

H.V.A.C Updates

(HEATING, VENTILATION, & AIR
CONDITIONING)

HVAC Updates

HVAC in the
Context of
COVID19

HVAC Design
&
Performance

SMCDSB HVAC
Activities
through
COVID19

The Purpose of HVAC Systems

The main purposes of a Heating, Ventilation and Air-Conditioning (HVAC) system are to help maintain good indoor air quality through:

- adequate ventilation
- filtration and
- thermal comfort

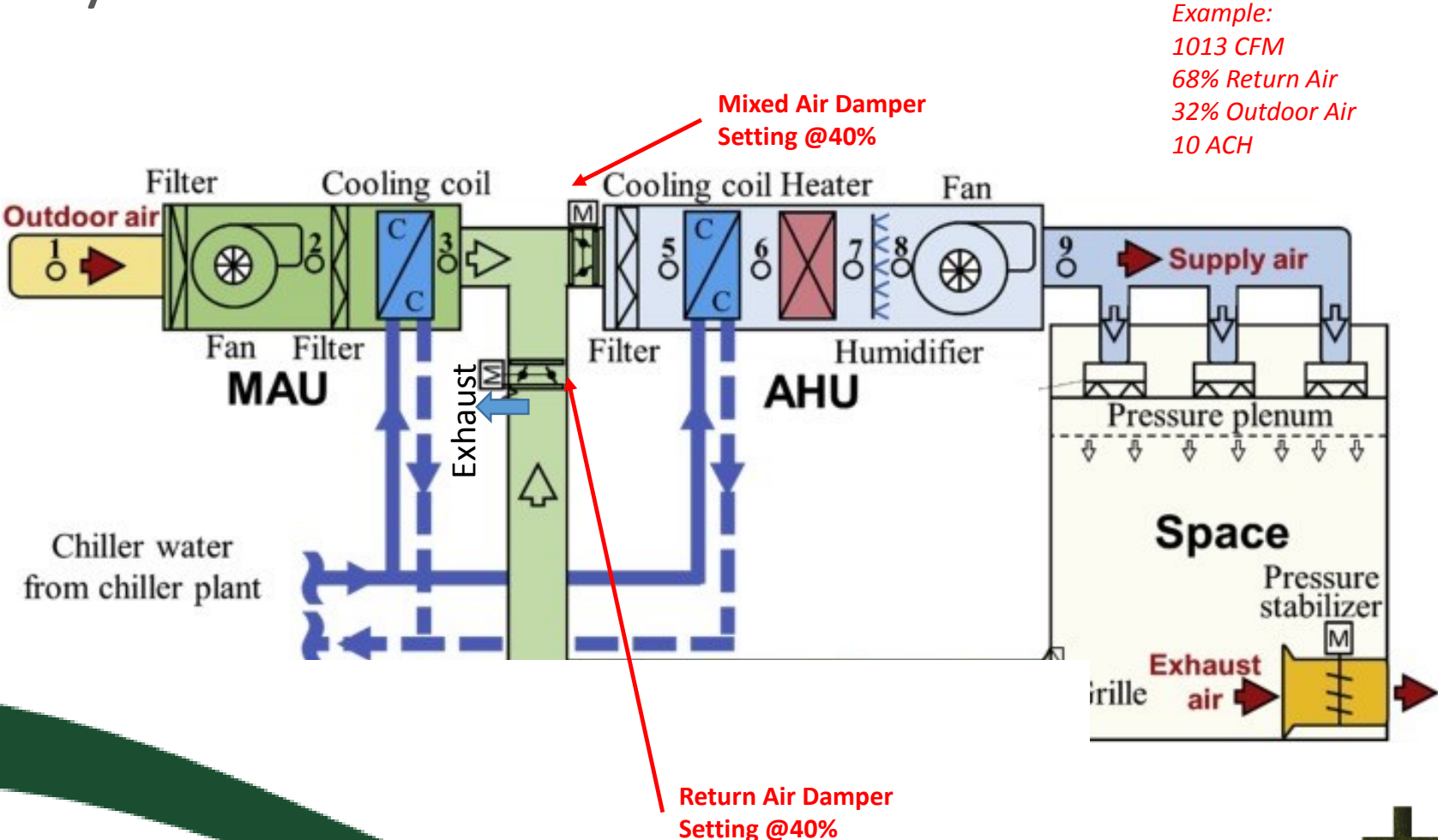
**All SMCDSB schools have mechanical ventilation*

HVAC System Components

HVAC systems comprise of various units in configuration



HVAC System Function



HVAC in the Context of COVID19

Considerations

- Proper Ventilation
- Filtration
- Reliability and Assurance (System Monitoring/Control)
- Engineering Consultant Recommendations
- **ASHRAE Guidelines**

ASHRAE Guidelines vs SMCDSB Operations

Parameter	ASHRAE Guideline	SMCDSB
ACH (Air Exchanges per Hour)	6-8 ACH (classroom)	ACH values will vary based on system configuration. Examples provided: GSH Rm201 (UV): 9 ACH GSH Rm220 (UV): 10 ACH PET Rm238 (HP): 9 ACH PET Rm264 (VAV): 9ACH
Outdoor Air%	30%	40%
Filtration	MERV13	MERV13 (From MERV11)
Occupied Settings	2hrs before/after occupancy	2hrs before/after occupancy

Air Quality vs Ventilation

What's the Difference?

What is Air Quality?

- Air quality includes multiple parameters of the supplied air to support the comfort of indoor climate. Includes:
 - Temperature
 - Humidity
 - CO,CO2
 - Dust/contaminants/Allergens
 - Appropriate volume of air
- SMCDSB Systems are designed to accommodate 15cfm per person based on standard class occupancy
- Air Quality issues are typically a result of system failure



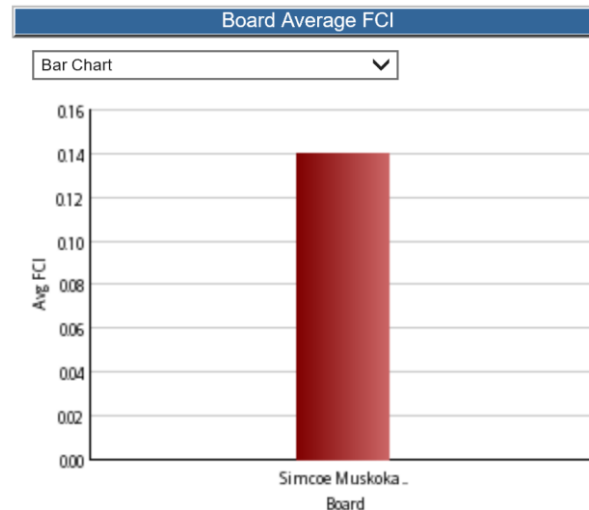
What is Ventilation and mixed air?

- Ventilation is moving air out of a space (Exhaust Air & Return Air).
- Returned air is mixed with Outside air and moved into the supply system (Temperature Balancing).
- Ventilation contributes to Indoor Air Quality.



SMCDSB HVAC Systems

- Relatively young portfolio of schools (~20 year vintage/design)
 - Newer code guidelines for proper ventilation
- FCI: 14%



Other Design Aspects/Features

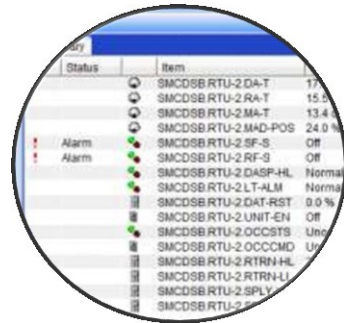
- Systems designed to accommodate 15cfm per person based on class sizes.
- Distribution systems integral to established building design.
 - Limits the ability to change system design.



Continuous Monitoring and Control



Local Alarm/Custodian Walkaround

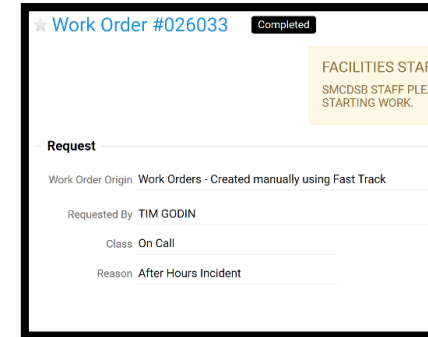
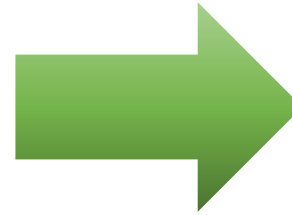


Status	Item	Value
	SMCDSB RTU-2 DA-T	17.7
	SMCDSB RTU-2 RA-T	15.5
	SMCDSB RTU-2 MA-T	13.4
	SMCDSB RTU-2 MAD-POS	24.0 %
Alarm	SMCDSB RTU-2 SF-S	OFF
Alarm	SMCDSB RTU-2 RF-S	OFF
	SMCDSB RTU-2 DASP-HL	Normal
	SMCDSB RTU-2 LT-ALM	Normal
	SMCDSB RTU-2 DAT-RST	0.0 %
	SMCDSB RTU-2 UNIT-EN	OFF
	SMCDSB RTU-2 OCCSTS	Unkn
	SMCDSB RTU-2 OCCCMD	Unkn
	SMCDSB RTU-2 RTRN-HL	Unkn
	SMCDSB RTU-2 RTRN-LI	Unkn
	SMCDSB RTU-2 SPLY	Unkn
	SMCDSB RTU-2	Unkn

BAS Alarm



Email Alert



Emergency Work Process



Emergency Portable HEPA Filtration Response Unit

SMCDSB Activities - Engineering Review

- Findings/Recommendations:
 - Systems reviewed have the appropriate capability.
 - Retro-commissioning of Dampers to confirm proper function of systems and response to controls/automation.
 - Use of MERV13 filters.

CVRIS Potential Opportunities

Nominations for Federal COVID Resiliency Funding

Unit Ventilator Replacements	St. Michael the Archangel
RTU Replacements	Our Lady of Lourdes
Heat Pump Replacements	St Peter's
Unit Ventilator Replacements	The Good Shepherd
Boiler Replacements	The Good Shepherd
Unit Ventilator Replacements	St Antoine Daniel
Boiler Replacements	St Antoine Daniel
HRU Replacements	Our Lady of the Bay Catholic HS (formerly Jean Vanier HS)
HVAC Replacements & Upgrades	St James
AHU Replacements	Our Lady of Grace

Replacement(s)/Upgrade(s) - Facilities Services School House	Facilities Services - School House
Unit Ventilator Replacements for Portables at GSH - The Good Shepherd Catholic	The Good Shepherd
Unit Ventilator Replacements for Portables at HCC - Holy Cross Catholic	Holy Cross
Unit Ventilator Replacements for Portables at MAI - St. Marie of the Incarnation Catholic	St. Marie of the Incarnation
Unit Ventilator Replacements for Portables at MRO - Monsignor J.E. Ronan Catholic	Monsignor J.E. Ronan
Unit Ventilator Replacements for Portables at SJV - St. John Vianney Catholic	St John Vianney
Unit Ventilator Replacements for Portables at SPA - St. Paul's Catholic	St. Paul's
Unit Ventilator Replacements for Portables at MCA - Monsignor Castex Catholic	Monsignor Castex
Unit Ventilator Replacements for Portables at OLG - Our Lady of Grace Catholic	Our Lady of Grace
Unit Ventilator Replacements for Portables at OLL - Our Lady of Lourdes Catholic	Our Lady of Lourdes
Unit Ventilator Replacements for Portables at SA - St. Antoine Daniel Catholic	St Antoine Daniel

SMCDSB Activities/Roadmap

System Capability

- Review like systems
- Verified Air Flow and Exchanges
(Refer to Sept '20 Report)

System Enhancement

- Installed at all SMCDSB Locations

Resiliency & Mitigation

- Installed at all SMCDSB Locations when a system failure occurs

Industry Guidance and Advice

- Recommendations

Optimisation

- Application of recommendations

In House HVAC Assessments

MERV13 Filter Upgrades

Portable HEPA Filtration Units (Emergency)

Engineering Review

Damper Retro-commissioning (Procurement in Process)

Ongoing Maintenance and Reliability Management

Questions or Thoughts?

