

Living Buildings and Bringing Buildings to Life

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Bringing Buildings to Life means...

Creating sustainable conditions in which
people of all ages and abilities can flourish.

How do we do this?

1.
**Turn to other models for
inspiration and action.**

The Old Zoo

- Dysfunctional behavior
- Illness
- Low reproductive success

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Low zoo attendance



The New Zoo

- Naturalistic habitats
- Behavioral enrichment – foraging, play, control
- Improved animal reproduction

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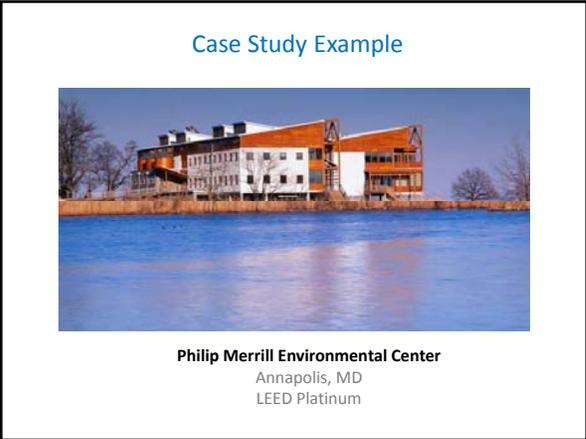
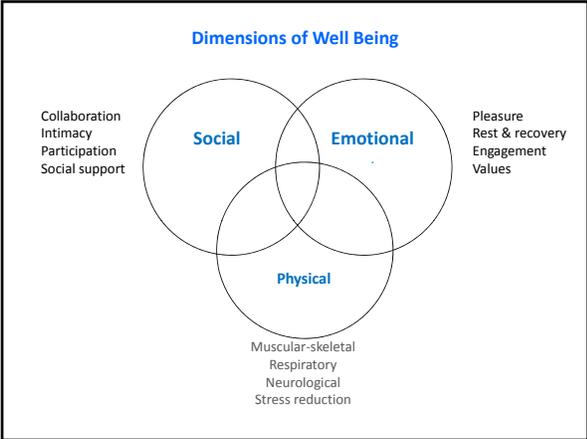
Increased attendance
Increased memberships



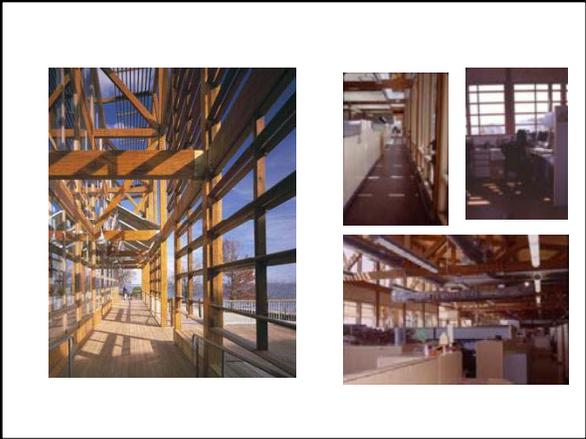

2.
**Know your animal – Design with its
basic needs in mind.**

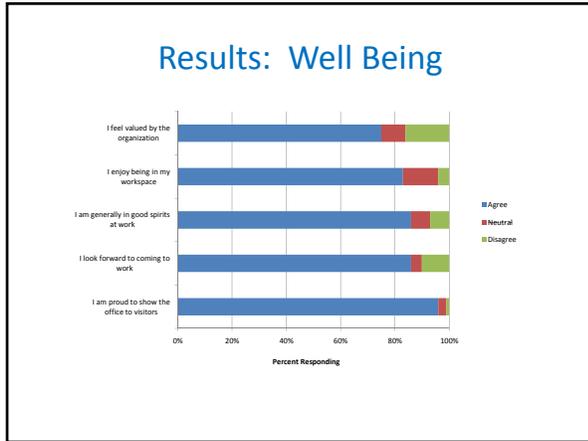
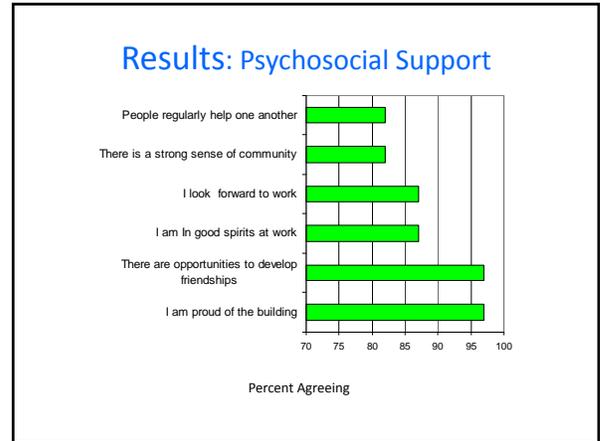
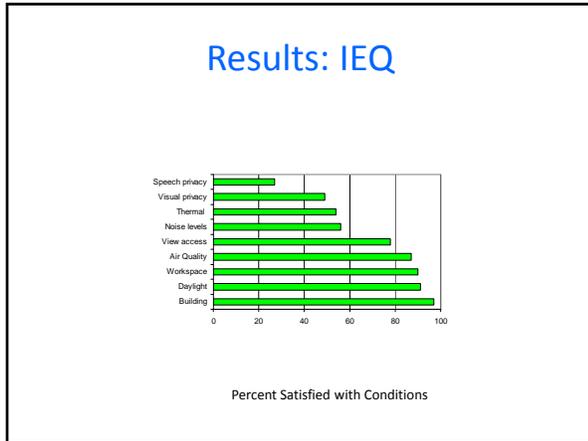
What does the human animal need to flourish?

- | | |
|--|--|
| <h3 style="color: #0070C0;">Survival Needs</h3> <ul style="list-style-type: none"> • Clear air • Clean water • Lack of toxins and pathogens • Safety • Protection | <h3 style="color: #0070C0;">Well Being Needs</h3> <ul style="list-style-type: none"> • Stimulate all the senses • Atmosphere free of undue pressure and stress • High degree of pleasure • Behavioral choice and control • Rest and recovery • Varied social interactions • Exploration and learning • Novel challenges suitable for age • Sense of pride |
|--|--|
- Boyden, 1971. Biological Determinants of Optimal Health.
 Diamond and Hopson, 1999. Magic Tree of the Mind



- ### Key Design Intentions
- Foster awareness of environmental design
 - Create a high quality, healthy atmosphere for employees to support job performance
 - Create a sense of community and improved ability to interact within and across groups





What People Liked Most

- Daylight and sunlight
- Connection to nature and to the Bay
- Feeling great at work
- Inspiration - living the values of the Chesapeake Bay Foundation

“I thought I had died and gone to heaven.” Senior Policy Analyst
“Everyday we can see what we are working on and what we are working for.” Senior Executive



Three Approaches

Literal
Facsimile
Evocative



Literal Facsimile Evocative

Why biophilia matters: key research findings

- Psychological & physiological stress reduction
- Shift to positive emotional states
- Improved ability to concentrate
- Entrainment of circadian rhythms
- NO EVIDENCE of negative effects

Kellert, Heerwagen and Mador, 2008. *Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life*. New York: Wiley.



Sunlight

Photons are a precious resource and should be shared by all.
Senior Engineer, Sun Microsystems

- Entrain circadian rhythms
 - Light detectors in eye have peak sensitivity at 480 nm (blue light/blue sky)
- Reduces depression in clinical settings
- Improves moods and reduces perception of pain
- Has wide range of other neurological benefits

Kiraly et al, 2006. Vitamin D as a neuroactive Substance. *Scientific World Journal*.
Walch et al, 2005. The effect of sunlight in postoperative analgesic medicine use. *Psychosomatic Medicine*.



Window views have broad influence on outcomes
Designing window views with nature in mind

Hospital studies

- Reduced days in hospital
- Reduced use of strong analgesics
- Improved emotional functioning

Office studies

- Reduced stress
- Improved concentration
- Improved life satisfaction

Housing and neighborhoods

- Reduce ADHD symptoms
- Reduced violence & crime
- Improved life satisfaction



J. Heerwagen, 2006. Investing in People. *Rethinking Sustainable Construction '06*, Sarasota, FL
R. Ulrich, 2008. Biophilic Theory and Research for Healthcare Design. In *Biophilic Design*. S.R. Kellert, J. Heerwagen, and M. Mador (Eds). Wiley.

Window Views can Improve Task Performance

A 2003 study by the Hescong-Mahone Group found a 6% improvement in call center average handling time for workers with the highest rated views, as compared to workers with no view at all.



Indoor plants can improve health and performance

Field et al 1998

23% decrease in neuropsychological symptoms in offices with plants - greatest reduction for fatigue

24% decrease in mucous membrane systems – greatest reduction for dry throat and cough

Wargocki et al, 2000

1.1% increase in performance for every 10% reduction in SBS complaints, indicating a 2.3% productivity gain due to the presence of plants in the office.




Field, T., et al (1998) The effect of indoor foliage plants on health on discomfort symptoms among office workers. *Indoor & Built Environment*, 7, pp. 304-306.

Wargocki, P., et al. (2000) Pollution Source Control and Ventilation Improve Health, Comfort and Productivity. in *Proceedings of Cold Climate HVAC 2000*, Sapporo, Japan, November 2-3, 2000

4.

People actively work to achieve comfort.



5.

There are many behavioral challenges

- Unsustainable biophilia
- Need for substantial changes in behaviors – people, not buildings, consume resources
- Demands of sustainability may run counter to our evolved human nature – do we have a conservation mental module?

6.

BUT good reasons to be positive...

- The changing nature of work and workplaces – flexibility, social equity
- Rewarding good behavior – smiley faces on energy bills
- The next generation has strong environmental values AND they act on the basis of their values

