Biophilic Design: Implementation & Outcomes

BEYOND SUSTAINABILITY – BIOPHILIC AND REGENERATIVE DESIGN IN ARCHITECTURE
Bruno Duarte Dias
European Scientific Journal March 2015
Note: Stephen R Kellert, 6 elements, 75 attributes

Biophilic Design:
1. Environmental features
2. Natural shapes and forms
3. Natural patterns and processes
4. Light and space
5. Place-based connections
6. Evolved human relationship to nature

Living System thinking
Charles Krone. Living system thinking sees what they are working on as a system of energies or life processes, rather than as things or as a system of things

1. Existence - concentrate on what is there
2. Operate - improve the efficiency
3. Maintain - focus on resilience
4. Potential - what existed but not yet manifested
5. Improve - restorative level
6. Regenerate - goes beyond improving current systemic performance

Heerwagen & Hase
Characteristics of Biophilic Design 2001

Enticement
- Information richness that encourages exploration, discovered complexity
- Visual distance, horizontal / sky imagery, strategic viewing conditions
- Canopy effect, enclosing surfaces, penetrable barriers and surfaces for views out
- Sense of playfulness

Biomimicry
- Fractal characteristics
- Designs derived from nature
- Use of natural patterns & forms

Water
- Glimmer or reflective surface
- Moving water
- Symbolic form of water

Biodiversity
- Outdoor natural areas with rich vegetation and animals
- Varied vegetation indoors and out
- Biodiversity: windows designed and placed to incorporate views

Sensory variability
- Natural rhythm and processes
- Changes and variability in environmental colors, air movement, light, temperature and texture over time and space

Biophilic in Practice: Buildings that Connect People with Nature
Alex Wilson,
Building Green, 2006,

Biophilia 1 qualitative
1. Nature incorporation
- Environmental elements
- Lighting
- Space layout
2. Pattern incorporation
- Nature’s patterns through the design
3. Nature interaction
- Within the building
- Within the project boundary, external to the building

Biophilia 2 quantitative
1. Outdoor biophilia
- Features either landscaped grounds or rooftop gardens accessible to building occupants
- Consists of, at minimum, 70% planting including tree canopies (within the 25%)
2. Indoor biophilia
- Potted plants or planted beds cover at least 1% of floor area per floor
- A plant wall per floor, covering a wall area equal or greater than 2% of the floor area, or covering the largest of the available walls, whichever is greater.
3. Water feature
- At least 1.8 m [5.8 to 6 ft] in height or 4 m² [43 ft²] in area
- Ultraviolet sanitation or other technology to address water safety

WELL V2 Standards
It has seven health categories: air, water, nourishment, light, fitness, comfort, and mind.
Registration for WELL costs $1,500 to $10,000, certification is $4,000 plus a square footage cost of $0.08 to $0.23 per square foot depending on project type and size. Performance costs $5,000 with a square footage cost of $0.15 to $3.5 per square foot.

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https://drive.google.com/file/d/1kdh1_42Wu1JGm94JQEQJ8nuuqo/view


https://c2.wellcertified.com/w/en/cowreview

https://www.fitwel.org/standard

Fitwell
US Center for Disease Control and Prevention, General Services Administration

Fitwell has twelve sections: location, building access, outdoor spaces, entrances and ground floor, stairwells, indoor environment, workplaces, shared spaces, water supply, cafeterias and prepared food retail, vending machines and snack bars, and emergency procedures.
Registration costs $1500 and certification costs $6,000.

Impacts Surrounding Community Health
Strategies that impact surrounding community health broaden the impact of the project past the health of on site occupants, reaching those who live, work, play, or learn in neighboring areas.

Reduces Morbidity and Absenteeism
Strategies that reduce morbidity and absenteeism promote decreased rates of chronic disease and mental health conditions, reductions in disease transmission, and fewer missed days of work.

Supports Social Equity for Vulnerable Populations
Strategies that support social equity for vulnerable populations ensure that a range of populations, including children, elderly, disabled, or socio-economically disadvantaged persons have increased access to health-promoting opportunities whether through universal accessibility, pricing incentives, targeted amenities, or pedestrian-focused environments.

Instills Feelings of Well-Being
Strategies that instill feelings of well-being promote inclusion, relaxation, and perceptions of safety, through reinvigorating and clean spaces, an enhanced connection to nature, and opportunities for social engagement.

Enhances Access to Healthy Foods
Strategies that enhance access to healthy foods provide occupants with expanded availability to fruits, vegetables, and other nutritious food options by diversifying the options and sources of healthier food options, promoting healthier choices, and reducing cost of healthier options through pricing incentives.

Promotes Occupant Safety
Strategies that promote occupant safety decrease risk of crime and injury, protect bicyclists and pedestrians from vehicular traffic, and increase stair safety.

Increases Physical Activity
- Strategies that increase physical activity incorporate opportunities for movement into everyday life whether through encouraging active transportation, promoting stair use, or expanding access to indoor and outdoor fitness areas and equipment.