Funded by the European Union

Mitigation Enabling Energy Transition in the MEDiterranean region

SITE PLANTATION – GS4

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Training on GRASS*Med* – meetMED II

WP3_A3.1.6

February 27, 2023

OUTLINE

- ✓ What is a Site Plantation?
- ✓ Benefits of Site Plantation
- ✓ How to Design Site Plantation?
- ✓ GRASS*Med* Recommendations
- ✓ Percentage of Plantation Area Calculation
- ✓ How to Comply with GRASS*Med*?

What is a Site Plantation?

It was once thought that **Green Spaces**, **Forests** and **Parks** needed to be **large areas**. After all, forests require acres and acres of space

What is a Site Plantation?

★ With Careful Planning ★

Mini-forests can thrive in lots as small as a typical parking lot, small area on school's campus, on the perimeter of a residential project etc.

Gardens can be planted in places that are often overlooked to create food forests in urban neighborhoods.

Even in dense urban areas, there are strips and pockets of land that could be opportunity to create green spaces.

Before planting can begin, you'll need to know what kinds of plants will grow in your area !

Research for local edible and native plants to grow where you live

Benefits of Site Plantation

Landscape design in green buildings should not be seen as a mere **decorative** element, but should be well conceived as a multi-function factor that provides various essential green services to a building, going beyond technology and behavior to **reduce energy** and **water use** or **improve indoor air quality**.

Vegetation can reduce heating and cooling requirements, clean the air and lower ambient temperature.

Site plantation improves:

- Connecting with nature
- Protecting natural wildlife
- Enhancing the quality of life
- Balancing man-made with natural
- Defining entertainment areas
- Boosting value for properties

Benefits of Site Plantation

Incorporating Green Plants into a Building

can significantly improve

Health, Comfort, Wellbeing and Productivity

of building occupants

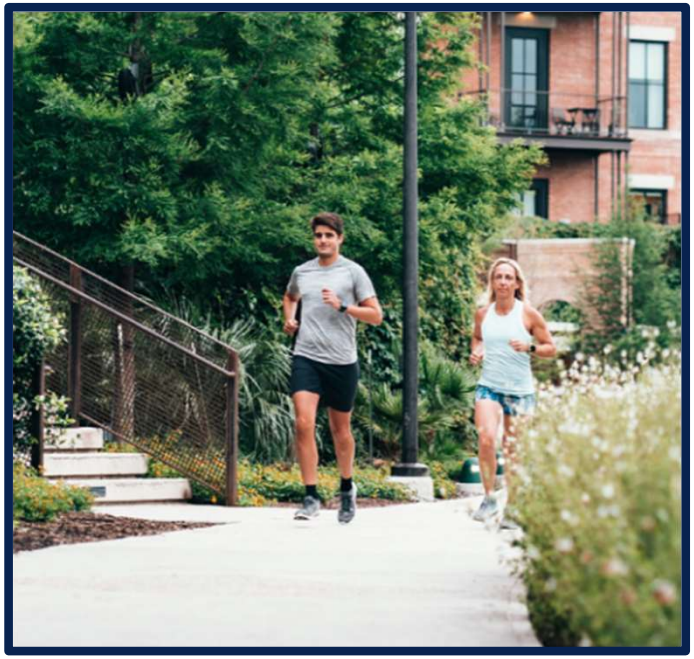
which can reduce levels of absenteeism and increase productivity !

Site Plantation – Green Building

BENEFITS

Can Be Split To **Three** Main Areas

Physical Health



Mental Health

Economic

Benefits of Site Plantation

Physical Health Benefits

Air Quality

Plantation
- Produces oxygen
- Eliminates dust, smoke, pollutants.

Improving the quality of the breathable air.

Lower Blood Pressure Lower Stress

Studies have shown that looking at plants and trees, even if only through a window, can lower blood pressure and levels of the "stress hormone" cortisol. High levels of cortisol have been linked to issues with learning and memory, weight gain and heart disease.

Reduce Inflammation in the Body & Boost Immune System

Being outdoors
- Reduce inflammation in the body, which in turn reduces autoimmune disorders, irritable bowel syndrome and even cancer.
- Boost the immune system, allowing the body to better fight routine illnesses like colds and the flu.

Benefits of Site Plantation

Mental Health Benefits

Multiple studies have shown that walking in nature improves **short-term memory**.

Symptoms of **anxiety, depression** and other mental health issues can all improve with time spent outside. For example, exercising outdoors instead of inside improved both self-esteem and mood in study participants.

Additional benefits include an increase in **focus** for tasks that require intense concentration and, as a result, improved **productivity**.

Benefits of Site Plantation

BENEFITS

Economic Benefits

Curb Appeal & Increased Property Value

A well-landscaped home can add approximately 6 to 25 percent of value compared to a property without any landscaping.
Curb appeal is real; how a home looks from the road will affect whether someone wants to buy it and how much they're willing to pay.

Energy Bill Savings

A well-planned landscape designed for energy efficiency can reduce heating and air conditioning costs by 10 to 30 percent.
Certain plants, especially ones that are native, require less water to thrive, which means lower water bills.

How to Design Site Plantation?

-- Two options for a Building to make it Green --

Plants can be integrated

Outside

- on roofs,
- outer vertical walls,

etc.

Inside

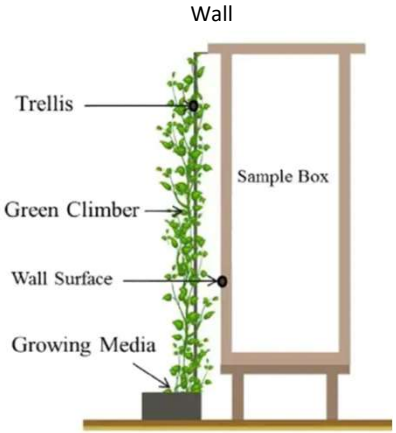
In the form of:
- a living wall or biofilter,
- potted plants placed in atriums and indoor

This presentation focuses on outdoor plantation

How to Design Site Plantation?

Green Facades

Green Facades are created by purposefully growing climbing plants both up and across the facade of a building. While most green facades are designed from plants that are either planted directly into the soil or in pots at the base of the exterior wall, some green facades place containers at varying levels across the building, especially in multistory buildings.

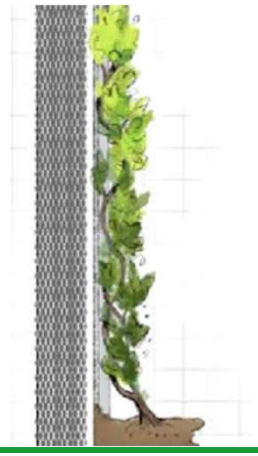


How to Design Site Plantation?

Green Facades

DID YOU KNOW?
INTERESTING FACT

Benefits of Green Facades for your Home, the Environment, and Your Health:

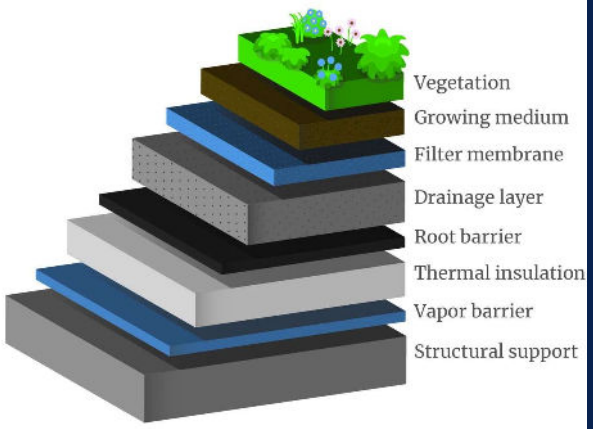


- Acoustic Buffering
- Biodiversity and Habitat
- Biophilic Design for Improved Mental Health
- Increased Thermal Insulation
- Healthier Cities and Cleaner Air

How to Design Site Plantation?

Green Roofs

Green Roofs are roofs that are partially or completely covered with plants and vegetation. These are also known as sedum roofs, grass roofs, or living roofs.



The vegetation is usually planted over a drainage membrane that sits on top of the roof, along with additional layers such as a root barriers and waterproofing products. When used correctly, this combination of products helps the plants thrive on the roof without causing damage to the building's structure.

Alternatively, you can use a modular green roof tray system that contains all of the component parts in a self-contained unit that can be placed directly on top of a waterproof layer.

How to Design Site Plantation?

Green Roofs

DID YOU KNOW?
INTERESTING FACT

Benefits of Green Roofs for your Home, the Environment, and Your Health:

- Promote biodiversity and support wildlife in urban areas
- Provide thermal protection and reduce energy use
- Improve air quality
- Help retain and purify rainwater
- Provide good sound insulation
- Increase the lifespan of the roof
- Help blend buildings into their surroundings
- Reduce your carbon footprint
- Extend the life expectancy of the waterproofing

GRASS*Med* Recommendations

PLANTATION SHADES

Use Trees as tool to provide shade during the hot summer months, and to reduce the house's natural lighting.

DID YOU KNOW? INTERESTING FACT

Trees should be planted on the east, west and south sides of the building.
In summer, their canopies provide shade, reducing cooling costs.
In winter, they shed their leaves, allowing natural lighting and solar heating.

- **East**-facing trees cast morning shadows on the building with a milder impact on the electricity bills.
- **South**-facing trees provide mid-morning and early afternoon shading.
- **West**-facing trees block the hot afternoon sun. These trees will have the greatest impact on the summer energy bills.

But it's the combinations of East, South and West that will deliver the biggest energy savings in summer.

- To the **north**, evergreen trees provide shade in summer and act as a windbreak in winter, improving overall comfort and energy efficiency.

GRASS*Med* Recommendations

GREEN FACADES

1. **Use** Green Facades because they are a relatively simple and cost-effective strategy to beautify your home, attract wildlife, improve the thermal performance of your home, and help clean up urban air quality issues.
2. **Choose** the best type of plant for your green façade.

It is important to consider whether you prefer:

- "SELF_CLIMBING" plants that don't require any climbing assistance infrastructure
- "TWINERS," which aggressively send up stems around a support system.

Self Climbing Photo Credit: Leanne Hanrahan

Twiners Photo Credit: Leanne Hanrahan

GRASS*Med* Recommendations

GREEN ROOFS

Install a green roof. When it comes to planning your green roof, you need to consider the weight of the system and the ability of your structure to support it.

There are lots of different ways to integrate green roofs into your life. You can install them in places like:

- Sheds
- Garages
- Bin stores
- Bike storage units
- Extensions\Offices
- Repurposed shipping containers

Unfortunately for green roofs, they do tend to be slightly more expensive than the traditional option. However, when you consider the range of incredible benefits, there no reason to allow cost to play a determining role in your decision.

GRASS*Med* Recommendations

NATIVE PLANTATION

Select the Right Plants!

Think native plants and edible plants, even better think native plants that are edible.

New sites can also be used to plant species that are declining in the natural environment due to loss of habitat.

Royal Poinciana - Tunisia

Wild Flowers – Morocco

PIBS - Palestine

Black Iris – Jordan's National Flower

Wild Flowers Lebanon

How To Calculate The Percentage of Plantation Area (% PAP)?

The percentage of plantation area (PAP) with respect to the total site area is calculated as follows:

$$\%PAP = \frac{\text{Plantation Area}}{\text{Site or Building Area}} \text{ x100\%}$$

%PAP calculation depends on the location of the planted area. Three options will be considered:

Option 1: Only the perimeter of the **BUILDING** is planted

Option 2: Only the perimeter of the **SITE** is planted

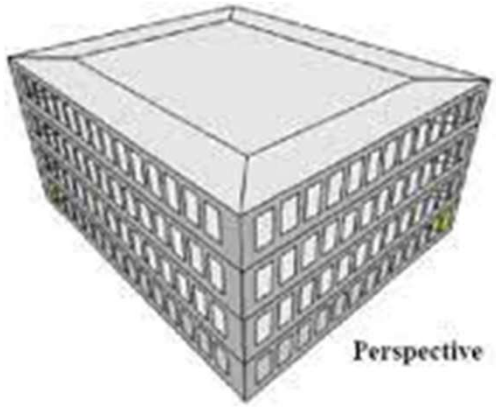
Option 3: Both of **SITE** and **BUILDING** perimeters are planted

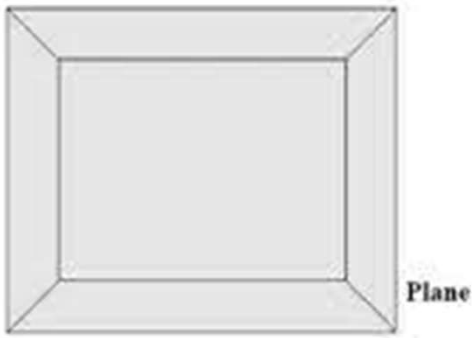
How To Calculate The Percentage of Plantation Area (% PAP)?

OPTION 1: Only the perimeter of the **BUILDING** is planted

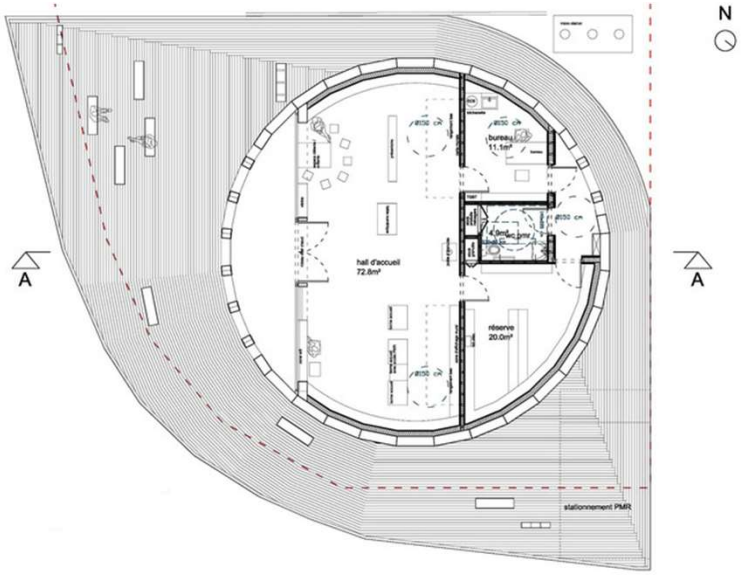
Two Cases

Rectangular / Square Building Shape





Circular Building Shape



How To Calculate The Percentage of Plantation Area (% PAP)?

OPTION 1: Only the perimeter of the **BUILDING** is planted

Rectangular / Square Shapes

Plantation Area (around the building perimeter) $= [(a + 2.x).(b + 2.x) - (a.b)]$

Approximated Area of the building (without plantation) $= (a.b)$

Approximated New Area of the building (with plantation) $= (a + 2.x).(b + 2.x)$

$$\%PAP = \frac{[(a+2.x).(b+2.x)-(a.b)]}{A} \text{ x}100\%$$

a = Length of the building area,

b = Width of the building area,

x=Width of plantation

A = Area of the site

How To Calculate The Percentage of Plantation Area (% PAP)?

OPTION 1: Only the perimeter of the **BUILDING** is planted

Circular Shapes

Plantation Area (around the building perimeter) $= \pi(r + x)^2 - \pi r^2$

Approximated Area of the building (without plantation) $= \pi r^2$

Approximated New Area of the building (with plantation) $= \pi(r + x)^2$

$$\%\mathbf{PAP} = \frac{[\pi(r+x)^2 - \pi r^2]}{\mathbf{A}} \text{ x}100\%$$

r = Radius of the building area,

x=Width of plantation

$\mathbf{A}$ = Area of the site

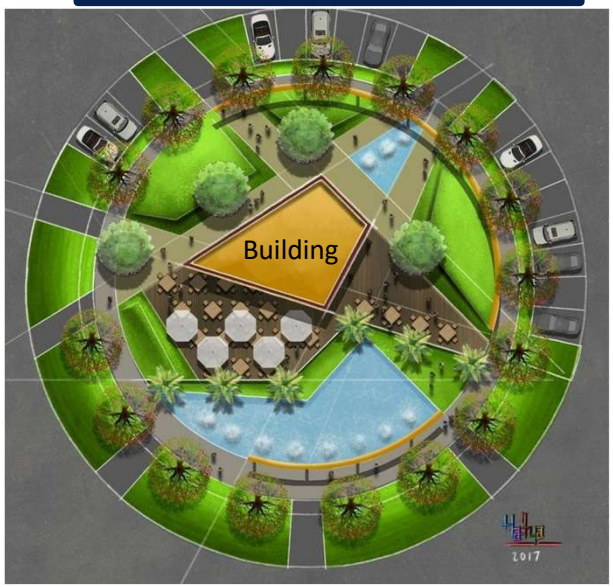
How To Calculate The Percentage of Plantation Area (% PAP)?

OPTION 2: Only the perimeter of the **SITE** is planted

Two Cases

Rectangular / Square Site Shape

Circular Site Shape



How To Calculate The Percentage of Plantation Area (% PAP)?

OPTION 2: Only the perimeter of the **SITE** is planted

Rectangular / Square Shapes

Plantation Area (around the building perimeter) $= [(a.b) - (a - 2.x).(b - 2.x)]$

Approximated Area of the site (without plantation) $= (a.b)$

Approximated New Area around the site (with plantation) $= (a - 2.x).(b - 2.x)$

$$\%\mathbf{PAP} = \frac{[(a.b)-(a-2.x).(b-2.x)]}{(a.b)} \text{ x100\%}$$

a = Length of the site area,

b = Width of the site area,

x =Width of plantation along the perimeter of the site from the inside

How To Calculate The Percentage of Plantation Area (% PAP)?

OPTION 2: Only the perimeter of the **SITE** is planted

Circular Shapes

Plantation Area (around the building perimeter) $= \pi r^2 - \pi(r - x)^2$

Approximated Area of the building (without plantation) $= \pi r^2$

Approximated New Area aroud the site (with plantation) $= \pi(r - x)^2$

$$\%\mathbf{PAP} = \frac{[\pi r^2 - \pi(r-x)^2]}{\pi r^2} \text{ x}100\%$$

r = Radius of the building area,

x =Width of plantation along the perimeter of the site from the inside

How To Comply With GRASS*Med*?

During the building design phase, it is required that an adjacent open space with greenery, including trees, grass, and flowers,… covers at least 20% of the site area.

Additional points will be awarded to buildings with trees planted on their east, west, and/or south sides, as well as on their facades.

How To Comply With GRASS*Med*?

Maximum Scoring for Residential Buildings	**10**
Maximum Scoring for Commercial Buildings	**15**
COMMERCIAL BUILDING – Percentage of Plantation Area "PAP"	Scoring Points
20% ≤ PAP ≤ 25%	4
25.1% ≤ PAP ≤ 30%	7
PAP ≥ 30.1%	10
Trees located on east and/or west sides of the building	3
Facades covered by plants	2
RESIDENTIAL BUILDING – Percentage of Plantation Area "PAP"	Scoring Points
20% ≤ PAP ≤ 25%	4
25.1% ≤ PAP ≤ 30%	6
PAP ≥ 30.1%	8
Trees located on east and/or west sides of the building	1
Facades covered by plants	1

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Together We Switch to Clean Energy

For any inquires or comments,
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This project is funded by the European Union