



GREEN WALLING AND ROOFING

2017-2018



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Why is it important to introduce vegetation in buildings?

- Aesthetic improvements
- Reduction of the urban heat island effect
- Improved exterior and indoor air quality
- Energy efficiency
- Reduction of noise
- Positive for human health
- Carbon sequestration
- Urban agriculture
- Reduction of footprint impact
- Enhancement of biodiversity
- Wastewater treatment and use
- Local job creation



Palace Hotel. London



Types of green walling

Retaining living walls

Designed to stabilize a slope while supporting vegetation in its structure

Modular. Made of interlocking units (concrete, timber, plastic, etc.) and geotextiles

They increase the angle of natural slope. Can perform angles of up to 90 degrees





Types of green walling

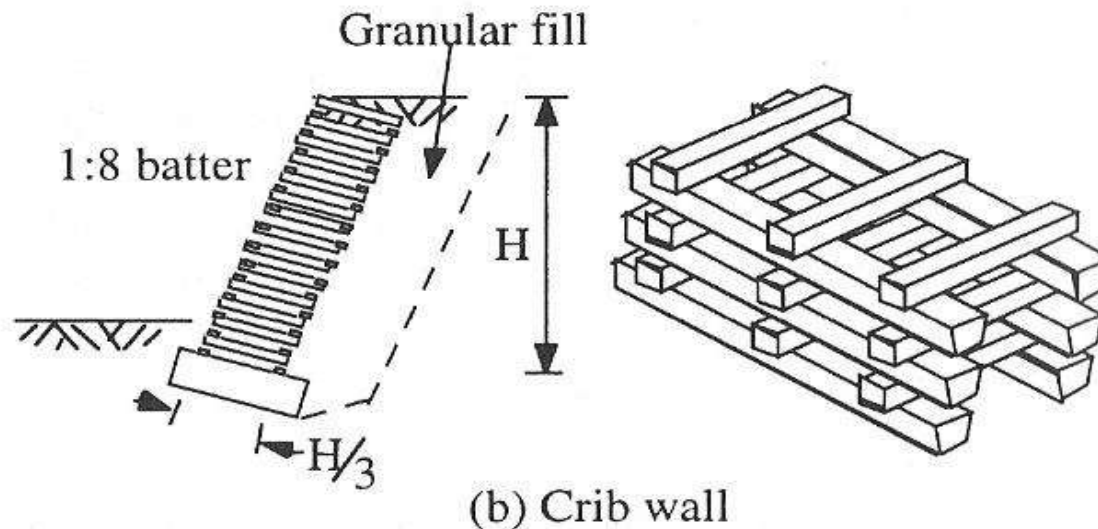
Retaining living walls

CRIB WALL

Small concrete or hardwood beams interlocked to form small boxes

Filled with granular material

VIDEO





Types of green walling

Retaining living walls

CRIB WALL





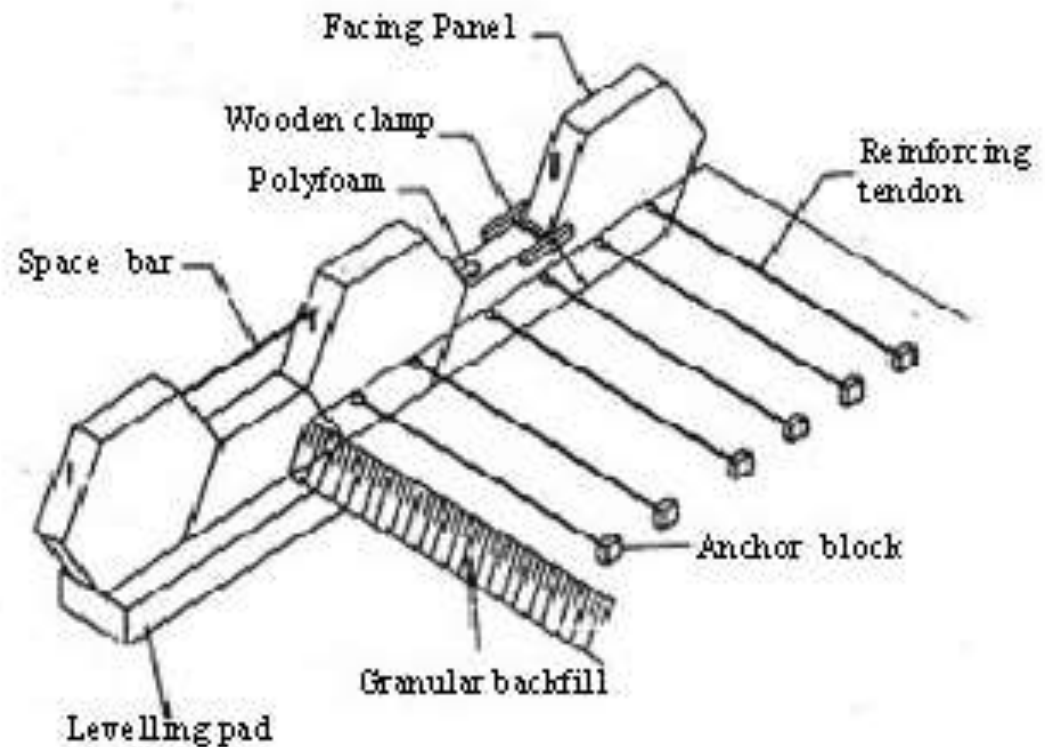
Types of green walling

Retaining living walls

REINFORCED EARTH

250 mm thick soil compacted layers between reinforcing mesh or strips of reinforcement

Attached to precast concrete facing panels





Types of green walling

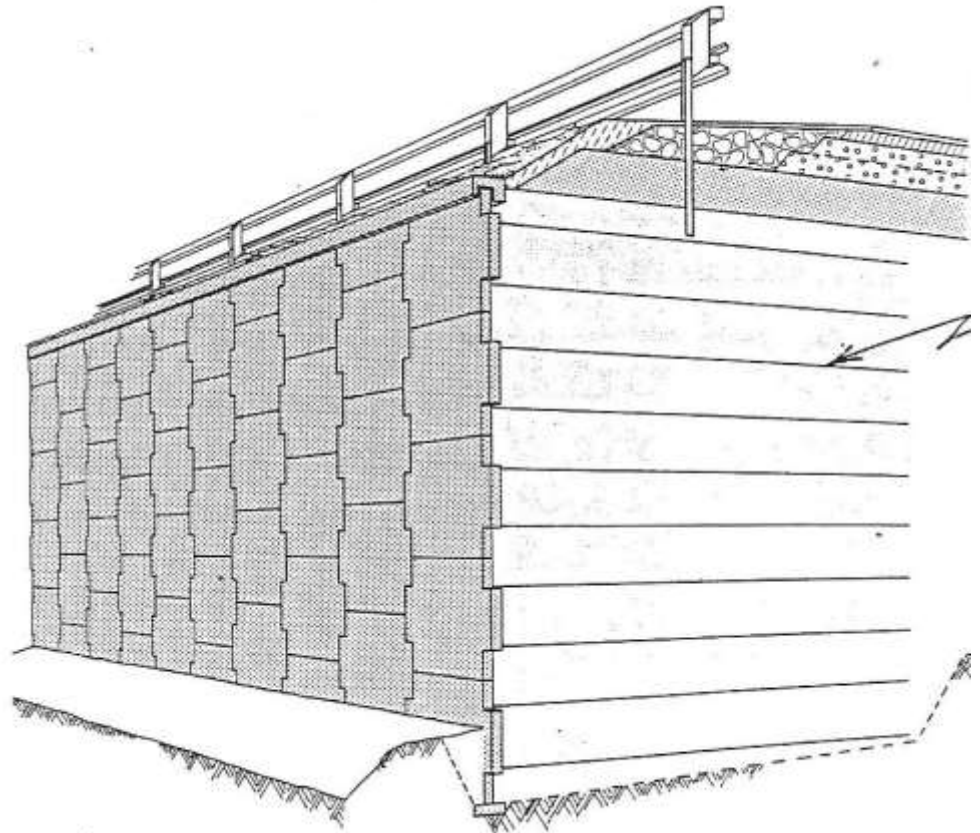
Retaining living walls

REINFORCED EARTH

Speed and low cost construction

Half the weight of a concrete wall

Cannot retain liquids

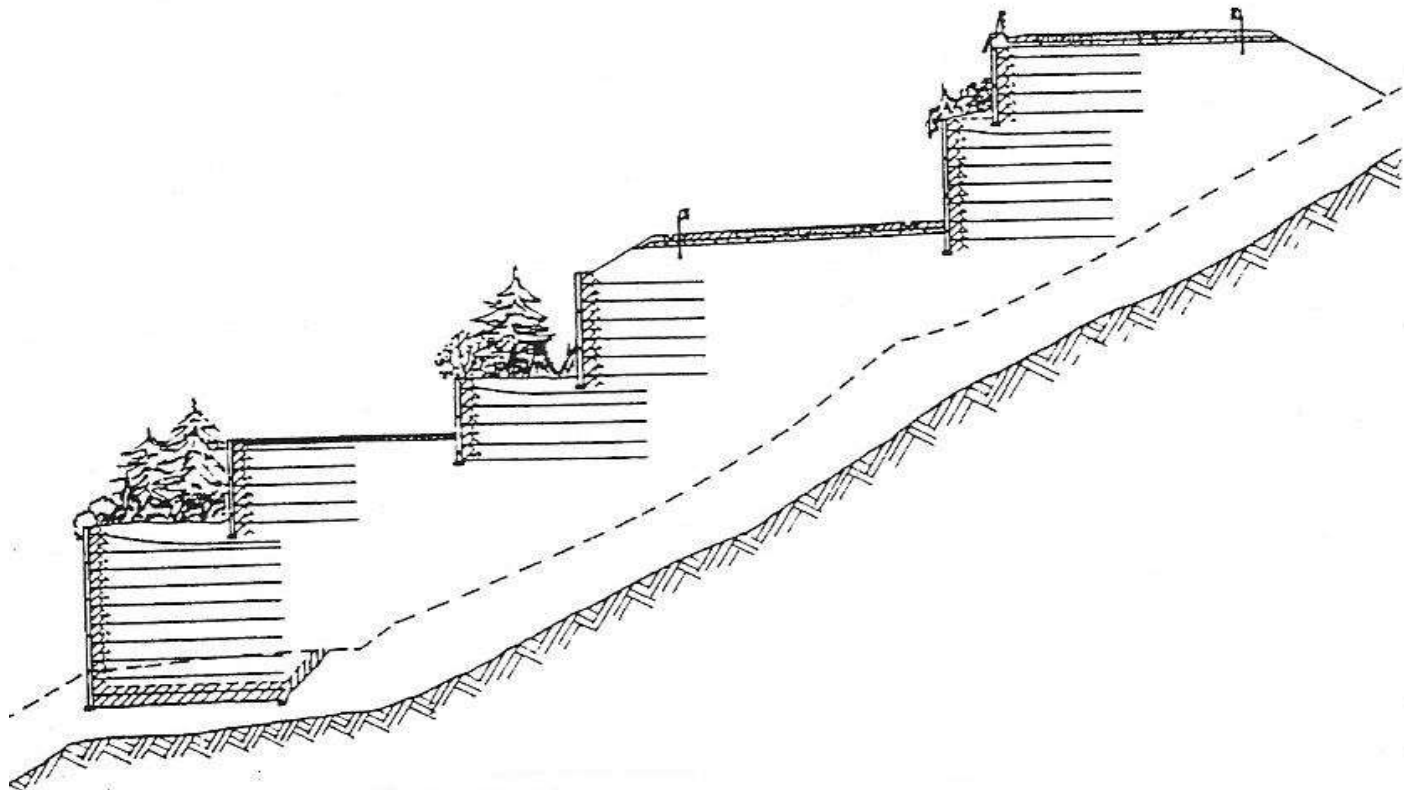




Types of green walling

Retaining living walls

REINFORCED EARTH





Types of green walling

Retaining living walls

REINFORCED EARTH



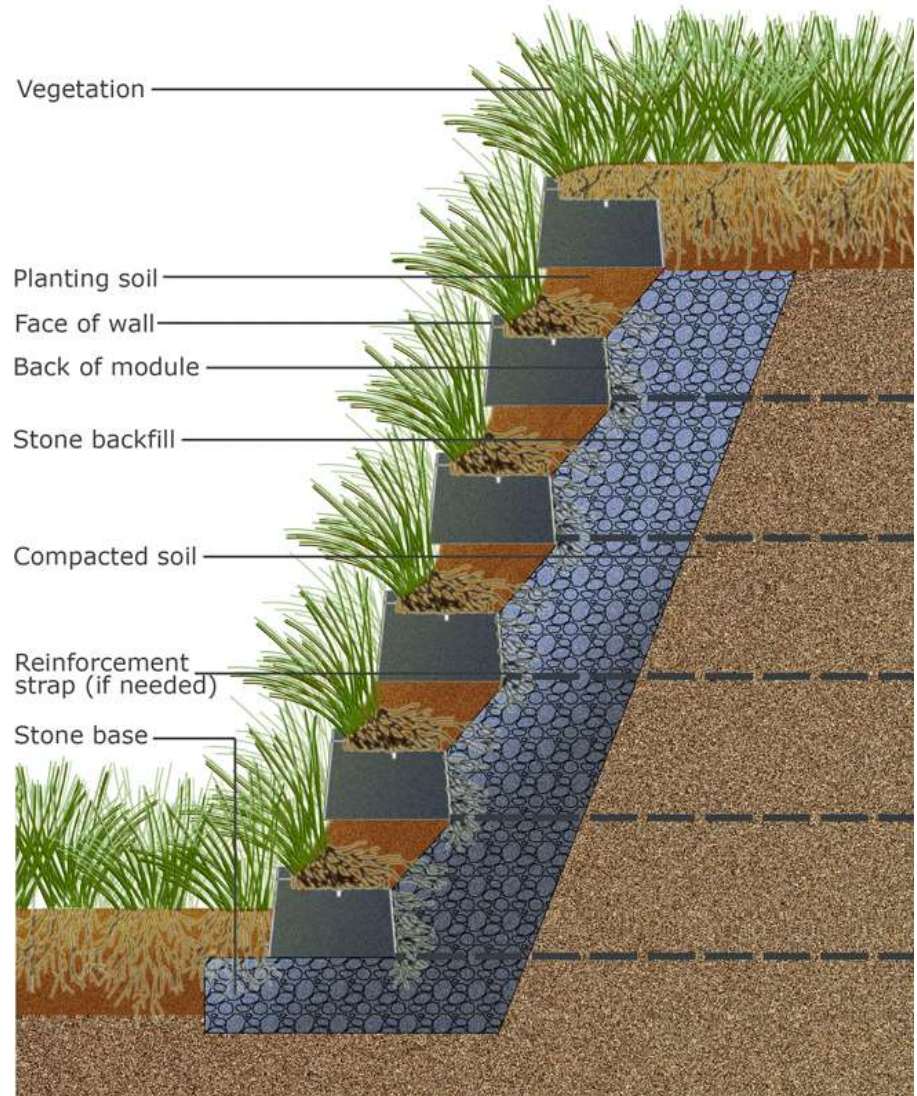


Types of green walling

Retaining living walls

REINFORCED EARTH

Smart Slope system





Types of green walling

Retaining living walls

Geogrids and geotextiles





GREEN WALLING AND ROOFING

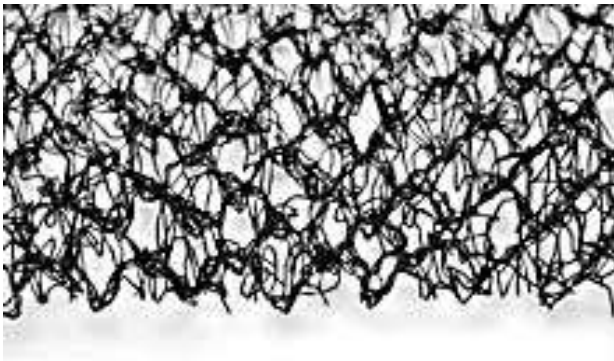




Types of green walling

Retaining living walls

Geogrids and geotextiles



Enkamat



Types of green walling

Retaining living walls

Geogrids and geotextiles

Fortrac





Types of green walling

Green facades

Supporting structure attached to the wall to allow climbing plants and cascading groundcovers grow

Plants are rooted in soil beds on the ground, intermediate levels or rooftops

Plant selection is very important

Attached to existing walls or freestanding



Silhcity carpark. Zurich



MFO Park. Zurich



Types of green walling

Green facades





Types of green walling

Green facades

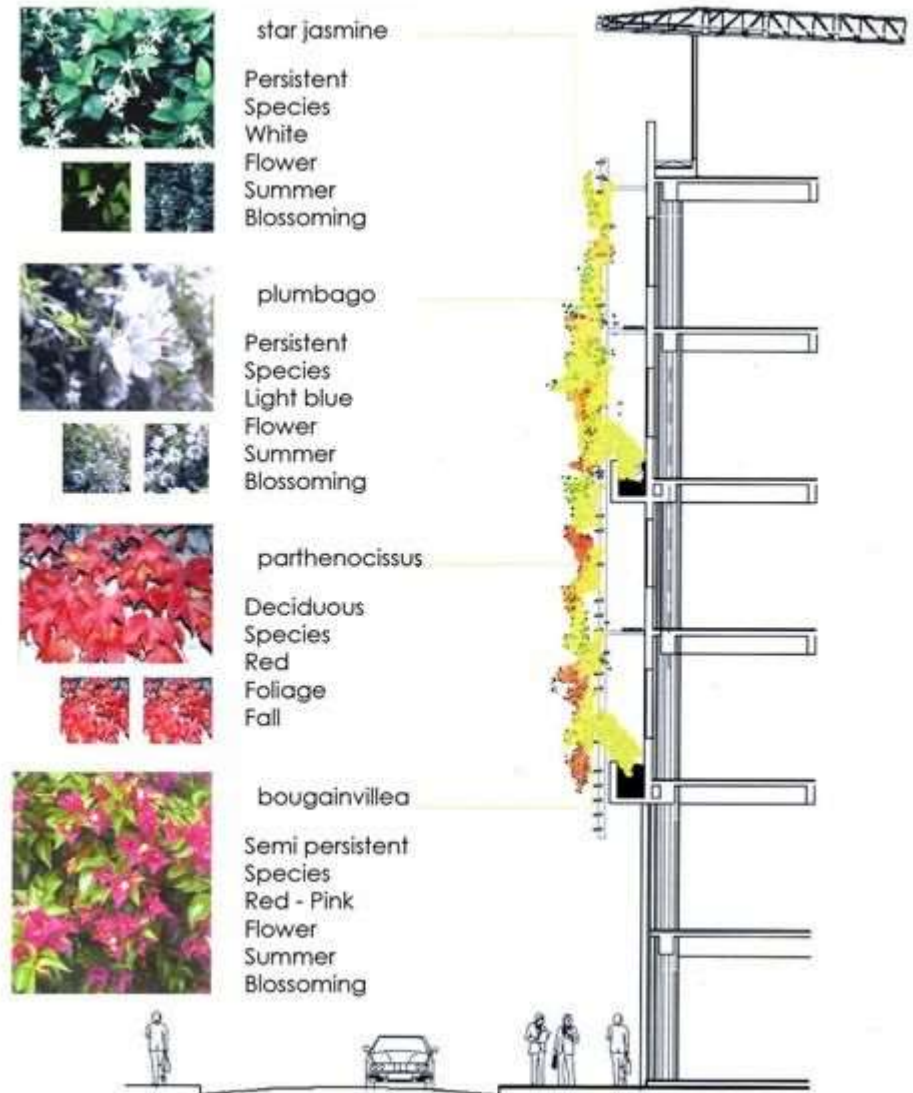


OMNI Façade systems



Types of green walling

Green facades



Office building. Concepcion. Chile



Types of green walling

Living walls

Pre-vegetated panels, modules, planted blankets or bags that are affixed to a structural wall or free-standing frame

Can support a great diversity and density of plant species

Plants are rooted directly in the structure or in growth medium before added to the structure. It is usually hydroponic

Growing media: organic (coconut coir, peat, tree bark) or inorganic (expanded clay pebbles, gravel, perlite, mineral soil)

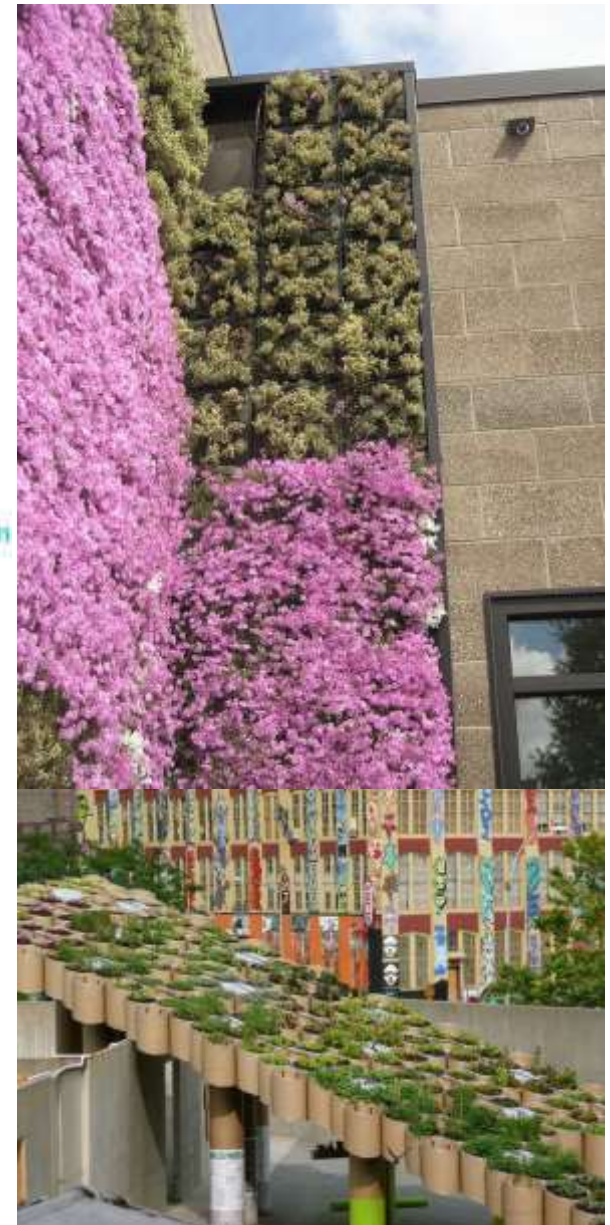
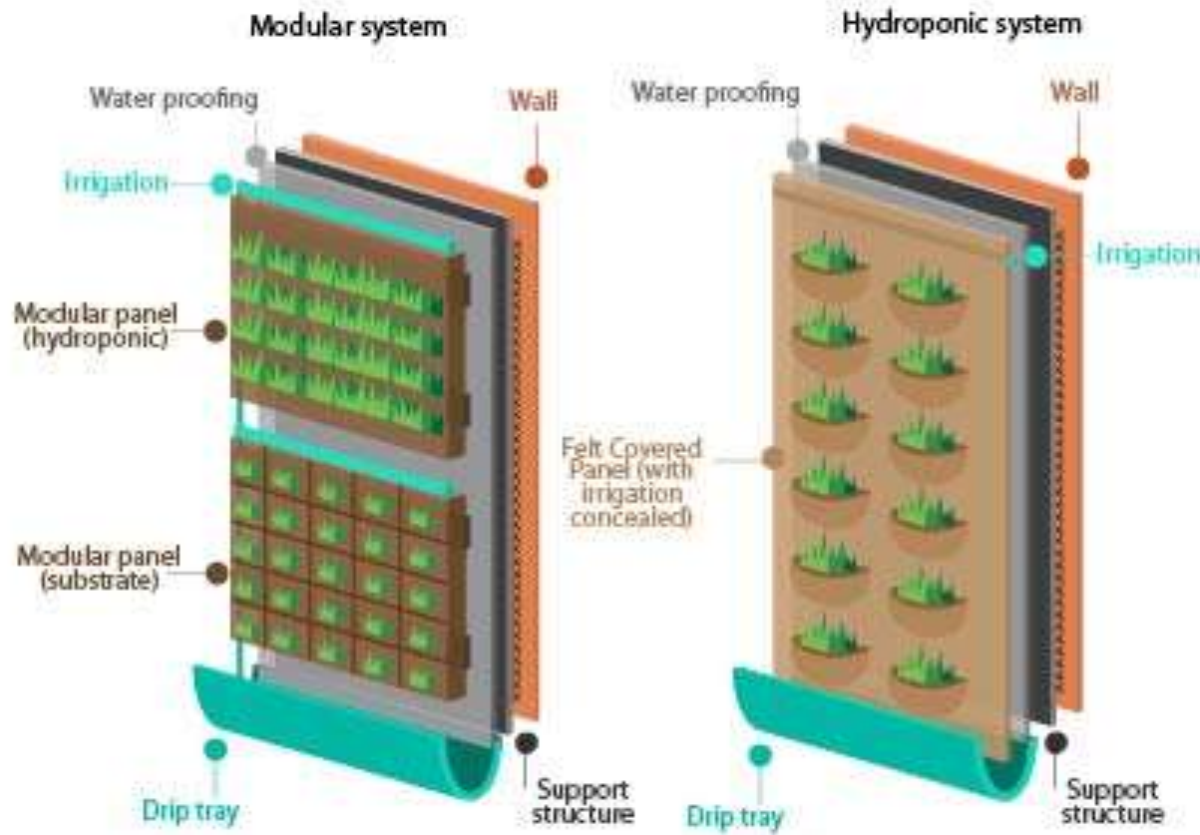




Starbucks. Seattle

Types of green walling

Living walls



Growing of plants in panel



Types of green walling

Pro wall system

1. Stainless Steel Frames
2. Stainless Steel Panels:
3. Growth Media (Organic coconut coir fibre)
4. Plants:
5. Remote Monitoring
Irrigation/Fertilization System





Types of green walling

Pro wall system





Types of green walling

Tray systems





Types of green walling

The Veripot system (indoors)





Maintenance

According to previous solutions...

what about maintenance?

Irrigation systems. Check timers, filters, valves, etc. from time to time

Access. Needed from time to time. Important location to have appropriate access

Drainage. Avoid clogged drainage. Check any organic matter is clean

Plants. They are alive and need attention. Check any leaf damage, disease, dieback and any dead foliage

Light. Design for appropriate light conditions and direct sun radiation if needed



Green roofs

Considerations:

- Increase of dead loads
- Adequate drainage
- Waterproof
- Maintenance

Two types:

- Flat roofs
- Pitched roofs



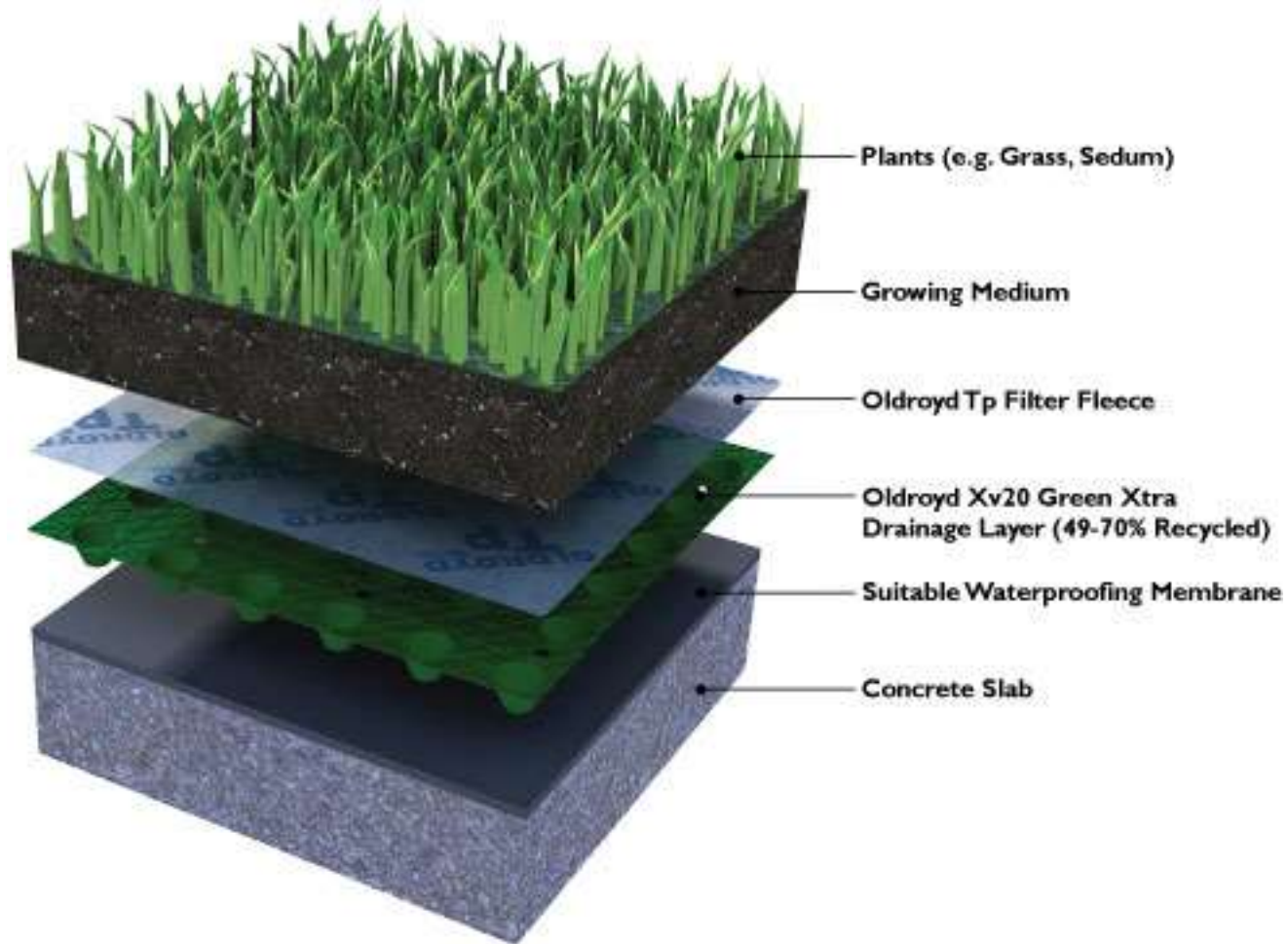


Green roofs

Can you detail a typical cross-section of one green flat roof and one green pitched roof?



Green roofs



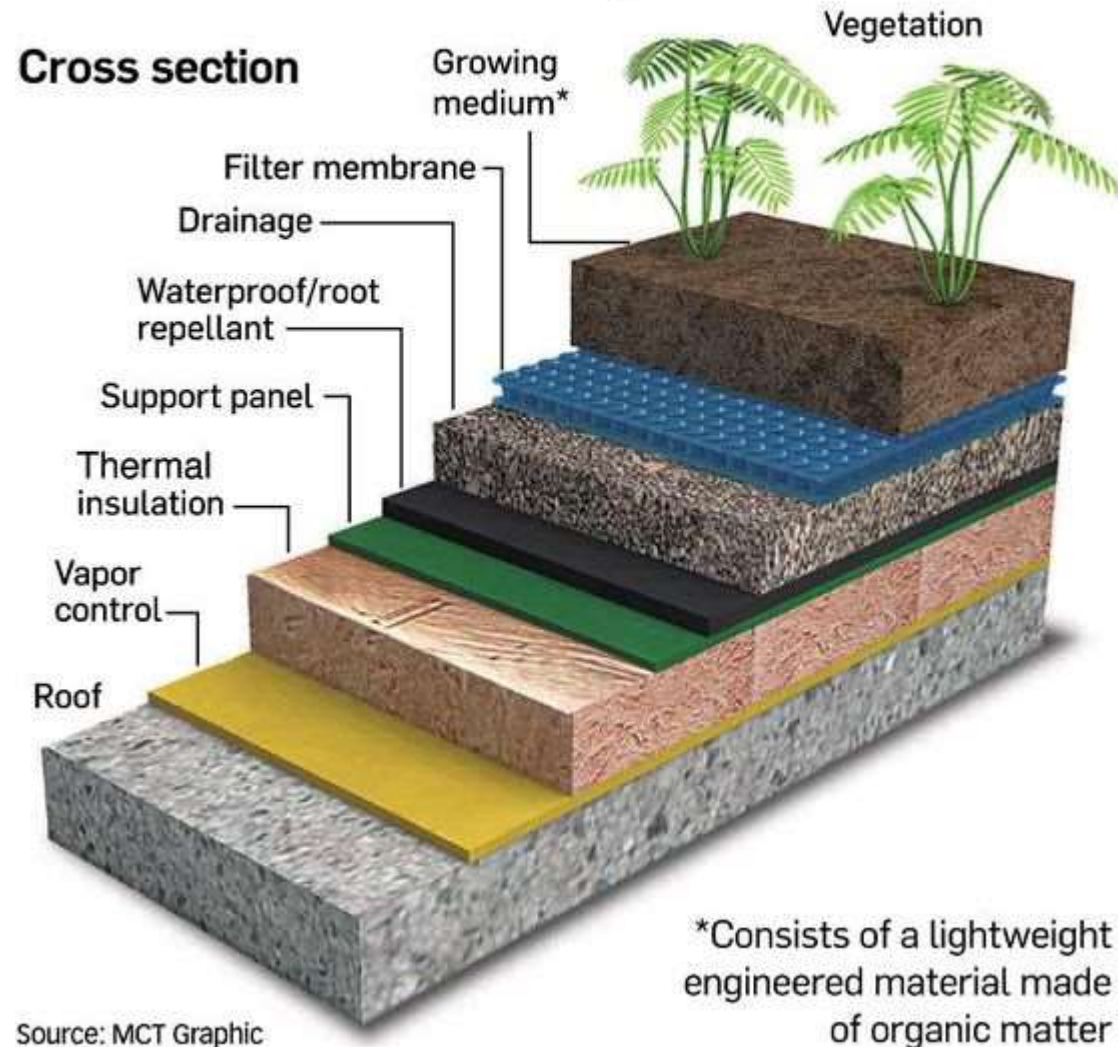
A typical build-up for an extensive or semi-intensive green roof. www.safeguardeurope.com



Green roofs

Roofs that really hold water

Green roofs vary in plant types used, size and shape, but may consist of some or all of the following:



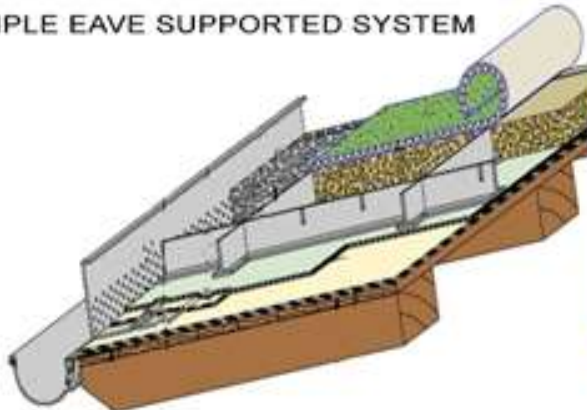
Source: MCT Graphic



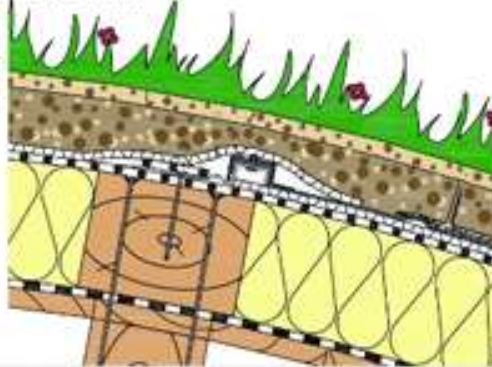
Green roofs

Systems for pitched roof

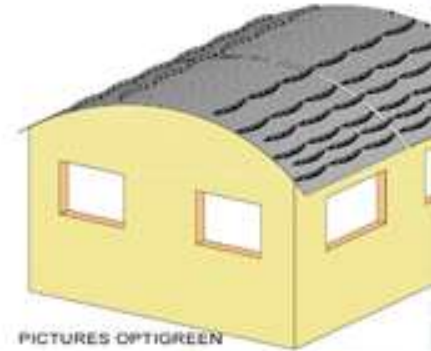
SIMPLE EAVE SUPPORTED SYSTEM



SIMPLE IN-AREA SUPPORTED SYSTEM



RIDGE SUPPORTED SYSTEM



PICTURES OPTIGREEN



The Roofing is finished



Retaining system and drainage



FLL Growing Media



Vegetation