

ARE YOUR CLASSROOMS HEALTHY?

School Building Maintenance Can Have a Direct Impact on Student Health, Absenteeism and Operating Costs.

School buildings are not always healthy. Far too often, we read about school buildings being closed as a result of illness among students and faculty. Frequently these illnesses are attributed to mold spores, but the source is seldom found or positively identified.

Mold grows almost anywhere there are damp cool surfaces and it proliferates in dark places. In outside and isolated locations there is usually no strong mechanism for carrying airborne mold spores into occupied spaces and the health threat is minimal. On the other hand, mold spores inside a building can become airborne by convective air movement and the air handler of the air conditioning system can circulate those contaminants throughout the occupied space.

In school buildings, an ideal place for the growth of mold and other pathogens is inside an air handler where water from condensation accumulates in a drain pan. When properly drained away, the flowing water does not promote mold growth. However, failure of the condensate drain system prevents drainage of the water and allows it to spillover and be blown onto internal components. There, in addition to a health threat, it causes property damage along with increased maintenance as indicated in Figures 1 and 2.

Figure 3 illustrates how failed drain systems cause internal wetness that produces a fertile growth place for health threatening organisms. It also illustrates how the conditioned air carries the contaminants into the classroom. Contaminates inside air handlers are far more health threatening than in any other location because all the air in the classroom passes through the air handler, over the mold formation and other contaminants, several times per hour.



FIGURE 1 Building Ceiling, Walls, Floor & Property - Contaminated and Damaged



FIGURE 2 Air Handlers - Contaminated and Damaged

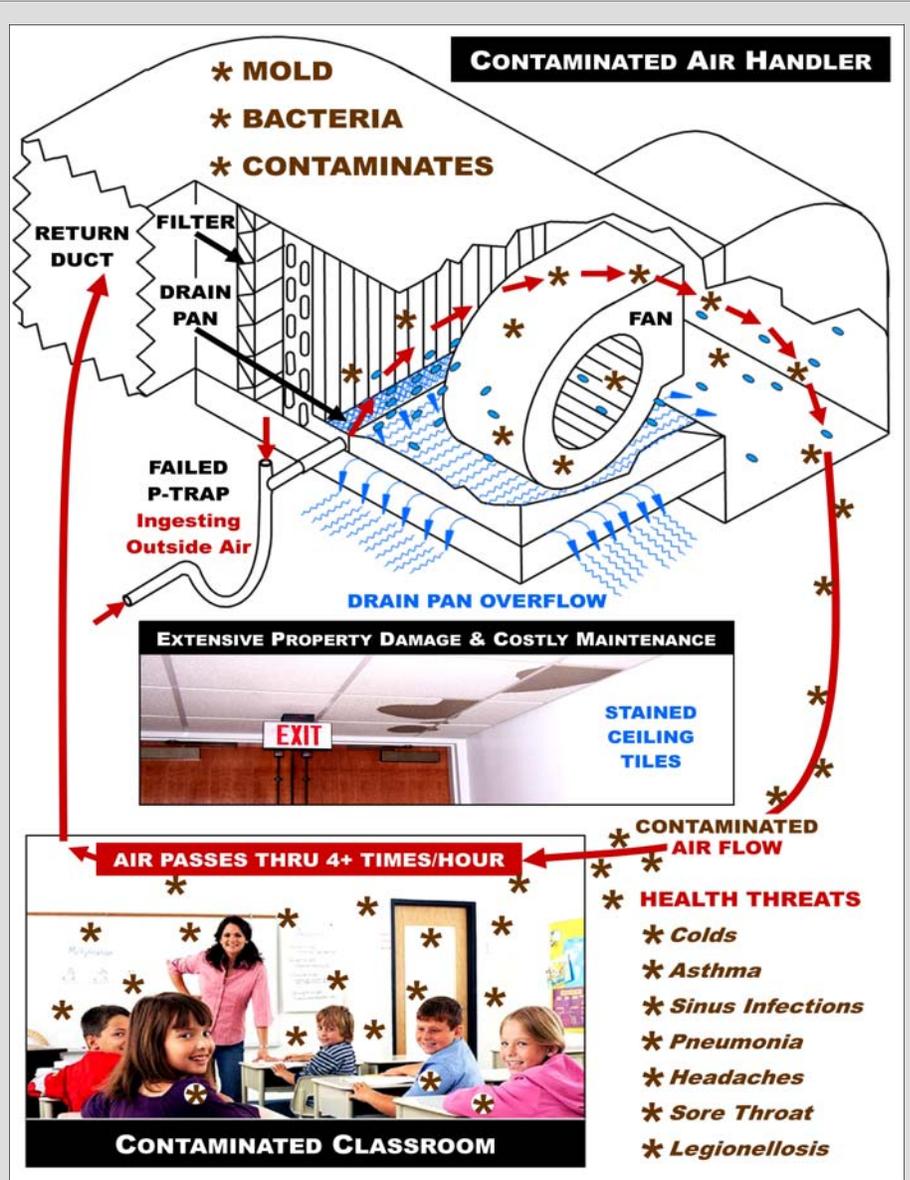


FIGURE 3 Illustration of a Contaminated Air Handler and Classroom

There are numerous reasons for drain system failures and the contamination of air handlers. Even the most favorable trap selections, represented in Figure 4, are subject to:

- condensate flow blockage which causes flooding;
- empty trap operation which allows 1) the ingestion of outside air, 2) entrainment and spraying of water, 3) condensate overflow and flooding; and
- freeze damage which holds no water and acts like an empty trap.

Poor trap selection, as depicted in Figure 5, is another way in which condensate traps fail. These failures can be attributed to the fact that drain systems receive little to no engineering attention because they are an interface between the air handler supplier and the drain system installer. Neither accepts the responsibility for drain system performance.

Even the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) published a summary of the impact and seriousness of trap failures on indoor air quality in Standard 62-89R (see sidebar).

Despite this warning, when drain system failures occur, the building owner is blamed for inadequate maintenance. In reality, no reasonable amount of maintenance can prevent the failure of condensate drain systems.

As the majority of maintenance personnel can attest, the preventative maintenance required to prevent trap and drain system failures, as well as the accompanying health threat and building damage, is enormous. In fact, in many facilities it may not be practical to do so. Indeed, in some cases, it may be impossible.

For a potential path to lower maintenance and building operating costs, healthier classrooms, and reduced absenteeism call Trent Technologies at 903-509-4843 or visit, www.TrentTech.com.

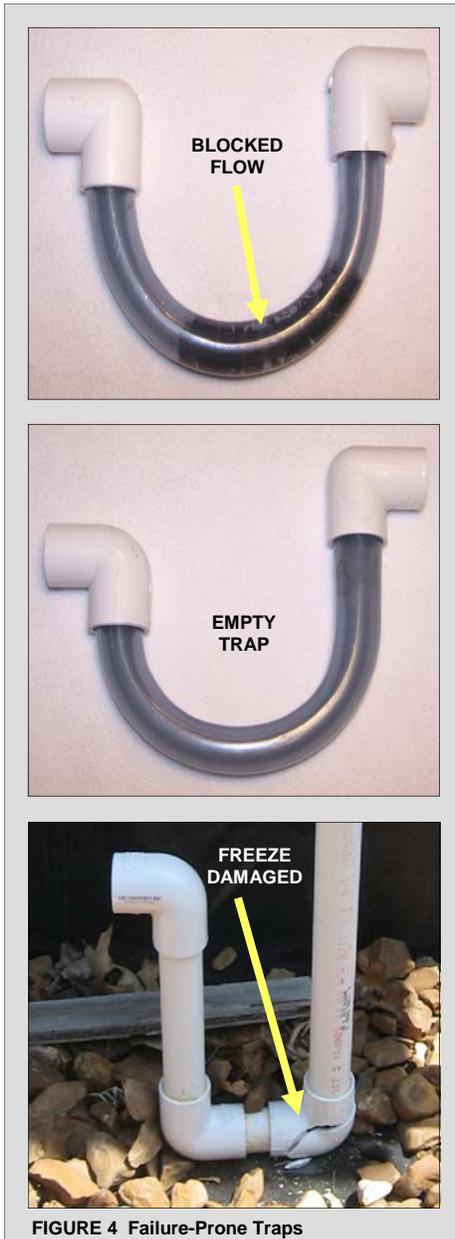


FIGURE 4 Failure-Prone Traps



FIGURE 5 Non-Functional Traps

ASHRAE STANDARD 62-89R

Paragraph: 5.6.4 Drains and Drain Pans.

“Condensate traps exhibit many failure modes that can impact on indoor air quality. Trap failures due to freeze-up, drying out, breakage, blockage, and/or improper installation can compromise the seal against air ingestion through the condensate drain line. Traps with insufficient height between the inlet and outlet on draw-through systems can cause the drain to back-up when the fan is on, possibly causing drain pan overflow or water droplet carryover into the duct system. The resulting moist surfaces can become sources of biological contamination. Seasonal variations, such as very dry or cold weather, may adversely affect trap operation and condensate removal.”

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