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HYDRO FARM



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## Vertical Gardens (Living Walls)





# INTRODUCTION

We are a Saudi company promoting Agricultural Innovation and serving individuals and companies in providing state of the art in Hydroponics and vertical farming total solutions for growing healthy crops and vertical gardens to help the national food security and preserving our natural resources.



## OUR VISION

We strive to preserve the environment and our natural resources as we are partners in this plant for our next generation.

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# ● Benefits of Vertical Gardens or Living Green Walls

## Benefits of Vertical Gardens or Living Green Walls

1

Living green walls purify the air

2

Green walls increase the feeling of well-being

3

A living wall reduces the ambient temperature

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Living walls offer a powerful "healing environment"





## Living green walls purify the air

The plants in a living significantly improve air condition. The wall filters particulate matter from the air, converting CO<sub>2</sub> into oxygen. Only one m<sup>2</sup> of living wall extracts 2.3 kg of CO<sub>2</sub> per annum from the air and produces 1.7 kg of oxygen. There have been many studies which prove that plants and the microbes found in soil media absorb harmful VOC's and convert them into a compound which plants use for food.

Initiative by Hydro Farm to cover columns of bridges in Dammam area to improve the look of the columns, to reduce the noise, to reduce dust from the air and to reduce the temperature.



# 2

## Green walls increase the feeling of well-being

This is a direct consequence of the first benefit. A cleaner air leads to fewer health complaints such as headaches and respiratory irritations, as well as increases in focus and attention. Complaints such as irritated eyes, headaches, sore throats and tiredness diminish. In offices where there is plenty of greenery, there is a noticeable decrease in absence due to illness.





# 3

## A living wall reduces the ambient temperature

Plants absorb sunlight. More accurately, 50% is absorbed and 30% reflected. This helps to create a cooler and more pleasant climate during summertime. For the indoor climate, this means also that 33% less air conditioning is required, which in turn means energy savings.

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# 4

## Vertical gardens reduce ambient noise

A living wall acts as a sound barrier to the building. It absorbs 41% more sound than a traditional facade and this results in a reduction up to 8 DB. Thus, the environment becomes much quieter, both inside and outside the building, with noise levels similar to those found in nature.

Interior living wall in Private Villa By Hydro f



# 5

## Green walls reduce stress

Living and working in a green environment has a positive effect on the well-being of people. Green offices stimulate relax by reducing stress. Blood pressure, heart activity, muscle tension, and brain activity could all be improved by viewing plants for as little as 3 to 5 minutes.

By Hydro Farm

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# 6

## Vertical gardens boost productivity

Directly linked to the sense of wellbeing, positive moods enhance learning and more efficient decision-making on complex tasks. Green exposure results as well in greater use of logical reasoning and more innovative approaches. A green workplace can result in a 15% increase in productivity. Plants have a positive effect on employee satisfaction.

Vertical Garden in Dhahran Mall by Hydro F

# 7

## Green spaces show a longer residence time

Company's employees are not the only one to reap the benefits. Green walls generate positive externalities also for people not living or spending much time in those places. Like customers of a shop or a restaurant. They can, in fact, appreciate the benefits only by taking the decision to spend time in that particular space. In this latter case, one beneficial effect is registered in the longer, on average, residence time customers spend in the shop and the overall satisfaction with the customer experience.



Green Garden in Private Villa By Hydro Farm



# 8

## Plant walls add value to the brand

The natural and sustainable appearance, combined with a reduction in energy costs, means an increase in the property's value. Studies have shown that a company's building may be viewed as a symbol of its environmental and social performance and may be an attraction for job candidates.



Green walls in meeting lounge by Hydro Farm



# 9

## More social interaction, less vandalism

Working or living in a green environment brings people together. It has been demonstrated that small scale greenery, in particular, has a positive effect on social cohesion in neighborhoods. To this regard, areas with more greenery suffer less hinder from aggression, violence, and vandalism.



Green Wall in Airport Lounge By Hydro Farm



# 10

## Living walls offer a powerful “healing environment”

Greenery encourages faster recovery for patients, resulting in a shorter hospital stay. A person tolerance for pain is higher in a green environment. This powerful effect is also known as a ‘healing environment’. By simply looking at environments dominated by green plants, flowers and/or water significantly promotes recovery and reduce stress in patients. Only a few minutes are needed to produce this effect.



Green Garden in Private Villa By Hydro Farm





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# ● Vertical Garden Technical Details



## Vertical Garden Technical Details:

The vertical garden consists of high-quality plastic planter units. Each planter unit consists of three or two pots. The planter units can be erected in different shapes, styles, angles, and heights. They can be fixed on the wall directly or as self-standing on steel frame. The planter units can be installed indoor or outdoor and it is almost maintenance free.

Inside the planter pots two layers of inert growing media is placed; the first layer is volcanic rock to provide proper breathability to the plant's roots, the second layer is a mixture of growing media with high porosity and surface area to ensure adequate moisture content to provide the plant with the required water. The media will hold the moisture to maintain dampness to the plant and reserve the water.

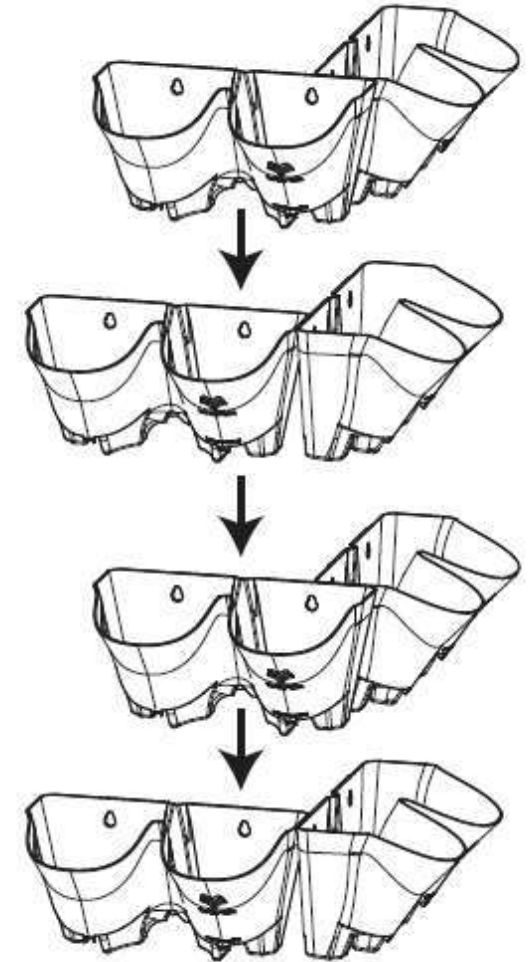
The irrigation system can be designed to circulate the water to save up to 70% of the irrigation water. A circulation tank needs to be installed if the client requires water reuse to conserve water. The irrigation system can be manual or automated.

This vertical system can be used for aesthetic purposes as vertical garden for seasonal plant or all year green plants. The system can also be used as vertical farm to grow Herbs and other leafy vegetables with high production capacity.

\* The plastic planter units are now locally produced.



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## Vertical Garden Technical Details:

Materials	PP POLYPROPYLENE
Green Pot dimensions	48 L * 18 W * 18 H
Green pot weight	376 g
Black liner weight	46 g
Green pot + 3 liner inside weight	514 g
Green pot + 3 liner inside weight Filled with water	1117 g
Green pot + 3 liner inside weight Filled with water and agriculture Medium	1448 g



Green Pot



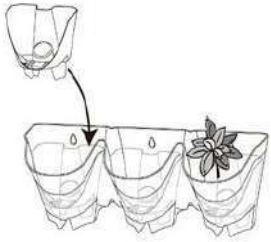
Liner



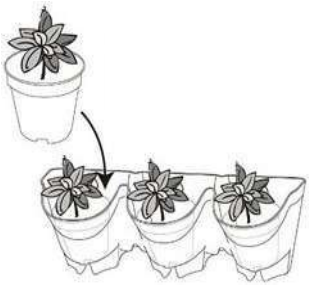
Liner inside the Green Pot



## Planting Options



Planting Option 1 :  
Put the liner into planter , then  
transplant plants to planter



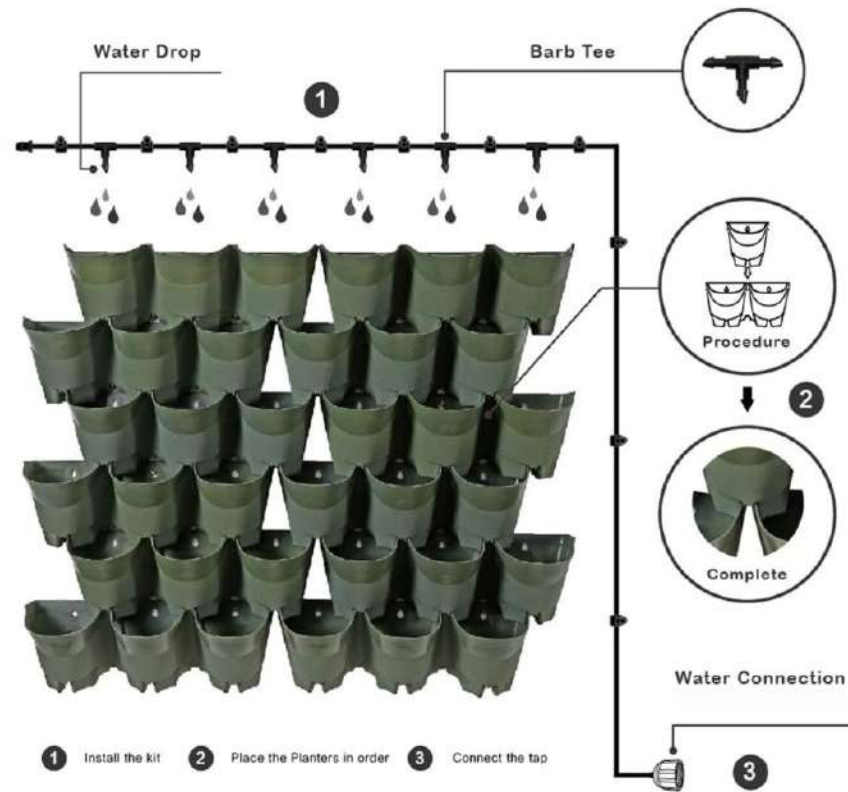
Planting Option 2 :  
Put planter with nursery pot into  
planter directly. ( nursery pot:  $\leq$   
120 mm, Height :  $\leq$  110mm )

## Setting up the system

1. Stack planter layer by layer against wall, screwed by wooden strip each 4 - 5 layer.
2. Choosing suitable pump to water plants only from top layer .
3. 14 pcs of planters for 1 m<sup>2</sup> total 42 pcs of plants .



## Irrigation System drawings

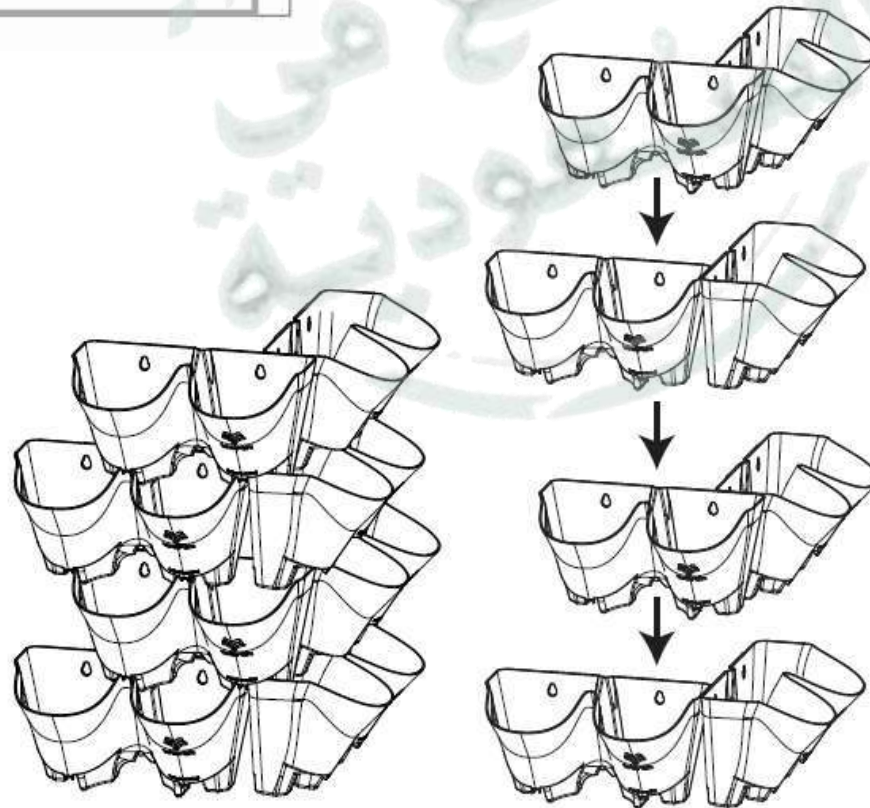
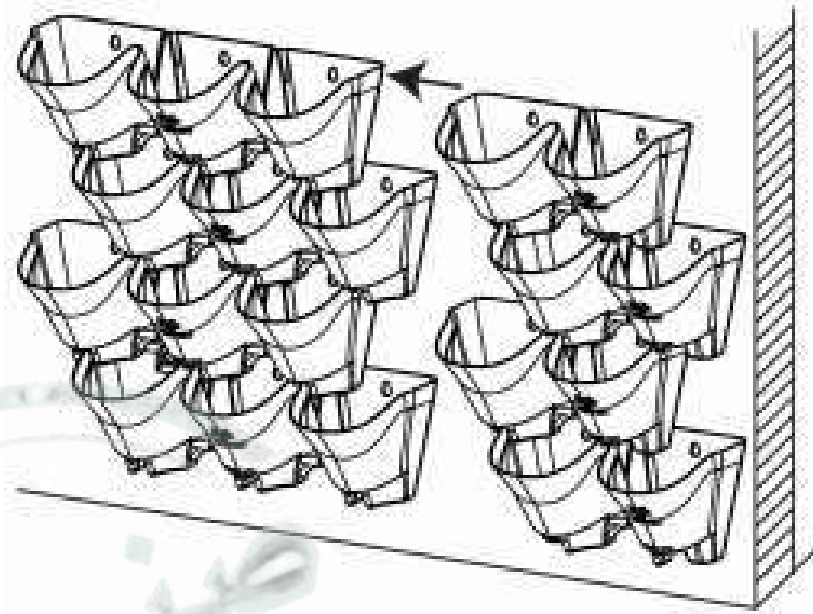
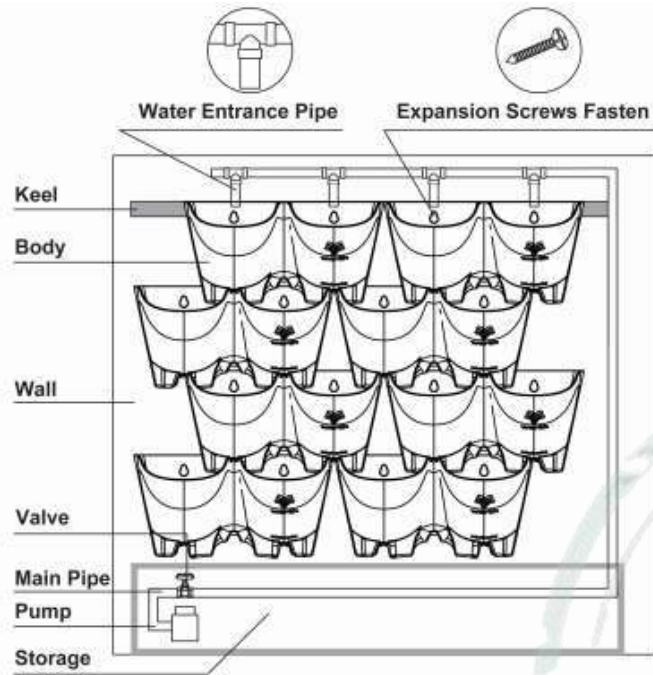


## SELF WATERING SYSTEM FROM TOP TO BOTTOM



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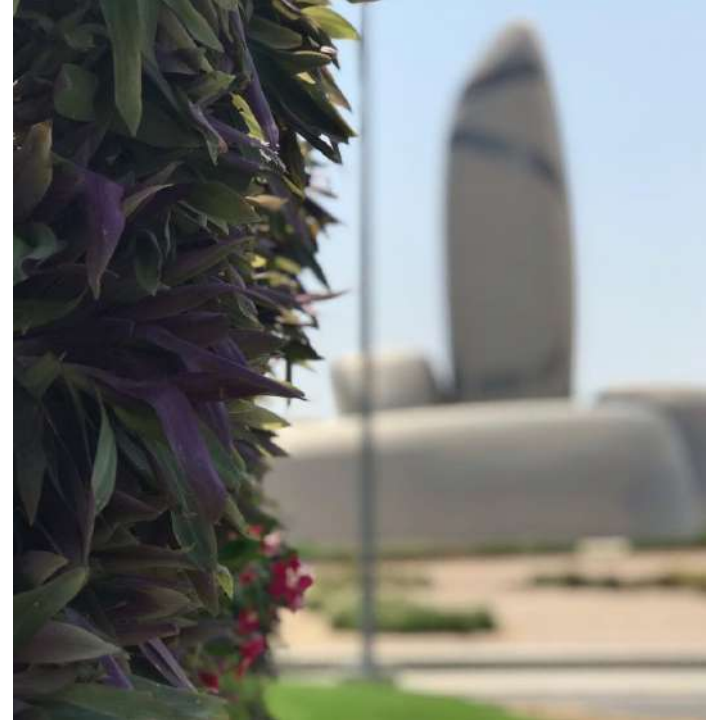
# ● PROJECTS' GALLERY

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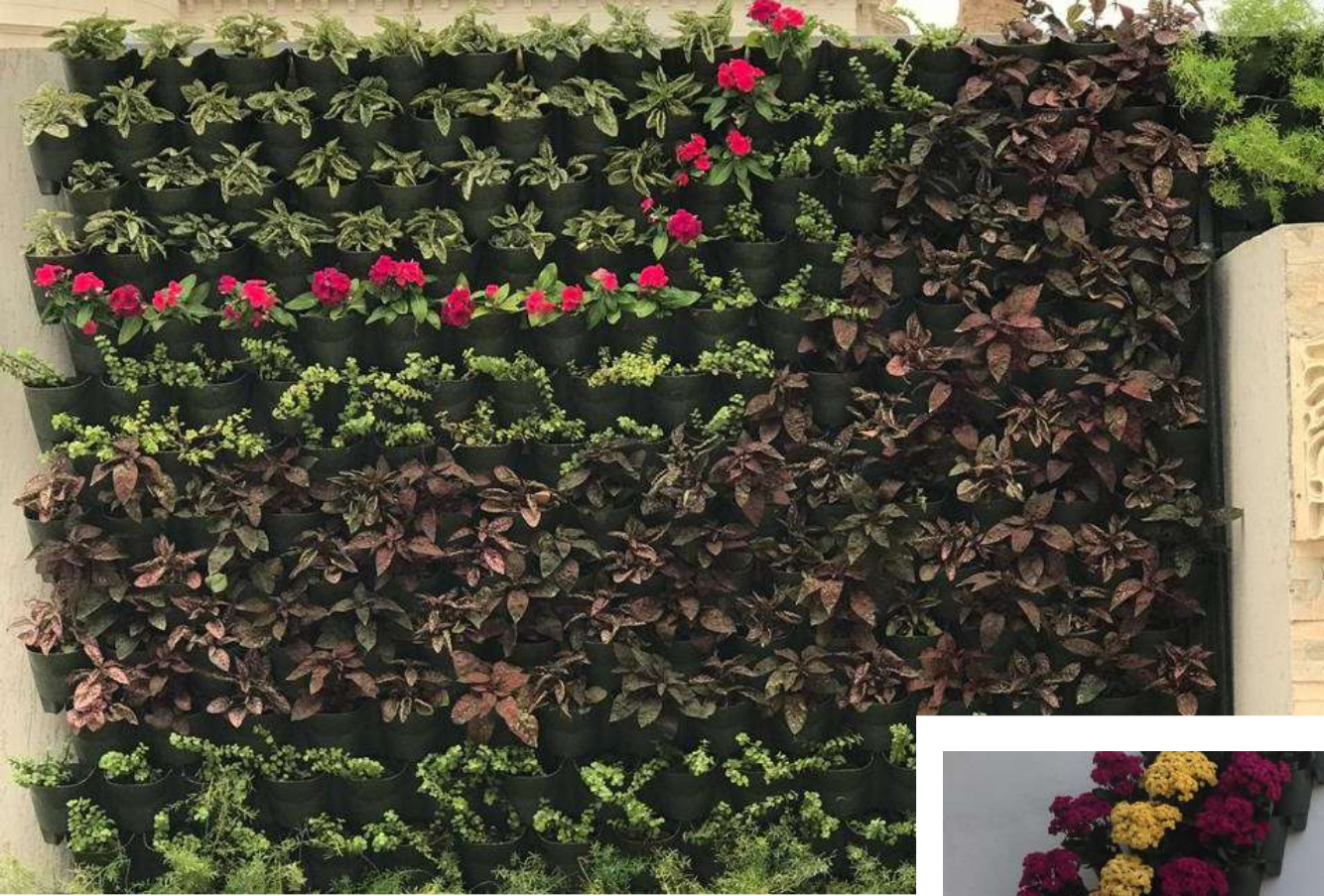
























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THANK YOU!

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