

# Meadowlark School

Boulder Valley School District | Erie, Colorado

## Evidence-based Design for Optimized Learning and Low Energy

To meet the Boulder Valley School District’s goals of providing exceptional learning environments and high energy efficiency, BranchPattern implemented many strategies to lower consumption while enhancing occupant thermal comfort and improving indoor air quality. A low energy in-floor radiant heating and cooling system works in tandem with a floor supplied displacement ventilation system to provide flexible conditioning of the occupied zone. While radiant cooling systems are rare in the United States, a collaborative approach to systems research, training, and operations resulted in the installation of one of the largest radiant cooling systems in a K-12 school.

BranchPattern’s research on the benefits of fresh air in both cognition and user wellness significantly influenced the design in a number

of ways. Operable windows and vents combined with ceiling fans allow for natural ventilation to create comfortable conditions a large portion of the school year. South facing solar chimneys are heated by the sun, resulting in buoyancy driven airflow, further increased the effectiveness of the natural ventilation system. Research on effective occupant signaling strategies were incorporated to notify occupants of when they should utilize natural ventilation in lieu of the mechanical system.

To meet the stated energy goal of 25 kBtu/sf/yr, lighting and electric loads have been designed to minimize consumption and the building is designed to accommodate a sizeable rooftop photovoltaic array. 20 daylighting tubes provide daylighting in spaces that would otherwise been artificially lit.

### Metrics

New Construction  
110,000 sf  
\$27.8 Million  
2,200 People per Day

### Specialisms

MEP Engineering  
Building Performance Modeling  
Research & Development

### Impacts

Energy goal of 25 kBtu / SF/ YR

### Completion

October 2017

