CAPE RESEARCH CENTRE SUB-PRECEINT

RANGE OF OPPORTUNITIES:
• Reduced built footprint equating to a widened biodiversity corridor

Advantages:
• Outside of Core Precinct
• In existing area of office use (CRC)
• Renovate TMNP discrete office zone
• Close to braai site
• Cob
• Fire risk in biodiversity corridor
• Outside of Core Precinct area
• Minimum use of non
• Energy efficiency and conservation
• Can involve removal of other buildings in corridor as part of scheme
• Visual impact when trees gone
• Fire risk in biodiversity corridor

Disadvantages:
• Outside of Core Precinct area
• Need to connect to existing services (especially sewer - most distant of the scenarios)
• Close to braai site – potential disturbance
• Phasing out of tenants
• In biodiversity corridor (but will be limited impact)

TMNP HEAD OFFICE SCENARIOS

Proposed Locations

TMNP HEAD OFFICE SCENARIOS

Location Assessment and Recommendation

LOCATION ASSESSMENT SCHEDULE

<table>
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<th>Locations Investigated</th>
<th>River Cottages Sub-PRECEINT</th>
<th>RIVER COTTAGES SUB-PRECEINT</th>
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<tr>
<td>Old Stables Building</td>
<td>Brick House</td>
<td>Stone Cottage</td>
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</table>
| Old development footprint to reduce existing building footprints

RECOMMENDATION

River Cottages

TMNP HEAD OFFICE SCENARIOS

Location Assessment and Recommendation

TMNP HEAD OFFICE: OPPORTUNITY FOR A GREEN BUILDING

PRINCIPLES OF GREEN BUILDINGS

• Sustainable/durable/low maintenance building design and operation
• Building must be sturdy and disaster resistant
• Design and build for long service life
• The building must be "future-proof" – access channels all around the structure to easily upgrade and add future technology
• Capable of being "stand-alone" without connections to gas mains or electric utility

Energy efficiency and conservation
• Work towards eliminating dependence on external sources of energy

Site / land management, reclamation and conservation

Water efficiency, management and conservation

Improved indoor air quality

Improved outdoor air quality

Material resource management, recycling and conservation
• Maximum use of reusable building materials such as timber, thatch and wool
• Minimum use of non-renewable, energy intensive building materials like steel, brick, vinyl, aluminium
• Use materials found on site or close to the site
• Locally source materials and components in order to minimise transportation impacts and create local jobs
• Re-use of building materials and products

TMNP HEAD OFFICE: OPPORTUNITY FOR A GREEN BUILDING

TECHNIQUES AND STRATEGIES FOR GREEN BUILDING

• Traditionally green building aims to be sustainable by aiming for low carbon emissions, typically by being energy efficient. Achieving energy efficiency in buildings will depend on the building type. In offices you need to address lighting and heating, ventilation and air conditioning (HVAC).
• The most obvious way to work towards energy efficiency and hence carbon neutrality is to employ techniques for temperature control. Comfortable indoor temperatures can be achieved by the use of effective passive heating and cooling systems which harness natural ventilation and shading. Increased solar shading, controllable natural ventilation and high thermal mass significantly decrease energy usage and carbon emissions.
• Energy-efficient techniques include (Lark, 2005)
 1. Passive solar – involves using the building’s orientation and mass, and the position of windows to help keep the building cool during the day, and warm at night.
 2. Passive cooling – typically involves strategic shading combined with ventilation and evaporative cooling.
 3. Active solar – captures solar energy in specialised collectors, stores it, and uses it to heat or cool.
 4. Earth shelter – places a portion of the building underground, reducing its heating and cooling load.
 5. Super-insulation isolates a building so that body heat will heat it, and summer heat is kept out.

• Energy devices:
  - Heat pumps – refrigeration technology that moves heat into or out of the earth
  - Photovoltaic panels – generate electricity directly from sunlight
  - Domestic hot water solar collection
  - Geothermal heat pumps
  - Earth source heat pumps
  - Insulation materials include
    - Glass fibres – used in building walls and roofs
    - Rock wool – used in building walls and roofs
    - Fibre glass – used in double-glazed windows
    - Clay brick
    - Adobe – earth brick
    - Adobe – earth bricks
    - Reclaimed earth rammed earth
    - Ceramic structures
    - Earthfast – well-bonded structures made of soil-bonded earth
    - Insulating materials include