

Spaul Environmental, Inc.

A professional team of engineers, industrial hygienists, safety experts, physicians, and health scientists

Environmental and Medical Monitoring
EPA/OSHA Compliance
Hazardous Waste Control
Indoor Air Quality Evaluations

Safety Evaluations
Training
Expert Testimony
Hazard Communication

18 April 1994

Ms. Judith Hunt, Director
Risk Management and Safety Department
School Board of Broward County
1320 Southwest Fourth Street
Ft. Lauderdale, FL 33312

RE: Follow-up Evaluation at Boyd Anderson High School of 25 March 1994

Dear Ms. Hunt:

This letter details the results of a follow-up evaluation for my 8 February 1994 follow-up evaluation at Boyd Anderson School. This most recent evaluation was to check on the progress of my recommendations that were identified in the 8 February evaluation. Between 4 and 9 March 1994, AirMax Service Corporation reportedly completed all items that were within their scope of services that had been listed as a deficiency in my 8 February report. The specific items that AirMax had reportedly completed were reported in a letter to Mr. Sylvester Davis on 11 March 1994 from Mr. Thomas Meyer of AirMax. As can be seen in that letter, access panels had been sealed, access doors had been sealed and treated, and missing screws had been replaced. Additionally, insulation that had been missed previously had been recently treated. The air handler units that had not been cleaned have since been cleaned and treated.

Although it was not in the scope of work for AirMax, as can be seen in item "f" on page 3 of Dr. Spaul's 8 February 1994 report, the housing for the fire damper had become detached and was moving inside the duct. Dr. Spaul was told prior to his most recent survey that the HVAC technicians had inspected the area and had not found a problem. Dr. Spaul inspected the same site during this recent evaluation, and found the same problem. For reasons of clarity, the following description is presented again to assist these technicians with this broken fire damper.

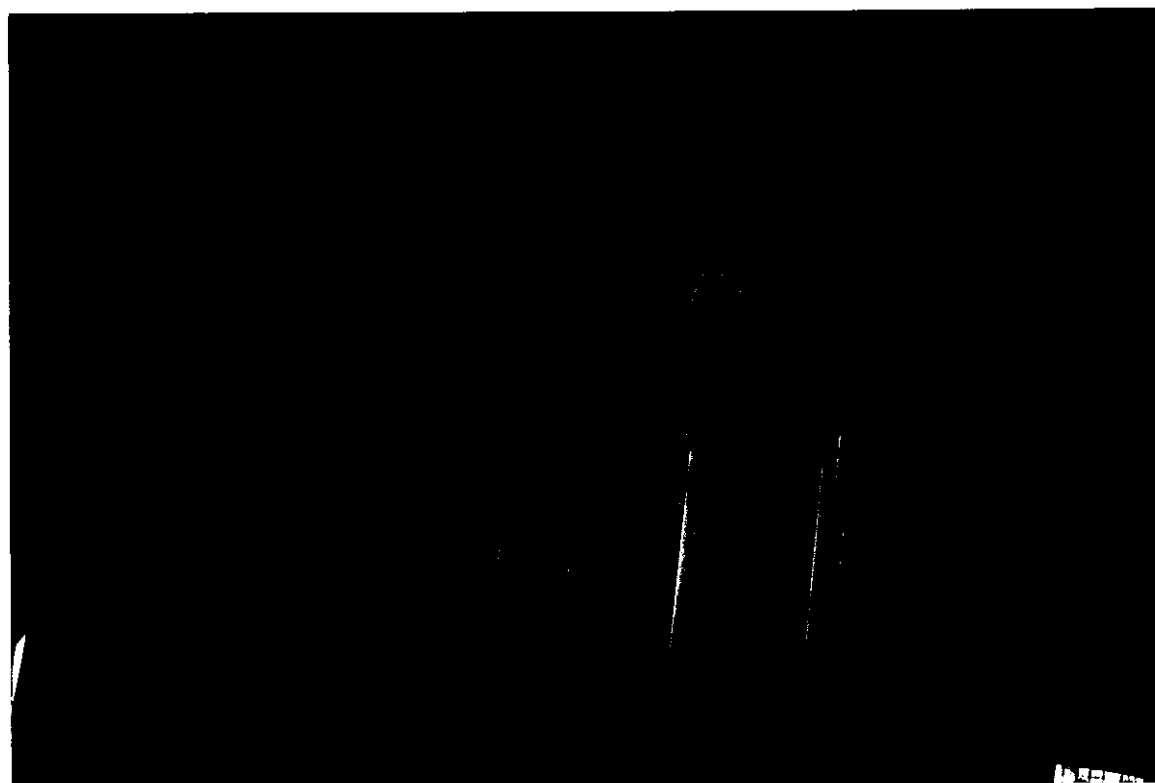
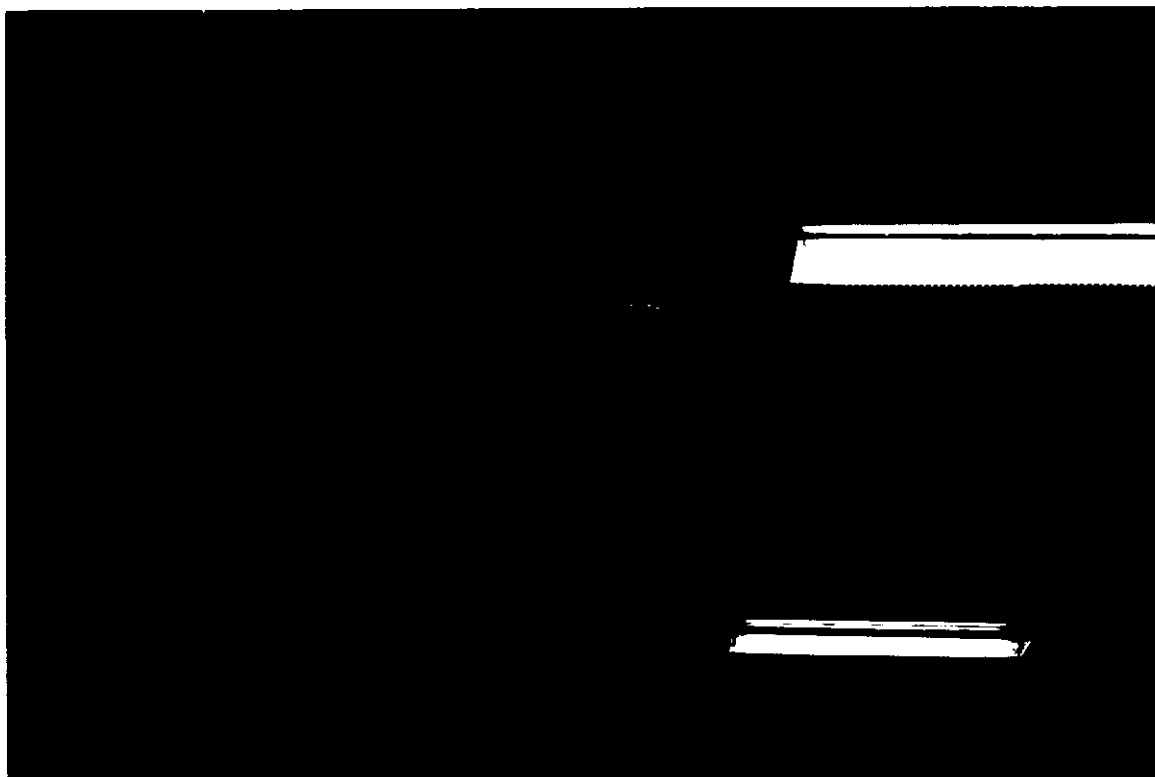
- a) Shut down air handler unit #20, and open the access panel in the supply duct that is closest to the fire damper, which is between the air handler unit and fire damper.
- b) With one person watching the fire damper frame, have another person put the unit into operation.
- c) The technician that is watching the fire damper housing from the access panel should see that the fire damper housing shifts inside the duct where it is not attached.
- d) Please refer to photograph 1 to observe where the fire damper housing has detached from the inside of the duct. If the HVAC technician still has difficulty finding this problem, please contact Risk Management and Safety, and Dr. Spaul will gladly show them the exact location during his next visit to Ft. Lauderdale.

PHOTOGRAPHIC DOCUMENTATION:

Photograph 1: Detached Fire Damper Housing From Inside Supply Air Duct For Air Handler Unit #20

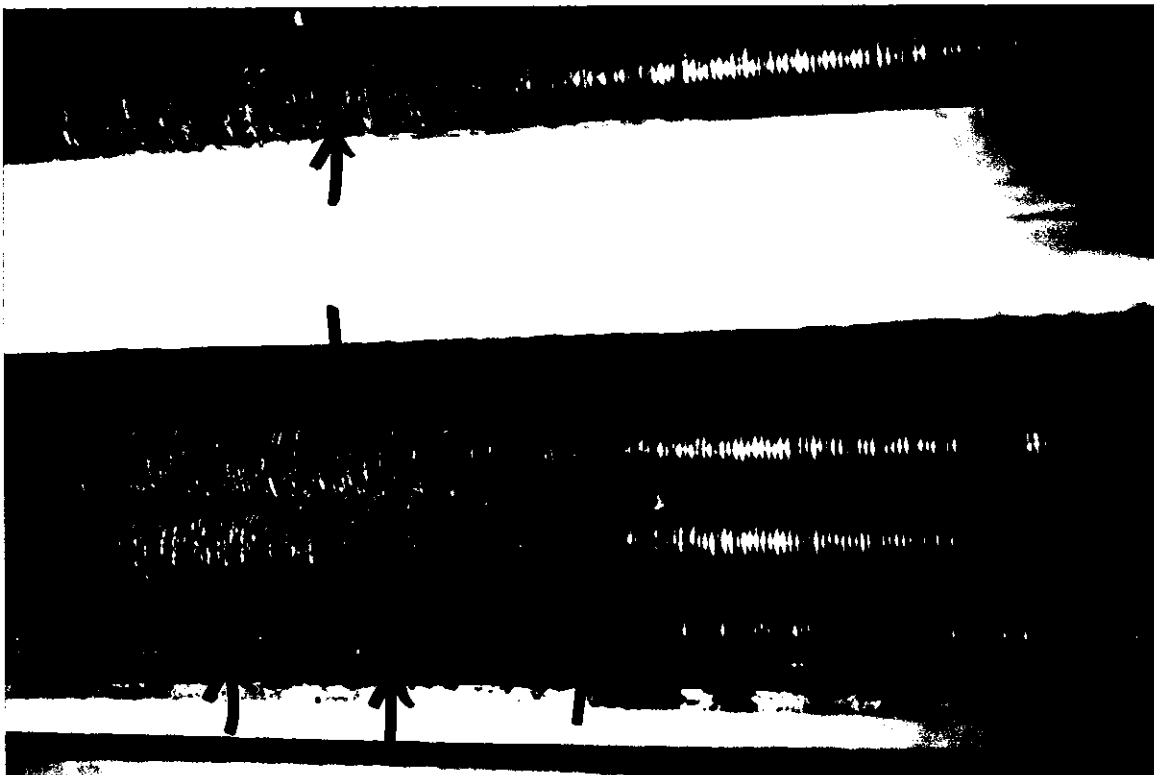


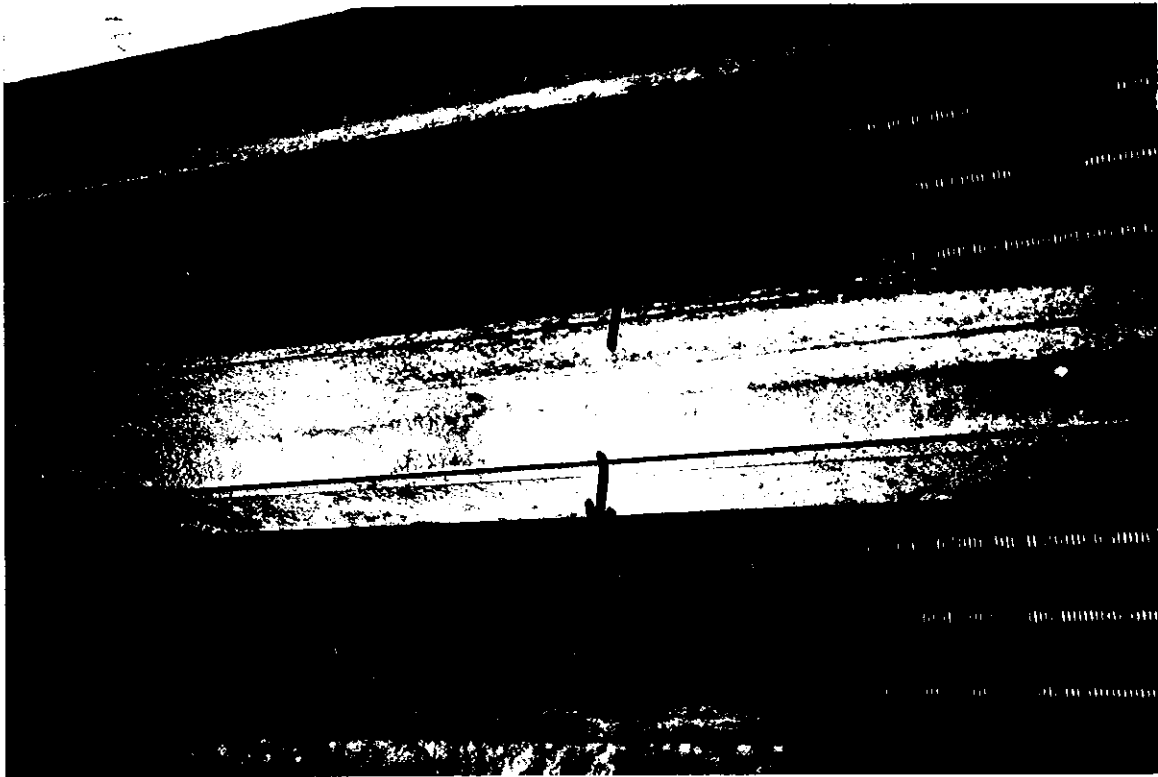
**Photographs 2-4: Black Mold Growths On Bottom Of Air Handler In
Gymnasium That Should Be Promptly Cleaned**





Photographs 5 & 6: Mold Growths And Residues That Were Not Cleaned From The Coils In The Air Handlers In The Gymnasium





Photograph 7: Dirty Coils And Intake Louvers On The Gymnasium Air Handler Unit #7



Photograph 8: Mold Growth Sites On The Coils In The Gymnasium Air Handler Unit #9



Photograph 9: Fan In Garage Air Handler Unit That Had Not Been Coated With Portersept



OBSERVATIONS:

1. The repairs to air handler unit #5, Room 165, have been performed (see item "d" on page 3 of Dr. Spaul's 8 February 1994 report).
2. Although filter changing was not a function within the contractor's scope, and is a school's function, the dirty filters that were identified in the 8 February report are now extremely dirty. The Principal needs to ensure that the custodians are changing all of the filters in a more timely manner than was observed.
3. AHU #4, in Room 107, had accumulations of surface molds in the supply air duct. Since these areas were outside the scope of the contractor's bid, these areas still have not been cleaned, but should be addressed.
4. The fan belt has been replaced and the missing fan belt cover has been re-attached in AHU #22, Room 239.
5. The deteriorated filter tray in the auditorium air handler unit still is in need of repair; the axial vanes on the fan are still not responding properly; the base of the fan housing is still rusted out. Spacers have been correctly installed in the filter rack.
6. The filters for the stage air handler unit are not properly sized for the unit, and stick out of the filter rack on the unit. The filter rack door cannot be closed, and dirty air is by-passing the filters. Properly sized filters will solve this problem.
7. The reported problem with the odors from boy's bathroom #143 still has not been corrected. This bathroom is under a strong positive pressure relative to the hall, rather than a negative pressure, which it should be. The district HVAC crew needs to check the exhaust fans for this bathroom to determine the reason for the positive pressurization of this space. Until this pressurization problem is corrected, this odor problem will continue.
8. The remaining portions of supply air duct to the administrative areas (see page 10 of the earlier report, "Administrative Areas", item #1) still have not been cleaned and treated. These areas were outside

the scope of work for AirMax, but should be treated. The small fan coil unit that is near the ceiling in the Registrar's Data Processing areas has now been cleaned. The dirty and stained carpet is still present.

9. In the gymnasium, the mold on the exterior of the units has not been removed (see photographs 2-4). This exterior mold should be washed off those exterior surfaces. In both units #7 and #9, the front of the coils has not been properly cleaned (see photographs 5-8) and residues remain in the fins of the coils. These areas need to be re-cleaned and properly flushed by the contractor. In AHU #9, no pan strips were present, and the insulation on the far side from the access panel to the fan chamber is not properly coated. Some areas of insulation in this fan chamber have not been coated.

10. The coach reported that the bottom of these two units drop condensation from the bottom of the units, which creates a safety hazard on the gymnasium floor. These lower panels (see mold growths in photographs 2-4) need to be externally insulated to stop this sweating on the exterior of these units.

11. The air handlers in the wrestling room and weight room are very clean, but the filters are extremely dirty.

12. AHU #1 - Garage Area:

- The outside air intake damper is frozen in the closed position;
- As can be seen in photograph 9, one of the two fans has not been properly coated with Portersept;
- The top panel, which provides access to the fan chamber is held in place with only one screw. Although there are three screws in the panel, two of them do not hold. Two additional screws are missing.

13. AHU #9 is clean, but the filters are too large and stick out of the filter access panel.

14. The air handler rooms are very clean and free of stored items.

15. The insulation on the chilled water pipes to AHU #23 needs to be replaced. At present, those pipes are sweating and the water is dripping to the floor, which creates an unsafe condition and a likely site for future microbial growths.

16. AHU #7:

- This fan has a very bad vibration and should be checked;
- The filters are too long and stick out of the unit.

In summary, there are only a couple of minor items that need to be completed by the contractor. I recommend that he be paid 90% of the contract amount, and the remaining 10% be retained until the above listed items from his contracted scope are completed. The School Board HVAC Supervisor can conduct the final inspection for this contractor for these minor items.

The School Board still needs to address the broken fire damper, the broken outside air intake damper on the garage unit, the positive pressurization in the boy's bathroom, the deteriorated filter racks and fan axial dampers, cleaning the remaining portions of the administrative unit air handlers, and replacing the insulation on the gymnasium air handler and chilled water lines for AHU #23.

The school needs to address the changing of the filters and ensuring that the filters are properly installed. The School Board has spent a lot of money cleaning these units, and this money can be easily wasted if the current sloppy practices of improperly installing filters and not changing the filters frequently enough are allowed to continue. The Principal should hold those custodians fully accountable for this very shoddy work with the filters, since only through proper filtration will these units remain clean.

Should there be any questions about this report, please do not hesitate to contact me.

Sincerely,



Wil A. Spaul, President
PhD, MPH, MSCE
Certified Industrial Hygienist

Adjunct Associate Professor of Indoor Air Quality
College of Public Health
University of South Florida - Tampa