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THE ROLE OF 'GREENING' AND AN ECOSYSTEM APPROACH TO ENHANCING CONSTRUCTION ERGONOMICS

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Introduction:

- Purpose: Ecological engineering principles considered:
  - as complementing the sustainable sites initiative, and to be
  - incorporated as an organisational management strategy

- Objective: Establish the use of ecosystems:
  - as the interface between technology and the environment
  - through the biophilic design concept and feng shui principles

- Originality and value: Establish and integrate ecology and ecosystems in construction ergonomics
  - as an aid to psycho-therapeutic stress management
  - to enhance the sustainable sites initiative in construction

- Methodology: Exploratory ‘greening construction site’ survey entailing
  - critical analysis of existing construction sites

Definition of biophilia:

- **"Biophilia is the innately emotional affiliation of human beings to other living organisms." (Wilson, 1984)**

Highlights:

- **The Biophilia hypothesis and *feng shui* principles**
- **Greening construction sites – Biophilic Construction Site Model (BCSM)**
- **Eco-psychology and nature-psychophysiology**
- **Ecological engineering**
- **Ecological systems (ecosystems), ergonomics, and sustainability**

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Case study: BHP Billiton Wessel's Mine Central Block Project, Hotazel (86km from Kuruman), South Africa - four construction sites are presented below (numbered left to right, 1st row then 2nd row)

- Murray and Roberts (M&R) (Photos 1, 2, and 3)
- Synntech Project Management (Photo 2)
- Gear Mine and Steel (Photo 4)
- BHP Billiton (Photos 5 and 6);
- Bashewa and Olivier (Photos 7 and 8)






1. M&R rose garden courtyard with giant water jug fountain
2. Sunny coloured shade over walkway leading from M&R to Synntech Project Management offices
3. Contrasting green grass courtyard to M&R workers changing room extension
4. The contrasting site of Gear Mine and Steel Construction devoid of beneficial natural

5. BHP Billiton central block office courtyard
6. Parking lot at BHP Billiton
7. Outdoor shelter at Bashewa and Olivier Construction site offices
8. Live chameleon in the Carmel Thorn tree on the Bashewa Construction site fed by workers

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Findings - beneficial application of ecological engineering on the construction site:

- **Contractors initiated the BCSM interventions unaware of the concept**
- **There is a sense of responsibility of the management towards sustaining the physical, economic, and social aspects of the workplace environment**
- **Maintenance of the biodiversity of the particular locality and region subverts the real threat of range shift from climate change**
- **Hydration, watering of plants and keeping the environment cool and pleasant creates a beneficial micro climate that is conducive to work in all seasons**
- **Established organisational social responsibility as an effective tool enhances worker health, welfare, and performance**