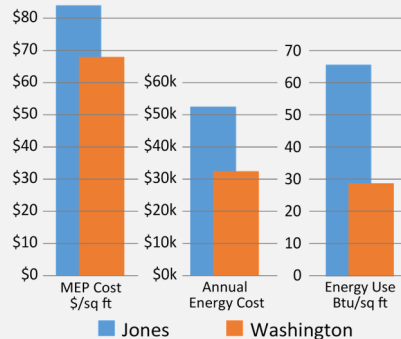


### Project History

Kirkwood Community College's Regional Centers work with area K12 schools, extending skills training from high-schools into areas that Iowa communities need. Design Engineers (DE) was hired to redesign a prototype building used at Jones County for a new Washington County Regional Center, targeting improved efficiency. As shown in the table below, our design-centric approach makes a measurable difference.

### Owner

Kirkwood Community College  
 Troy McQuillen, VP of Facilities  
 troy.mcquillen@kirkwood.edu



### Good Engineering Matters in Millions to the Bottom Line

It may not seem like the difference between two competent engineering firms could be that great, but as this comparison shows, it can amount to millions of dollars. This unique situation allows a real-world comparison of two structures that are nearly identical except for MEP design. Although both buildings function for their intended educational purpose, the Design Engineers building cost **\$1,400,000 less to build and operate** over a typical 25-year life cycle.

### Unique Opportunity to Compare Engineering Approaches

Very rarely do two buildings share so many characteristics as the prototype, Jones, and our project, Washington. The buildings have identical window, wall, and roof insulation specifications, differing only slightly in orientation. Facility functions are almost identical with offices, classrooms, welding, automotive, manufacturing and architectural shops. Washington provides 11% more square footage and adds an energy-intensive automotive paint booth with 17,500 cfm of exhaust, yet according to Kirkwood's actual utility bills, Washington's energy cost is **\$20,000 less per year** than Jones.

### The Design Engineers Difference

HVAC for Jones County includes rooftop units and hot water reheat terminal units where DE's project, Washington, uses geothermal heat pumps connected to a vertical ground heat exchanger. Over the 25-year life of the mechanical system the higher efficiency of the heat pump system results in over \$500,000 in energy savings. Despite the typically higher initial cost of geothermal heat pumps, the 11% larger building and 12% escalation in construction cost during the 5 years between bidding, the cost-effective design of Washington's MEP systems cost **\$600,000 less to build** than Jones.



Kirkwood Jones County – Industry Standard Engineers, Bid 9/08



Kirkwood Washington County – Design Engineers, Bid 3/13

	Industry Standard Engineers JONES COUNTY	Design Engineers WASHINGTON COUNTY	% Change
Area	33,475 sf	37,217 sf	11% larger
General Construction Cost	\$113/sf	\$116/sf	3% more
<b>MEP Systems Cost</b>	<b>\$84/sf</b>	<b>\$68/sf</b>	<b>20% less</b>
Annual Energy Use	66 kBtu/sf	29 kBtu/sf	56% less
<b>Annual Energy Cost</b>	<b>\$1.55/sf</b>	<b>\$0.86/sf</b>	<b>45% less</b>