

*Elevate. Cultivate. Grow.*

**PIPP**<sup>®</sup>  
HORTICULTURE

# MULTI-TIER GROW ROOM DESIGN

Measure Twice, Build Once





# TAKE IT FROM **THE EXPERTS**

Pipp Horticulture has designed and installed Vertical Mobile Racking Systems in **over 2,500 grow rooms** worldwide. These experiences have taught us valuable insights and best practices for designing successful multi-tier indoor cannabis grow rooms. From pre-design considerations, to specifics on each growing system, all the way to starting up your room for the first time, Pipp can give you the confidence needed to grow vertically!

Read on for some **frequently asked questions** that growers have about creating a successful mobile vertical grow space.





Q1

## DO YOU NEED TO MODIFY YOUR HVAC DESIGN WHEN RETROFITTING A GROW ROOM TO MULTI-TIER RACKING?

When retrofitting a grow room to a multi-tier design, it is **always recommended** to also retrofit your HVAC system. Multi-tier retrofits mean you will be increasing the plant count, canopy footprint, and the number of lighting fixtures within the room. This results in the need for additional cooling and dehumidification capacity to control the climate. Along with the additional capacity required, relocating the supply and return ductwork within the room is also needed to ensure proper air distribution throughout the space and prevent microclimates. A purpose-built HVAC design for multi-tier rooms often results in **higher yields** per square foot and an overall **increase in product quality**.





## Q2

### WHAT ARE THE BEST PRACTICES FOR TIER HEIGHTS IN FLOWER ROOMS?

In general, tier heights in flower between **5.5'-6'** are recommended. However, there are always exceptions for cultivation strategies that require taller or shorter plants. Too short of a tier height can result in plants growing into the lighting fixtures causing a number of issues including **photo-oxidation** (bleaching) and the restriction of airflow.

Too tall of a tier height can **limit the headspace** above the racks for heat to rise and when using a top-down in-rack airflow system, such as vertical air solutions, increases the distance air has to travel from the duct to the plant canopy.



Q3

## DO PIPP'S VERTICAL MOBILE RACKING SYSTEMS WORK WITH AEROPONIC & RECIRCULATING DEEP WATER CULTURE (RDWC)?

Both of these irrigation or hydroponic methods can be used on Mobile Carriages. The only limiting factor is the volume, and more specifically, the weight of the required reservoirs. Our Bulk Racking can support up to a maximum of **2,150 lbs per shelf** level. This limits the reservoirs to an absolute maximum of **250 gallons**. Preferably to 200 gallons or less.



Q4

## DOES VAS OFFER A **UVC LIGHT INTEGRATION** OPTION TO AID IN GMP/EU-GMP AIR STERILIZATION COMPLIANCE?

At this time, Vertical Air Solutions (VAS) does not offer a UVC light integration option. Our team closely considered offering an air sterilization option such as UVC, but upon closer examination found that it was **more effective**, both on a cost and efficacy basis, for these systems to be installed within the HVAC ductwork and not within the in-rack airflow systems.







Q5

**DO YOU HAVE ANY BEST PRACTICES  
OR RATIOS FOR **SIZING DRYING ROOMS**  
BASED ON THE SIZE OF FLOWER ROOMS?**

Unfortunately, no. With all the **variability** in harvest strategies, plant size, ceiling heights, and other factors, a general ratio based on the size of flower rooms never seems to pencil out. Instead, we like to have a conversation with the customer, **understand their goals and SOP's**, then use that information to size a drying room tailored to their facility and processes.

Q6

## IN ADDITION TO THE **ELEVATE® PLATFORM SYSTEM**, DOES PIPP OFFER ANY OTHER SOLUTIONS FOR ACCESSING & WORKING ON THE UPPER TIERS?

Pipp offers a few different options, and there are a wide variety of solutions in the greater market. Pipp offers small, lightweight aluminum folding ladders, as well as rolling Cotterman style ladders. The **ELEVATE® Platform System** is very versatile and can be set up mid-aisle with a couple of decks to quickly access specific locations.







Q7

## ARE ALL RACKS/COMPONENTS COATED WITH A MICROBIAL COMPONENT?

The powder coating used on our product is a customized blend including **Anti-Microbial and Anti-Fungal additives**. Basically, it includes a small amount of silver ions that help reduce growth of common mold and mildews. These coatings will not eliminate the need for consistent spot cleaning and regular deep cleans.

Q8

**ARE PIPP'S MULTI-LEVEL RACKING SYSTEMS AVAILABLE IN HOT-DIPPED GALVANIZED STEEL? THE CONCERN IS THAT THE FINISH OF PAINTED RACKS CAN DETERIORATE OVER TIME AFTER REPEATED PRESSURE WASHING & CLEANING IN BETWEEN HARVESTS.**



Our current racking finish specifications use a robust powder coating capable of withstanding **over 500 hours** of salt spray testing. We are also now utilizing a **Dual Coat Technology** on our Modular Uprights that provide even better corrosion resistance. To answer directly, yes Pipp has the option to offer our Multi-Level Racking with a galvanized finish if requested. Keep in mind this will impact costs and lead times, as it is not our standard. Any product used in these types of environments will still rely on proper care and maintenance to ensure long-term performance.

On a related note, pressure washing is certainly a safe process for deep cleaning these cultivation rooms, but we have seen many **fogging and foaming process'** come into use successfully over the last few years. Maybe worth considering over the "aggressive" powerwashing.





**WHAT IS THE LONGEST ROW LENGTH AVAILABLE FOR A TRAK-FREE™ SYSTEM (I.E. ONLY ONE TRACK IN THE BACK)?**

**Q9**

Pipp's **TRAK-FREE™ Carriage Systems** can be built up to **56' long**, as long as it meets these additional design criteria:

- Track runs wall-to-wall
- All carriages in a system are of equal length



## Q10

### WHAT ARE THE **MINIMUM SQUARE FOOTAGE REQUIREMENTS** RECOMMENDED FOR YOUR SYSTEMS?

We are happy to quote any size system you need for your facility. **4'x4'** is our smallest “standard” tray offering. However, the cost per sq. ft. will be higher the smaller the system gets due to the complexity and associated cost of the front channel and drive box.





Q11

**WHAT NEW ADULT-USE  
& MEDICAL MARKETS  
ARE YOU MOST EXCITED  
ABOUT AND SEEING YOUR  
SYSTEMS INSTALLED IN?**

We are excited about every new legal cannabis market and look forward to a future where cannabis is **legally available and accessible to all!** Although specifically, we are excited about several international markets that are coming online such as Thailand and Germany, along with many others. Domestically, the northeast markets of New York and New Jersey are very exciting and Florida is issuing additional licenses in the near future as well.




## DO VAS PLANT HANGERS INTEGRATE WITH PIPP'S BULK RACKING?

Q12

VAS Plant Hangers are a great and flexible drying solution that integrates with our Bulk Racking and hang bars seamlessly. They also work well on hang bars while on the lighter Rivet Style Shelving. These hangers are a fantastic solution that allow for a very **efficient process** of hanging multiple smaller portions of plants (though they still can be used for full plants as well).



Contact **Pipp Horticulture's** experienced team of indoor cannabis operators and designers to take the first step towards your vertical farming future!

 (616) 988-4044

 [info@piphorticulture.com](mailto:info@piphorticulture.com)