Enhancing Environmental Sustainability in Public Housing Development

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CONTENT

- BACKGROUND
- SUSTAINABLE STRATEGY
- R&D EFFORTS
- ECO-INITIATIVES
HOUSING & DEVELOPMENT BOARD

FORMED IN: 1960

VISION

Affordable Homes,
Vibrant Towns,
Cohesive Communities
BACKGROUND

SHELTER

QUALITY

LIFESTYLE

COMMUNITY

ENVIRONMENT
BACKGROUND

TRACK RECORD

Apartments Constructed = Over 970,000 DUs

HOUSING MORE THAN 80% OF THE POPULATION IN SINGAPORE
INTERNATIONAL AWARDS

- United Nation’s World Habitat Award (1991)
- American Concrete Institute Award (1994)
- ASEAN Federation of Engineering Organisation’s Award (2001)
- UK’s Royal Society for Prevention of Accident (ROSPA) in 1993 and 2002 for excellence in construction safety management
“Development which meets the needs of the present without compromising the ability of future generations to meet their own needs”
ENVIRONMENTAL SUSTAINABILITY

BACKGROUND

Housing a Nation

The Balancing Act

Living Environment
Conscious decision to be efficient at the outset of a project.

INTEGRATED APPROACH

Design -> Construct -> Maintain

ENVIRONMENTAL SUSTAINABILITY
SUSTAINABLE STRATEGY
Design → Construct → Maintain
DESIGN

Take Advantage of Nature

Wind flow analysis

Cross Ventilation

Building Orientation

Natural Daylight

Maximize Greenery
Design

Buildability

Modular Blocks

Unit Configuration - Door and Window Standardisation

Repeated Features
DESIGN

Embracing Prefab

Total Precast Building System

Prefab Toilets

Prefabicated Meshes
**Prefabrication**

- Reduce Noise
- Reduce Air pollution
- Less traffic Congestion
- Less Wastage

![Prefabrication Images]
DESIGN

Comfortable and Healthy

Universal Design & Green Connectivity

More landscape areas

Green Areas for Community Bonding
SUSTAINABLE STRATEGY

Design → Construct → Maintain
Construction

Site Mechanisation

- Better Quality Control
- Reduced Wastage
Construction

Prefabration Management System

- Less wastage
- Good Housekeeping
Construction

Minimize Wastage

Prefab Toilets

Prefab Meshes

Timber Form to Metal Form
Construction

Safe Construction

- Safety Is **The Basic Responsibility** Of Everyone

- Safety Is **The Priority** In A Work Operation

- Safety Is **To Adopt PRO-ACTIVE Approach** To Prevent Accident Occurrence
Maintain

Reduce Maintenance Problems

- Better Materials and Solutions
- Feedback loop established

Brickwalls replaced with precast walls

Ferrocement Secondary Roofing System

Concrete Water Tanks
SUSTAINABLE STRATEGY

Maintain

Lower Energy Consumption

- Energy Efficient Technologies
- Power Saving Strategies

Energy Efficient Light Fittings

Light Control and Motions sensors

Power Saving Devices

Lift Systems
Maintain

Easy Maintenance

- Landscaping Maintenance
- Cleaning of estates

Hardy plants

Anti-fungal External Paint

Centralised Refuse Chutes
OUR R&D EFFORTS

- Exploiting New Technology and New Materials
- Embracing Change
- Doing things differently
- Sustainable
ENHANCING GREEN

Green Roofs
ENHANCING GREEN

Vertical Greening

- Testing Plant Species
- Vertical Systems
- Maintenance Requirements
Greenery Provision

Formulae:

Quantitative Effects of Greenery

\[ GnP = (\text{Rule 1} + \text{Rule 2} + \text{Rule 3}) \times \frac{\text{Total Green Area}}{\text{Site Area}} \]

Conceptual diagram of Rule Tabulation

<table>
<thead>
<tr>
<th>No.</th>
<th>Component / Units</th>
<th>Based On</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule 1</td>
<td>Grass / Ground Cover (sqm)</td>
<td>Green Area of Ground Cover / Grass (Thru Ground)</td>
</tr>
<tr>
<td>Rule 2</td>
<td>Shrubs + Trees + Palms (sqm)</td>
<td>Green Area of Shrubs + Trees + Palms (Thru Ground)</td>
</tr>
<tr>
<td>Rule 3</td>
<td>Grass + Shrubs + Trees + Palms (On Buildings) (sqm)</td>
<td>Green Area of Grass + Shrubs + Trees + Palms (On Building surfaces such as roof or façade)</td>
</tr>
</tbody>
</table>
R&D EFFORTS

ENCOURAGING RECYCLING

Recyclable Intermediate Chute System (RICH)

- To provide a convenient mode for HDB dwellers to recycle
- Present door to door collection method is labour intensive
- Collaborated with SembEnviro on RICH
Eco Precinct @ Punggol successfully launched 28 March 2007
Sustainable Construction... the HDB way....

Creating a Sustainable Living Environment!