1. Introduction
2. Nature and Stress
3. Biophilic Design Strategies
1. The problem
BIOPHILIC DESIGN PRINCIPLES

ORGANIC/NATURALISTIC DIMENSION
(Direct Interactions)
(In direct Interactions)
(Symbolic Interactions)

PLACE-BASED/VERNACULAR DIMENSION

6 ELEMENTS

ENVIRONMENTAL FEATURES

NATURAL SHAPES AND FORMS

NATURAL PATTERNING AND PROCESSES

LIGHT AND SPACE

PLACE-BASED RELATIONSHIPS

EVOLED HUMAN-NATURE RELATIONSHIPS

over 70 ATTRIBUTES

1. Colour
2. Water
3. Air
4. Sunlight
5. Plants
6. Animals
7. Natural materials
8. Views and vistas
9. Façade greenery
10. Geology and landscape
11. Habitats and ecosystems
12. Fire

1. Botanical motifs
2. Tree and columnar supports
3. Animal (mainly vertebrate) motifs
4. Shells and spirals
5. Egg, oval, and tubular forms
6. Arches, vaults, and domes
7. Shapes, twisting straight lines and right angles
8. Simulation of natural features
9. Biomorphology
10. Geomorphology
11. Biomimicry

1. Sensory variability
2. Information richness
3. Age, change, and the patina of time
4. Growth and efflorescence
5. Central focal point
6. Patterned wholes
7. Boundaries spaces
8. Recurring spaces
9. Linked series and chains
10. Integration of parts to wholes
11. Complementary contrasts
12. Dynamic balance and tension
13. Fractals
14. Hierarchically organized ratios and scales
15. Natural light
16. Filtered and diffused light
17. Light and shadow
18. Reflected light
19. Light pools
20. Warm light
21. Light as shape and form
22. Spaciousness
23. Spatial variability
24. Space as shape and form
25. Spatial harmony
26. Inside-outside spaces
27. Geographic connection to place
28. Historic connection to place
29. Ecological connection to place
30. Cultural connection to place
31. Indigenous materials
32. Landscape orientations
33. Landscape features that define building form
34. Landscape ecology
35. Integration of culture and ecology
36. Spirit of place
37. Avoiding placelessness
38. Prospect and refuge
39. Order and complexity
40. Curiosity and enticement
41. Change and metamorphosis
42. Security and protection
43. Mastery and control
44. Affection and attachment
45. Attraction and beauty
46. Exploration and discovery
47. Information and cognition
48. Fear and awe
49. Devotion and spirituality

(Kellert, 2008; image Kost, 2014)
1. Locating in or adjacent to nature
2. Moving in nature
3. Daylight and views
4. Natural materials: Wood
5. Plants
6. Natural Scents
1 Locating in or adjacent to nature

(Oakley, 2015)
All existing trees preserved.
Filter strip removes contaminants from parking run-off.
Detention pond controls storm water while planting removes phosphates.
Cut and fill balanced by creating berm and pond on the site.
Composite wood deck built with 50% wood chips and 50% post-consumer plastic.
Crushed concrete used for parking lot base in lieu of virgin crushed limestone.
Wool shirts from tree pruning operation used for ground mulch.
Biodiversity promoted by creating habitat and food supply for bats, birds and other species.
Walking paths designed for wider community use.
Boulevard and hedgegrow planted by City in lieu of planting replacement trees for approaches elsewhere.
220,000 litres less water used due in part to the xeriscape landscape (native prairie restoration / non-irrigated system).
100 trees planted at the south end of the site by all members of the firm.
The building incorporates a geothermal cooling and heating system.
The 153 preserved spruce trees filter air before it enters the building’s air intakes.
2 Moving in nature

Google - Bay View Complex, Mountain View, California

(Palmer, 2016)
3 Daylight and views

(Canos, 2014)
4 Natural Materials: Wood
5 Plants

(Palmer, 2016)
6 Natural Scents (Giles, 2014)
1. Locating in or adjacent to nature
2. Moving in nature
3. Daylight and views
4. Natural materials: Wood
5. Plants
6. Natural Scents
Nature-based Features to Support Stress Reduction in Knowledge Workers

Ann Callaghan
Conestoga College, Cambridge, ON
acallaghan@conestogac.on.ca

Dr. Shauna Mallory-Hill
University of Manitoba
s.mallory-hill@umanitoba.ca