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



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.
- 9.Future Scope for Industry Growth.

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

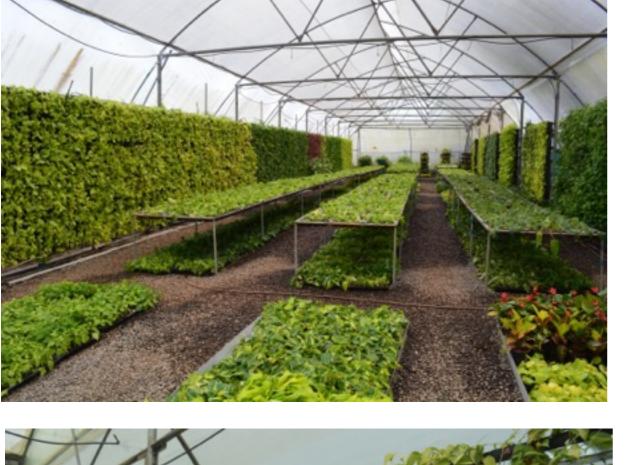
» START AS NURSERYMEN 1986 » LANDSCAPING SINCE 1989 **» TREE TRANSPLANTATION 1995** » GREEN PRACTICES & URBAN FARMING 1996 » SLOPES STABILISATION 2001 » SOIL RECLAMATION 2004 » LIGHT WEIGHT ROOF GARDENING 2006 » VERTICAL GARDENING 2008 » GREEN CURTAINS 2011 » HYDROPHILIC FOAM BASED SYSTEMS 2012 » WONDERGREEN 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

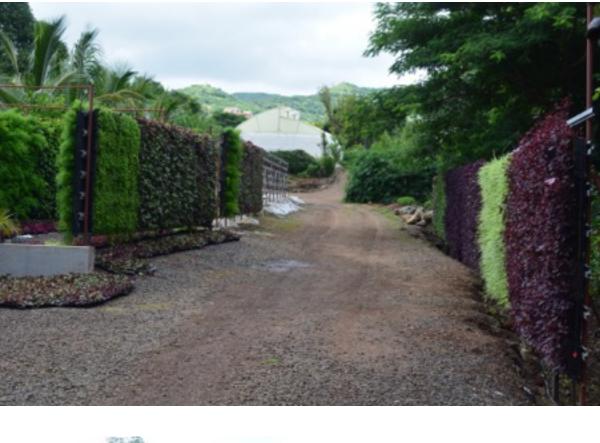
ELT RESEARCH CENTRE, VILLAGE VARAVE, PUNE



GREENERY IN GREEN BUILDINGS

ELT FACILITY, VILLAGE VARAVE, PUNE









GREENERY IN GREEN BUILDINGS

SHORT INTRODUCTION TO TECHNOLOGY

You Tube Link to Different Systems : <u>https://youtu.be/SpD9i48zgHs</u>

THE WORLD SCENARIO

TEN LARGEST GREEN ROOFS IN THE WORLD

CHICHESTER, WEST SUSSEX, ENGLAND 32,000 sq meters ROLLS-ROYCE PLANT

FRANKFURT, GERMANY 80,000 sq meters FRANKFURT INTERNATIONAL AIRPORT

> BONDORF, GERMANY 50,000 sq meters LOGISTIKZENTRUM

SINGAPORE 25,013 sq meters REPUBLIC POLYTECHNIC

ZARAGOZA, SPAIN 43,172 sq meters EXPO ZARAGOZA EMPRESARIAL BUSINESS PARK

FEW SMART PROJECTS

GREENERY IN GREEN BUILDINGS

www.eltindia.com

VANCOUVER, CANADA 24, 282 sq meters

DEARBORN, MICHIGAN

UNITED STATES

42,179 sq meters

Z4,282 SQ METERS VANCOUVER CONVENTION CENTRE

VANCOUVER, CANADA 26,664 sq meters VILLAGE ON FALSE CREEK

CHICAGO, ILLINOIS UNITED STATES 99,127 sq meters MILLENNIUM PARK

ATLANTA, GEORGIA, UNITED STATES 28,243 sq meters GEORGIA INTERNATIONAL PLAZA

PITCHED ROOF UPTO 75 DEGREES SLOPE AT FEW LOCATIONS

GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS





GREENERY IN GREEN BUILDINGS



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 GREENERY IN GREEN BUILDINGS

SYJONG, SOUTH KOREA. ARCHITECTS: BALMORI ASSOCIATES

15 GOVT. ADMIN. BUILDINGS ARE CONNECTED.

GREENERY IN GREEN BUILDINGS

SYJONG, SOUTH KOREA. ARCHITECTS: BALMORI ASSOCIATES



GREENERY IN GREEN BUILDINGS

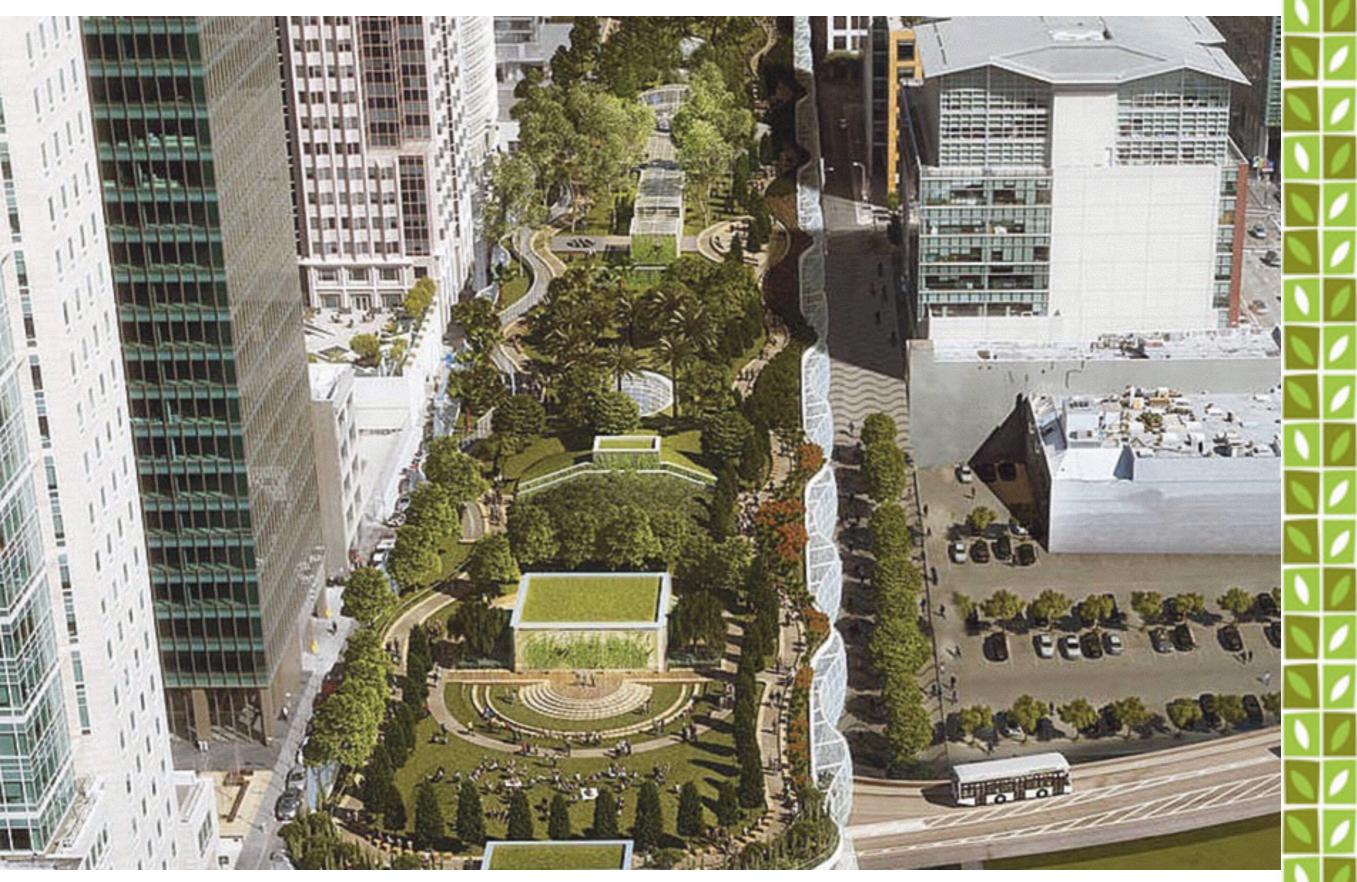
LANDSCAPE ARCHITECTS : PWP

GREEN ROOF AREA : 20000m²

GARDEN FOR BUILDINGS & GREY WATER FOR GARDEN

GREENERY IN GREEN BUILDINGS

TRANSBAY TRANSIT CENTER, SAN FRANCISCO



GREENERY IN GREEN BUILDINGS

TRANSBAY TRANSIT CENTER, SAN FRANCISCO



THE 260' AND 367' TALL TOWERS WITH900 TREES & MORE THAN 20,000 SHRUBS & OTHER PLANTS

GREENERY IN GREEN BUILDINGS

GREENERY IN GREEN BUILDINGS





GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS

CONSORCIO – CHILE OFFICE BUILDING, CHILE, SOUTH AMERICA ARCHITECTS : ENRIQUE BROWNE ARQUOTECTOS

TRELLIS SYSTEM PROVIDES SHADING DURING SUMMER & ALLOWS HEAT TO REACH BUILDING IN THE WINTER

GREENERY IN GREEN BUILDINGS

CONSORCIO – CHILE OFFICE BUILDING, CHILE, SOUTH AMERICA ARCHITECTS : ENRIQUE BROWNE ARQUOTECTOS



GREENERY IN GREEN BUILDINGS

CONSORCIO – CHILE OFFICE BUILDING, CHILE, SOUTH AMERICA ARCHITECTS : ENRIQUE BROWNE ARQUOTECTOS

GREENERY IN GREEN BUILDINGS

GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS

MFAR, BANGLORE

GREENERY IN GREEN BUILDINGS

ONGC, DEHRADUN

GREENERY IN GREEN BUILDINGS

DELTA TERRACE, NAVI MUMBAI

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

COUNTRY	MONTHLY TEMP. MAX.	HUMIDITY	MONTHLY RAINFALL
FRANCE	25	65 ~ 85	35 MM
SINGAPORE	31	60 ~90	175 MM
CANADA	27	55 ~ 70	50 MM
AUSTRALIA	29	60 ~ 70	45 MM
INDIA	47.8	15 ~ 90	0 MM TO 150MM

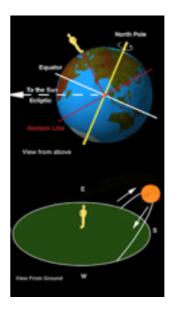


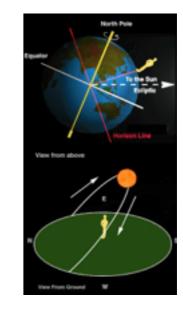
UNDERSTANDING MICRO CLIMATE

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

WITH

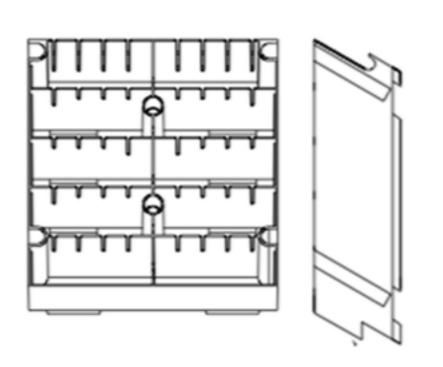
LONGEVITY ENABLED GROWTH MEDIUM

GREENERY IN GREEN BUILDINGS

GREENERY IN GREEN BUILDINGS

ELT Living Wall System

- 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.
- Top collection chamber for irrigation emitter line.



- Water management incorporated into design with the notches.
- Drain window for each comprtment 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.

GREENERY IN GREEN BUILDINGS

Recycled Plastic Mounting

Strip



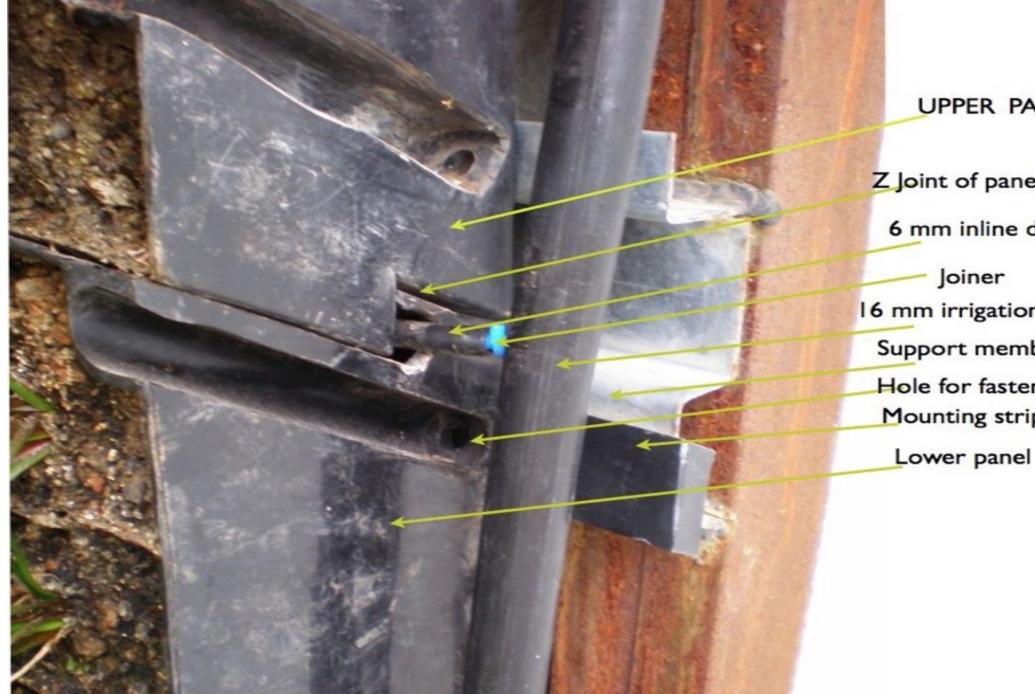


Mounted on the structure

Wall Mounted For Sales Enquiries Call-020 27219275: <u>Email-sales@eltindia.com</u>: Visitwww.eltindia.com

GREENERY IN GREEN BUILDINGS

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

GREENERY IN GREEN BUILDINGS

ENGINEERED GROWTH MEDIA



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS

SHAHAPUR, MUMBAI.

GREENERY IN GREEN BUILDINGS

SHAHAPUR, MUMBAI.

GREENERY IN GREEN BUILDINGS

THRISSUR, KERALA.

GREENERY IN GREEN BUILDINGS



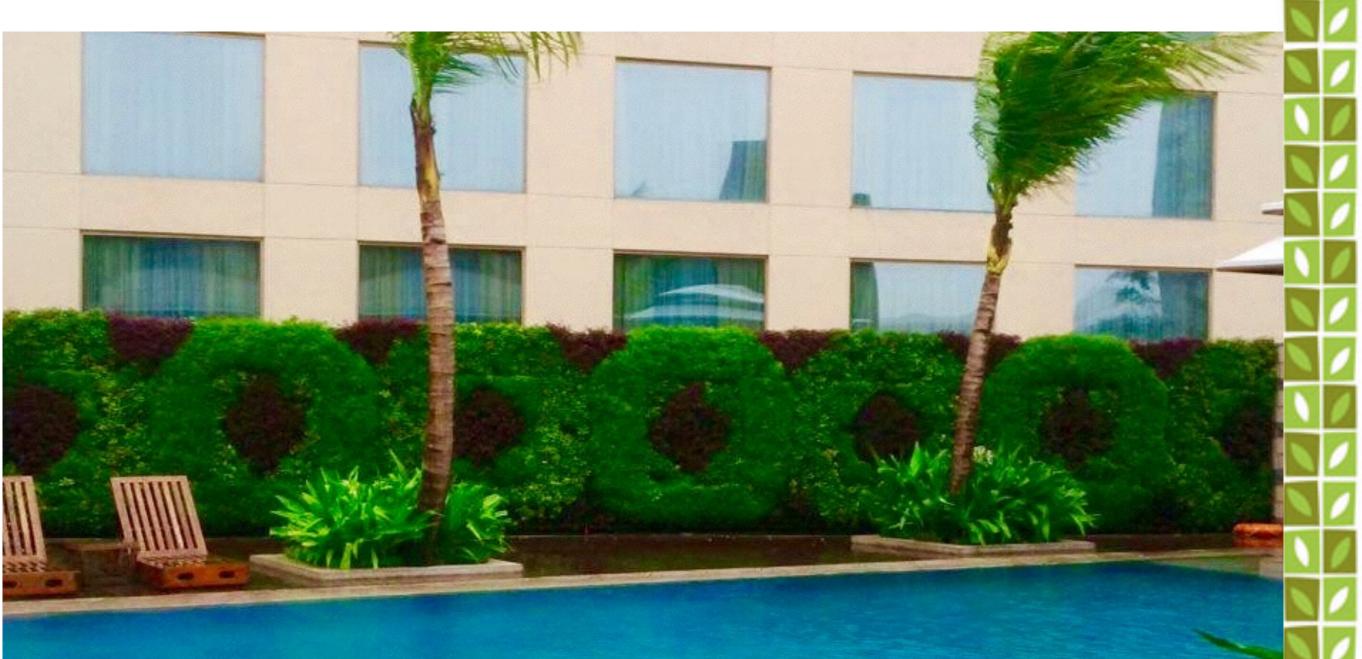
GREENERY IN GREEN BUILDINGS

GREENERY IN GREEN BUILDINGS

THRISSUR, KERALA.

JW MARIOTT, TERMINAL 2, MUMBAI

GREENERY IN GREEN BUILDINGS



JW MARIOTT, TERMINAL 2, MUMBAI

GREENERY IN GREEN BUILDINGS

KALPATARU INSPIRE, MUMBAI

GREENERY IN GREEN BUILDINGS

CHOIR FORUMS. COM

RASHTRAPATI BHAVAN

GREENERY IN GREEN BUILDINGS

DURG, RAIPUR, UTTARKHAND.

GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS

ELT LIVING WALL SYSTEM

WITH

HYDROPHILIC FOAM

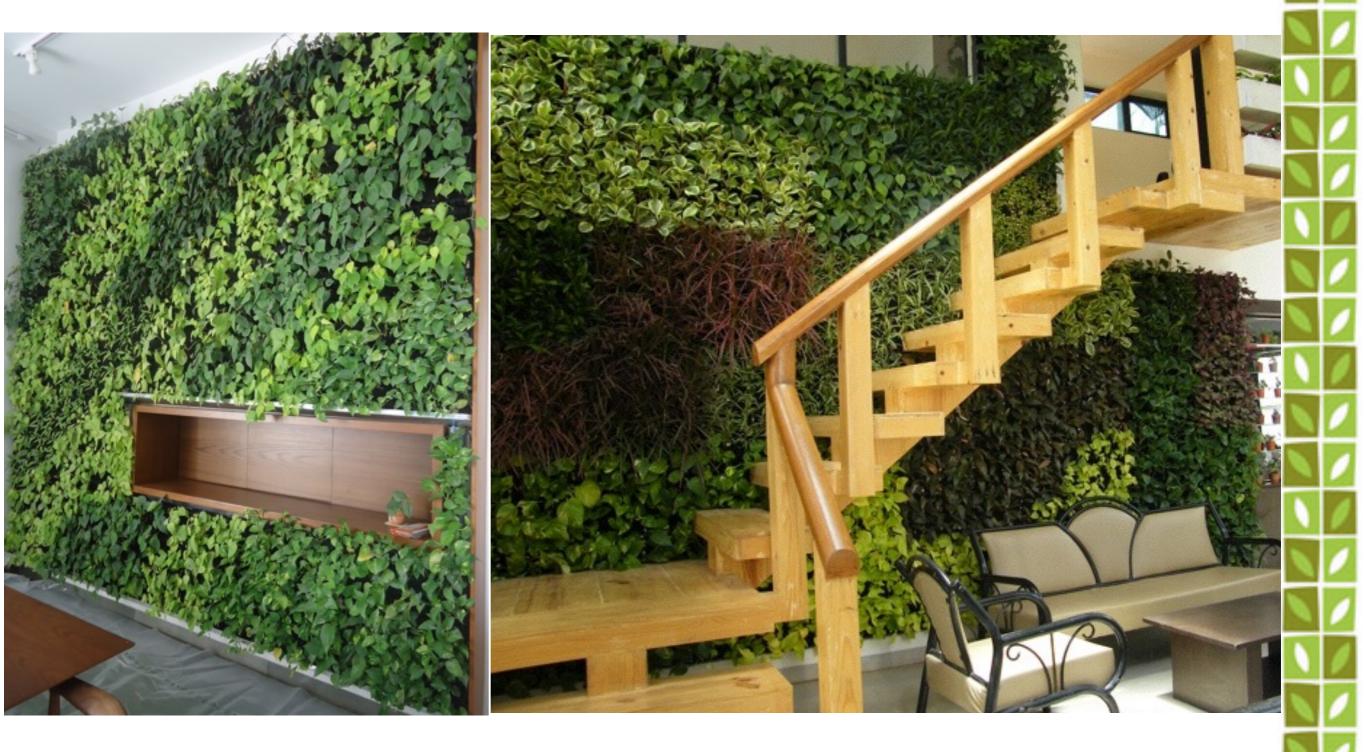


GREENERY IN GREEN BUILDINGS

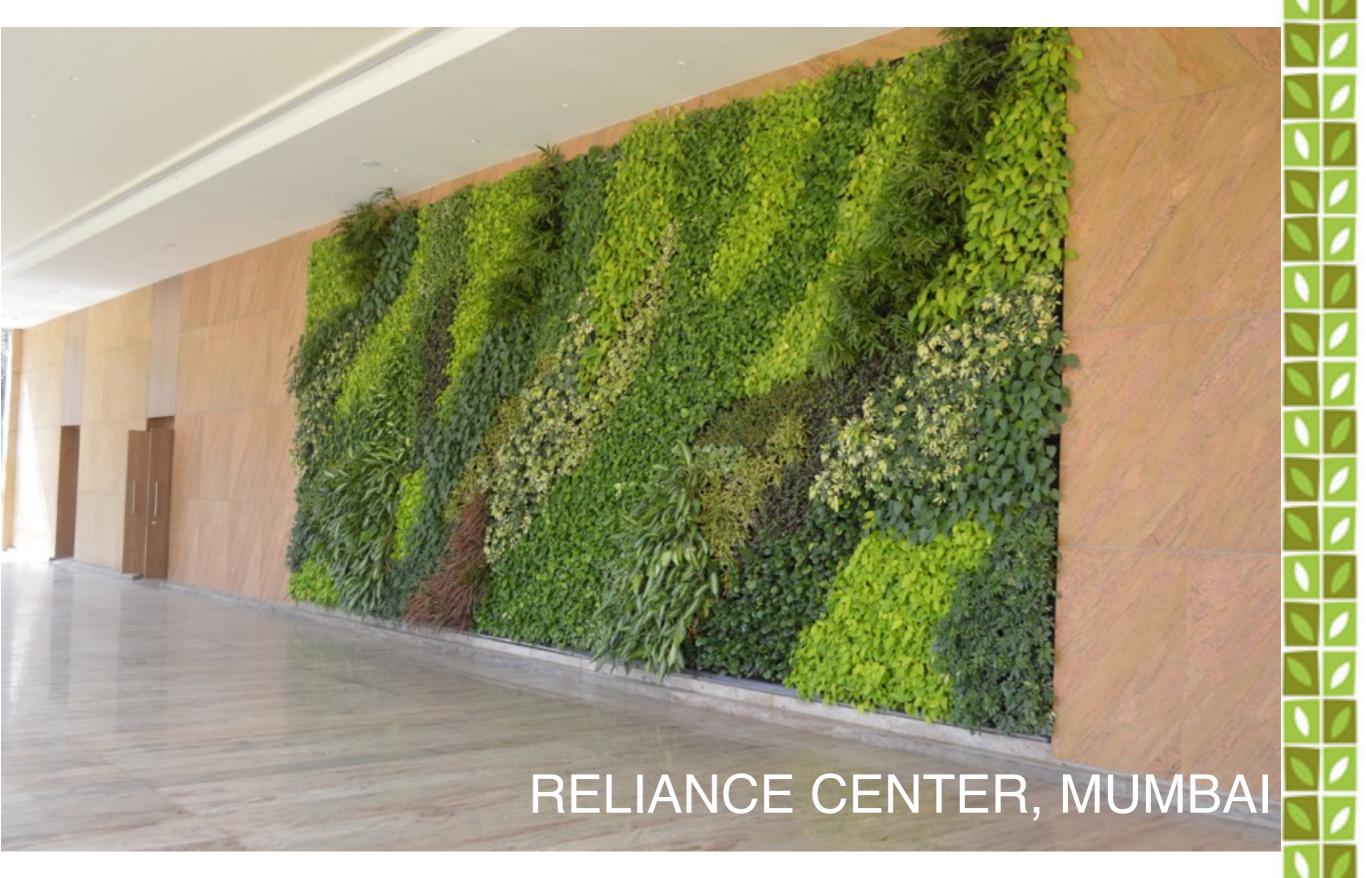








GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS

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

GREENERY IN GREEN BUILDINGS

SELF WATERING VERTICAL GARDEN SYSTEM

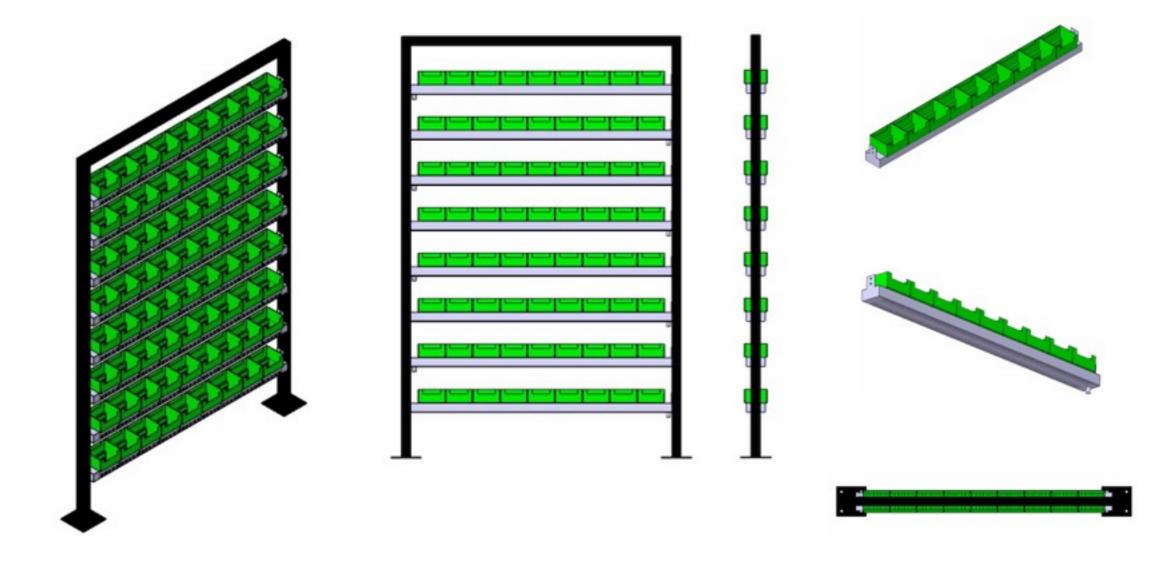
LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS

LINEAR GREENS VERTICAL GARDEN SYSTEM

GREENERY IN GREEN BUILDINGS

LINEAR GREENS VERTICAL GARDEN SYSTEM



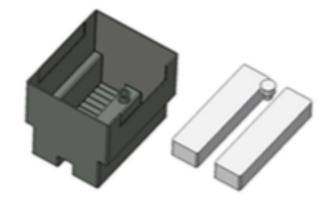
GREENERY IN GREEN BUILDINGS

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.

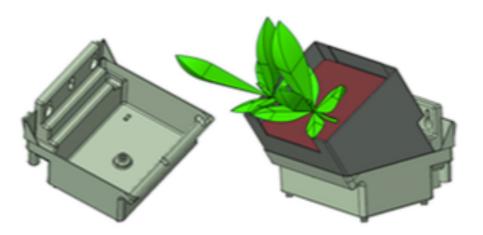
- Agro Planter is made of Poly propylene & has strength & long life
 Hydrophilic substrate acts as filter
 blanket, retains water & provides
 anchorage to roots.
 - Hydrophilic substrate is placed at the bottom of the planter.
- Planter is filled with Lightweight, porous, well drained ELT growth media which is a combination of inorganic & organic material.
 Depending on required looks & site conditions, plants varieties are chosen.







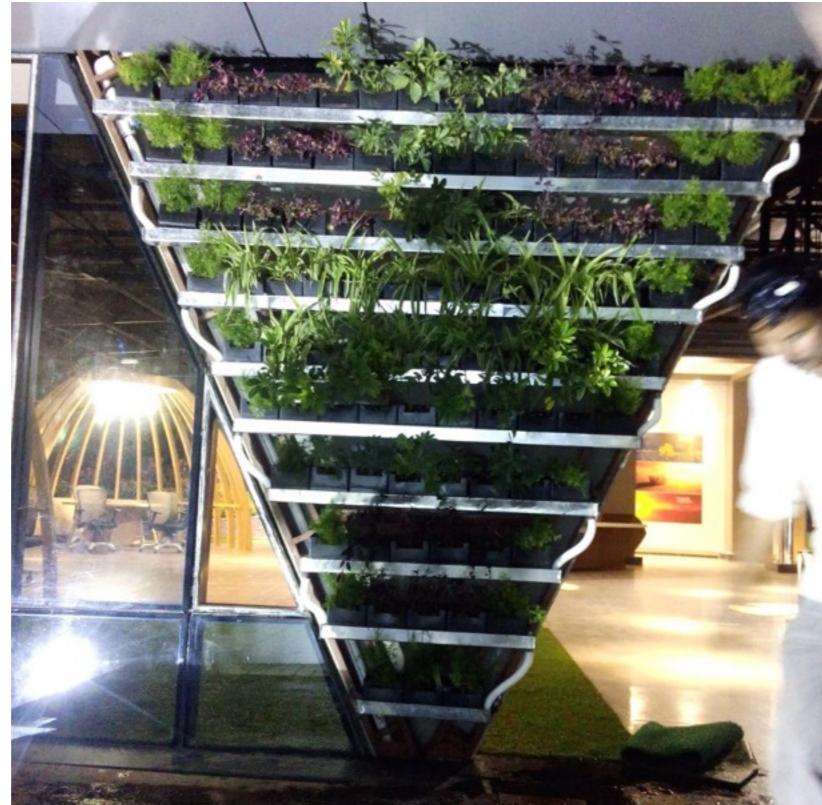
ELT are Agro Planters are mounted onto the wall or on framework using Irrigation trays. There are 2 different types of irrigation trays, one is Holder which is made from Polypropylene & each planter fits into the individual holder. This Holder in turn is fitted onto the wall or frame or mesh. Irrigation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



GREENERY IN GREEN BUILDINGS







GREENERY IN GREEN BUILDINGS

GREENERY IN GREEN BUILDINGS

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GREENERY IN GREEN BUILDINGS



GREENERY IN GREEN BUILDINGS







GREENERY IN GREEN BUILDINGS

GREENERY IN GREEN BUILDINGS





GREENERY IN GREEN BUILDINGS

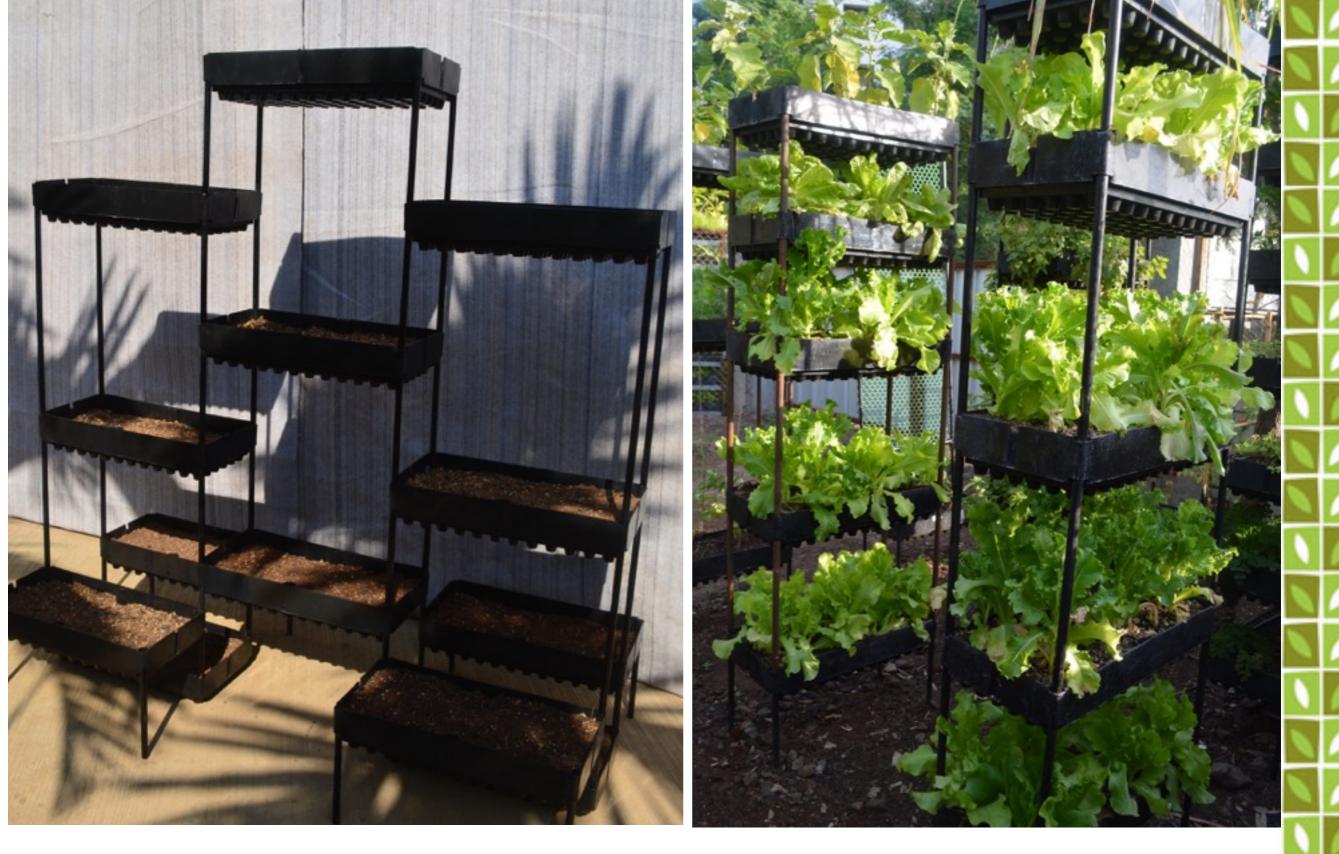


GREENERY IN GREEN BUILDINGS





GREENERY IN GREEN BUILDINGS



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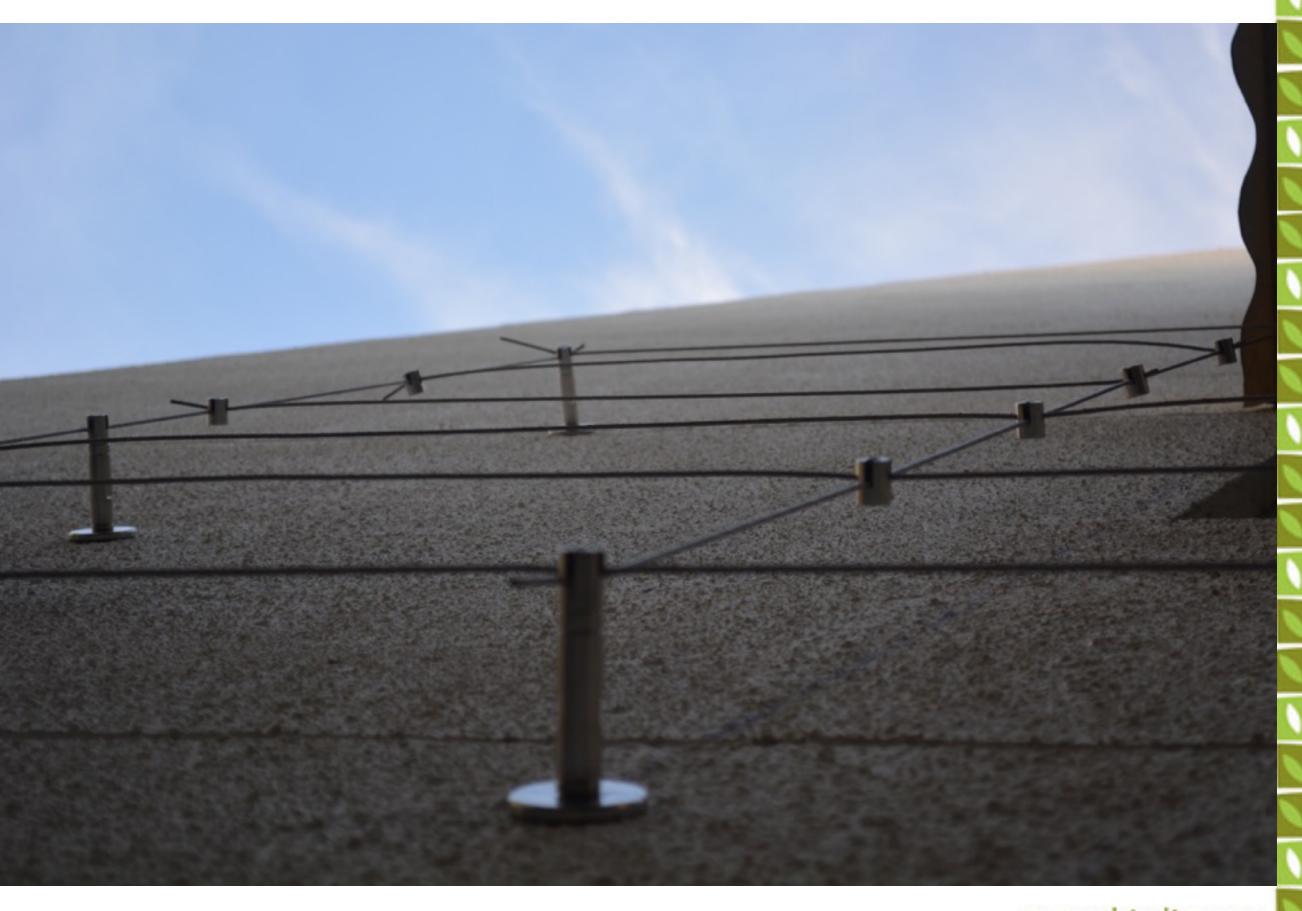


GREENERY IN GREEN BUILDINGS



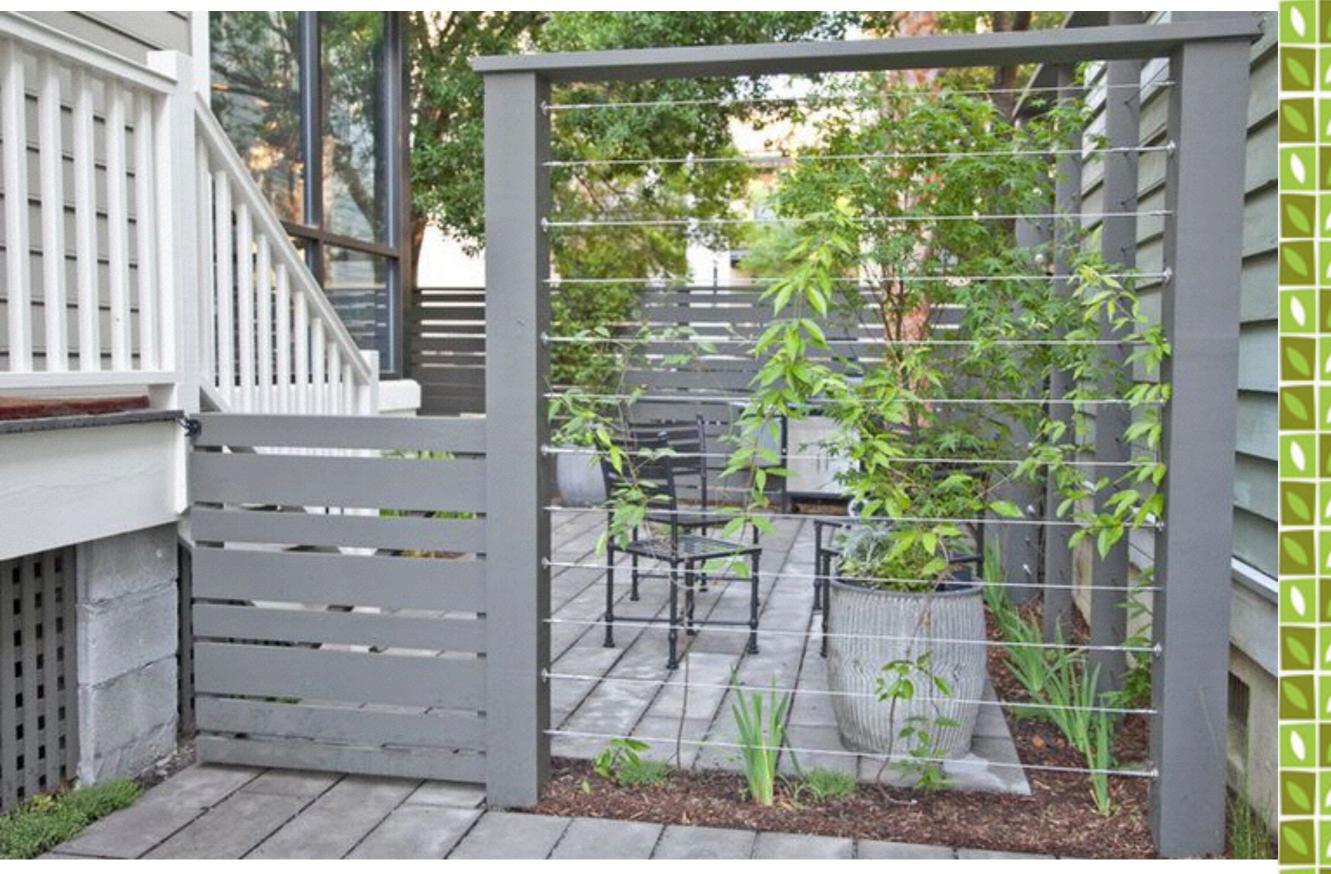




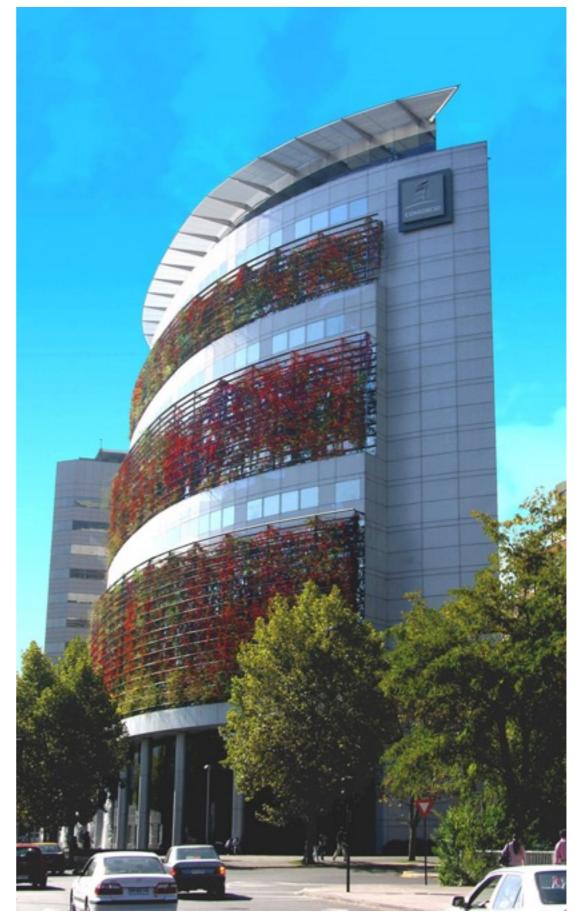


















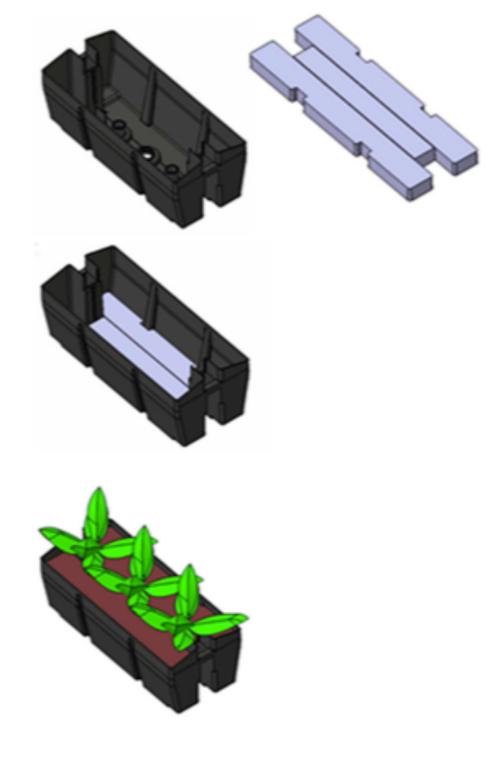
ELT Wonder Green System

This system consists of Module, Hydrophilic substrate, Joinery, Plants & Growth Medium.

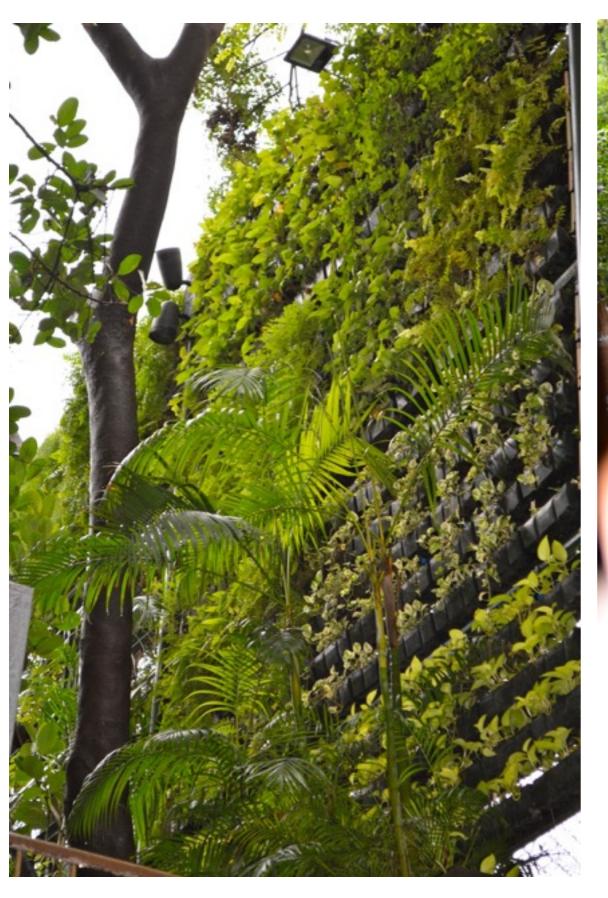
 Module is made of Poly propylene & has strength & long life Hydrophilic substrate acts as filter blanket, retains water & provides anchorage to roots.

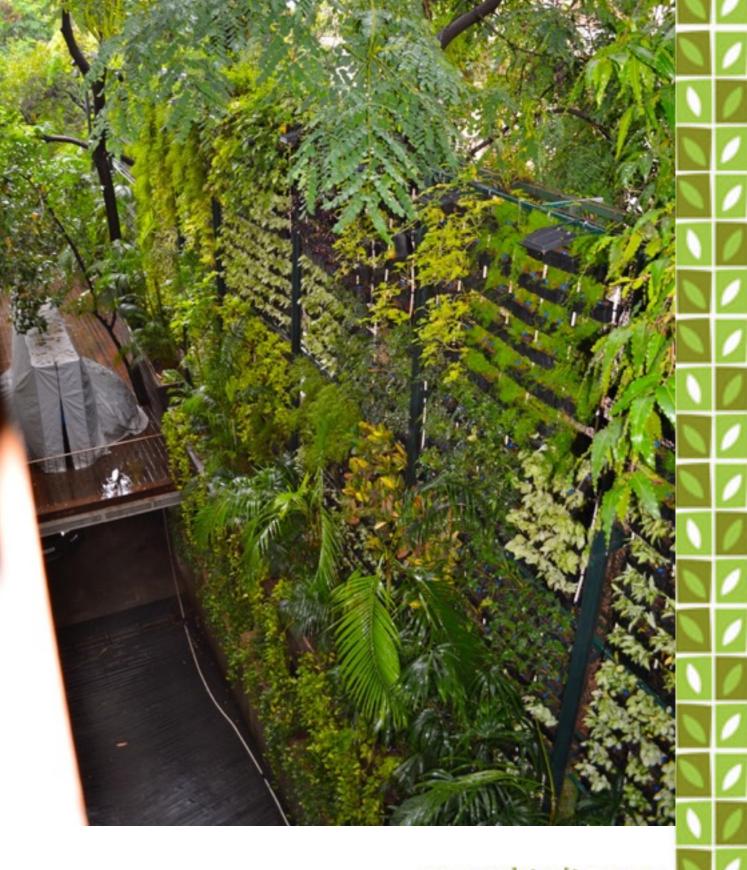
Hydrophilic substrate is placed at the bottom of the module.

 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.















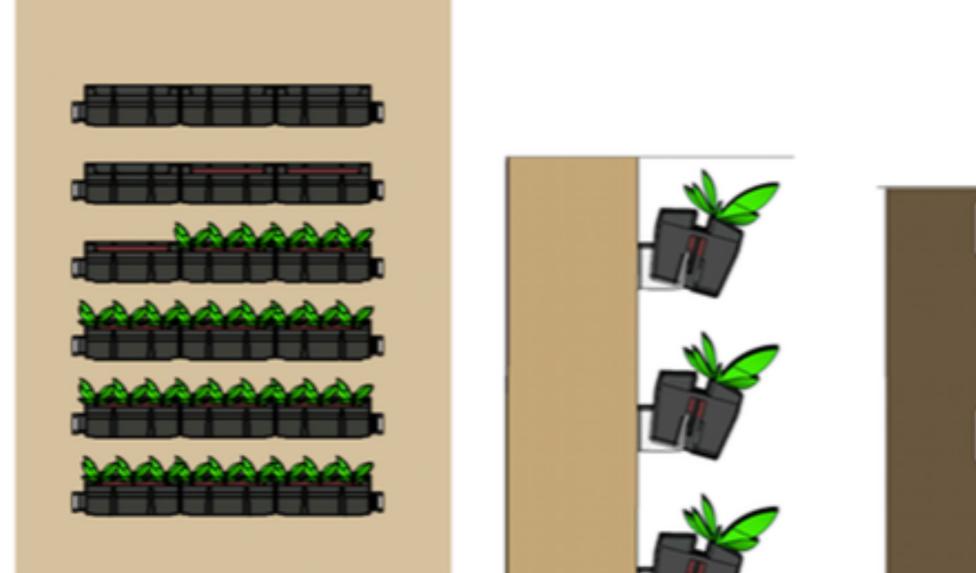


WALL MOUNTED BIO-WALL

WALL MOUNTED BIO-WALL



WALL MOUNTED BIO-WALL





WALL MOUNTED BIO-WALL



WALL MOUNTED BIO-WALL

















3" THK URBAN FARMING ON GREEN ROOF



3" THK URBAN FARMING ON GREEN ROOF



3" THK URBAN FARMING ON GREEN ROOF



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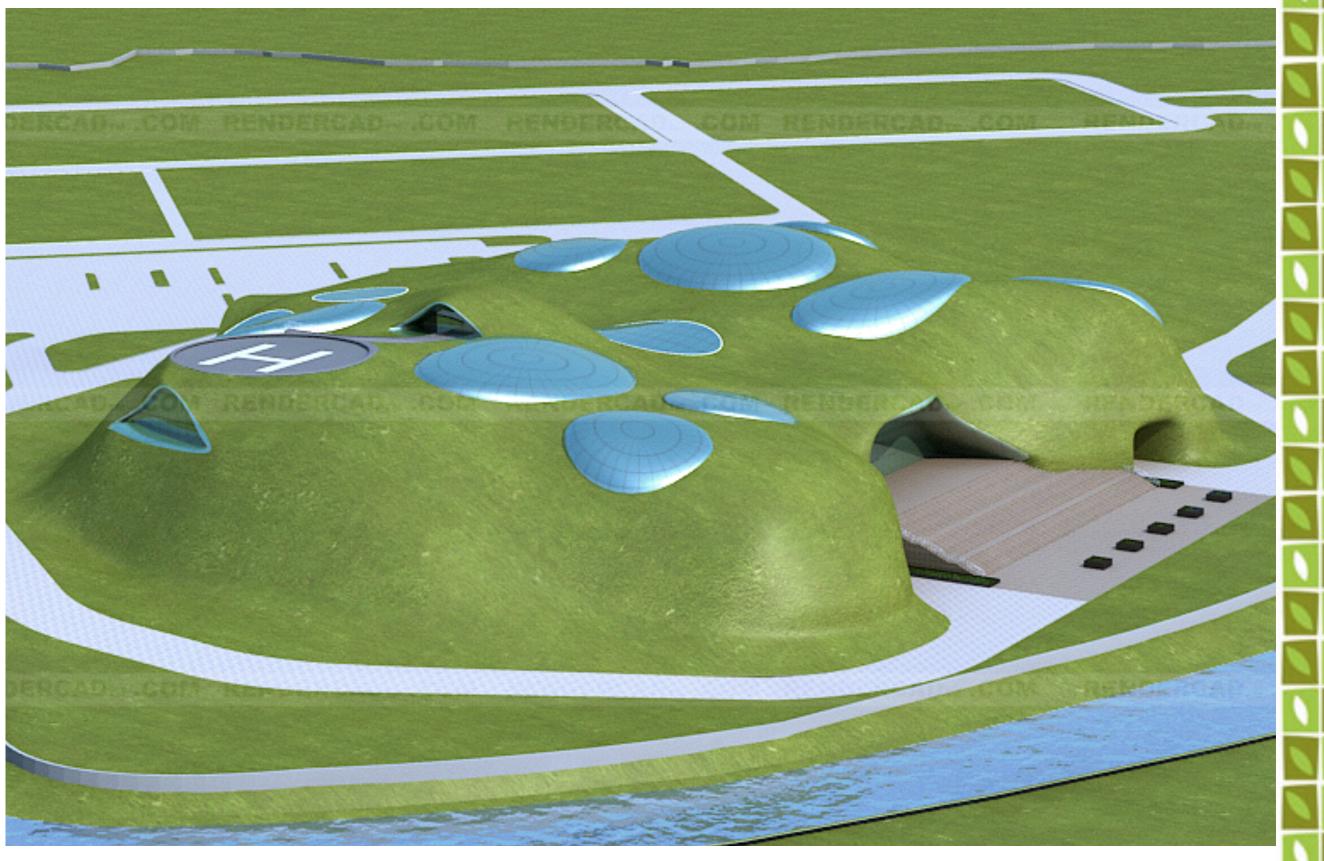
3" THK URBAN FARMING ON GREEN ROOF

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. 9.Plant Protection, Organic and Green Approach **10.Load Factor and Soil Depth 11.Plant Selection**

HOW WAS THIS MADE







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.

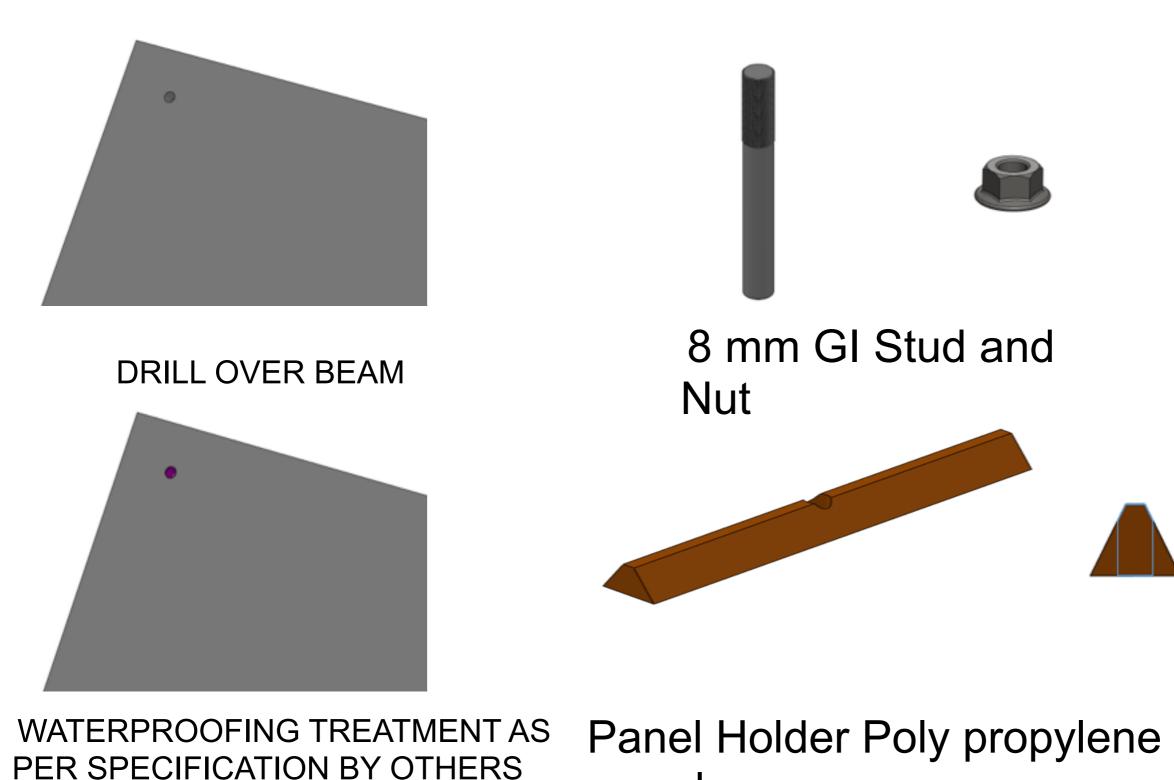
Method Statement

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

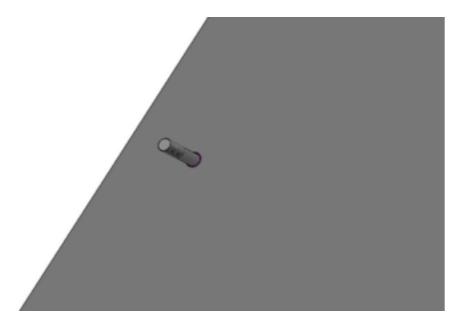
2. For slopes up to 45 degrees: a. Insert panel holders in the studs provided.

- **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.

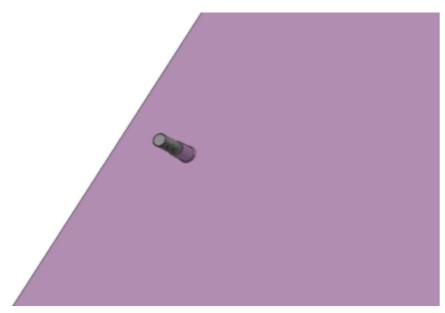
3. For slopes above 45 degrees: A - After waterproofing treatment, lay the drain board (by ELT) & the drain boards to be secured using the stude (by ELT), already fixed to the slab by others



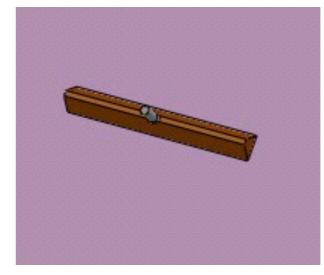
co-polymer



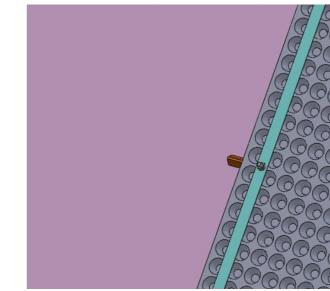
INSERTION OF STUD



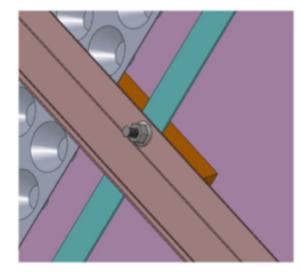
WATERPROOFING AS PER SPECIFICATIONS BY OTHERS



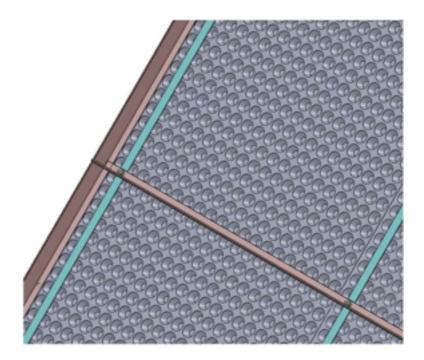
INSERTION OF PANEL HOLDER



PANEL HOLDERS TO FIXED IN THE STUD UNDER GREEN ROOF PANELS

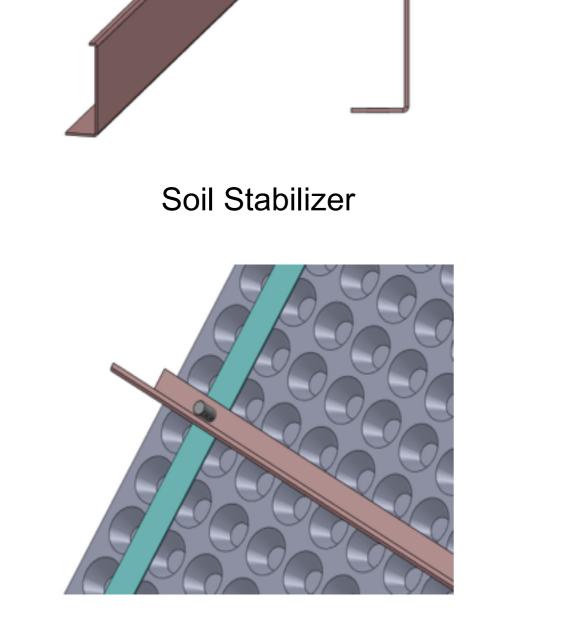


Typical Joints



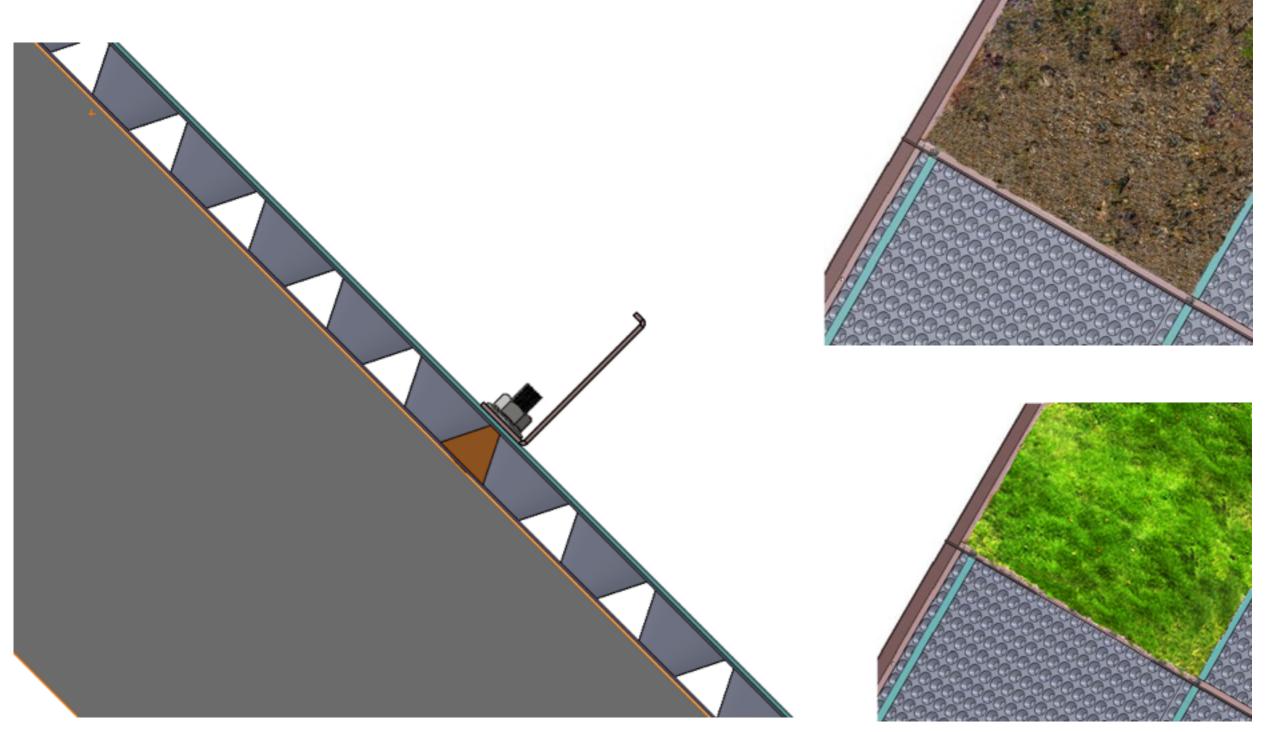
Typical Joints





Fixing Soil Stabilizer

Fixing on Slopes





Mock Up & Similar Installations



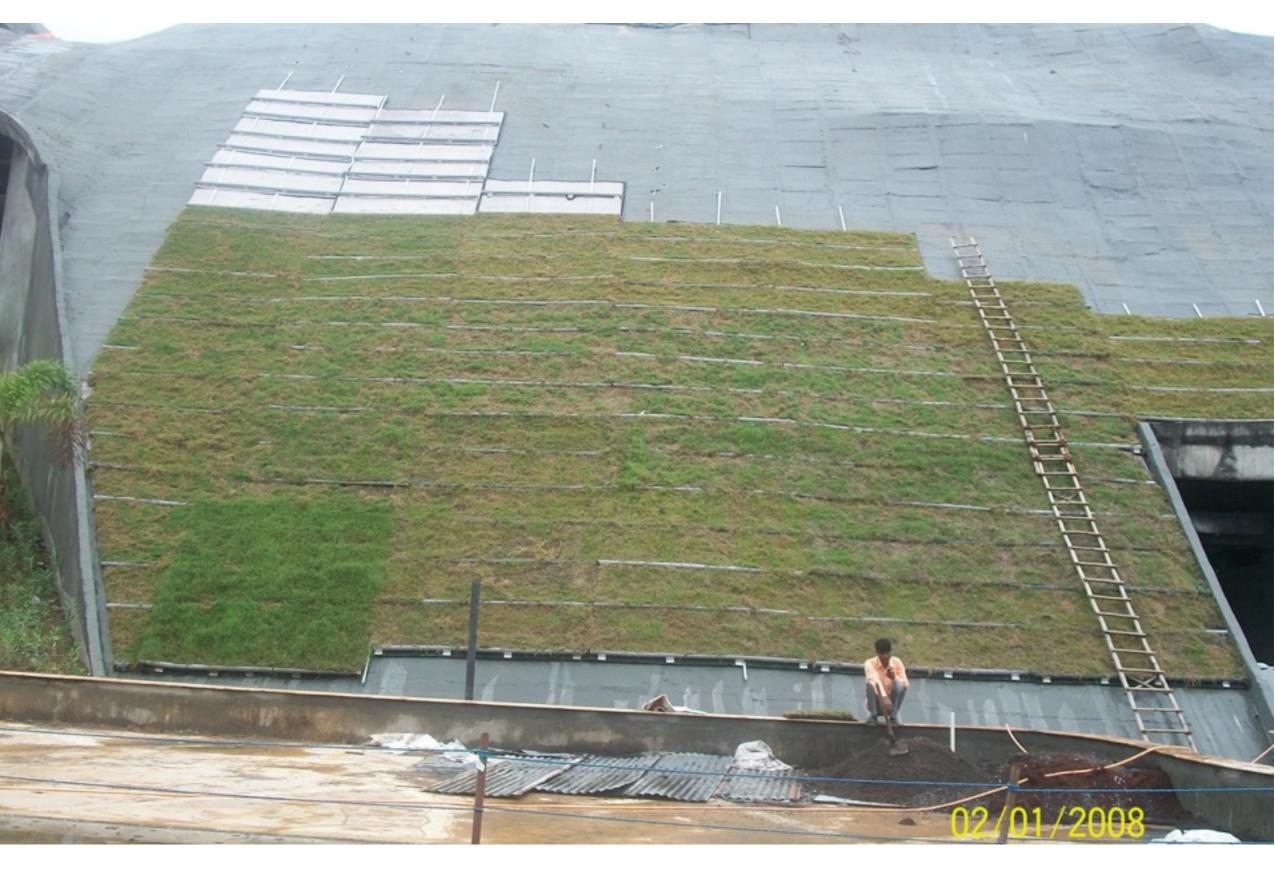


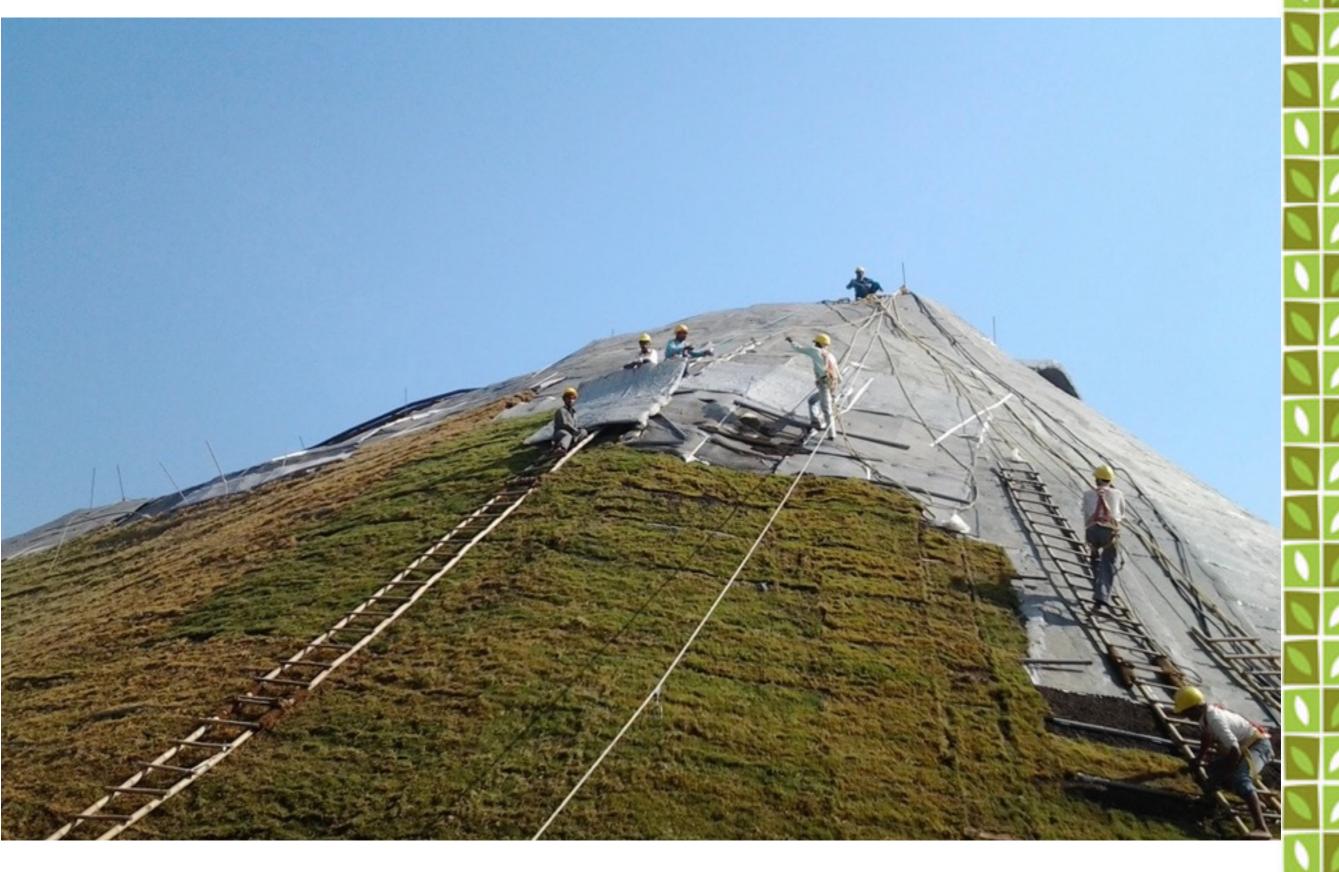




STUDDS ON THE ROOF @ 1.2 METERS N BOTH DIRECTIONS

FIXING ELT DRAINAGE BOARD







13/09/2013 10:20

HOW WAS THIS MADE





STONE PAVED AREA ABOVE CONCRETE

SPACE FOR GRASS

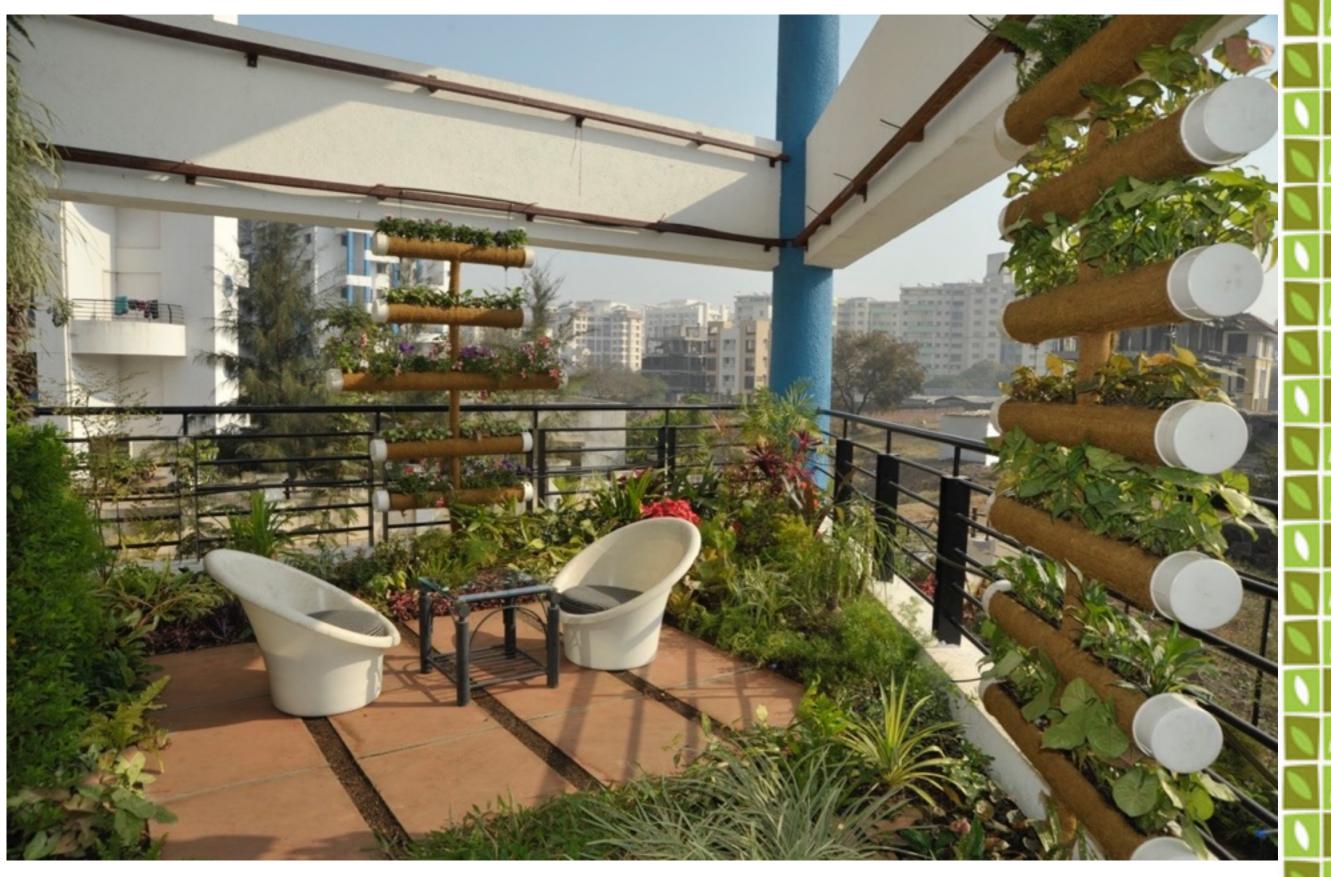
GREEN ROOF MEMBER



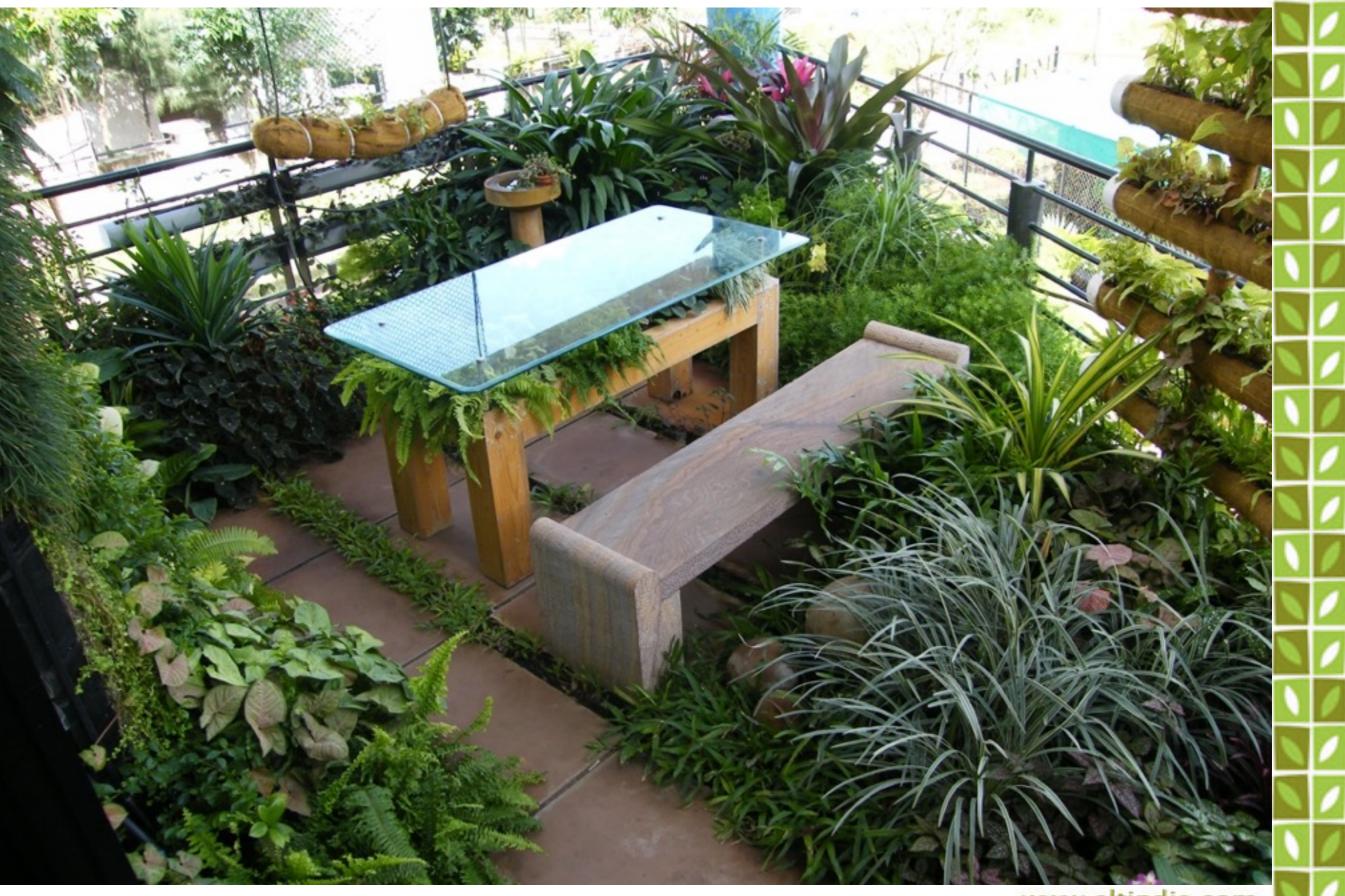
IRRIGATION LINES



CREAT 300% GREENERY IN URBAN HABITATS



CREAT 300% GREENERY IN URBAN HABITATS



CREAT 300% GREENERY IN URBAN HABITATS











































