GREEN WALLS, WONDERGREEN BIO WALLS, WONDERGREEN BIO CURTAINS, FLEXI GREEN, SELF WATERING VERTICAL GARDENS, GREEN ROOFS, MODULAR GREEN ROOFS, GREEN MATRIX GREEN CURTAINS, GREEN STRINGS, ECO GROW SUBSTRATES

ELT INDIA
The Lifestyle Gardening
www.eltindia.com
Contents
1. Introduction
2. World scenario: Few Projects
3. What are Plants Requirements?
4. What are the Climatic Factors to be considered?
5. What are Micro Climatic Factors
6. What are the Site Specific Factors to be considered?
7. What kind of projects are executed in India?
8. Different sustainable systems for creating non-conventional greenery.
WHO ARE WE?

This venture into greenery started back in 1986. It led to an extended period of entrepreneurship that has lasted almost 30 years.

ELT INDIA has expertise in Vertical Gardens, Green Roofs, Light Weight Gardening, Sensor based Automation of Irrigation with Remote Monitoring, High-rise Greenery, Urban Farming Nursery, Vertical Farming in addition to Soft-scape, Large Tree Transplantation, Soil Reclamation & Soil Stabilisation.
WHO ARE WE?

Ecogreen Landscape Technologies India Pvt. Ltd,

DIRECTORS: Pradeep Barpande & Anuradha Barpande

Expertise:
Research
Experiment
Development
Manufacturing
Growing
Installing
Maintaining of non conventional greeneries.

ELT India Operates in countries, India, Malaysia & Bahrain through network partners & export ELT India products to few more countries.
ELT BENCHMARKS

» START AS NURSEYMEN 1986
» LANDSCAPING SINCE 1989
» TREE TRANSPLANTATION 1995
» GREEN PRACTICES & URBAN FARMING 1996
» SLOPES STABILISATION 2001
» SOIL RECLAMATION 2004
» LIGHT WEIGHT ROOF GARDENING 2006
» VERTICAL GARDENING 2008
» GREEN CURTAINS 2011
» HYDROPHILIC FOAM BASED SYSTEMS 2012
» WONDERGREEN BIO WALLS & BIO CURTAINS 2013
» SELF WATERING GREEN WALL SYSTEMS 2014
» MODULAR GREEN ROOF SYSTEM 2014
» GREEN MATRIX SYSTEM 2014
» SENSOR BASED CONTROLS & MONITORING 2015 (LAUNCH)
» ELT GREEN TRELLIS 2015
GREENERY IN GREEN BUILDINGS

ELT RESEARCH CENTRE, VILLAGE VARAVE, PUNE
ELT FACILITY, VILLAGE VARAVE, PUNE

GREENERY IN GREEN BUILDINGS
SHORT INTRODUCTION TO TECHNOLOGY

You Tube Link to Different Systems: https://youtu.be/SpD9i48zgHs
FEW SMART PROJECTS AROUND THE WORLD?

GREENERY IN GREEN BUILDINGS
INHABITED HILLS, TAIWAN, ARCHITECTS : BIG

PITCHED ROOF
UPTO 75 DEGREES SLOPE AT FEW LOCATIONS

GREENERY IN GREEN BUILDINGS
INHABITED HILLS, TAIWAN, ARCHITECTS : BIG

GREENERY IN GREEN BUILDINGS

WORLD TRENDS
www.eltindia.com
INHABITED HILLS, TAIWAN, ARCHITECTS: BIG

GREENERY IN GREEN BUILDINGS
SYJONG, SOUTH KOREA. ARCHITECTS: BALMORI ASSOCIATES

15 GOVT. ADMIN. BUILDINGS ARE CONNECTED.

GREEN ROOF AREA : 27 ACRES, GREEN ROOF LENGTH : 3.5KM

WORLD TRENDS
www.eltindia.com
SYJONG, SOUTH KOREA. ARCHITECTS: BALMORI ASSOCIATES

15 GOVT. ADMIN. BUILDINGS ARE CONNECTED.

GREENERY IN GREEN BUILDINGS
LANDSCAPE ARCHITECTS: PWP

GREEN ROOF AREA: 20000m²

GARDEN FOR BUILDINGS & GREY WATER FOR GARDEN

GREENERY IN GREEN BUILDINGS
GREENERY IN GREEN BUILDINGS
TRANSBAY TRANSIT CENTER, SAN FRANCISCO

LANDSCAPE GARDEN
BUS TERMINAL
MALL
METRO
WORLD TRENDS

GREENERY IN GREEN BUILDINGS

WWW.ELTINDIA.COM
BOSCO VERTICALE TWIN TOWER, MILAN ARCHITECT: STEFANO BOERI, ITALI.

THE 260’ AND 367’ TALL TOWERS WITH 900 TREES & MORE THAN 20,000 SHRUBS & OTHER PLANTS

GREENERY IN GREEN BUILDINGS
BOSCO VERTICALE TWIN TOWER, MILAN ARCHITECT: STEFANO BOERI, ITALI.

GREENERY IN GREEN BUILDINGS

WORLD TRENDS
www.eltindia.com
BOSCO VERTICALE TWIN TOWER, MILAN ARCHITECT: STEFANO BOERI, ITALI.

GREENERY IN GREEN BUILDINGS
BOSCO VERTICALE TWIN TOWER, MILAN ARCHITECT : STEFANO BOERI, ITALI.
TRELLIS SYSTEM PROVIDES SHADING DURING SUMMER & ALLOWS HEAT TO REACH BUILDING IN THE WINTER

GREENERY IN GREEN BUILDINGS
GREENERY IN GREEN BUILDINGS
GREENERY IN GREEN BUILDINGS

CONSORCIO – CHILE OFFICE BUILDING, CHILE, SOUTH AMERICA
ARCHITECTS: ENRIQUE BROWNE ARQUITECTOS
PROJECTS IN INDIA

MFAR, BANGLORE

GREENERY IN GREEN BUILDINGS
ONGC, DEHRADUN

GREENERY IN GREEN BUILDINGS
ONGC, DEHRADUN
DELTA TERRACE, NAVI MUMBAI

PROJECTS IN INDIA

GREENERY IN GREEN BUILDINGS
WHAT DO PLANTS REQUIRE

BASIC FACTORS RESPONSIBLE FOR SUCCESS OF VEGETATION

GREENERY IN GREEN BUILDINGS
WHAT DO PLANTS REQUIRE
BASIC FACTORS RESPONSIBLE FOR SUCCESS OF THE VEGETATION

SUNLIGHT
ANCHORAGE FOR ROOTS
GROWTH MEDIUM OF RIGHT QUALITY
MOISTURE LEVELS AROUND SHOOT SYSTEM
MOISTURE LEVELS NEAR ROOT ZONE
ENOUGH DEPTH FOR ROOTS TO ABSORB NUTRIENTS
ROOT ZONE TEMPERATURE
POLLUTION
WATER QUALITY
IRRIGATION

GREENERY IN GREEN BUILDINGS
### WHICH SYSTEM TO CHOOSE

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>MONTHLY TEMP. MAX.</th>
<th>HUMIDITY</th>
<th>MONTHLY RAINFALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRANCE</td>
<td>25</td>
<td>65 ~ 85</td>
<td>35 MM</td>
</tr>
<tr>
<td>SINGAPORE</td>
<td>31</td>
<td>60 ~ 90</td>
<td>175 MM</td>
</tr>
<tr>
<td>CANADA</td>
<td>27</td>
<td>55 ~ 70</td>
<td>50 MM</td>
</tr>
<tr>
<td>AUSTRALIA</td>
<td>29</td>
<td>60 ~ 70</td>
<td>45 MM</td>
</tr>
<tr>
<td>INDIA</td>
<td>47.8</td>
<td>15 ~ 90</td>
<td>0 MM TO 150MM</td>
</tr>
</tbody>
</table>

**FRANCE**

**ENGLAND**

**CANADA**

**SINGAPORE**

**GREENERY IN GREEN BUILDINGS**
UNDERSTANDING MICRO CLIMATE

A. UNDERSTANDING SITE SPECIFIC MICRO-CLIMATIC FACTORS.

1. LIGHT INTENSITY, AVAILABILITY AND DURATION
2. NEARBY WATERBODY
3. NEARBY FIRE PLACE / CHIMNEY
4. DIRECTION OF GREEN WALL- FACE
5. SUN PATH & SHADE DIRECTION DURING DIFFERENT SEASONS
6. OTHER STRUCTURES, TREES & OTHER ELEMENTS THAT CAN AFFECT MICRO CLIMATE
7. WIND VELOCITY
8. NEARBY INDUSTRIAL ESTABLISHMENTS CAUSING DIFFERENT TYPES OF MICRO-CLIMATIC HAZARDS LIKE DUST, SMOKE, FUMES, GASES & OTHERS.
9. WATER QUALITY
10. SALT SPRAY

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

GREENERY IN GREEN BUILDINGS
ELT Living Wall System

FEATURES:

• Modularity for easy installation & handling.

• Recyclable polypropylene copolymer material with longer life expectancy.

• Size 300 mm x 300 mm x 100 mm.

• Provision for screwing the panels to mounting strips.

• Individual cells for water retention & plant support.

• Panel spacers on the back to keep panel away from wall & allow for an air space.

• 2 Mounting channels across the back, support weight across the whole panel.

• Water management incorporated into design with the notches.

• Drain window for each compartment to drain water into catchment area of lower panel.

• Unique Z pattern of nesting help to transfer water and provide stability to the Green wall.

• Drain tray is provided at the base of the Green wall to collect excess water.
INSTALLATION

Recycled Plastic Mounting Strip

Wall Mounted

For Sales Enquiries
Call-020 27219275: Email-sales@eltindia.com: Visit-
www.eltindia.com

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

IRRIGATION SYSTEM

UPPER PANEL
Z Joint of panels
6 mm inline drip line
Joiner
16 mm irrigation line
Support member
Hole for fastener
Mounting strip
Lower panel

GREENERY IN GREEN BUILDINGS

www.eltindia.com
ENGINEERED GROWTH MEDIA

GREENERY IN GREEN BUILDINGS
HDFC, MUMBAI

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

GREENERY IN GREEN BUILDINGS
SHAHAPUR, MUMBAI.

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

THRISSUR, KERALA.

GREENERY IN GREEN BUILDINGS

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THRISSUR, KERALA.

GREENERY IN GREEN BUILDINGS

ELT LIVING WALL SYSTEM ELT SUBSTRATE

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JW MARRIOTT, TERMINAL 2, MUMBAI

GREENERY IN GREEN BUILDINGS
JW MARIOTT, TERMINAL 2, MUMBAI

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

KALPATARU INSPIRE, MUMBAI

GREENERY IN GREEN BUILDINGS
RASHTRAPATI BHAVAN

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

DURG, RAIPUR, UTTARKHAND.

GREENERY IN GREEN BUILDINGS

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SAR, UDYOGVIHAR, GURGAON

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM ELT SUBSTRATE

HOTEL REGENCY, BAHRAIN.

GREENERY IN GREEN BUILDINGS
PRIVATE RESIDENCE, MUMBAI

ELT LIVING WALL SYSTEM ELT SUBSTRATE

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM

WITH

HYDROPHILIC FOAM
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

GREENERY IN GREEN BUILDINGS

www.eltindia.com
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

RELIANCE CENTER, MUMBAI

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

OBEROI, COMMERCE II, MUMBAI

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

GREENERY IN GREEN BUILDINGS
GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

MFAR, BANGLORE

GREENERY IN GREEN BUILDINGS
ELT LIVING WALL SYSTEM WITH HYDROPHILIC FOAM

AREA OF INSTALLATION : 1,596.00
AVERAGE LEAVES PER SQ. FEET : 156.00
ESTIMATED NUMBER OF LEAVES : 2,48,976
LEAVES SURFACE AREA PER SFT : 20.13
TOTAL LEAVES SURFACE AREA : 32,127.00

GREENERY IN GREEN BUILDINGS
LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
LINEAR GREENS VERTICAL GARDEN SYSTEM

ELT Self Watering Vertical Garden System
This is made of ELT agro planter & Irrigation tray, Hydrophilic substrate, Growth Medium & Plants.

- Agro Planter is made of Poly propylene & has strength & long life. Hydrophilic substrate acts as filter blanket, retains water & provides anchorage to roots.

- Hydrophilic substrate is placed at the bottom of the planter.

- Planter is filled with Lightweight, porous, well drained ELT growth media which is a combination of inorganic & organic material. Depending on required looks & site conditions, plants varieties are chosen.

- ELT are Agro Planters are mounted onto the wall or on framework using Irrigation trays. There are 2 different types of irrigation trays, one is Holder which is made from Polypropylene & each planter fits into the individual holder. This Holder in turn is fitted onto the wall or frame or mesh. Irrigation Tray can be continuous tray either of metal or suitable material.
LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
LINEAR GREENS VERTICAL GARDEN SYSTEM

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LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
MODULAR GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
MODULAR GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS
MODULAR GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS

www.eltindia.com
URBAN FARMING & VERTICAL FARMING

GREENERY IN GREEN BUILDINGS
URBAN FARMING & VERTICAL FARMING

GREENERY IN GREEN BUILDINGS
URBAN FARMING & VERTICAL FARMING

GREENERY IN GREEN BUILDINGS
WIRE ROPE GREEN TRELLIS SYSTEMS
WIRE ROPE GREEN TRELLIS SYSTEMS
WIRE ROPE GREEN TRELLIS SYSTEMS
WIRE ROPE GREEN TRELLIS SYSTEMS
WIRE ROPE GREEN TRELLIS SYSTEMS
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.

ELT Wonder Green System
This system consists of Module, Hydrophilic substrate, Joinery, Plants & Growth Medium.

• Module is made of Poly propylene & has strength & long life
  Hydrophilic substrate acts as filter blanket, retains water & provides anchorage to roots.

• Hydrophilic substrate is placed at the bottom of the module.

• Module is filled with Light weight, porous, well drained ELT growth media which is a combination of inorganic & organic material. Depending on required looks, site conditions, plants are planted in such filled module.

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WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
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WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WONDERGREEN BIO-CURTAIN INSTALLED ON WIRE ROPES.
WALL MOUNTED BIO-WALL
WALL MOUNTED BIO-WALL
WALL MOUNTED BIO-WALL
GREEN ROOF SYSTEMS
GREEN ROOF SYSTEMS
GREEN ROOF SYSTEMS
3” THK URBAN FARMING ON GREEN ROOF
3” THK URBAN FARMING ON GREEN ROOF
3” THK URBAN FARMING ON GREEN ROOF
1. Surface and subsoil hydrology
2. Root growth, Root Barriers and Air Pruning
3. Wind Velocity, Mechanical Anchoring of Shoot System and Root System
4. Light Intensity, Shade Path and Artificial Lights
5. Micro climate
6. Longevity of Soil Mix, Slow Biodegradability and Replenishment
7. Water Quality, Irrigation and Feeding
8. Sensor based automation of irrigation with remote monitoring facility.
10. Load Factor and Soil Depth
11. Plant Selection
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR

HOW WAS THIS MADE
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR

DIFFERENT SLOPES AND VALLEY FORMATIONS
Method Statement to Install Ecogreen-Flexiroof on steep slope

Considering the slope, weight on studs, stability of soil and system, we have suggested the following methodology for installation 40 to 75 degree slope or have height more than 13 meters.

Method Statement

1. For slopes up to 15 degrees: Conventional system with drainage board, geo textile & growth medium

2. For slopes up to 45 degrees: a. Insert panel holders in the studs provided.
   b. Lay ELT Drain board over surface.
   c. Fix aluminum strips vertically and secure by fixing in the studs.
   d. Fix soil stabilizers at a distance as per slopes.
   e. Lay growth medium.
   f. Lay lawn carpets of local species.

3. For slopes above 45 degrees: A - After waterproofing treatment, lay the drain board (by ELT) & the drain boards to be secured using the studs (by ELT), already fixed to the slab by others
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR

- DRILL OVER BEAM
- WATERPROOFING TREATMENT AS PER SPECIFICATION BY OTHERS
- 8 mm GI Stud and Nut
- Panel Holder Poly propylene co-polymer
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR

INSERTION OF STUD

WATERPROOFING AS PER SPECIFICATIONS BY OTHERS

INSERTION OF PANEL HOLDER

PANEL HOLDERS TO FIXED IN THE STUD UNDER GREEN ROOF PANELS

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ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR

Fixing on Slopes
Mock Up & Similar Installations
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR

FIXING ELT DRAINAGE BOARD
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR
ONGC, DEHRADUN. ARCH. HAFEEZ CONTRACTOR
CREAT 300% GREENERY IN URBAN HABITATS

HOW WAS THIS MADE
CREATE 300% GREENERY IN URBAN HABITATS
CREAT 300% GREENERY IN URBAN HABITATS
CREATE 300% GREENERY IN URBAN HABITATS

STONE PAVED AREA ABOVE CONCRETE

SPACE FOR GRASS JOINT

GREEN ROOF MEMBER
CREATE 300% GREENERY IN URBAN HABITATS
CREATE 300% GREENERY IN URBAN HABITATS
CREATE 300% GREENERY IN URBAN HABITATS
CREAT 300% GREENERY IN URBAN HABITATS
CREATE 300% GREENERY IN URBAN HABITATS
MODULAR GREEN ROOF SYSTEM
MODULAR GREEN ROOF SYSTEM
MODULAR GREEN ROOF SYSTEM
MODULAR GREEN ROOF SYSTEM
GREEN ROOF ON TIN ROOF
GREEN ROOF ON TIN ROOF
GREEN ROOF ON TIN ROOF
GREEN ROOF ON TIN ROOF
GREEN ROOF ON TIN ROOF
GREEN ROOF ON TIN ROOF
GREEN ROOF ON TIN ROOF
THANK YOU