

# Living Stones Academy: Instilling "Prime Citizenship"

## About Living Stones Academy

Nestled on a Fulton Heights hill top, Living Stones Academy is committed to instilling values of community service, justice, and prime citizenship into the hearts and minds of little ones. An important aspect of children's learning environment is the space in which they live, learn and play. Living Stones Academy has taken monumental steps to make their school building a place which stewards resources continuously, acts neighborly and promotes healthy surroundings which fosters children's curiosity and growth.

## BEFORE

Purchased in 2014 from the Grand Rapids Public School system, the building was ready with two wings of classrooms, office space, a gymnasium, and a playground adjacent park with ample green space. Over 25 years old, the boiler and roof were reaching end of life. A hot water loop radiant ceiling heating system behind the drop ceiling, built in 1955 was an out-of-date design. The existing ventilation system had been decommissioned since the 70s. At the time this cut costs, though diminished the air quality via reduced air changes. The building's metal roof deck and brick & mortar envelope allowed for excessive thermal bridging. The expansion and contraction of the steel frames at times would crack the single glazes windows. For LSA, this was just the starting point...

## AFTER

LEDs were changed in the corridor even before the report was complete; for LSA, the investment was a no-brainer. 3 months later, old machinery has been cleared and the duct work has been checked and cleaned in preparation for the improved ventilation. LSA is ready to use passive airflow to increase fresh oxygen content in the classrooms and use the night air to cool the building before the day begins.

Patch roof repairs were completed, this will protect them as they plan for their expansion and remodel. LSA is gathering works of a capitol campaign to expand the school because of growing attendance rate. Sustainable designs will be foundational to this expansion, intending to enhance the heating system, roof replacement, and considering renewable energy photovoltaics.

## THE AUDIT

The GR2030 Energy Assistance Program audit, performed by Catalyst Partners, intended to mitigate the expected energy costs by adding ventilation. Replacements were identified for the heating system and boiler system which would save them a cumulative of 33% on energy savings and 28% on cost savings. Insulation opportunities were discovered in the hot water supply with a payback just shy of 2 years. An Indoor Environmental Quality tested the air for total volatile organic compound (TVOC) and carbon dioxide (CO2). Although the air diffuses as the building sits empty overnight, these metrics rise sharply at 8 am and sustain throughout the day.

This validates the intentions to open more air circulation throughout the building. Anticipating a 30,000 kWh energy increase from the ventilation system, Catalyst search for renewable offsets. In the appendix, Catalyst Partners noted that LSA had great sun exposure and solar potential. With an estimated \$4,700 annual savings and available rebates of over \$17,900, a solar photovoltaic system could pay off in 10.6 years. This would allow for the the array to give clean and cost-effective solar for the whole latter half of its life.



### Energy Conservation Measures (ECMs) chosen for year 1 and 2

ECMs	Cost Savings (%)	Incentive Available	Payback (years)
LED lights	2%	\$2,121	0.8
Boiler Replacement	12%	\$1,400	30
Ventilation System Addition	-33%	NA	NA

## To Put This into Perspective

Living Stones Academy is intentional with every action. It speaks volumes about their integrity as an organization to prioritize the upgrade which benefits air quality for children over the pocket book. Dropping from an EUI of 50.2 kBtu/sf/yr to 61.1 demonstrates LSA commitment to live by example. Stewarding resources and reducing downstream impact demonstrates the hallmarks of LSA's character: to be servant leaders, justice seekers, and community investors. A reduction of 19.8 tons of CO2 per year means modeling creation care and prime citizenship to youth, "so that they may also make the world a little more of what it was intended to be - just, beautiful, and true." - Head Master