

***BEST 4 April 12-14, 2015 Kansas City***

***Introducing the BEST 4  
on behalf of the Technical Committee***

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# *Definition of Building Science*

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**“Knowledge about building, called, for convenience, building science, is valuable largely because it is useful in predicting the outcome of the result of some building situation. .... Rational design is possible only when there is a capability to establish, each time a choice is made, the probability of a particular result.”**

***Hutcheon N.B. “The Utility of Building Science”,  
J. Thermal Envelope & Building Science, July 1998***

*The difference between learning building science at Uni  
or learning when applying it in the practice is like*

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*The difference between  
the almost-right word and the right  
word is really a large matter --  
it's the difference between the  
lightning bug and lightning*

*Mark Twain [Samuel Longhorne Clemens]*

# *The focus of the BEST conferences*

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**2015** *Performing Architecture*

*(synchronized form and function)*

**2012** *High performance buildings:*

*Combining Field Experience With Innovation*

*(innovation in the field practice)*

**2010** *Change of the design paradigm*

*(process leading to the outcome)*

**2008** *Energy efficiency and durability*

*on cross-roads (CRITICAL issues)*

## *Time for some reflections:*

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- ❑ *This conference is not to only to deliver you some practical information **but also a highlight some changes in the built environment***
- ❑ *Expectations change— a house with the garage in suburbs from 1960's is now replaced by a city dwelling with amenities: public transportation and green space*
- ❑ *We want a higher living comfort for the same cost of living*

*Think out of the box – bioclimatic and HVAC integrated with the enclosure*



**Termite mound in  
Mexico**

**Sunny and shaded sides**  
Convective cooling and ventilation – Eastgate Center , a large building in Zimbabwe uses 10% of energy for it only re-circulates the cool air  
*We have 2 papers on this*

# *Application of BEES 3.0 to review alternatives*

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<i>Cladding</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>Brick w mortar</i>	0.0580	6.60	2723	41.4
<i>Vinyl siding</i>	0.0023	2.28	927	23.5
<i>3-coat stucco</i>	0.0026	2.63	1377	8.95
<i>AAC w flying ash</i>	0.0018	2.63	830	7.99

*A = overall environmental impact*

*B = cost, C = global warming effect*

*D = embodied energy*



## *Predictions for next generation: water to water HP, more thermal mass*

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- ❑ *Water to water heat pump gives you both heating and cooling as needed*
- ❑ *Large surface low temperature hydronic heating and cooling wins –it provides temperature control, thermal mass and lower cost of heat distribution*
- ❑ *Hydronic heating and cooling will also be located in walls – it is easier to panelize it and better for indoor climate*



## *Predictions for the next generation: thermal mass better coupled with ventilation*

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- *A light weight concrete or masonry with continuous exterior thermal insulation may be a preferred type of wall*
- *More moisture buffering is likely.*
- *With solar heating or cooling combined with PV, some form of a glazed and ventilated exterior panels are becoming the preferred type of cladding.*