


City Centre Sustainable Housing Design Competition

Workshop 3: Sustainable Performance Criteria

Date: 3 April 2024
Time: 16:00-18:00
Venue: Online hosted by the CIB

Presenter: Jeremy Gibberd



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Structure

- Sustainability Performance Criteria
- Sustainable Building Characteristics
- Sustainable Building Targets
- Sustainable Design Generation

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Sustainable Performance Criteria

- Energy
- Water
- Waste
- Materials
- Biodiversity
- Transport
- Resource use
- Management
- Products and services
- Local economy
- Access
- Health
- Education
- Inclusion
- Social cohesion

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Energy

- Objective:** Energy consumption is minimized and renewable energy used.
- Orientation
- Building layout
- Roof construction
- Wall construction
- Floor construction
- Window to wall ratio
- Ventilation opening
- Internal lighting
- Installed equipment power density
- Food cooking
- Water heating
- Renewable energy

Potential Targets: Net positive energy (X%), Energy sources: X% renewable energy sources, Energy consumption: X kWh/m2.annum, Energy consumption: X kWh/person.annum

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Water

- Objective:** The consumption of mains potable water is minimized.
- Toilets
- Wash hand basins
- Showers
- Hot water
- Landscape
- Greywater
- Rainwater harvesting

Potential Targets: Net positive water (X%), Water sources: X% water from rainwater harvesting, Water reuse: X% water recycled on site, Water

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Waste and Emissions


- Objective:** Emissions, pollution and waste directed to landfill is minimized.
- Reusable containers
- Recycling area
- Recycling collection
- Organic waste
- Sewage
- Construction waste

Potential Targets: Net positive waste (X%), Waste production: X kg per person per day, Onsite organic waste recycling: X%, Metal/plastics/paper waste recycled: %, Waste directed to landfill: X kg per person per day, Black/grey water recycling: %, Construction waste reused/recycled (weight): %

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Materials

- **Objective:** Negative impacts of construction materials are minimized.
- Area per person
- Building reuse
- Biobased materials
- Recycled content
- Local sourcing
- Refrigerants
- Volatile organic compounds
- Formaldehyde




Kandalama

Potential Targets: Sufficiency: m2/person, Building reuse: % (area), Construction: %(weight) from biobased materials, Recycled content: % (weight), Harmful/hazardous materials: zero specified

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Biocapacity

- **Objectives:** Biocapacity is supported.
- Brownfield sites
- Municipal boundary
- Vegetation
- Green roofs
- Biodiversity
- Ecosystems




Kandalama

Potential Targets: Net positive increase in vegetation on site, Site coverage with vegetation: %, Biodiversity: Species richness, Onsite carbon sequestration/carbon emissions: %, Ecosystems services: provisioning/regulating/supporting/cultural/ha

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Transport

- **Objective:** Energy efficient transportation is supported.
- Pedestrian routes
- Cycling
- Cargo bikes
- Public transport
- Non-motorised transport
- Electric vehicles




Green Riders Academy

Potential Targets: Safe walking routes: km/ha, Safe cycling routes: km/ha, Public transport: affordable, accessible and within 400m along safe walking route, Material and goods transportation: affordable cargo bikes / electric vehicles for moving goods

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Resource Use

- Objective:** Efficient use of land and resources is made.
- Site density
- Building area per person
- Food production
- Renewable energy generation



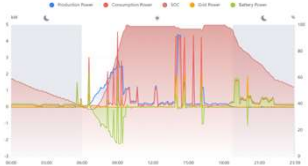
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Potential Targets: Site density: units/ha, people/ha, Sufficiency: area/person, Food production on site: % of requirements, Renewable energy on site: % of requirements

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Management

- Objective:** Management supports efficiency and sustainability.
- Building use guide
- Energy metering
- Water metering
- IEQ
- IOT
- AI
- Resident's association




Potential Targets: Building user guide: Online/app/paper, Energy metering: accessible/app-based, Water metering: accessible/app-based,

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Services & Products

- Objective:** Sustainable production and consumption are supported.
- Urban agriculture
- Local fresh produce markets
- Local manufacture and repair of clothing, furniture
- Building maintenance and repairs
- Equipment hire
- Product-as-a-service



Potential Targets: Sustainable services and products available within 400/800m walking distance from homes: food/clothing/furniture/repairs/equipment hire/library,

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Local Economy

- **Objective:** The local economy is supported.
- Locally sourced materials and products
- Affordable small rental units
- Small enterprise support
- Access to
- Construction workers
- Notice board
- Local currency

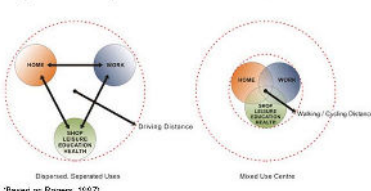


Potential Targets: Local content: Value of construction materials from within 50km, Value of construction manpower from within 50km, Value of annual maintenance and repairs supported by contractors within 50km, Support for local economy: Notice boards, local currency, incentives

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Access

- **Objective:** Easy access to everyday requirements is enabled.
- Work
- Creche
- Primary school
- Secondary school
- Library
- Internet access
- Banking
- Groceries
- Post office
- National and local government services




Potential Targets: Access to everyday requirements within 400m from homes: work, creche, schools, library, banking, groceries, post office, national and local government services (grants, passports, ID, rates and taxes).

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Health

- **Objective:** Healthy and productive environments are provided.
- Clean water
- Healthy diets
- Thermal comfort
- Clean air
- Daylight
- External views
- Exercise
- Recreation
- Access to clinics
- No hazards




Potential Targets: Access to requirements for health within the environment/400m: clean water, healthy diet, thermal comfort, clean air, daylight, views, exercise, recreation, access to clinics, health education, no hazards

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Education

- Objective:** Access to education and ongoing learning is provided.
- Primary schools
- Secondary schools
- Ongoing learning
- Internet
- Noticeboards
- Space for learning
- Building User Manual
- Construction worker education

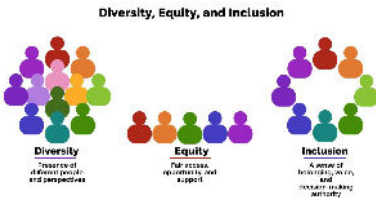


Potential Targets: Access to requirements for health: clean water, healthy diet, thermal comfort, clean air, daylight, views, exercise, recreation, access to clinics, health education, no hazards

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Inclusion

- Objective:** Diversity, equity and inclusion are promoted.
- Public transport
- Accessible local facilities
- External routes
- Entrances and exits
- Lobby
- Window, door, lighting controls
- Doors
- Bathroom
- Kitchen
- Inclusive employment
- Affordability




Potential Targets: Accessible services within 400m of housing: public transport/schools/clinics/retail etc, Full accessible home: %, Affordable homes: %

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Social Cohesion

- Objective:** Social cohesion and belonging is promoted.
- Occupants
- Community spaces
- Shared spaces parks, play areas
- Community communication
- Residents' association



Potential Targets: Shared spaces within 400/800m of homes: play areas, parks, community halls, Community communication: Newsletter, social media, notice board, Residents association: Structure/communication/activities,

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Sustainable building design performance criteria: BEST, BREEAM, Greenstar, LEED, SBAT, WELL

| | | |
|-----------------|-----------------------|-------------|
| Air | Energy | Shelter |
| Water | Water | Mobility |
| Nourishment | Waste | Food |
| Light | Materials | Goods |
| Movement | Biodiversity | Services |
| Thermal Comfort | Transport | Waste |
| Sound | Resources | Biocapacity |
| Materials | Management | Health |
| Mind | Local Economy | Knowledge |
| Community | Services and Products | Employment |
| Innovation | Access | |
| | Health | Others? |
| | Education | |
| | Inclusion | |
| | Social Cohesion | |

WELL certified, Gibberd

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Analysis-Targets-Concepts-Test-Present

- **Discover:** Understand the problem – Analysis.
- **Define:** Set out the challenge - Targets
- **Develop:** Develop alternatives - Concepts
- **Deliver:** Test out solutions iteratively - Test
- **Detail:** Present solutions with performance data, evidence and rationale

Jeremygibberd.com Design Museum

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Thank you, Questions?

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