School/Facility: Waverly Elementary

Location: Portable 196

Date of IEQ Report Form: September 22, 2017

Date(s) Investigated: September 28, October 17, and November 7, 2017

Date of Report: December 18, 2017

IEQ Concern:

Uneven temperatures and high humidity are continued to be experienced. The concern was reported and investigated last school year.

IEQ Investigation Process:

Identify deficiencies that may impact IEQ and/or sources of odor concerns. Typically includes the following depending on the nature of concern, but not limited to:

- interview/questionnaire of concern individual(s)
- inspection above drop ceiling (condition of roof deck, pipe insulation, return air plenum)
- inspection of ventilation system (operation of variable air volume box and outdoor air dampers, check controls, measurements of carbon dioxide, temperature and relative humidity, sources near outdoor air intake, measure return and supply air volume, cleanliness of coils, liner and condensate pan)
- inspection of exterior
- inspection below drop ceiling (housekeeping, sink and floor drain traps, signs of past and present moisture concern via visual and/or moisture meter, mold growth, ensure connection of current and capping of abandoned sanitary vents, odorizers, excessive plants and fabric items, identify potential pathways, and measure volatile organic compounds, carbon monoxide, and lighting)

Findings:

- Initial visit:
    - Observed thermostat settings included fan set to "auto" and fan and heating icons appeared to be blinking, then became steady. The cooling and heating icons were both displayed with the heating icon blinking at one point.
    - The thermostat was reading and set at 73 degrees Fahrenheit.
    - The fan continuously operated during the visit.
    - At 7:10 a.m. the portable was 79.3 degrees and 57.9% humidity.
    - At 7:22 a.m. the portable was 76.2 degrees and 64% humidity.
    - The ventilation unit was blowing hot air while outdoor temperature was in the low 70's.
    - No musty odors detected.
    - No mold growth that would appear to be associated with extended continuous period (~10 days, 24/7) of high humidity (>70%) was observed.

- Temperature and humidity data loggers were deployed and/or data collected on the subsequent visits. The Office of Environment only evaluated the humidity data since thermal discomfort (temperature) is addressed by Building Services.
    - During September 28th to November 8th, in general, the only bout of extended elevated humidity (65-88%) was October 7th through October 12th. No humidity related mold growth was observed.
- Building Service HVAC Shop
    - The fan would not shut off when the thermostat's temperature setting was satisfied. The fan control relay was sticking.
    - Deployed their own data loggers to evaluate.

Corrective Actions:

- Work order 43748 created to address concern.
- Building Services replaced the fan relay control on October 12th.
- Building Services installed a new thermostat and setup/programmed software on October 24th.
- Building Services installed a relay for the outdoor air damper motor on November 8th.
- The wall thermostat was removed so insulation could be added within the wall to ensure the outdoor air or the return air duct will not affect the readings on the thermostat.
- The dampers of the supply air diffuser nearest the thermostat were closed so not to influence the thermostat.
- Building Services evaluated and verified settings and functions to ensure proper operation of ventilation equipment and controls.