

## Life Cycle Cost Analysis of School Building Types



By William A Keeter  
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## Concretables Life Cycle Study

### Executive Summary

Concretables are safer, last longer and cost less than conventional modular buildings over the life cycle of the structures. Concretables, which are made of steel reinforced cast concrete, can save almost 50% over the life cycle of structures when compared to metal constructed modulars and hybrid modulars. They even cost less than permanent tilt wall structures over a 25, 50 and 100-year cycle.

These are the conclusions of an independent study conducted by William A. Keeter, president of BK Reliability Engineers. Mr. Keeter is widely recognized as a national leader in the field of maintenance and reliability of equipment and buildings. Over the past 25 years, he has held maintenance leadership positions in the U.S. Military, the nuclear industry, and several manufacturing companies. Mr. Keeter is an internationally recognized author in England, Australia and the US and has presented at several internationally attended conferences, including the Society of Maintenance and Reliability Professionals. Royal Concrete Concepts retained his firm for the expressed purpose of creating a totally independent comparable study of the modular construction industry.

Among his conclusions:

- Concretables are 44-48% less expensive over 25, 50 and 100 year cycles, when compared to metal stud and hybrid modulars.
- Concretables are approximately 40% less expensive than permanent tilt wall structures averaging \$166 per square foot.
- While Concretables initially cost more than traditional portables, they have far less maintenance requirements and last much longer, which saves money over the long haul.
- Concretables have many non-monetary benefits, such as easier access for disabled students and quieter operations on the inside of the buildings.
- Concretables are more resistant to hurricane damage and other natural disasters, reducing the risk of disrupting normal operations.

BK Reliability Engineers uses a detailed analysis methodology of cradle to grave costs associated with a project. The methodology is consistent with the National Institute of Standards and Testing and is accepted by the Society of Maintenance and Reliability Professionals Association.