Sealing Leaky HVAC Ducts

With a renovation of an elementary school revealed substantial leakage in a portion of ductwork, a pilot program to evaluate a sealing technology was put into action.

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Adrian Tylin, former sustainability initiatives officer for LAUSD, discusses the project.

Facility Executive Staff

This project involved 11 of LAUSD’s active K-8 elementary school buildings. The school currently serves more than 1,200 students and includes classrooms, a library, computer lab, and administrative offices. The duct sealing was limited to the supply and return ductwork serving the building’s administrative offices, and the return duct serving the kitchen and surrounding classrooms.

What were the motivating factors to pursue this project?

The initial interest in Aeroseal was related to our need to meet building code requirements. At the same time, we saw this as a potential avenue for substantial energy and cost savings. Our test and balancing (T&B) experts determined that the ductwork had leakage levels well above specifications. Assessing the ductwork and sealing those leaks using traditional duct sealing methods would have required a substantial amount of demolition to the existing building, the time needed and the disruption that would be caused by the demolition, along with the costs of reducing this level of air infiltration. If we were to proceed, the Aeroseal technology seemed to be the answer.

How did you research the options available in the market? Did you arrive at the final decision to implement Aeroseal?

We had several important meetings with Aeroseal representatives as we investigated the technology to ensure it was safe as well as effective. This included a rigorous approval process conducted by our office of education health and safety (OEHS). It also included a review of research conducted by Lawrence Berkeley National Laboratory where the technology was first developed. We also reviewed the associated MROD documents and a detailed bid/selection from other school districts, hospital administrators, and commercial building owners where the technology was applied.

There were several aspects of the technology that made it particularly appealing.

1. Highly Effective: The research mentioned below is linked to 50% effective at sealing duct leaks.
2. Non-destructive: There was no other viable option of assessing the existing ductwork without leaving the building, or after building infrastructure.
3. It took the greatest cost out of the process: The computerized process monitors the leakage rate whilst it is sealing. At the end of the sealing process, the system generates a report, a “before and after” report that documents the results. There was no need to follow up with additional T&B measurements.

Once approved at that level, we identified the LAUSD 3rd Elementary to be a pilot project.

Please share the project timeline.

The initial research and approval process spanned about an year. We then began the planning stage, where the Aeroseal representatives met with our engineers and planned out a course of action. Over the course of a few months, we put the project out to bid, selected Power Group (Los Angeles), as our Aeroseal contractor for the job. They conducted site visits and developed a final plan of action.

The actual sealing process took just a little time to complete from start to finish. On the first day, the supply and return ducts serving the administrative offices were sealed. On the second day, we sealed the return duct serving the kindergarten classrooms. On the first day of sealing, there were several distinct personnel assigned to help enhance and evaluate the process, including school administrators, maintenance and operations staff, inspectors, and engineers. The sealing portion of the project was conducted over two-weeks of winter breaks when the building was relatively unoccupied.

What were the results?

First, the technology was very effective. Past testing showed that leakage rates were reduced by about 90%. This is within our self-imposed code requirements. Reducing that amount of leakage has led to a significant impact on energy use. We are in the process of calculating how much we will be saving over a year, but we feel confident that it will be enough to provide a return on investment.

With 10 new schools in the district—more than 14,000 buildings overall—the energy saving potential of effective duct sealing costs would represent hundreds of thousands of dollars in reduced facility costs.

Any other comments on this project, or lessons learned?

There were many skepticism on how to measure the process as it was being applied to the school building, but everyone came away impressed with how well it worked. The bottom line is that there simply aren’t any other viable reasons for tackling this problem.