Everett Public Schools HVAC System Summary - Updated September 7,2021

1. All Everett Public Schools HVAC systems have been professionally engineered and constructed to ASHRAE standards
2. Merv 13 filters have been added to all units with the exception of portable univents which cannot operate properly with a Merv 13 filter
3. Univents have been converted to an antimicrobial media with a Merv 9 rating, portable HEPA filters have been installed in portables with MERV 9 rated media
4. Classroom doors should be closed to keep air from mixing from other areas
5. ASHRAE 62.1 required number of air exchanges are 3.15 changes per hour for traditional systems with overhead supply, and 2.5 per hour for floor displacement type systems.
    a. Current spot checks for the district reflect air exchange rate average per classroom at 6.86 air changes per hour. This is double the ASHRAE required number of air exchanges.
6. All building HVAC systems are monitored remotely for operation through our building access control systems (BAS). Buildings have varying equipment, each site is being monitored for optimal airflow, discharge temp alarms and mixed air temp alarms.
7. BAS systems have been adjusted to meet ASHRAE recommendations for re-opening of schools.
    a. Where applicable all outside air (OSA) setpoint for all single zone applications have been set to 35% and provide mixed air low limit setpoint.
    b. Where applicable all OSA set point for all multi-zone VAV applications to 45% and provide mixed air low limit setpoint
    c. Revised current scheduling to allow operation to continue in the Occupied mode 24/7 in specific setting where temperature control maybe a concern. Make up air (MA) low limit shall override any command or signal to open
    d. Revised current Co2 operational settings in order to allow OSA dampers to remain open unless MA temp drops below setpoint.
8. Maintenance, repairs and building control monitoring are ongoing

School	Type of System	Operational Description	Last Filter Change	Next scheduled Filter Change	COVID Filter Type	Special Considerations	Portable HEPA filters	HEPA Delivered
Cedarwood Elementary	Gas-fired furnaces, single zone w/adjustable OSA setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with classroom returning air which then passes through the filter then heated, and distributed into the room.	Aug-21	Dec-21	Merv 13	Portables 1, 2, 3, 4, 5 and 6 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	CWE Port 1	3/4/2021
							CWE Port 2	3/23/2021
							CWE Port 3	3/23/2021
							CWE Port 4	3/23/2021
							CWE Port 5	3/23/2021
							CWE Port 6	3/23/2021
Emerson Elementary	Gas-fired furnaces, single zone w/adjustable OSA setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with class room returning air which then passes through the filter then heated, and distributed into the room.	Aug-21	Dec-21	Merv 13	Portables 1, 2, 3 4, 6 and 7 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	EME Port 1	3/23/2021
							EME Port 2	3/23/2021
							EME Port 3	3/23/2021
							EME Port 4	3/23/2021
							EME Port 6	3/23/2021
							EME Port 7	3/23/2021
Forest View Elementary	Rooftop mounted 100% OSA HRU with VAV to Floor Displacement, ceiling return.	The Roof Top Unit (RTU) that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver fresh air and heat to the space it is serving. Heating is provided by the hydronic heating loop. The classroom wings have heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the outside air being brought in.	Aug-21	Dec-21	Merv 13			

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Garfield Elementary	Single zone Air Handling Units, hydronic heating, adjustable OSA setpoint. (Multi-buildings)	Each classroom has its own AHU. Air Handling Units (AHU) are very similar to the terminology used for Roof Top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space or classroom it serves. Air goes through the coil, is heated based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork.	Aug-21	Dec-21	Merv 13			
Hawthorne	Gas-fired furnaces, single zone w/adjustable OSA setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with class room returning air which then passes through the filter is heated, and distributed into the room.	Aug-21	Dec-21	Merv 13	Portables 1 has a univent. The district will provide a portable HEPA filter for this portable. In addition the AC unit can be operated in fan mode to provide additional air flow.	HAE Port 1	3/24/2021
Jackson Elementary School	Gas-fired furnaces, single zone w/adjustable outside air (OSA) setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with classroom returning air which then passes through the filter then heated, and distributed into the room.	Aug-21	Dec-21	Merv 13			
Jefferson Elementary	Indoor 100% OSA, heat recovery units (HRU's) with variable air volume (VAV) to Floor Displacement, ceiling return.	Package Air Handling Unit (AHU) is similar to a Roof Top Unit (RTU) that sits on the roof or in a penthouse and is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver fresh air and heat to the space it is serving. Heating is provided by the hydronic heating loop. The classroom wings have heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the 100% outside air.	Aug-21	Dec-21	Merv 8	Merv 13 not needed HRU system supply and return air do not mix		
Lowell Elementary	Gas-fired furnaces, single zone w/adjustable OSA setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with classroom returning air which then passes through the filter then heated, and distributed into the room.	Aug-21	Dec-21	Merv 13	Portables 806 & 807 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	LOE Rm 806 I40B4300893	3/24/2021 LOE Rm P2/807

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Madison Elementary School	Combination of wall mounted and above ceiling ducted Unit Ventilators, single zone, hydronic heating and adjustable OSA setpoint.	Hydronic ceiling mounted and exterior wall mounted univents. Outside air and room air is brought into the unit. The air passes over the hydronic coil then through the filter and is dispersed into the room. The return air is ducted back to the individual units, some of the classroom air is mixed with outside air and re-circulated the rest is exhausted out of the building.	Aug-21	Dec-21	Merv 13	Class room unit ventilators have good airflow and air exchanges . Air changes per hours (ACH) Results: Room 156 8.87 ACH, Room 153 11.06 ACH. Annex results: Room 223 9.08 ACH and room 216 8.63 ACH		
Mill Creek Elementary	Gas-fired furnaces, single zone w/adjustable OSA setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with classroom returning air which then passes through the filter then heated, and distributed into the room.	Aug-21	Dec-21	Merv 13	Portables 1,2 and 3 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	MCE Port 1 MCE Port 2 MCE Port 3	3/24/2021 3/24/2021 3/24/2021
Monroe Elementary	Single Zone Air Handling Units (AHU) w/supply & return/exhaust fan to displacement grille, overhead return. Heat reclaim Loop via Relief and OSA discharge/intake coils @ louvers.	Each room has their own packaged air handling unit or (PAHU), this very similar to the terminology used for Roof top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated to the space it is serving. The classroom wings have heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the 100% outside air.	Aug-21	Dec-21	Merv 13	Break out areas on 2nd floor should not be used. Portable 1 and 2 have univents. District will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	MOE Port 1 MOE Port 2	3/22/2021 3/22/2021
Penny Creek Elementary	Air Handling Units(AHU), hydronic heating, single zone w/adjustable OSA setpoint.	Each room has their own packaged air handling unit or (PAHU), this very similar to the terminology used for Roof top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space or classroom it serves.	Aug-21	Dec-21	Merv 13	Portable 1, 2, 3 and 4 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	PCE Port 1 PCE Port 2 PCE Port 3 PCE Port 4	3/25/2021 3/25/2021 3/25/2021 3/25/2021
Silver Firs Elementary	Gas-fired furnaces, single zone w/adjustable OSA setpoint.	Each classroom has an individual dedicated gas furnace. Outside fresh air is blended with class room returning air which then passes through the filter and is then heated, and distributed into the room.	Aug-21	Dec-21	Merv 13	Portable 1 has a univent and is a test site for new equipment that will add additional airflow. Unit is on order. A portable HEPA filter will be provided by the district until the new system is installed and tested. AC units can be run in fan mode to provide additional air flow.	SFE Port 1	3/25/2021

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Silver Lake Elementary	Single zone Blower Fan Coils or unit ventilators with hydronic heat, and adjustable OSA setpoint .	Bldg A and Bldg C are the same, each class rooms is serviced by its own fan coil unit. A fan coil is essentially an air handling unit with a fan, and a heating coil plus a filter. Temp control is via a room mounted sensor. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the classroom it serves. Bldg B is served by unit ventilators. Each unit brings in its own outside air via louver vented to the outside. In heating mode outside air passes over the hydronic coil then through the filter and is dispersed into the room. The return air is circulated back through the bottom of the unit and some of the air is mixed with outside air and re-circulated to its own specific room; the rest is exhausted out of the building.	Aug-21	Dec-20	Merv 13	Portable 3 has a univent. District will provide portable HEPA filters for this portable. In addition AC units can be operated in fan mode to provide additional air flow.. Restroom portable 11, confirmed exhaust fan is operational. B bldg. has unit ventilators. Results: Classroom B17 4.94 ACH, B18 4.14 ACH, B21 3.59 ACH.	SLE Port 3	3/4/2021
Tambark Creek Elementary	Packaged indoor VAV Air Handling units with DX cooling, hydronic heating. w/adjustable OSA	Packaged AHU is a unit that sits in a penthouse. This unit contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, the air goes through the coil, is either heated or cooled based on the temperature demand in the space.The return air is delivered back to the unit where it goes through the fan and supply ductwork. The heating is provided by air passing over hydronic coil and is dispered into each room. Each room has its own VAV box for variable air volume. These systems will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system as needed.	Aug-21	Dec-21	Merv 13			
View Ridge Elementary	Single Zone AHU w/supply & return/exhaust fan. Reverse-return Heat reclaim Loop via Relief and OSA discharge/intake coils @ louvers.	Each room has their own packaged air handling unit or (PAHU), this very similar to the terminology used for Roof top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated to the space it is serving. The classroom wings have heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the 100% outside air.	Aug-21	Dec-21	Merv 13			

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Whittier Elementary	Indoor constant volume Air Handling Units, serve multiple classrooms with reheat coils, share common return, only main unit can be adjusted for OSA setpoint. Single and multiple zone High Efficiency VAV Air Handling Units, hot water heating, adjustable OSA setpoint. Common exhaust system and zoned return for each classroom. (Multi-buildings)	This site has AHU's they are very similar to the terminology used for Roof top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a ducted louvered intake, and mixes with the return air that is ducted from the space or classroom it serves. Air goes through the coil, is heated based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork.	Aug-21	Dec-21	Merv 13			
Woodside Elementary	Air Handling Units, gas heating, single zone w/adjustable OSA setpoint. Common exhaust system and zoned return for each classroom. (Multi-buildings)	Packaged AHU as the unit that sits in a penthouse and a complete package unit. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The heating is provided by air passing over hydronic coil and dispered into each room. Each room has its own VAV box for variable air volume. These systems will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system as needed.	Aug-21	Dec-21	Merv 13	Portable 3 has a univent. The district will provide portable HEPA filters for this portable. In addition AC unit can be operated in fan mode to provide additional air flow.	WOE Port 3	3/25/2021
Eisenhower Middle	Packaged indoor VAV Air Handling units with DX cooling, hydronic heating. w/adjustable OSA setpoint. VAV at each classroom, return back to common return riser. Science CR's, single zone, hydronic heating, adjustable OSA setpoint Air Handling Units & Purge Fans.	Packaged AHU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The heating or cooling can be from refrigeration, hot or cold water and for heating only, gas. Each room has its own VAV box for variable air volume. These systems will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system as needed..	Aug-21	Dec-21	Merv 13	Portable 2, 4 and 5 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	IKE P2 IKE P4 IKE P5 IKE P3	3/27/2021 3/27/2021 3/27/2021 8/25/2021
Evergreen Middle	Packaged indoor VAV Air Handling units with DX cooling, hydronic heating. w/adjustable OSA setpoint.	Packaged AHU as the unit that sits within the mechanical penthouse is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered to the unit via a ducted louvered intake, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The heating is supplied by hot water from the boiler, cooling is supplied refrigerant passing through DX coils on each unit. Each room has its own VAV box for variable air volume. These systems will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system as needed. .	Aug-21	Dec-21	Merv13	Portable 1, and 2 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	EVM P1 EVM P2	3/27/2021 3/27/2021

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Gateway Middle	Single and multiple zone High Efficiency VAV Air Handling Units, hot water heating, chilled water cooling, adjustable OSA setpoint. Common exhaust system and zoned return for each classroom. (Multi-buildings)	Packaged AHU as the unit that sits in a penthouse and a complete package unit. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The heating is provided by air passing over hydronic coil and dispered into each room. Each room has its own A VAV box for variable air volume. These systems will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system as needed.	Aug-20	Dec-20	Merv 13			
Heatherwood Middle	Area A/B; Packaged rooftop VAV Air Handling units with DX cooling and hydronic heating. VAV at each CR, return back to common return riser. Area C; Packaged Rooftop 100% OSA 90% HRU VAV Air Handling unit with DX cooling and hydronic heating. Multiple VAV zones.	Roof Top Unit (RTU) sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The cooling is provided from refrigerant and heating by the hydronic heating loop. Area C The classroom wing has heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the 100% outside air.	Aug-21	Dec-21	Merv 8 and Merv 13	Portable 2,3, 9 and 10 have unitvents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	HWM P2 HWM P3 HWM P9 HWM P10	3/27/2021 3/27/2021 3/27/2021 3/27/2021

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North Middle	4-pipe Fan Coil Units with hydronic heating/cooling. De-coupled DOAS for each space.	A (4) pipe simply refers to the number of piping connections to a mechanical piece of equipment. In this case, a fan coil. A fan coil is essentially an air handling unit with a fan, and in this case, both a heating and a cooling coil, and not much else other than a filter. The piping consists of hot water return/supply and chilled water return/supply. Temperature control is via the room mounted sensor. Fan coils can be equipped with outside, return and supply air connections controlled via motorized dampers just like all other air handling units and furnaces. The classroom wings have heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the 100% outside air.	Aug-21	Dec-20	Merv 8 and Merv 13	Merv 13 not needed HRU system supply and return air do not mix. Except for gym unit.		
Cascade High School	Single Zone Heat Pumps w/central boiler plants, cooling towers. Adjustable OSA setpoint. Multi-buildings. Science Building HVAC systems are original.	These units are equipped with a fan and onboard coil that refrigerant passes thru and depending on the position of the reversing valve/temperature setpoint, will either be extracting or discharging the heat from the air which is delivered to the conditioned space via the supply ductwork. Similar to furnaces and air handling units, return air and outside air are delivered to the unit and controlled via motorized dampers.	Aug-21	Dec-21	Merv 13	Confirmed Merv 13 do not impact the operation of the water source heat pumps.		
Everett High School - Main	Main Bldg.; Packaged rooftop VAV Air Handling units with DX cooling and hydronic heating. VAV at each classroom, return back to common return riser. Total of two. Single zone Fan Coil Units w/hydronic heat, common return w/adjustable OSA setpoint for interior zones.	The Roof Top Unit (RTU) that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The cooling is provided from refrigerant and heating by the hydronic heating loop. A VAV system, or variable air volume, requires a variable air handling unit (VAHU), that includes a special type of motor that is able to, when commanded by sequence or by manually adjusting the Variable Frequency Drive (VFD), will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system	Aug-21	Dec-21	Merv 13			

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Everett High School - Commercial Bldg. C	Commercial; 2-pipe, hydronic heating, Fan Coil Units @ interior zone w/adjustable OSA setpoint, wall mounted, hydronic heating Unit Ventilators w/adjustable OSA setpoint.	A fan coil is essentially an air handling unit with a fan, and in this case, both a heating and a cooling coil, and a filter. The piping consists of hot water return/supply and chilled water return/supply. Temperature control is via the room mounted sensor. Fan coils are equipped with outside, return and supply air connections and controlled via motorized dampers. Wall mounted unit ventilators bring in outside air. The air passes over the hydronic coil then through the filter and is dispersed into the room. The return air is ducted back to the individual units, some of the air is mixed with outside air and re-circulated the rest is exhausted out of the building.	Aug-21	Dec-21	Merv 13	Rooms with univents and lower level rooms in the Voc building have been tested and have plenty of of air flow and air exhange. Results: C110 - high 13.75 ACH, Med 8.88 ACH, Low 6.85. Results: C200 - high 11.43 ACH, Med 8.27 ACH, Low 6.85 ACH		
Everett High School - Little Theater	Little Theatre; Single zone Air Handling Units w/hydronic heat, adjustable OSA setpoint.	Packaged air handling unit or (PAHU), this very similar to the terminology used for Roof top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space or classroom it serves. Air goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork.	Aug-21	Dec-21	Merv 13			
Everett High School - Vocational Bldg. E	Vocational; ceiling mounted, hydronic heating, single zone Unit Ventilators w/adjustable OSA setpoint.	Wall mounted unit ventilators bring in outside air. The air passes over the hydronic coil then through the filter and is dispersed into the room. The return air is ducted back to the individual units, some of the air is mixed with outside air and re-circulated the rest is exhausted out of the building.	Aug-21	Dec-21	Merv 13	Evaluating unit ventilators and lower floors for airflow. Room E100 Results 12.88 ACH, Room E105 results 7.68 ACH		
Everett High School - Civic Bldg. B	RTU	Roof top Unit RTU as the unit that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space or classroom it serves.	Aug-21	Dec-21	Merv 13	Unit ventilators and lower floors. Results B-104 6.9 ACH. Room B105 2.74 ACH Room B106 3.6 ACH . Modifcations and air balance have been approved. Contractor is currently working on this project.		

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Everett High School - Gym	RTU - with HRU	This is a Roof Top Unit (RTU). This is a complete package it contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves. The air goes through the coil and is either heated or cooled based on the temperature demand in the space it serves. Return air is delivered back down to the space through the fan and supply ductwork. The heating or cooling can be from refrigeration or hot or cold water. The classroom wings have heat recovery units (HRU). This system brings in 100% outside air which is heated and distributed to the classrooms along the outside wall at floor level. The air is exhausted through a dedicated duct in the ceiling. The heat from the air is removed via a heat exchanger then the air is exhausted. The energy recaptured is used to reheat the 100% outside air.	Aug-21	Dec-21	Merv 13			
Jackson High School	Packaged indoor VAV Air Handling units with DX cooling, hydronic heating. w/adjustable OSA setpoint. VAV at each classroom, return back to common return riser. Science CR's, single zone, hydronic heating, adjustable OSA setpoint Air Handling Units & Purge Fans.	The Roof Top Unit (RTU) that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The cooling is provided from refrigerant and heating by the hydronic heating loop. A VAV system, or variable air volume, requires a variable air handling unit (VAHU), that includes a special type of motor that is able to, when commanded by sequence or by manually adjusting the Variable Frequency Drive (VFD), will slow down or speed up the primary fan to either increase and or decrease the amount of primary air to the system, hence, variable air volume. The difference is that the primary unit supplies air via high velocity ductwork to VAV "boxes" that are able to sense the amount of airflow coming into the box and adjust an internal damper to provide the design air for the space.	Aug-21	Dec-21	Merv 13	Portable 3,4, 7 10 and 11 have univents. The district will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	JHS P3 JHS P4 JHS P7 JHSP10 JHS P11	3/27/2021 3/27/2021 3/27/2021 3/27/2021 3/27/2021

School	Type of System	Operational Description	Last Filter Change	Next scheduled Filter Change	COVID Filter Type	Special Considerations	Portable HEPA filters	HEPA Delivered
Sequoia High School	Main Bldg.; Packaged rooftop VAV Air Handling units with DX cooling and hydronic heating. VAV at each classroom, return back to common return riser. Total of 2.	The Roof Top Unit (RTU) that sits on the roof is a complete package. It contains the fans, coils, outside air, relief and return dampers and controls to deliver heated or cooled air to the space it is serving. Outside air is delivered via a louver intake at the unit, mixing with the return air that is ducted from the space it serves, goes through the coil, is either heated or cooled based on the temperature demand in the space it serves, and is delivered back down to the space through the fan and supply ductwork. The cooling is provided from refrigerant and heating by the hydronic heating loop.	Aug-21	Dec-21	Merv 13			
Portable Type A	Electric Furnace		Aug-21	Dec-21	Merv 13			
Portable Type B	Univents - Cedar Wood, Ike, Emerson, Evergreen, Hawthorne, Heatherwood, Jackson HS, Lowell, Mill Creek, Monroe, Penny Creek, Silver Firs, Silver Lake, Woodside	Electric exterior wall mounted unit similar to an electric furnace. Outside air is brought into the unit at the base and passes through the filter. The air then passes over electric coils and a fan draws it up and through top of the unit into room.	Aug-21	Dec-21	Antimicrobial media Merv 9 rating will install	District will provide portable HEPA filters for these portables. In addition AC units can be operated in fan mode to provide additional air flow.	Completed	
Portable Type C	Heat pumps	Refrigerant is used to either generate heating to cooling depending on conditions. These units are equipped with a fan and onboard coil that refrigerant flows thru and depending on the position of the reversing valve/temperature setpoint, will either be extracting or discharging the heat from the refrigerant which is delivered to the conditioned space via the supply ductwork. Return air and outside air are delivered to the unit and controlled via motorized dampers.	Aug-21	Dec-21	Merv 13			