

## CoreNet Pop-Up 6/11/20

CoreNet NorCal held an excellent Pop-Up: What's the Buzz Around Workplace HVAC? On June 11th. Moderated by Annemarie Erbel, Founder, Erly Consulting, the program featured two global thought leaders on this hot topic, Jamie Qualk, Vice President, WSP and Koray Kaya, Principal, Alfa Tech. Here is a brief recap of key points and a link to the [recording](#).

Three levels of response to the COVID-19 Crisis:

- Immediate – focused on operations
- Short Term – existing buildings
- Long Term – impact on future building design

### Initial Thoughts

Qualk – Core Ideas:

- HVAC design strategies will not cure or eliminate COVID-19 concerns
- HVAC can contribute to keeping spread down since it is an airborne virus
- All buildings and the systems in them are essentially custom
- Some concepts may work in some buildings but not necessarily in others
- Recommends employing a consultant to make recommendations for your specific building
- Any time you change the design or operational profile of a system it is going to impact your energy bill

Kaya – Concurred With Qualk and Emphasized:

- The primary transmission of the virus is contact from person to person
- Airborne viral transmission beyond the six foot space is not confirmed by the authorities
- All suggestions are secondary to what is already suggested by public health agencies

### 1 - What are the current problems being encountered by your clients?

Kaya

- Bringing employees to back work – easier in some locations than others
- Coordinating with building management (especially for multi-tenant buildings)
- Creating safe work environments for their employees
- Each building and every application is different
- We have good tools to apply on a case by case basis

Qualk

- How to return the facility to a normal or “new normal” operating condition – during transition and after

- How to make employees feel safe to return
- What types of air delivery or filtering systems are possible to address their goals
- We typically have the right tools in our toolbox – things we have known about and implemented for a long time

## **2 - What is the difference between high rise and low rise suburban buildings?**

### Qualk

- All buildings are unique based on size, age, use, the types of systems in them and specific engineering in those systems
- Larger the building the more challenges that can arise
  - Large systems that have to interact well with each other to operate efficiently
  - When making changes there are follow on effects to other systems
- Small buildings present same concerns about throwing energy systems into disarray

### Kaya

- Highrise / multi-tenant applications – you have less control
  - Sharing same system with tenants that have different utilizations, needs and schedules
- Single tenant buildings can be easier or just as challenging
  - May have old systems without flexibility or extra capacity for future improvements

## **3 - Air filtration – What do different MERV ratings mean? Is there any way to guarantee our safety? What happens with hepa filters?**

### Kaya

- We are using the conventional filtration systems to capture particles in the air stream
- MERV rating is associated with the number of particles – the higher rating the more efficient the system
  - They look at different particle sizes from ultra-fine to coarse
  - Test systems with different velocities and assign the efficiency level to the system
  - Systems have different mechanisms to capture particles including straining
  - MERV 13 is sufficient for capturing airborne viruses
  - MERV 14 is 10-15% more efficient for much smaller particles and recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- The information we have on the virus is that it is 0.16 micron / fairly small – human hair is about 50 micron

- The virus particles group together in nuclei or droplets which are usually much larger / up to 100 micron range and easier to capture
- Hepa filters are much greater efficiency than MERV ratings and more challenging In commercial buildings

**4 - How does this affect maintenance cost? Do the filters need to be changed more regularly? What types of procedures need to be followed?**

Kaya

- If we are not making any changes there is not a benefit in changing filters more frequently
- If changing the system with some of the electrical methods the systems will capture more and need to change filters more frequently
- OSHA already has process and protocols in place for filter replacement

Qualk

- Agreed - If you are not changing the filter efficiency or filtering components in your building and a robust Method of Procedure already exists your in place methods of procedure may not change
- With the new OSHA standards and due diligence around keeping people safe, you may need to write a new procedure that helps staff feel safe executing filter changes

**5 - Are there any new technologies that building owners and designers should be aware of?**

Qualk

- We are getting lots of emails about new technologies – be wary of any that make robust claims
- We prefer strategies, tactics, and products that have been in the industry for a long time
- For example, UV lighting has been around in the healthcare setting and is fairly common
  - Recommend having a consultant help with the selection and placement of these system components

Kaya

- We are trying to utilize current technologies looking at the way this virus is similar to previous viruses or some of the compounds we can filter out with existing systems
- Some of these systems have been used for odor control or VOC control and were phenomenal
- Some of the newer technologies are being used for energy savings and reducing outside air

- There have been tests on COVID but are not going to provide enough information / tests are being done in chamber environments which might not match what you have in your buildings

## **6 - Is there a way to provide 100% outdoor air to dilute the air in a space? Is it necessary and how does it impact the system?**

Qualk

- 100% outside air would be great – it could provide a potentially safer environment
- Not all buildings are set up to be able to accommodate that approach
- Keep in mind it could influence both your energy bill and the comfort of occupants
- You may not be able to operate outside air during certain times of year depending on your location
- You may be introducing additional humidity (considered a pollutant in some parts of the country) / you may encounter additional need temper and dehumidify the additional OA delivery.

Kaya

- If your building is 100% occupied there is no way we can supply 100% outside air without increasing system capacity
- With decreased occupancy due to social distancing it may be possible
- You would need a consultant to check the loads in your building

## **7 - What are your thoughts on needle point bipolar ionization versus UV lighting for air handlers?**

Kaya

- The challenge is exposure time
- Need to pay attention to velocity and air temperature
- Bipolar is one of the technologies being tested on COVID
  - Looks like it is working in the chamber and looks like a promising application
  - Will be less expensive to install than UV lighting

## **8 - Is there benefit to running HVAC during unoccupied hours?**

Kaya

- That is one of the suggestions from ASHRAE's suggestions / as well as REHVA for our European clients
- If you can't provide 100% outside air the only way to flush buildings is during the night

- Depends on the risk factors in your building
  - If it is a high rise building it may make sense
- It won't cure everything but will help
- Talking about outside air – not air flow rate / if increasing air flow rate it may make things worse for some system types

Qualk

- Contributes to the dilution we are looking for
- By running overnight you are just extending your operational hours ( in many cases systems shut down or set back in the evening and then there is an accompanying morning warm-up or cool-down cycle)
- Need to be comfortable with how that impacts your energy costs

## 9 - Can you address how building systems are unique with some examples?

Kaya

- We have to look at the specific system we have to work with and determine what capacity it has and what type of changes we can make
- There is a different strategy of each system in terms of disease contro;
- For example:
  - Increasing air flow in overhead system it makes things better
  - Increasing air flow in an underfloor system will make it worse

Qualk

- Every time we sit down to design a new building there are completely different considerations and goals including:
  - Location
  - Orientation of the building
  - Number of floors
  - Program
- We address each in different ways
- All design solutions have follow on effects on efficiency and how you can control them
- Some buildings have many different systems that all need to operate together
- Every decision has capital expense and operational expense considerations

## Closing thoughts

Kaya

- Main questions remain unanswered– is this virus airborne?
- Currently the World Health Organization (WHO) does not mandate but recommends taking these building system precautions but none of the authorities are requiring them

- So we are providing suggestions / majority of them in terms of filtration will help for other purposes as well
- Have heard situations of building owners doing things to just make occupants feel more comfortable and safe / cautions we shouldn't be freaking out

#### Qualk

- We need to remember that it's still early days to answer such a complicated question
- Our best minds are still investigating these ideas and concepts
- We don't have success stories to point to yet
- Still a lot of time to learn how HVAC systems can contribute to controlling the spread of COVID and other viruses that could occur down the line
- While we know systems can contribute to slowing the spread, we are not sure what the best solution is for a particular building
- Encourages people to be patient and rely on the tools and consultants you have to make sure your systems operate as efficiently as they can during this turbulent time
- We know we can make positive impact and over time it will become more clear what the priorities should become and how we should proceed