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## Energy Efficient Indoor Air Quality Preliminary Report November 2020

### Progress to Date:

#### A. General

1. *Bi-weekly internal check-in meetings to discuss findings and status amongst the multiple Bergmann project teams.*

#### B. St. John Fisher

1. *Analyzing available trended data, schedules, damper positions, and other control points within BMS on building by building basis. Investing operable changes as buildings enter in to heating mode.*
2. *Created three separate calculation workbooks for buildings served by constant volume RTUs, variable air volume RTUs, and MAUs. Calculations include:*
  - i. *Scheduling*
  - ii. *Pre- and Post-Occupancy Flush with UVGI*
  - iii. *Pre- and Post-Occupancy Flush without UVGI*
  - iv. *Filter and Coil Static Pressure Impacts Due to UVGI*
  - v. *OA Code Minimum vs Current OA Provided*
3. *Received preliminary information from second UVGI vendor on November 25<sup>th</sup>. Currently being reviewed/compared with first vendor for both effectiveness and exposure rates.*

#### C. The Harley School

1. *MERV 13 filters have been installed throughout the building.*
2. *Harley is actively working with their BMS contractor to make software adjustments, test functionality, and upgrade failed or failing control components.*
3. *Discussions with second UV vendor in progress to compare "on-the-fly" kill rate data.*
4. *Lower School and Middle School are currently having in-person classes daily. Upper School is utilizing a hybrid approach (50% in-person capacity every day).*
5. *Created three separate calculation workbooks for areas served by constant volume RTUs, variable air volume RTUs, and MAUs. Calculations include:*
  - i. *Scheduling*
  - ii. *Pre- and Post-Occupancy Flush with UVGI*
  - iii. *Pre- and Post-Occupancy Flush without UVGI*
  - iv. *Filter and Coil Static Pressure Impacts Due to UVGI*
  - v. *OA Code Minimum vs Current OA Provided*
6. *Received preliminary information from second UVGI vendor on November 25<sup>th</sup>. Currently being reviewed/compared with first vendor for both effectiveness and exposure rates.*

### Study Findings to Date

#### A. Resources and Guidance Documents

1. *ASHRAE Guidance*
2. *NYS Department of Health*
3. *NYS Education Department*



4. *Manufacturer's literature (UV, filters)*
5. *CUNY Building Performance Lab*
6. *NIH UV Reports and Findings on COVID*

## B. Building Specific Opportunities

### 1. St. John Fisher

- i. RCx performed on November 19<sup>th</sup> and 20<sup>th</sup>. Primary findings include:
  1. OA and RA damper controls that do not modulate (loose, locked, not physically connected, no power to controller)
  2. OA and RA damper controls that are out of alignment or have a bad scaling factor
  3. BMS screenshots that do not physically reflect the unit (AHU has return air but BMS shows a 100% OA unit)
  4. Logic controls that required refreshing (OA at 0% even though BMS says 20%. Refreshed controls and is properly responding and at the correct position).

### 2. The Harley School

- i. RCx performed on November 13<sup>th</sup>. Primary findings include:
  1. Energy recovery wheels not able to be engaged on.
  2. OA and RA damper BMS positions not equal to physical conditions.
  3. Dampers not responding to adjustments in the BMS.
  4. Most units are properly scheduled and controlled. They respond appropriately to adjustments made in BMS.

## C. Findings

### 1. St. John Fisher

- i. *All HVAC systems on the campus are currently schedule 24/7 with no unoccupied schedule or temperature setbacks.*

### 2. Harley School

- i. *Range of acceptable space temperatures has been expanded to allow for more flexibility in the volume of outside air delivered to each zone.*

### 3. Current 24/7 operation of AHUs may limit the ability for savings. St. John Fisher would like to implement/update to allow for:

- i. Reduced OA at night
- ii. Wider temperature setpoints at night

## D. Lessons Learned

1. *Updates and changes to COVID guidance from reputable sources need to be constantly monitored (NYSED, ASHRAE, NYSDOH), as minor updates and release changes can happen without notification. For example, UV is now acceptable for P-12 schools, if they are not active in any occupied space. In AHU usage is also acceptable.*
2. *Vendors are regularly reaching out to The Harley School with products and information, some of which conflicts with NYSED guidance. We are offering our knowledge to assist in decision making.*
3. *Leverage available electronic files and past reports*

## E. Work Plan Adjustments

*None*



F. Next Steps

1. Finalize report and calculations
2. Draft reports anticipated 12/4