household will avoid participating in any social gatherings that violate Massachusetts guidelines regarding such gatherings (<https://www.mass.gov/info-details/covid-19-state-of-emergency#limits-on-gatherings->)

If a family declines to so certify – or elects not to complete and submit the form, students in that family will not be permitted to participate as in-person learners (a) for 14 calendar days after school resumes at the end of the break or (b) until they provide proof of a negative test result for COVID-19 for such students. The test must be administered on or after three calendar days have passed following the resumption of school at the end of the break. Until then, these students may participate remotely.

# **Policy For Returning to In-person Learning After Thanksgiving Break**

**Failure in completing and submitting form PRIOR to Thanksgiving Break**

**OR**

**Failure to attest to limiting travel to low-risk states**

**OR**

**Failure to attest to adhering to guidelines regarding social gatherings**

**MEANS**

**Students will be required to be remote learners until:**

- **12/14 (two weeks)**
- **Provide results of a negative COVID test administered no earlier than 12/3**

# **Policy For Returning to In-person Learning After Thanksgiving Break**

**Two weeks of remote learning is reasonable timeframe to determine if anyone in student's family contracted virus**

**COVID test administered no earlier than 12/3 allows three days after break for potential virus to incubate and show up on test**