

North Colonie SD		Preliminary Findings Report #5 - 11/23/20		Pratt Institute	
		Albany Medical Center			
Work Plan Tasks Completed	<ul style="list-style-type: none"> Collected utility data for each school and have calculated a pre-COVID baseline for electrical and thermal consumption. Surveys at greater depth are being ongoing throughout the duration of the study. Comprehensive spreadsheet breaking down all heating and ventilation systems as well as our proposed IAQ recommendations has been created IAQ technology vendors have been contacted in order to obtain budget pricing and other information. Savings and Cost Analysis Models have been created. These models are being inputted with utility data and budget pricing and are equipped with Guth DeConzo's savings calculations and formulas. These models will produce initial costs to the district, the annual kWh and kW savings, the annual \$ savings (per school) and the payback period. Shaker High School - Inspection of the 'Wrestling Room' was conducted and we are working with the school and facility staff to create a Scope of Work for replacement/repair of unit serving this space. Facility has contractor in mind we are working closely with as well. A lighting audit has been conducted using existing drawings and documents. We are exploring the use of upper room UV lighting in certain areas of concern (nurse's offices, locker rooms, music rooms, lunch rooms) Guth DeConzo has submitted a final draft report to NYSERDA and is currently being reviewed NYSERDA comments have been received. Guth DeConzo is working through comments to incorporate all changes requested by NYSERDA. Will re-submit once completed. Refer to 'Report Due Date' section in this table for more info 	<ul style="list-style-type: none"> Collected utility data for Medical College and South Clinical Campus and have calculated a pre-COVID baseline for electrical and thermal consumption. Surveys at greater depth are to be ongoing throughout the duration of the study. Comprehensive spreadsheet breaking down all heating and ventilation systems as well as our proposed IAQ recommendations has been created and is being filled out as field work continues (SCC field work has been completed). Refer to 'Existing Conditions' row below. Guth DeConzo has initiated the process to be granted remote access to the AMC BMS IAQ technology vendors have been contacted in order to obtain budget pricing and other information Savings and Cost Analysis Models have been created. These models are being inputted with utility data and budget pricing and are equipped with Guth DeConzo's savings calculations and formulas. These models will produce initial costs to the district, the annual kWh and kW savings, the annual \$ savings (per school) and the payback period. A lighting audit is underway as we are looking at existing drawings and documents to determine where the various buildings could benefit from upper room UV. Was noted by staff that many rooms already utilize upper room UV lighting. Draft report is being written. Guth DeConzo is awaiting comments on the North Colonie Report from NYSERDA in order to incorporate all applicable comments in this Albany Med Report. Draft report to be submitted week of Nov. 23rd. NYSERDA to review and return with comments. 	<ul style="list-style-type: none"> Owner has given proper approval to move forward with study. We have obtained utility data used in previous project Guth DeConzo has done at Pratt Institute. Guth DeConzo has obtained equipment lists, drawings and other information from previous projects and field inspections Savings and Cost Analysis Models have been created using the same templates as North Colonie and Albany Med Savings Analysis models. Draft Report has been started and savings/cost models are being placed calculated and incorporated into report. Refer to 'Report Due Date' section in this table for more info on submission date. 		
Study Findings	<ul style="list-style-type: none"> Existing mechanical drawings and TAB Reports for all schools have been compiled and review of the drawings has started and is ongoing. Guth DeConzo has also obtained remote access to North Colonie SD BMS system. Facility filter inventory log has been obtained. This documents the schedule and type of filter replacements around the facility. We are going to recommend a more structured and streamlined approach to compile this filter information to allow for a more clear and concise inventory. There are opportunities throughout all the schools for short term strategies to increase the IAQ in rooms that utilize energy recovery units or return air units. In the short term, we are proposing an increase in outdoor air changes wherever possible. Guth DeConzo has obtained the preliminary schedule for the schools (i.e. certain grades will have certain time frames they are in the schools) Through our ability to access the district's BMS, we were able to determine the daily schedule of all units in all schools for last school year and compare it to the current unit schedule they are using this year thus far. They seem to be increasing the time period all of their units run (i.e. starting at 5am and running late after students leave in order to purge the schools and introduce more fresh air) The schools are all currently implementing a daily purge cycle in order to introduce more fresh air. This was one of our proposed strategies. Wrestling Room is served by a make-up air unit that supplies air to the space (outdoor air/return air). This unit does not contain a heating or cooling coil. Heating in the space is provided by cassette heating in the ceiling. 	<ul style="list-style-type: none"> Existing mechanical drawings and TAB Reports for all schools have been compiled and review of the drawings has started and is ongoing. Facility regularly keeps up with filter replacement. Documentation of replacements are kept on notecards on units themselves. We have been conducting more research into bi-polar ionization. Case studies and other literature has been passed along. O2 Prime (Siemens) claims to have a zero ozone producing needle point ionization technology. AMC staff have expressed interest. 	<ul style="list-style-type: none"> Existing mechanical drawings and TAB Reports for all schools have been compiled and review of the drawings has started and is ongoing. Based on prior knowledge of Pratt, Guth DeConzo is aware of some areas of concern that are lacking updated HVAC (Engineering Hall, Emerson Townhouses) It was found that Pantas Hall, Emerson Townhouses, Willoughby Hall, East Hall, Pratt Studios, and Higgins South are not connected to facility BMS. This inhibits ability to use BMS modification (i.e. OA increase) in these buildings. The use of in-room humidifiers or air purifiers are solutions that both the facility and Guth DeConzo are interested in for areas with no AHUs or no BMS connections. 		
Existing Conditions	<ul style="list-style-type: none"> Shaker Middle School - utilizes heat recovery units to serve classrooms. Other spaces use return air units with outdoor air and return air mixing box. Shaker Middle School - Some perimeter rooms use unit ventilators to condition the space. These unit ventilators take out outdoor air through the perimeter wall and mix with return air from the space. Shaker High School - uses a combination of heat recovery units, return air units and unit ventilators around the perimeter. Shaker High School - It was noted by staff that the 'Wrestling Room' (rooms A102A and A105A) was having trouble with space temperature and comfort. Appears as though a make-up air unit was installed in the ceiling with supplemental heat provided by cabinet unit heaters. Airflow measurements were taken and air change rates were calculated in order to further identify a possible solution (room experiences about 5.5 ACH). We are exploring options to increase IAQ in this unique space. Latham Ridge Elementary - uses return air AHUs to provide ventilation to some pods of rooms. Rooms within those pods are then cooled using rooftop units. Other rooms are conditioned using unit ventilators or variable refrigerant flow units. Heat is provided through radiant floor heating. Blue Creek Elementary - is served by a combination of return air AHUs, plate and frame heat recovery units and unit ventilators. Heat is provided by radiant floor heating. Boght Hills Elementary - served by a combination of return air air handling units, energy wheel and plate and frame heat recovery units as well as unit ventilators or variable refrigerant flow units. Southgate Elementary - served by a combination of return air air handling units, plate and frame energy recovery units (with VAV boxes) and unit ventilators. 	<ul style="list-style-type: none"> South Clinical Campus - the spaces in this building are served by a combination of return air AHUs and energy recovery units. All of the units in this building are on variable speed drives and are able to be ramped up or down depending on the need. South Clinical Campus - Short Stay RTU-01 (serving the top op. short stay area of the campus) is already equipped with a steam humidifier manifold as well as UV lighting in the unit at the cooling coil. South Clinical Campus - it was noted by the AMC staff that AHU-02 serving the radiology area could use a full replacement in the near future. Medical College - Field work for this building has not yet commenced. We have obtained HVAC data from existing drawings but need to get on site for verification. 	<ul style="list-style-type: none"> Guth DeConzo is developing a matrix of existing conditions of all spaces in the buildings included in this study. This is ongoing as we are continuing the inspections of drawings and reports. It has been found from previous projects Guth DeConzo has been involved with at Pratt that Arc, North Hall, Stable Hall, Higgins Hall and Manhattan Campus all have relatively modest HVAC systems. Pantas Hall - fan coil units with OA grille and operable windows. Not on BMS Stable Hall - fan coil units with OA grille and operable windows in each room. 2 AHUs provide heating and cooling to corridors and lobby. Emerson Townhouses - steam radiators for heating (local controls), split systems & window AC for cooling. Willoughby Hall - steam radiators for heating, no cooling. Not on BMS. ARC - 4 AHUs w/ VAV boxes for academic spaces, 3 H&V units serve gymnasium area. Engineering Hall - steam radiators for heating and window AC for cooling. 2 small RTUs for supplemental conditioning. Noted that 1 of the RTUs may not be in operation. North Building - 5 AHUs and FCUs for heating, split system for cooling. East Hall - steam radiators for heating and VRF zones for cooling. Not connected to BMS. Pratt Studios - New HVAC system was installed with HW reheat coils. Need to investigate further. Library - 3 AHUs provide heating and cooling (3 dedicated chillers for chilled water cooling). Connected to BMS. Film & Video - 6 gas fired DX RTUs. Connected to BMS. Higgins Hall - Higgins North and Center use FCUs and are included on BMS. Higgins South has steam radiation and is not on BMS. Pratt Manhattan - 20 AHUs provide heating and cooling (6 rooftop chillers) AHUs are on BMS. 		
Proposed Strategies	<ul style="list-style-type: none"> We are proposing increasing the outdoor air exchange rate wherever possible. In rooms/areas that are served by air handling units or heat recovery units, we are proposing that the facility either run the units at full capacity (if they are 100% outdoor air) or modulate the outdoor air damper to allow for more outdoor air (if the units are return air units). This is more of a short term strategy for the upcoming months when schools open. Rooms that are served only by unit ventilators or VRF units, we are proposing opening the windows. This is more of a short term strategy for the upcoming months when school opens. We are exploring an approach to use the facility's BMS and CO2 sensors to control units based on occupant density (i.e. larger group of people gathered in the classroom = higher airflow). This also includes a daily purge cycle (running units before students arrive and after they leave) to purge the schools of stale air and introduce fresh air. Filter upgrades are proposed across the board on all units in all schools. We have costs and savings breakdowns for both installation of MERV 13 filters as well as a new technology, the Dynamic V8 filter. The Dynamic V8 filter is an electrostatically charged filter that has the same rating as MERV 15 filters, but with less of a pressure drop. The Dynamic V8 filters are rather expensive. An in-depth cost analysis will be presented in final report. UV-C is being explored as an option for units where possible (much more cost effective when UV light can be installed inside of unit and no extra duct work construction is required). Stand alone combination HEPA/UV units are being explored as they have been brought up numerous times by facility staff. These units are plugged into a regular 120V wall outlet and are placed directly in the room. Sound criteria is a concern with these. Upper room UV lighting is being looked into for special areas of concern such as nurse's offices, lunch rooms, locker rooms, and music rooms. These areas are especially important as disinfection of these high traffic common areas is vital. 	<ul style="list-style-type: none"> Upon further research into bi-polar ionization, and the expressed interest in this technology by the AMC staff, we have found a ionization technology that claims to produce no negative ozone effects (O2 Prime Bi-Polar Ionization). We intend to pass along case studies and other information on this product. This is a potential strategy to be used pending necessary research and approval. UV-C is being explored as an option for units where possible (much more cost effective when UV light can be installed inside of unit and no extra duct work construction is required). Daily purge cycles in areas that are not occupied 24/7 shall be recommended (office spaces in South Clinical Campus and classroom and office areas in Medical College) Upper room UV lighting in rooms that do not currently have them implemented. Albany Med uses this technology in various rooms around the South Clinical Campus already. Filter upgrades (where higher MERV rated or HEPA filters are not currently being used) is another proposed strategy. MERV 13 and Dynamic V8 savings and cost analyses models will be analyzed and put in front of staff. 	<ul style="list-style-type: none"> Pratt is comprised of multiple older buildings. Due to this, we suspect (and will verify as we inspect older drawings and schedules) that some spaces are under ventilated and would benefit from BMS modifications and increased Air Exchanges. East Hall, Engineering Hall and Pratt Studios have limited HVAC systems and would require localized solutions (i.e. localized humidification, UV / HEPA air purifiers) Buildings that currently do have air handling equipment, the replacement of their current filters with MERV 13 is being recommended. Facility staff and management have shown considerable interest in localized humidification for townhouses, apartments and dormitories. Buildings lacking any sort of forced air heating or ventilation (i.e. AHUs or RTUs) will require local air purification. Guth DeConzo has investigated Medify Air Purification units and will include the savings/cost associated with these types of units in report. UV-C is being explored for buildings which utilize either AHUs or FCUs. Guth DeConzo will include the implementation of UV-C airside lighting into FCUs (of which there are many) and AHUs. Some buildings (Higgins, Pantas, Stable) are mostly served by FCUs. UVGI lighting is a rather expensive measure to fully incorporate. Guth DeConzo will recommend UVGI Upper Room lighting in certain critical spaces such as health/nurse facilities, locker rooms, and some classrooms with high occupant density and fluctuation. 		
Lessons Learned	<ul style="list-style-type: none"> We encountered inconsistent filter names and types in North Colonie's filter lists. We are suggesting a new approach to the facility to inventory and monitor their filter inventory and maintenance schedule would be beneficial for all parties. The use of proper nomenclature and vocabulary when compiling a filter inventory is essential for proper documentation. 	<ul style="list-style-type: none"> Certain areas of the South Clinical Campus would be better accessed after hours (after 6pm) as stated by the staff. Operating and patient rooms are more easily surveyed when not in use. 			
Work Plan Adjustments	<ul style="list-style-type: none"> Shaker Middle School existing drawings have inconsistent room names with what is actually being constructed/changed in the field. This is due to a change order that occurred during construction. We have obtained the 'as-built' room names and will adjust accordingly. Ozone generation has been completely ruled out as an IAQ option. All clients have expressed no interest in this technology. As stated in the 'Work Plan Tasks Completed' section, we have been focusing on working with the High School facility staff in order to create a Scope of Work for the Wrestling Room unit replacement. This was a specific area of concern to the school. 	<ul style="list-style-type: none"> We have not encountered any obstacles that render a need for any adjustments in our work plan. We will continue on with the proposed work plan. Ozone generation has been completely ruled out as an IAQ option. All clients have expressed no interest in this technology. Staff stated they have a satellite campus (office building) that would be another potential area of inspection if time and budget allow. 	<ul style="list-style-type: none"> On-site field inspections will be difficult to conduct due to the location of Pratt and its Covid policies. Research of the extensive collection of existing drawings and reports Guth DeConzo has access to will help mitigate this difficulty 		
Next Steps	<ul style="list-style-type: none"> Analysis of our savings and cost models will allow us to determine which IAQ strategy is most beneficial for each individual situation. This will aid the district in determining which IAQ path is most worthwhile and which are too costly to be implemented. We intend to issue a draft report to the district on Friday 10/2 which will include our findings, our savings and cost breakdowns, and our recommendations of IAQ strategies based on the situation each school/air handling unit presents. Awaiting comments from NYSERDA on draft report. Once comments are received, we will address all comments and make edits to report accordingly. Addressing NYSERDA comments on draft report. 	<ul style="list-style-type: none"> Surveys of mechanical systems and existing drawings throughout Medical College shall continue. Conduct lighting audit for UVGI purposes and pricing. Determine which IAQ technology and/or strategy will work best for the various spaces/schools. Facility asked us to provide a progress report to them in 2 weeks. This report will include our findings, our recommendations and our preliminary cost and savings analyses. Guth DeConzo will finalize draft report and send out to NYSERDA for review once comments from North Colonie have been received and incorporated into Albany Med Report. Guth DeConzo submit draft and await comments for NYERDA. 	<ul style="list-style-type: none"> Commence on-site surveys of mechanical systems. Inquire about receiving remote access to facility's BMS system On-site surveys may be harder to accomplish due to the current COVID protocols. Guth DeConzo has extensive archives of existing drawings, reports and information on Pratt acquired over numerous previous projects. Reach out to facility staff to inquire about some missing info in our existing conditions equipment list. 		
Report Due Date	Addressing comments from NYSERDA; re-submit Dec. 4th.	Submit draft week of Nov. 23rd.	Submit draft in early Dec.		