
AGENDA

The City of Buchanan Planning Commission, in compliance with Michigan's Open Meetings Act, hereby gives notice of a Planning Commission meeting to be held in the Chamber of City Hall.

** Comments may also be submitted in writing at least 4 hours in advance to the Community Development Director Richard Murphy at rmurphy@cityofbuchanan.com*

** Buchanan City will provide necessary and reasonable auxiliary aide and services to those individuals with disabilities who wish to attend the public meeting upon receiving at least one (1) week's prior notice. Any such individual requiring such aids or services should contact the city in writing or by telephoning: Buchanan City Clerk; 302 North Redbud Trail, Buchanan, MI 49107, 269-695-3844.*

I. PUBLIC HEARINGA. Call to OrderB. Roll CallC. Opening of Hearing and Statement of Purpose of the Hearing

The purpose of the Public Hearing is for the Plan Commission to consider a Special Use Application from Boone Labs, Inc. to operate a Medical Marihuana Grow Facility and an Adult Use Marihuana Grow and Process Facility at 106 E. Chicago St. also known as 107 E. Alexander St. Buchanan MI 49107.

D. Announcement of the Rules of the HearingE. Presentation by the ApplicantF. Presentation by the OppositionG. Applicant's RebuttalH. Closing of Hearing**II. Regular Meeting - Call to Order****III. Pledge of Allegiance****IV. Roll Call****V. Approve Agenda****VI. Public Comments - Agenda Items****VII. Approve Minutes**

A. Consider approval of February 8, 2022, Planning Commission Meeting Minutes.

VIII. Old Business

A. Richard Martin to replace Jason Lietz as the planning commission representative for the Buchanan Tree Friends.

IX. New Business

A. Consider the application submitted by Boone Labs, INC. to operate a Medical Marihuana Grow Facility and an Adult Use Marihuana Grow and Process Facility at 106 E. Chicago St also known as 107 Alexander St.

- X. Subcommittee Reports (if any)**
- XI. Public Comment - Non-Agenda Items Only**
- XII. Community Development Director Comments**
- XIII. Commissioner Comments**
- XIV. Adjournment**



PUBLISHED: 3/31/2022

Berrien County Record

**NOTICE OF PUBLIC HEARING
CITY OF BUCHANAN
Plan Commission**

A Public Hearing has been set for Tuesday, April 12, 2022, at 7:00 p.m. at Buchanan City Hall, 302 N. Redbud Trail, Buchanan, Michigan 49107. The purpose of the Public Hearing is for the Plan Commission to consider a Special Use Application from Boone Labs, Inc. to operate a Medical Marihuana Grow Facility and an Adult Use Marihuana Grow and Process Facility at 106 E. Chicago St. also known as 107 E. Alexander St., Buchanan MI 49107. At the above time and place, all interested parties will be given an opportunity to be heard before the Plan Commission issues its determination regarding the application. Parties seeking visual or audio accommodation may contact Clerk Kalla Langston at (269) 695-3844, preferably with as much advance notice as possible, so that suitable arrangements can be made to help make needed accommodations.

Written comments may also be submitted in advance of the meeting to Community Development Director Richard Murphy either by delivery to Buchanan City Hall, or via email to rmurphy@cityofbuchanan.com.

Richard Murphy
Community Development Director













Kalla Langston
City Clerk



Results

58 Results

Parcel ID	Owner	Property Address	City
11-58-0035-0176-02-1	WOLFE DONALD R	110 W CHICAGO ST	BUCHANAN
11-58-0035-0178-00-7	HAYDEN CAROLINE	109 W CHICAGO ST	BUCHANAN
11-58-0035-0179-00-3	MERRILL JESSICA	111 W CHICAGO ST	BUCHANAN
11-58-0035-0181-01-6	HERMAN GARY G & HERMAN BARBARA G	108 W ALEXANDER ST	BUCHANAN
11-58-0035-0182-00-4	O NEILL PEGGIE	110 W ALEXANDER ST	BUCHANAN
11-58-0035-0184-00-7	HAGBERG KATHY A	107 W ALEXANDER ST	BUCHANAN
11-58-1500-0006-01-4	DUDGEON SHARON J	204 S OAK ST	BUCHANAN
11-58-1500-0007-00-2	WITTORP CHARLES A & WITTORP CONNIE	208 S OAK ST	BUCHANAN
11-58-1500-0009-00-5	FLEMING DAVID	304 S OAK ST	BUCHANAN
11-58-1500-0010-01-1	1516 PROPERTIES LLC	105 W CHICAGO ST	BUCHANAN
11-58-1500-0011-01-8	WAHLSTROM WILLIAM PERRY & DANIEL LORI ANN	306 S OAK ST	BUCHANAN
11-58-1500-0012-00-6	SCHINSKE MARVIN	102 W ALEXANDER ST	BUCHANAN
11-58-1500-0013-00-2	BLACKBIRDS LLC	402 S OAK ST	BUCHANAN
11-58-1500-0014-00-9	BLACKBIRDS LLC	404 S OAK ST	BUCHANAN
11-58-1500-0038-00-5	ROUSH JAMES C & ROUSH REBECCA S	201 S OAK ST	BUCHANAN
11-58-1500-0039-01-0	FLETCHER JEFFERY J & FLETCHER KELLY J	203 S OAK ST	BUCHANAN
11-58-1500-0041-02-2	HARMAN PROPERTIES LLC	207 S OAK ST	BUCHANAN
11-58-1500-0042-00-2	SUKICH JEFF	107 E CHICAGO ST	BUCHANAN
11-58-1500-0042-01-1	PLEASANT MATTHEW MICHAEL	210 DAYS AVE	BUCHANAN
11-58-1500-0043-00-9	WISHART DAVID & WISHART PATRICIA A	208 DAYS AVE	BUCHANAN
11-58-1500-0044-01-3	CHRISTIE DENNIS B & ELIZABETH A LONGBRANCH LIVERY LLC	206 DAYS AVE	BUCHANAN
11-58-1500-0044-03-0	BUCHANAN CITY OF	108 ROE ST	BUCHANAN
11-58-1500-0045-00-1	BUCHANAN CITY OF	301 S OAK ST	BUCHANAN
11-58-1500-0047-02-1	J & J BUILDINGS LLC	106 E CHICAGO ST	BUCHANAN
11-58-1500-0049-01-5	DILLINGER LORNA	308 DAYS AVE	BUCHANAN
11-58-1500-0050-01-3	PRESSEY THOMAS E & PRESSEY JOANN C	306 DAYS AVE	BUCHANAN
11-58-1500-0052-01-6	KLOSKA ROBERT J & KLOSKA MARCELLA J	108 E CHICAGO ST	BUCHANAN
11-58-1500-0052-02-4	SWEENEY AARON J & SWEENEY MELISSA R	302 DAYS AVE	BUCHANAN
11-58-1500-0053-00-4	MILLER MICHELLE R	104 E ALEXANDER ST	BUCHANAN
11-58-1500-0053-01-2	FORD CORY	106 E ALEXANDER ST	BUCHANAN
11-58-1500-0054-00-1	CUMMINS ROBERT R, II & CUMMINS AMY	403 S OAK ST	BUCHANAN
11-58-1500-0056-01-1	J & M COMPANY LLC	405 S OAK ST	BUCHANAN
11-58-1500-0057-00-0	CANFIELD DUANE W & CANFIELD JUDITH C	105 E SMITH ST	BUCHANAN
11-58-1500-0057-01-8	ROLLF RUSSEL E & ROLLF RAMSEY J	408 DAYS AVE	BUCHANAN
11-58-1500-0058-01-4	CANFIELD DUANE W & CANFIELD JUDITH C	205 E SMITH ST	BUCHANAN
11-58-1500-0058-02-2	PIATTI TERRY PIATTI DEANNA	406 DAYS AVE	BUCHANAN
11-58-1500-0059-00-2	KREITER BENJAMIN & KREITER VICTORIA	404 DAYS AVE	BUCHANAN
11-58-1500-0060-02-7	HARTMAN CATHERINE M	402 DAYS AVE	BUCHANAN
11-58-1500-0060-03-5	WISHART DAVID M TRUST NO 1 THE	108 E ALEXANDER ST	BUCHANAN
11-58-1500-0109-00-0	LINGLE PAUL C & LINGLE AMY J	401 DAYS AVE	BUCHANAN
11-58-1500-0110-00-8	JC INVESTORS LLC	403 DAYS AVE	BUCHANAN
11-58-1500-0111-00-4	DEORNELLAS ANTHONY	405 DAYS AVE	BUCHANAN
11-58-1500-0112-00-1	BAKER JOAN PRENTICE BRANDY	407 DAYS AVE	BUCHANAN
11-58-1500-0117-00-2	J & M COMPANY LLC	301 DAYS AVE	BUCHANAN
11-58-1500-0118-00-9	J & M COMPANY LLC	303 DAYS AVE	BUCHANAN
11-58-1500-0119-00-5	ALAN ANDREA	305 DAYS AVE	BUCHANAN
11-58-1500-0120-00-3	FORD NATHANIEL L	307 DAYS AVE	BUCHANAN
11-58-1500-0120-01-1	DAVIDSON STEVEN N	309 DAYS AVE	BUCHANAN
11-58-1500-0121-00-0	FORD NATHANIEL L	308 S RED BUD TR	BUCHANAN
11-58-1500-0122-00-6	MURDOCK NICHOLAS J	306 S RED BUD TR	BUCHANAN
11-58-1500-0124-00-9	J & M COMPANY LLC	206 E CHICAGO ST	BUCHANAN

 11-58-1500-0124-01-7	 MARTIN MELINDA	208 E CHICAGO ST	BUCHANAN
 11-58-1500-0126-00-1	 MCELROY AUDRA	205 DAYS AVE	BUCHANAN
 11-58-1500-0127-00-8	 CARLISLE WILLIAM D & CARLISLE BETTY SUE	207 DAYS AVE	BUCHANAN
 11-58-1500-0128-00-4	 MC GUIRE MARLON M & MC GUIRE JOAN R	209 DAYS AVE	BUCHANAN
 11-58-1500-0129-00-1	 CLARK MICHAEL G CLARK SAMANTHA A	210 S RED BUD TR	BUCHANAN
 11-58-1500-0130-00-9	 SWARTZ DONALD L	208 S RED BUD TR	BUCHANAN

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PENDING APPROVAL



CITY OF BUCHANAN PLANNING COMMISSION

TUESDAY, FEBRUARY 08, 2022 – 7:00 PM

CHAMBER OF BUCHANAN CITY HALL - 302 N REDBUD TRAIL, BUCHANAN MI

MINUTES

- I. *The City of Buchanan Planning Commission, in compliance with Michigan's Open Meetings Act, hereby gives notice of a Planning Commission meeting to be held in the Chamber of City Hall.*
- II. ** Comments may also be submitted in writing at least 4 hours in advance to the Community Development Director Richard Murphy at rmurphy@cityofbuchanan.com*

** Buchanan City will provide necessary and reasonable auxiliary aide and services to those individuals with disabilities who wish to attend the public meeting upon receiving at least one (1) week's prior notice. Any such individual requiring such aids or services should contact the city in writing or by telephoning: Buchanan City Clerk; 302 North Redbud Trail, Buchanan, MI 49107, 269-695-3844.*

III. PUBLIC HEARING

A. Call to Order

Public Hearing was called to order by Chairman Jason Lietz at 7:00 P.M.

B. Roll Call

Present: Richard Martin, Ralph McDonald, Sean Denison, Jason Lietz

Absent: Kevin Barker

City Staff: Community Development Director Rich Murphy; City Clerk, Kalla Langston

- C. Opening of Hearing and Statement of Purpose of the Hearing- *The purpose of the Public Hearing is for the Planning Commission to review a Special Use Application from Sardor Vakhidov, Blackbirds LLC and Elkhorn LLC to operate an Adult Use Marihuana Process Facility at 402-404 S. Oak St., Buchanan MI 49107.*

D. Announcement of the Rules of the Hearing

Rules were read by Lietz.

E. Presentation by the Applicant

Rhett gave a site plan to the Planning Commission. Rhett is asking for a special use permit for processing to be able to see his product from start to finish. He has been working nonstop on his business and investing in Buchanan. He wants to proudly represent the community and takes great pride in his work. Security is the utmost priority. Rhett is planning on doing it all in house, so that he can extract in an environment friendly way.

Jessica Price spoke in favor.

F. Presentation by the Opposition

Correspondence by email in opposition due to location.

G. Applicant's Rebuttal

Rhett responded to email.

H. Closing of Hearing

Lietz closed the public hearing at 7:21 P.M.

PENDING APPROVAL

IV. Regular Meeting - Call to Order

Chairman Lietz opened the regular meeting at 7:21 P.M.

V. Pledge of Allegiance

Lietz led in the Pledge of Allegiance

VI. Roll Call

Present: Martin, McDonald, Denison, Lietz

Absent: Barker

VII. Approve Agenda

Addition of item "B" under new business to have Richard Martin replace Jason Lietz as the representative for the Buchanan Tree Friends.

Motion made by McDonald, seconded by Denison to amend the agenda. Voice vote carries unanimously.

VIII. Public Comments - Agenda Items

None

IX. Approve Minutes

A. *December 14, 2021, Regular Meeting Minutes*

Motion made by Denison, Seconded by Martin to approve the December 14, 2021 Regular Meeting Minutes. Voice vote carries.

X. Old Business

None

XI. New Business

A. *Consider application submitted by Sardor Vakhidov, Blackbirds LLC, and Elkhorn LLC to operate an Adult Use Marihuana Process Facility at 402-404 S. Oak St.*

Murphy gave his report to the Planning Commission *see Attachment A*. Agrees with Rhett that he has been working nonstop and has been very communicative with City Hall on his progress.

Discussion between Rhett and Planning Commission about the transportation.

Martin asked how the cold treatment works, Rhett was able to explain.

Discussion about the site plan in front of them. The Planning Commission decided to review the site plan and adjust the site plan. After their decision regarding the special use permit, they would take it up to add to the agenda.

McDonald wanted to make sure that the information on the application had the correct information on different zoning areas. Northside residential, Westside residential, Eastside combination of industrial and residential.

McDonald wanted the Public Service report from the Fire Department and Police Department. Murphy said he could get that to them soon.

PENDING APPROVAL

Lietz wanted to address the correspondents with questions to Rhett. He wanted to know if there will be an additional odor. Rhett says no due to the cold processing. He asked about fencing, security, and lighting, Rhett says no changes.

Motion made by Martin, seconded by Denison to approve the application submitted by Sardor Vakhidov, Blackbirds LLC, and Elkhorn LLC to operate an Adult Use Marihuana Process Facility at 402-404 S. Oak St. with adoption of the staff report as findings of fact. Roll call vote carried unanimously.

Motion made by McDonald, seconded by Denison to amend the agenda to add "XI. New Business, Item C Review, and approval of site plan for 402-404 S Oak St. adult use marihuana grow and process facility" Voice vote carries unanimously.

B. Richard Martin to replace Jason Lietz as the representative on the Buchanan Tree Friends.

Martin says they will be incredible disappointed to not have Lietz on the Buchanan Tree Friends. Martin is going to talk to Buchanan Tree Friends at the meeting tomorrow to see what the majority of the BTF group feels about Lietz not being a member.

Motion made by Denison, seconded by McDonald, to table item "B" till next meeting. Voice vote carries unanimously.

C. Review and consideration for approval of site plan for 402-404 S Oak St. adult use marihuana grow and process facility.

Planning Commission and Rhett discussed different options for the site plan and came up with an informal site plan to approve. *See attachment B.*

Lietz wanted to make sure that Rhett knows if there is a setback due to an old access easement, he will need to come back before them and make an amendment. He would also like to see a legend for the colored areas. There appears to be a remnant of the drive by the parking area, the zoning ordinance requires that any parking spaces and any off-street access aisles need to be concrete or asphalt, needs to be noted on the plan. As far as storm water, typically for a small number of places like this you would just slope the area, as it needs to have the direction of the storm water going into the grass area.

Motion made by Denison, seconded by McDonald to give conditional approve to the site plan for the marihuana grow and process facility at 402-404 S Oak St, Blackbirds LLC, and Elkhorn LLC. With the condition a revised formally drafted site plan be submitted to the city along with any application fee that may be required. Roll call vote carried unanimously.

XII. Subcommittee Reports (if any)

McDonald reported that the Friends of the Trail did not meet last month, so he has nothing to report. Martin reported on the Buchanan Tree Friends with a brief history of the group.

XIII. Public Comment - Non-Agenda Items Only

Norma Ferris made comments about water and garbage that would be coming from 402-404 S Oak. St.

XIV. Community Development Director Comments

Wanted to make sure the commissioners are aware of the 5-year rec plan that was just approved by the City and Township. Murphy encouraged the Planning Commission to look at it.

Murphy would like to propose to seek more planning commissioner members. They are a Commission of 7.

PENDING APPROVAL

XV. Commissioner Comments

Denison: Thanked the commission and working together with Murphy to see this through.

Martin: None

McDonald: Thanked Langston for the minutes, Thanked Rhett for his continued investment and commitment to Buchanan.

Lietz: None

XVI. Adjournment

Motion made by Martin, seconded by Denison to adjourn the meeting at 8:57 PM. Voice vote carries unanimously.

Jason Lietz, Planning Commission Chair

Kalla Langston, City Clerk



STAFF REPORT TO THE PLANNING COMMISSION
SPECIAL USE REQUEST: 402-404 S. OAK STREET
Adult Use Marihuana Processing 02.07.2022

GENERAL INFORMATION:

Applicants:	Sardor Vakhidov and Blackbirds, LLC
Status of Applicants:	Developer/Presented by Rhett Johnson
Existing Zoning:	M -1 Light Industrial
Property Address:	402-404 S. Oak Street, Buchanan MI 49107
Present Land Use:	Light Industrial
Adjacent Use:	N – Light Industrial/Residential S – Light Industrial E – Light Industrial W– Residential

The applicant applied for and was approved for a Special Use for an Adult Use Class C Grow facility in September of 2021 and wishes to expand their operation in Buchanan to including Processing.

The applicant has requested a special use approval to operate an Adult Use Marihuana Process Facility at 402-404 St. Oak Street. The applicant has stated that Process Facility will be compliant with all City and State regulations related under MRTMA. This report will address the standards contained in the Zoning Ordinance.

Section 20.03 - Basis of Determination Prior to approval of a special use application, the Planning Commission shall insure those standards specified in this Article, as well as applicable standards established elsewhere in this ordinance, shall be satisfied by the completion and operation of the special use under consideration.

Following are the Standards, with my commentary in *italics*.

1. **General Standards.** The Planning Commission shall review the particular circumstances of the special use application under consideration in terms of the special use standards and shall approve a special use only upon a finding in consideration of each of the following standards, as well as applicable standards established elsewhere in this ordinance.

A. The special use shall be designed, constructed, operated, and maintained in a manner harmonious with the character of adjacent property and the surrounding area.

The proposed special use Adult Use Marihuana Process Facility will be designed, constructed, operated, and maintained in a manner harmonious with the character of adjacent property and the surrounding area because it will be used in accordance with the requirements of the Zoning Ordinance, Ordinance 2019.10.413. (Adult Use Marihuana Police Power Ordinance), Ordinance 2019.11/414 (Zoning Ordinance Amendment), and all State of Michigan requirements.

B. The special use shall not change the essential use of the surrounding area.

The special use shall not change the essential use of the surrounding area because it is an adaptive reuse of a parcel already zoned light industrial.

C. The special use shall not be hazardous to adjacent property, or involve uses, activities, materials, or equipment which will be detrimental to the health, safety or welfare or persons or property through the excessive production of traffic, noise, smoke, fumes, or glare.

The special use shall not be hazardous to the adjacent property or detrimental to the health, safety and welfare of persons and property because it will be conducted in a locked facility in compliance with all applicable City Ordinances and State of Michigan requirements. It will have an extensive carbon scrubber air filtration system and exterior lighting and security cameras. The Fire Department previously reviewed the application and will inspect the facility as required by both the City and State.

D. The special use shall not place demands on public services and facilities in excess of current capacity.

The special use shall not place demands on public services and facilities in excess of current capacity because it will be constructed in compliance with all City and State requirements. Water, sewer, and electric utilities are available to the site, as is gas if required. Adequate parking is available on site.

E. The special use is in compliance with the City of Buchanan Comprehensive Plan.

The special use is in compliance with the City of Buchanan Master Plan. The special use is an adaptive reuse of a building zoned light industrial.

2. Conditions. The Planning Commission may require reasonable conditions in conjunction with approval of any special land use. The conditions may include conditions necessary to ensure that public services and facilities affected by a proposed land use or activity will be capable of accommodating increased service and facility loads caused by the land use or activity, to protect the natural environment and conserve natural resources and energy, to ensure the compatibility with adjacent uses of land, and to promote the use of land in a socially acceptable and economically desired manner. Conditions imposed shall consider all of the following:

A. Be designed to protect natural resources, the health, safety, and welfare, as well as the social and economic well-being of those who will use the land use or activity under consideration, residents, and landowners immediately adjacent to the proposed land use or activity, and the community as a whole.

B. Be related to the valid exercise of the police power and purposes which are affected by the purposed use or activity.

C. Be necessary to meet the intent and purpose of the zoning regulations be related to the standards established in the Ordinance for the land use or activity under consideration; and be necessary to ensure compliance with those standards.

D. The conditions imposed with respect to the approval of a land use or activity shall be recorded in the public record of the approval action and remain unchanged except upon the mutual consent of the Plan Commission and the landowners.

The Planning Commission may impose the condition that the special use approval is limited specifically to an Adult Use Marihuana Class Process Facility.

3. Decision

The Plan Commission has two options to consider, whether to grant the special use request with or without conditions or whether to deny. The Planning Commission must make findings of fact to support your decision considering the factors above.

Based on the above findings, the Community Development Department recommends approval of the special use request.

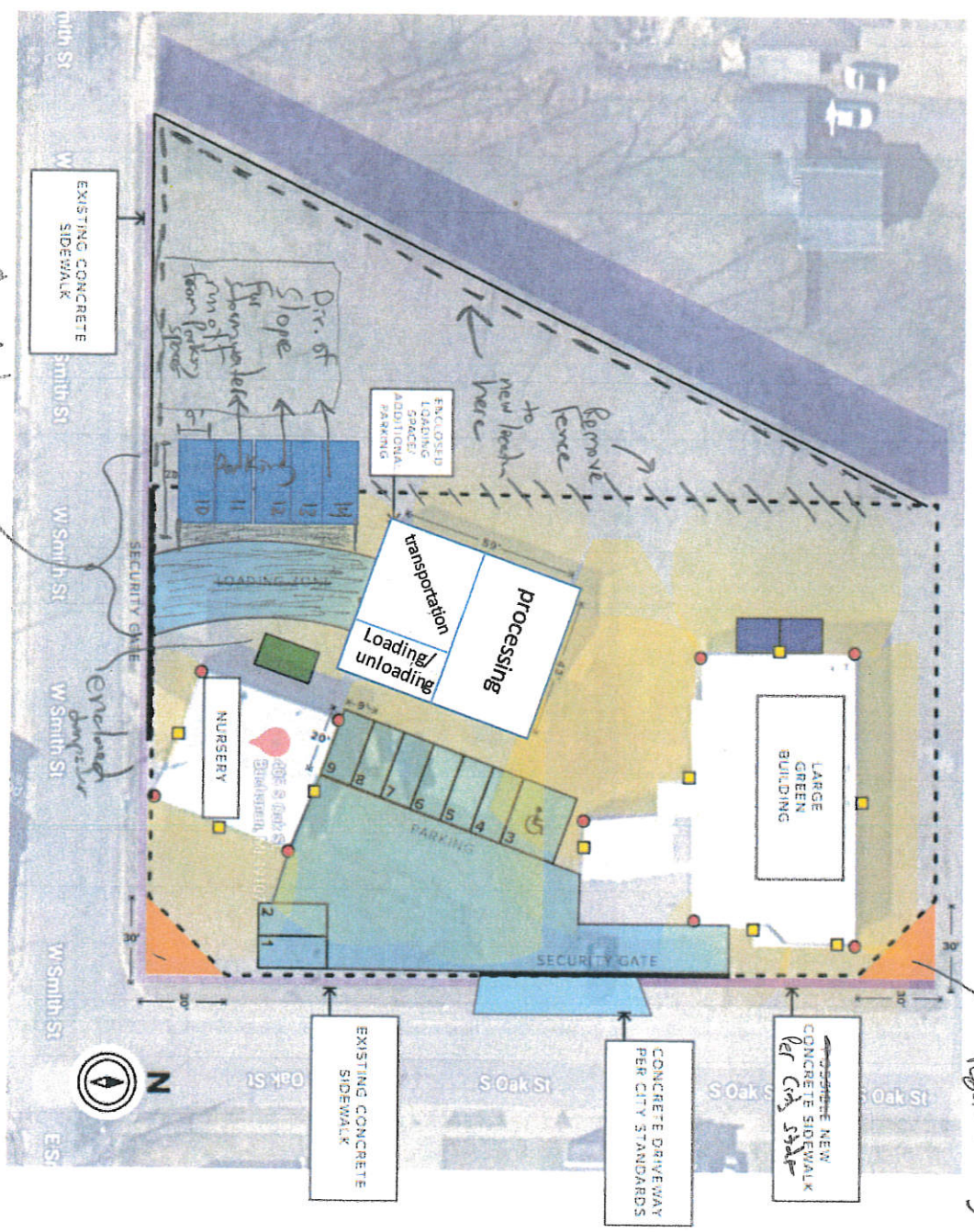
Respectfully submitted,

Richard Murphy
Community Development Director

Revised Site Plan for 402-404 Oak Street
 Add Use Maintenance Grow + Processing Facility

Date: 2/8/22

- Legend
- - Lightings
 - - Enclosed Waste + Rubbish Receptacles
 - - Relocated parking spaces
 - - Air Conditioner Units.



clear vision required by zoning ord.

Plan Notes:

- Surface of parking spaces + access drive to be asphalt or concrete per 20. Sec. 19.03(11)(B).
- Note what the required min. number of off-street parking spaces is 11.

Boone Labs Inc.
107 Alexander Street
Buchanan, Michigan 49120

J & J Buildings LLC
19850 State Line Rd.
South Bend, Indiana 46637
January 6, 2022

Richard & Robert,

Thank you for your continued interest in expanding the Boone Labs Inc. Operation located at 107 Alexander Street, Buchanan, Michigan 49120.


We have been in conversation for some time now about the concept of Boone Labs Inc. expanding to include a growing phase to the present anticipated process.

As the landlord of the full facility, we are in agreement that adding a growing process in the adjacent 8500 sq. feet is not only a good business decision for you, but would be in concert with our direction for leasing the building. Our current tenant in that space is now on a month by month arrangement and may be consolidating back into the north section of the overall building.

With this letter we are giving Boone Labs Inc. permission to move forward with whatever formal licensing and or regulatory requirements must be met to accomplish authorization to add Cannabis Growing in our physical facility.

Thank you for being a valued tenant at 107 Alexander Street, Buchanan, Michigan 49120.

Respectfully,

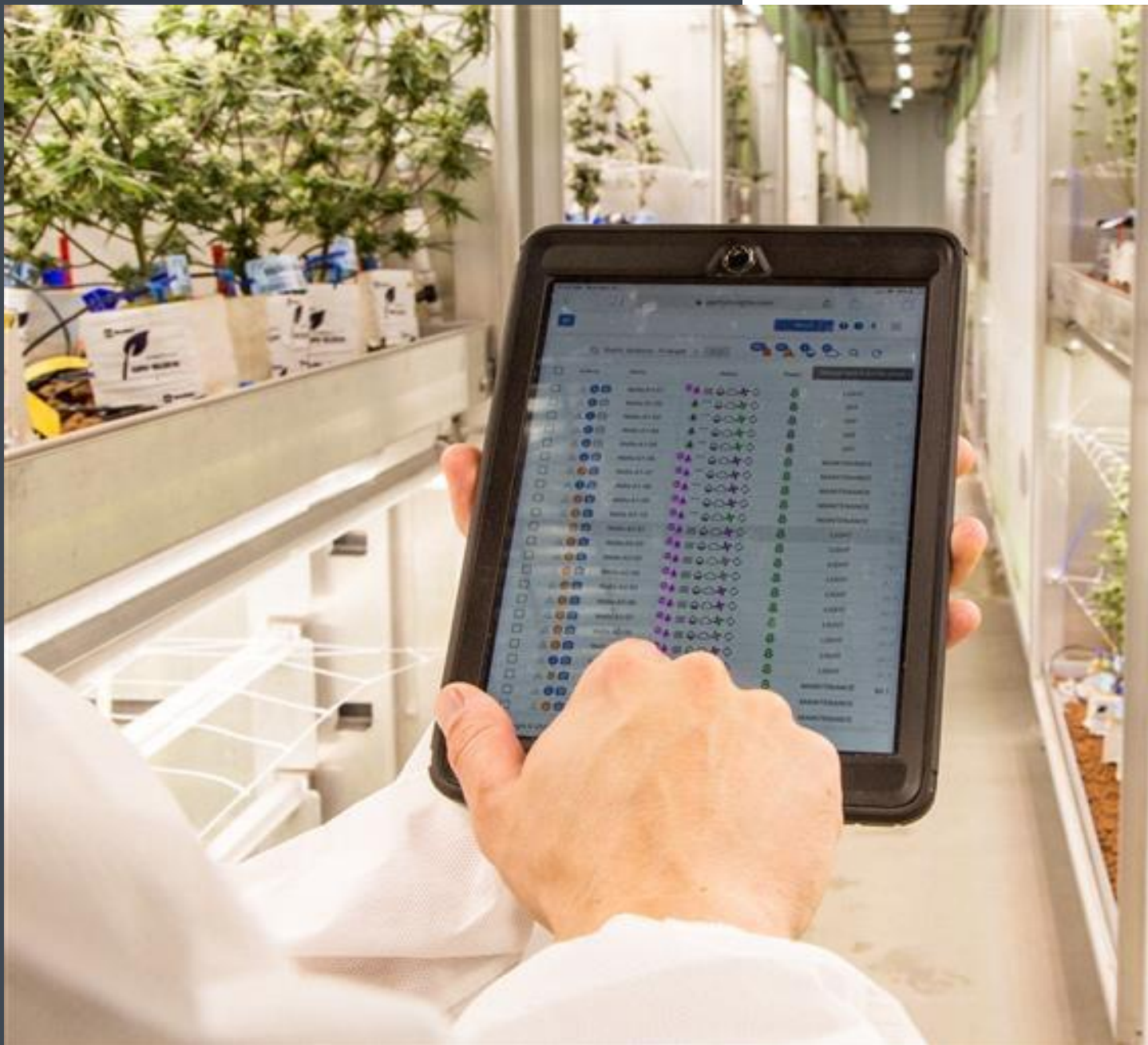


John W Doster Sr., Member
J & J Buildings LLC



AGRIFY™

Grow with Precision | 2021



BUILDING A SUSTAINABLE FUTURE TOGETHER

Work smarter with the operational ease of a complete, fully integrated grow system that:

- Delivers actionable insights and data for efficient operations that will improve your ROI
- Supplies full environmental control
- Provides the ability to optimize yield, maximize consistency, and scale with minimal risk at the lowest possible cost

VERTICAL FARMING UNIT (VFU) FEATURES

Environmental Control

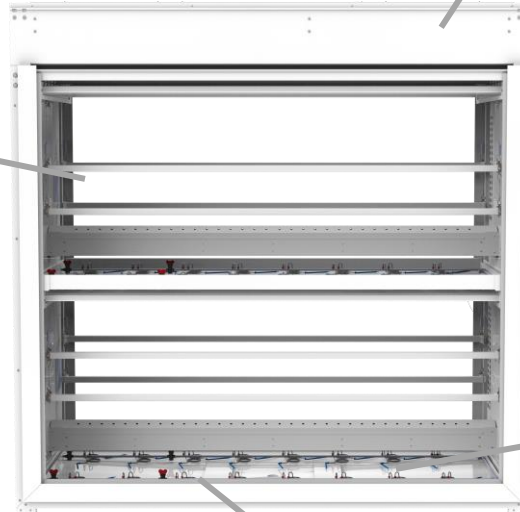
- Temperature control
- CO₂ control
- VPD monitoring and control
- Humidification
- + more

LED Lighting

- Down lights + inter-lights
- Photoperiod control
- Sunrise/Sunset feature
- Light intensity control for both down and inter-canopy fixtures

Manufacturing

- Made in the USA
- Our manufacturing operations are based in Atlanta, GA
- We are a factory direct supplier, you deal directly with us



ERP and Software Integration

- Grow plan (cultivation recipe) features including ramped lighting schedule
- Compliance documentation
- Data collection
- Business insights (OPEX calculator) and data analysis tools
- Production planning algorithm
- METRC and Confident Cannabis integrations
- Harvest analytics
- Custom reports and 24/7 configurable alerts (phone, SMS text, email)
- Remote access and control
- Task and staff management

Fertigation Control

- 3 Irrigation formula inputs
- Frequency and duration control
- Volume control within 5 mL (Duration x Duration)
- Irrigation dry-backs and delayed starts

GLOBAL CANNABIS MARKET: \$90B by 2026

THE RAPID GROWTH OF THE CANNABIS INDUSTRY HAS LED TO AN EVER-CHANGING LANDSCAPE THAT HAS PLAGUED THE SUPPLY-CHAIN WITH MAJOR INEFFICIENCIES.



Key Man Risk



Project Delays



Slow Return on Investment



Crop Failure



Inconsistent Quality



Lack of Funding

Agrify's approach: A holistic solution to cultivation that treats a production facility as an ecosystem whose success is built on every component working together optimally, mitigating external inefficiencies by taking the guesswork out of internal system cohesion.

INDOOR GROWING 1.0

Inefficiencies with Indoor Grow Methods



Unutilized vertical space in indoor facilities



Incompatible grow equipment requires system integrators, causing project delays and inefficiency



Inability to optimize facility grow environment for multiple strains



Direct production-related operational costs are high (industry avg. \$436/lb. - \$536/lb.)



Poor biosecurity mitigation and limited prevention of crop-wide devastation



Labor intensive and dangerous working conditions



THE FUTURE OF GROWTH

Agrify's Quality & Consistency at Scale:

- <0.67% variation in cannabinoids in 10 harvests.
- <0.02% variation in terpenes across 10 harvests for two different strains.
- Average strain potency increase of 29%+ total cannabinoids.
- Yield increase of 6x per square foot compared to conventional system.
- Operational cost decrease of 25%-40% per lb.



NUMBERS THAT SPEAK FOR THEMSELVES

CASE STUDY:

A Micro-Climate Controlled Environment Results In Higher Quality & Consistency

- Increased Average Cannabinoid Compound by 34.39% in 25 Strains
- Greater consistency with 0-.02% variance between batches

Strain	Cannabinoid Compound							Agrify VFU Improvement
	THCa	THC	CBDa	CBD	CBN	CBG	Total	
Pineapple OG Agrify VFU Grown	32.15%	0.64%	0.91%	0.00%	0.15%	0.10%	33.95%	76.09%
Pineapple OG Pre-Agrify Grown	16.09%	2.76%	0.44%	0.00%	0.00%	0.00%	19.28%	
Day Dreamer Agrify VFU Grown	24.77%	4.70%	0.34%	0.00%	0.00%	0.00%	29.80%	107.23%
Day Dreamer Pre-Agrify Grown	13.93%	0.45%	0.00%	0.00%	0.00%	0.00%	14.38%	
Lemmon 714 Agrify VFU Grown	21.13%	2.52%	1.63%	0.00%	0.00%	0.00%	25.30%	39.55%
Lemmon 714 Pre-Agrify Grown	16.95%	0.14%	1.04%	0.00%	0.00%	0.00%	18.13%	
A-Dub Agrify VFU Grown	26.96%	0.17%	0.00%	0.00%	0.00%	0.00%	27.14%	62.13%
A-Dub Pre-Agrify Grown	16.07%	0.18%	0.50%	0.00%	0.00%	0.00%	16.74%	

PRODUCTION RESULTS THAT DELIVER

Consistent Cannabinoid and Terpene Ranges Across a Variety of Strains



- Candy Cane - 10 Harvest Batches
 - Cannabinoid Range 0.67%
 - Terpene Range 0.08%
- Lemon Haze - 12 Harvest Batches
 - Cannabinoid Range 0.38%
 - Terpene Range 0.02%
- Some Thing Blue - 7 Harvest Batches
 - Cannabinoid Range 0.96%
 - Terpene Range 0.08%
- The Bling - 8 Harvest Batches
 - Cannabinoid Range 0.14%
 - Terpene Range 0.35%

AN INTEGRATED SYSTEM FOR CULTIVATION

**Agrify's Vertical Farming Unit (VFU) + Agrify Insights =
Improved Processes, Improved Results**

6x

Yield Increase

When stacked 3 units high

25%+

Increase in Potency

With granular environmental control

30%

Lower OPEX

With a VFU system

Data collection + granularly controlled microclimate cultivation =
Consistency, quality, and reproducibility at scale

VERTICAL FARMING UNITs (VFUs)

Compartmentalized Growing Environments

Optimize and replicate strain-specific cultivation environments

Maximizing Facility Yield

Stack VFUs vertically to create up to 6x yield/sf

Data Driven Insights

1 million+ data points collected per VFU annually

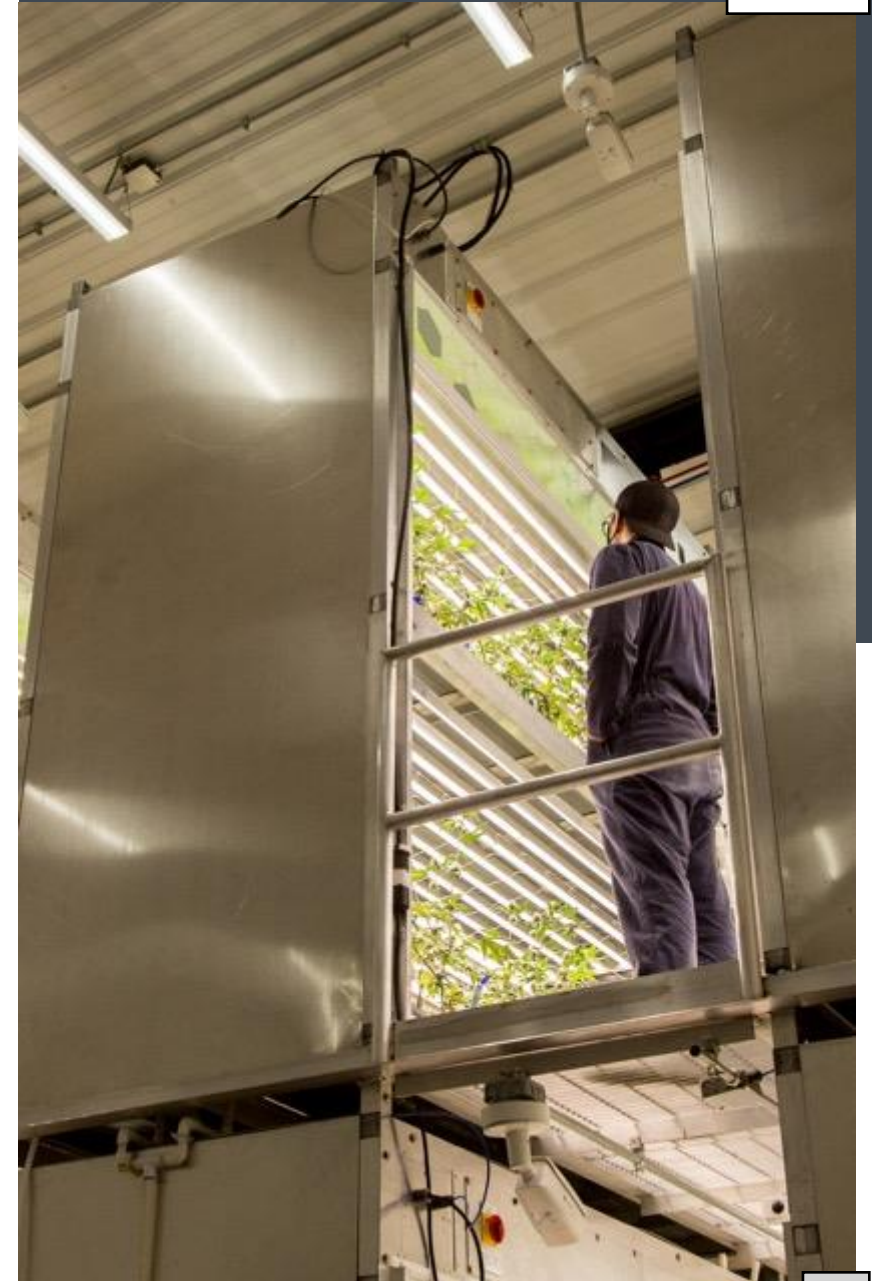
LED Lighting

Built-in LED top light and inter-canopy lights

Increase Operational Efficiency

Average operational cost per lbs. is \$350/lb.

*industry average is \$436/lb. - \$516/lb.



AGRIFY INSIGHTS™ CULTIVATION SOFTWARE

Precision Monitoring and Controls

Automate temperature, humidity, lighting, CO₂, irrigation, and fertigation parameters

Create and Optimize Cultivation Plans

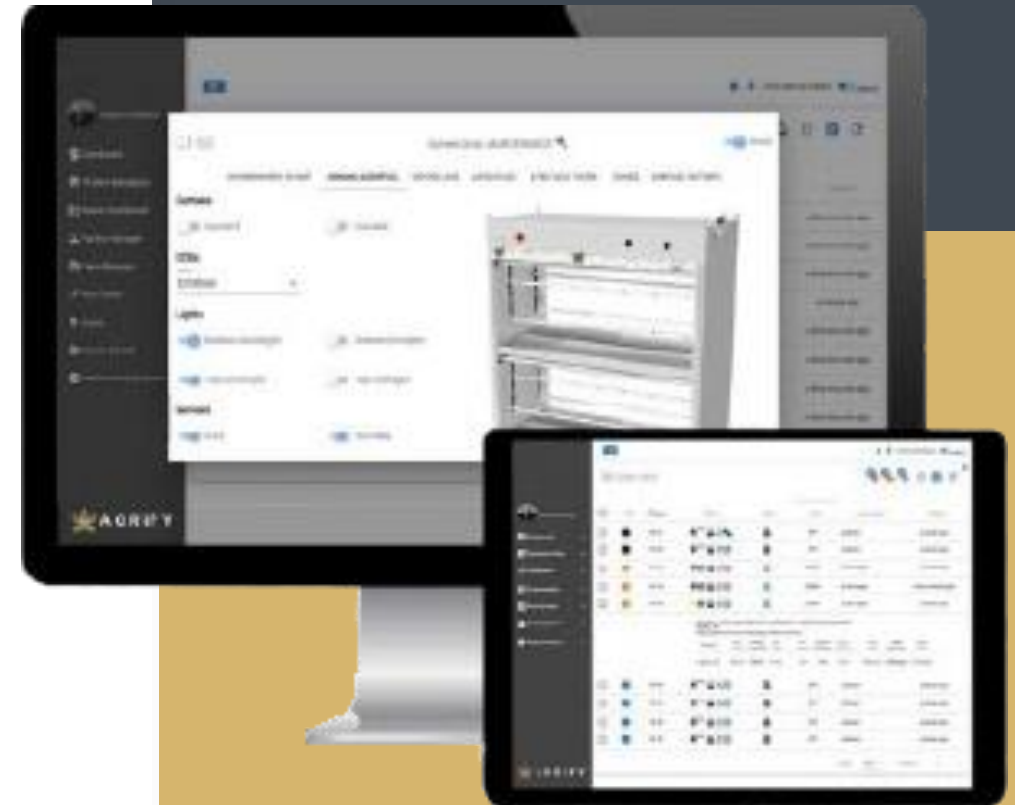
Strain-specific grow plans developed via real-time analytics

Demand-Based Production Planning

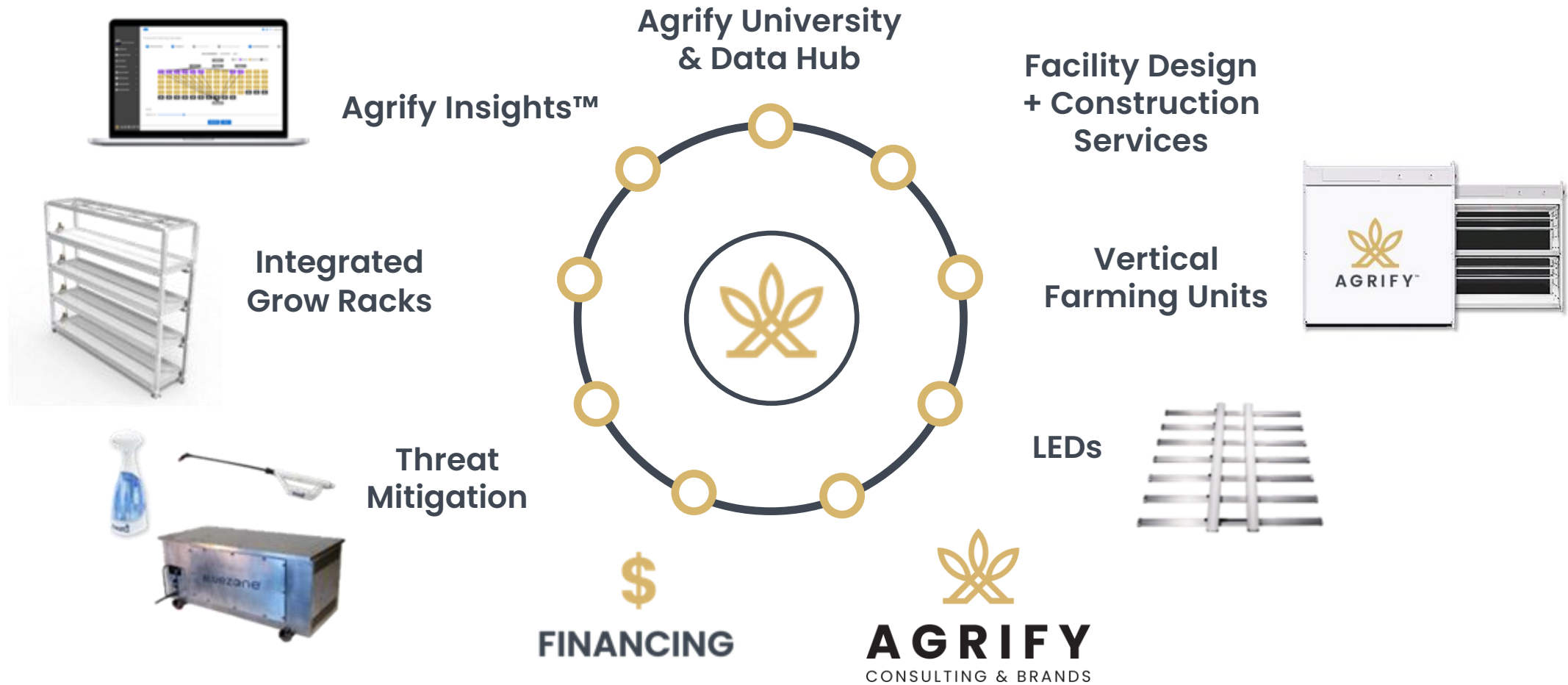
Optimize yield with weekly harvesting and staggered growth cycles

Automated Workflow

Complete ERP system with role-based dashboards to minimize human errors



THE AGRIFY™ ECOSYSTEM



Agrify's products and services work in tandem to provide end-to-end cultivation solutions.

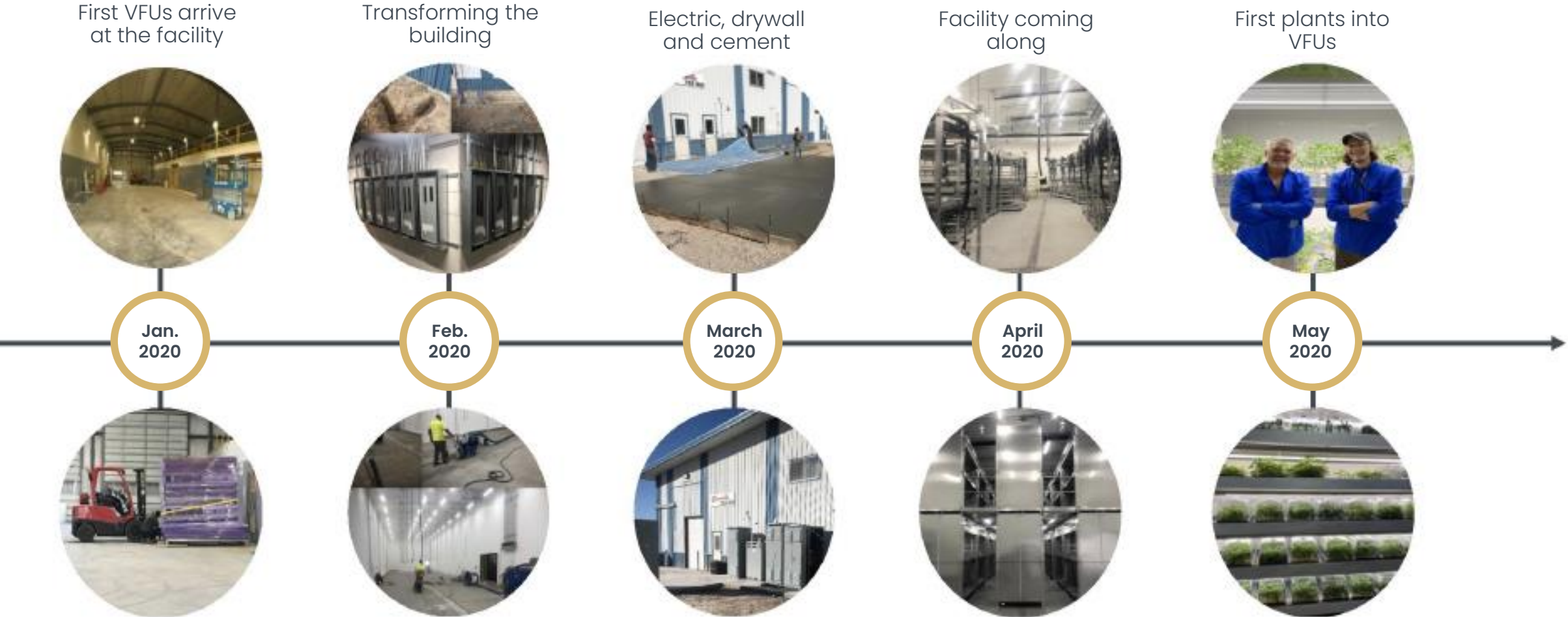
Each element is designed to work seamlessly together to produce high-quality and consistent flower at the lowest operating cost.

APPENDIX

- VFU Deployment Timeline- *Slide 15*
- Plant Production Timeline- *Slide 16*
- VFU FAQs- *Slide 17*
- Customer Testimonials - *Slide 18*
- Agrify Services – *Slides 19, 20*



VFU DEPLOYMENT TO PRODUCTION



PLANT PRODUCTION TO PERPETUAL HARVESTING

Plant progress evident

Significant plant growth

Plant maturity continues to develop

First harvest ready

2nd round harvest begins 1st week of November



June 2020

July 2020

Jul-Aug 2020

August 2020

Nov. 2020



FAQS | VERTICAL FARMING UNITS

Is the Agrify Insights software packaged with the Vertical Farming Unit?

Agrify delivers an integrated hardware and software solution that maximizes each Vertical Farming Unit and facility operations from seed to harvest.

What are the dimensions on the Vertical Farming Unit?

The VFU's exterior dimensions are 100.75" x 47.88" x 110.75" (L x W x H). The VFU offers 2 tiers of canopy with 40" grow height per tier (to the bottom of the LED top light). Please see our VFU data sheet for more details.

What type of material is the Vertical Farming Unit made of?

The VFU is manufactured using aluminum alloy and has a powder coating for corrosion resistance and system durability. The VFU's LED lights are IP65 wet location rated, DLC, and NSF certified. Operators will have access to Agrify's standard operating procedures for sanitation and maintenance of the VFU.

How does the system connect with a cultivation facility?

The VFU houses an internal environmental control unit (ECU) that connects with a central chilled water system, central fertigation and irrigation system, and CO2 connection. The use of these resources is optimized by conditioning the VFU's microclimate as the system operates comfortably in an ambient working environment.



CUSTOMER TESTIMONIALS

**The flower grown in the Agrify VFU's
"Is the best flower I have seen all year."**

- MSO purchasing agent and WhiteCloud Botanical customer

"Agrify's VFU and software have allowed us to operate more efficiently. We streamlined our workflow and are getting better results because of it."

- Agrify Customer in Denver, CO

AGRIFY SERVICES

Facility Design & Construction

Ensure efficiency and productivity with our hassle-free turn-key solution – from architecture design, engineering, and construction to integrated grow solutions, and equipment financing.

Capital Financing

Whether you're a startup or a multi-state operation, you'll find generous financing terms so you can scale your indoor grow the smartest way possible – with our AI-powered technology.

Agrify University

Agrify University is an immersive, hands-on, project-based learning environment where science, data and technology are used to assist next-generation growers in cultivating high-value crops with efficiency at scale. The Agrify University classroom, located in Billerica, MA, is a safe space to learn and grow, both for prospects and employees.



AGRIFY SERVICES

Utility Rebates

Recoup tens of thousands of dollars invested in our energy-efficient LED grow lights – we're here to help you navigate the ins and outs of LED rebate programs to get your rebate check in hand.

Consulting & Brands

Maximize efficiency and your ROI with our comprehensive consulting services – from initial VFU set-up to scaling up operations to marketing your high-quality crops.



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AGRIFY™

10-VFU Customer Package

Package Contents

- ❖ **Product guide**
- ❖ **Equipment List and Info Sheets**
- ❖ **Equipment Connection Layout**
- ❖ **Equipment Utility Guide**



AGRIFY™

10-VFU Product Guide

Disclaimer

This document and any discussions about it are not a contract or promise. Any agreement between you and Agrify must be in a writing signed by both parties. The product specifications and other information in this document are subject to change.

Please contact the Agrify team to develop a more accurate and customized calculations and guidelines for your solution.

Product Introduction: Vertical Farming Units

Compartmentalized Growing Environments

Optimize and replicate strain-specific cultivation environments.

Maximizing Facility Yield

Stack VFUs vertically to create up to 6x yield/SF.

Data-Driven Insights

1 million+ data points collected per VFU annually.

LED Lighting

Built-in LED top light and inter-canopy lights.

Increase Operational Efficiency

The average operational cost per lbs. is \$350/lb.
*industry average is \$436/lb. - \$516/lb.



Product Introduction: Agrify Insights™ Cultivation Software

Precision Monitoring and Controls

Automate temperature, humidity, lighting, CO₂, irrigation, and fertigation parameters.

Create and Optimize Cultivation Plans

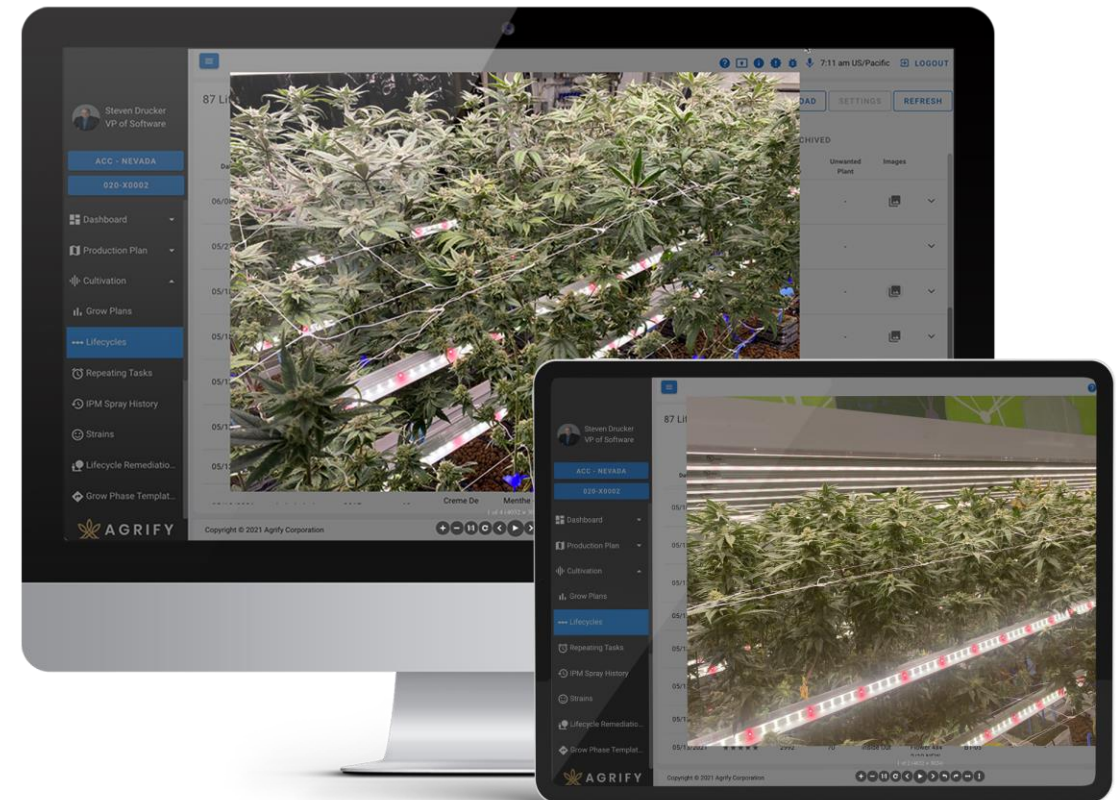
Strain-specific grow plans developed via real-time analytics.

Demand-Based Production Planning

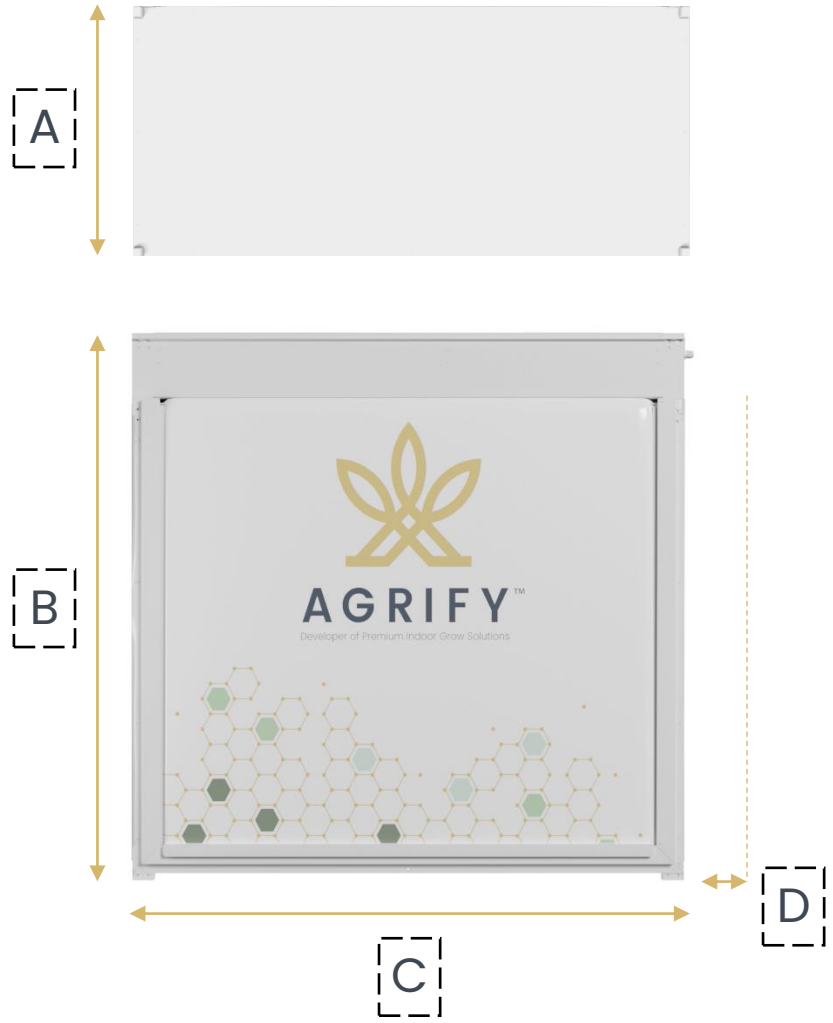
Optimize yield with weekly harvesting and staggered growth cycles.

Automated Workflow

Complete ERP system with role-based dashboards to minimize human errors.



Product Dimensions – Single Unit



Dimensions for laying out VFUs

A	Overall Width	47.875"
B	Overall Height	104.375"
C	Overall Length	105.125"
D	Mechanical Chase Req.	4.5" (required only on the side with the connections)

- **Overall Width** – Measured from the outside of the curtain track to the outside of the other curtain track.
- **Overall Height** – Measured from bottom of the unit to the top, not including a mounting foot.
- **Overall Length** – Measured from outside panel to panel, not including any protrusions for service attachments.
- **Mechanical Chase** – This is the additional length required to allow for service attachments and piping.

Notes:

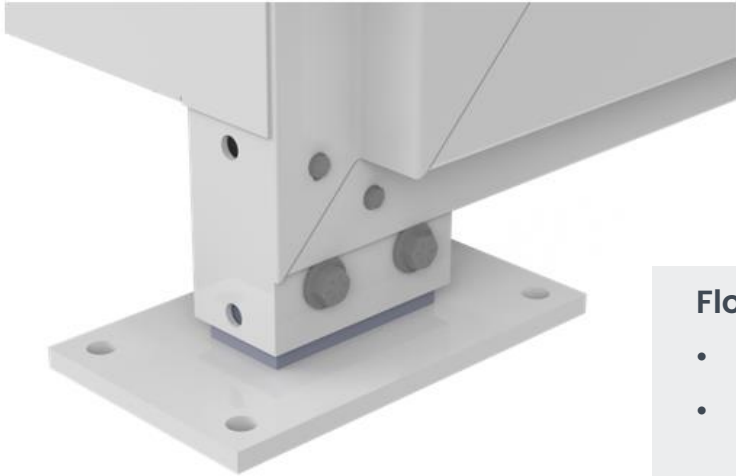
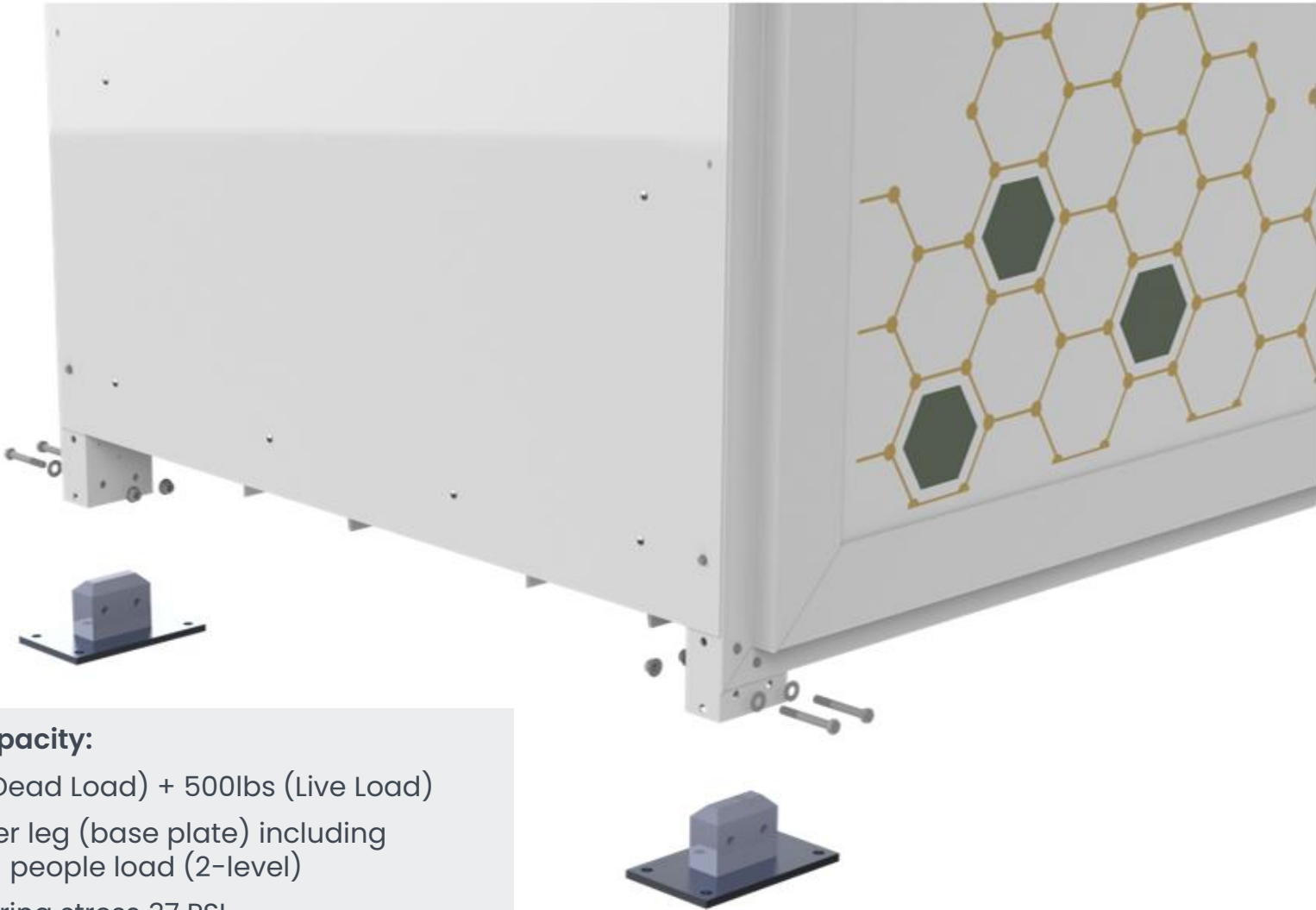
- The curtain tracks extend from the long side of the VFU by 1.4 inches on each side – For purposes of determining clearance distances the Overall Width of the VFU is 47 7/8".
- Plumbing and Electrical connection fittings for the VFU are located on one of the short length sides – They protrude from the unit by 4 1/2" (mechanical chase D).
- Need – Clearance required between the bottom of the footer (or base plate) to the floor for drain clearance.

Product Dimensions – Footers

- VFUs require footer assemblies at all four corners of the unit.
- The footers need to be anchored to the ground per the appropriate local structural requirements.

Note:

- Please contact licensed structural engineering to specify and provide drawings for mounting footers.



Floor load capacity:

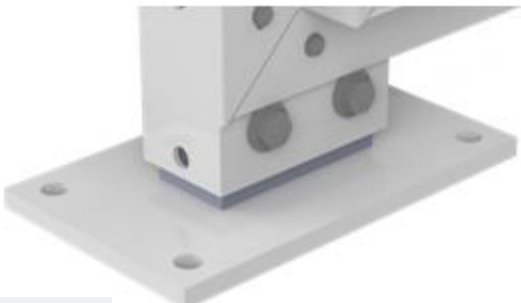
- 1000lbs (Dead Load) + 500lbs (Live Load)
- 1700lbs per leg (base plate) including catwalk + people load (2-level)
- Plate bearing stress 37 PSI

Product Dimensions

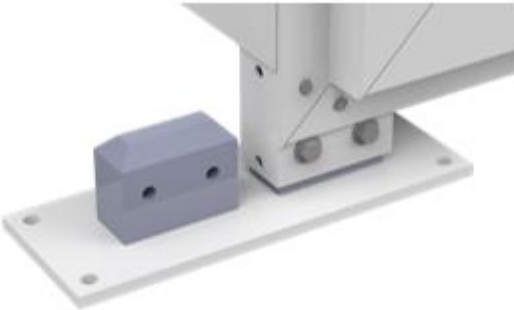
Footers

- VFUs come with three different footer styles as shown below:

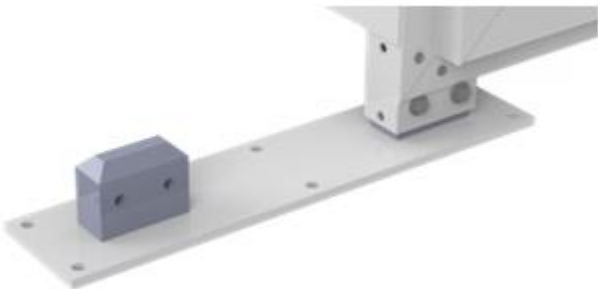
Single VFU



Double VFU – 1" Spacing



Double VFU – 9" Spacing

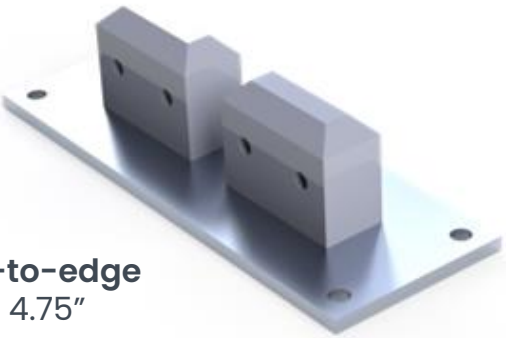


Footer Plate Thickness
0.375"



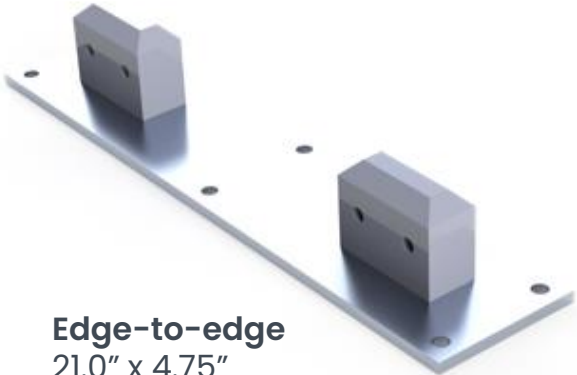
Edge-to-edge
8.0" x 4.75"

Holes Center-to-Center
6.75" x 3.50"



Edge-to-edge
13.0" x 4.75"

Holes Center-to-Center
11.75" x 3.50"

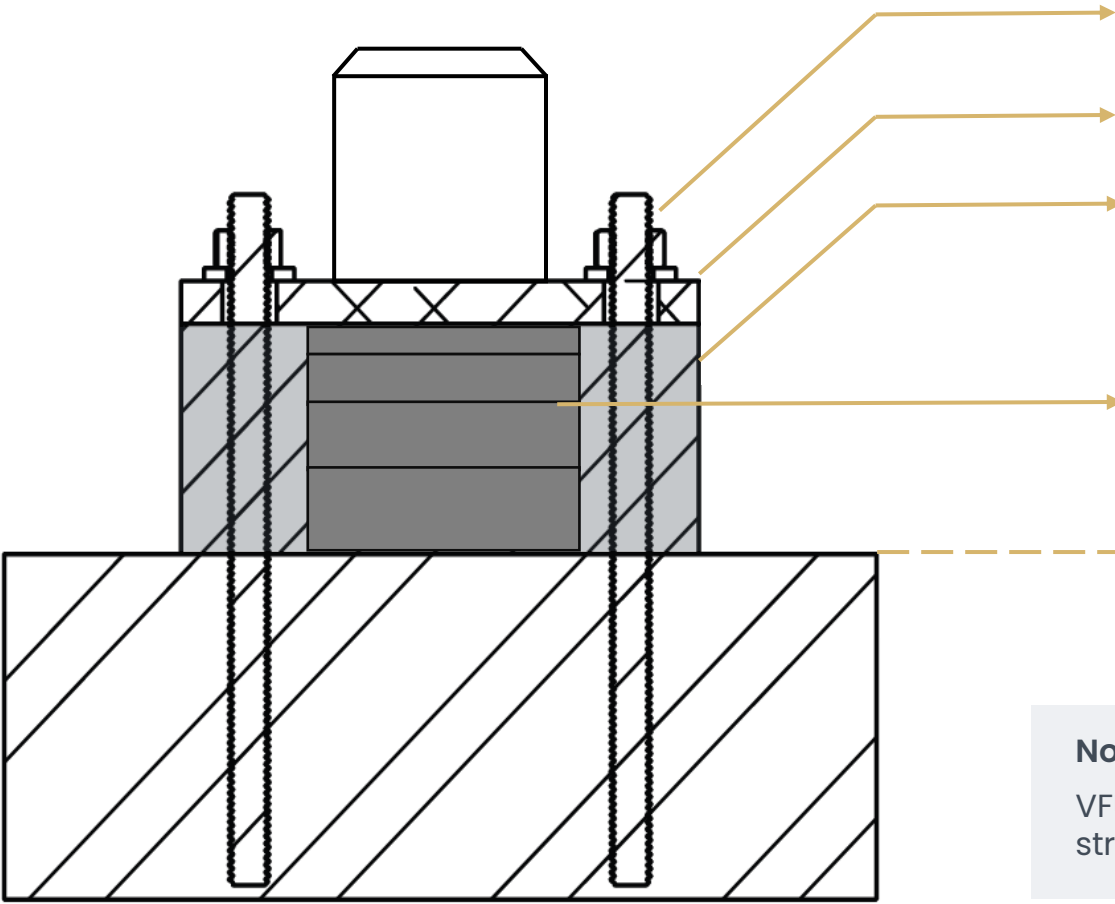


Edge-to-edge
21.0" x 4.75"

Holes Center-to-Center
9.875" x 3.50"

Product Dimensions

Footer Installation



Anchoring Bolt (0.375" x 2.75")

VFU Baseplate

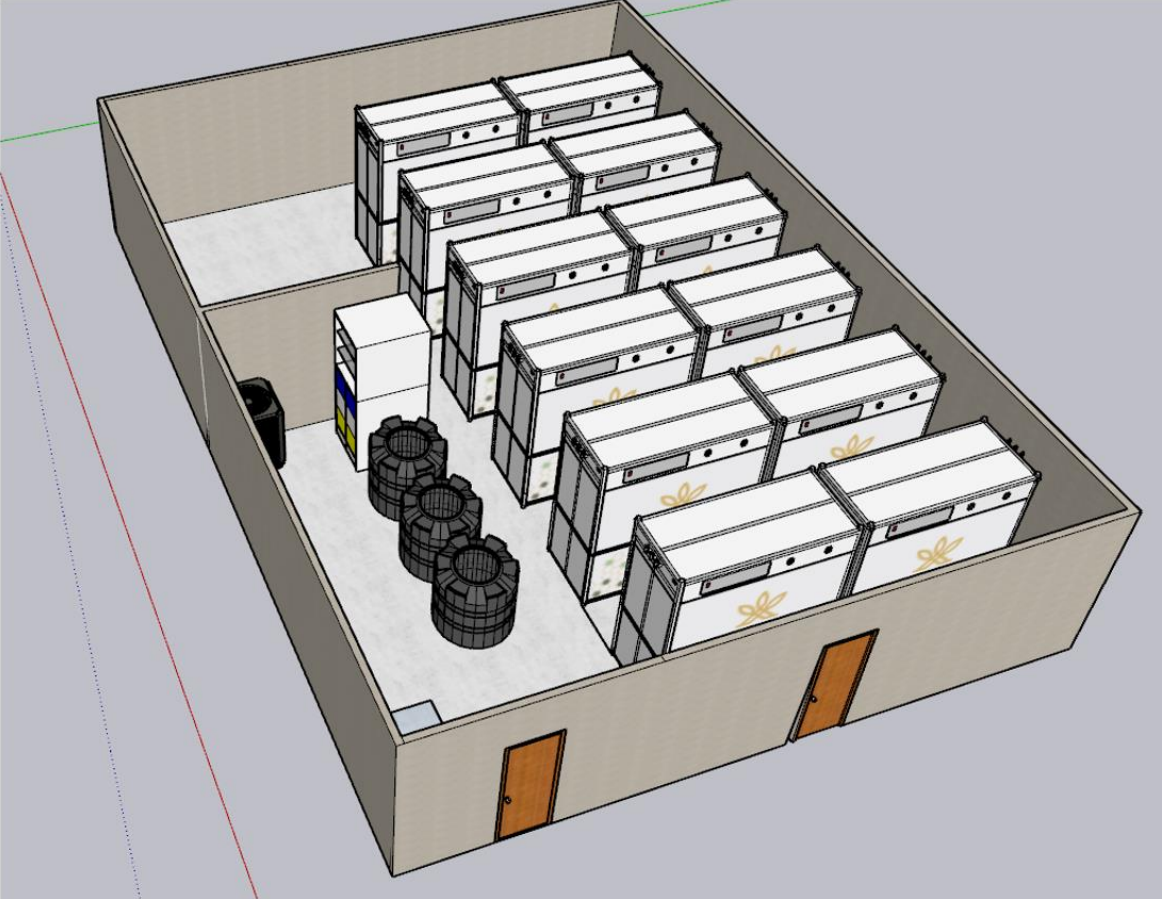
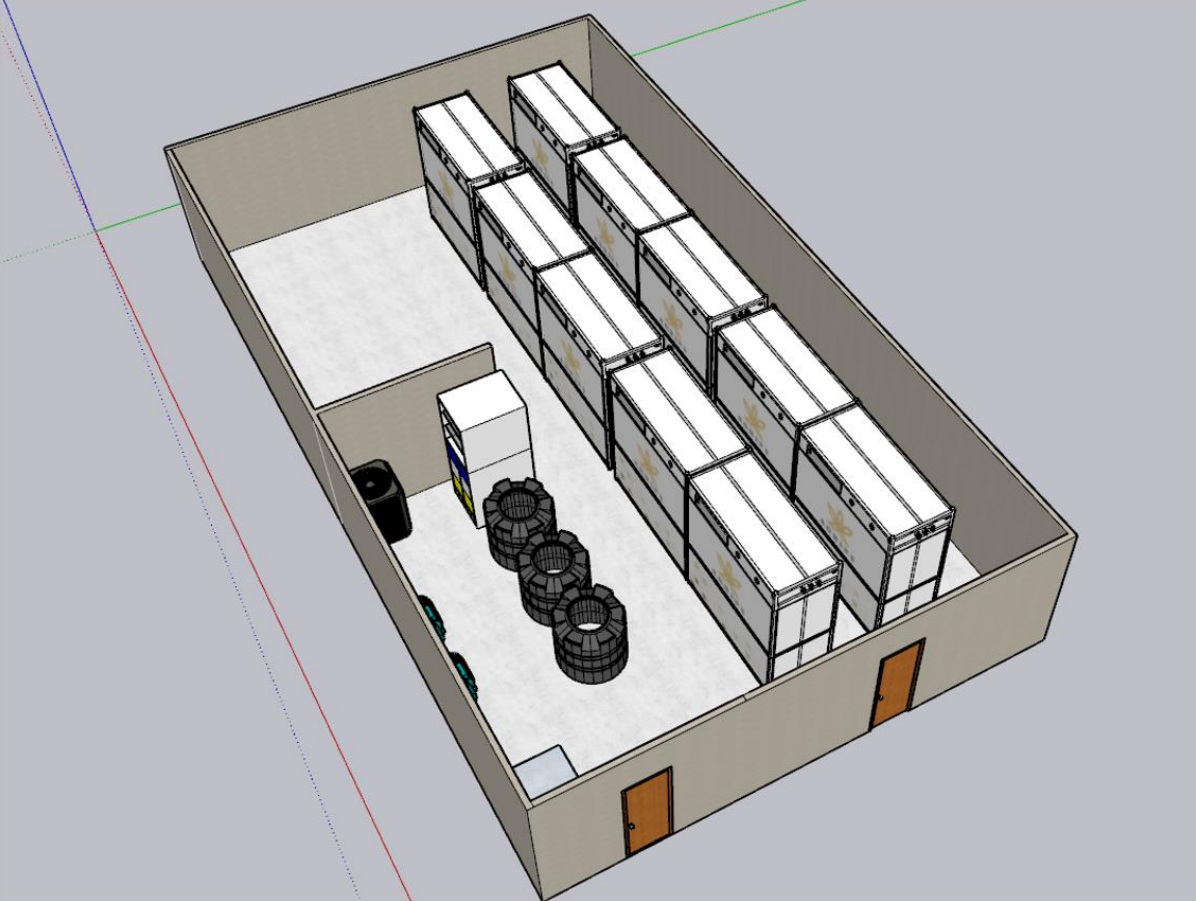
Grout
Needs to have a min. 1.5" thickness with a max. of 3.0"
For grout between 3" and 5" must have pea gravel
For grout greater than 5", a footing is required with appropriate reinforcement

Shims
Shims of 4 different thicknesses are provided for additional structural support
3" x 5" dimension with thicknesses 1/8", 1/4", 1/2" and 3/4" (2pcs each)

Floor High Point (0" Elevation)

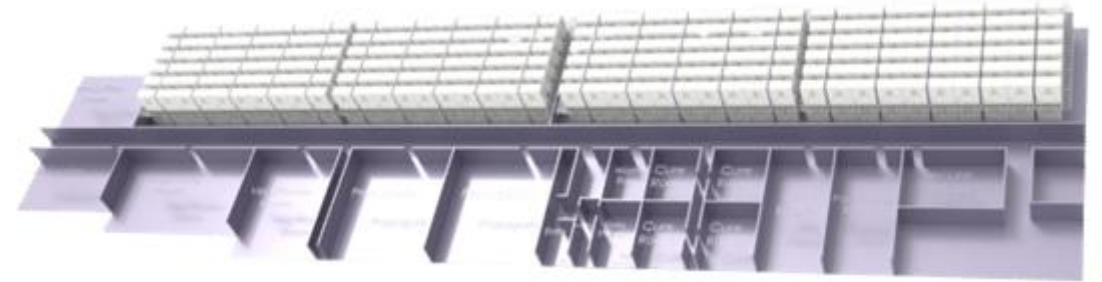
Note:
VFU baseplates need to be anchored to the floor, per adherence to local structural requirements.

Product Architecture – Support Systems



Product Architecture – Peripheral Construction

- Sealed and conditioned grow room
 - ✓ All penetrations sealed & plugged
 - ✓ FRP/SIP panels walls
 - ✓ Epoxy sealant floor
- Conditioned space with an ideal cooling load – 350 sf/ton.
- Infrastructure for facility-level plumbing, HVAC ductwork, and electrical is also required.

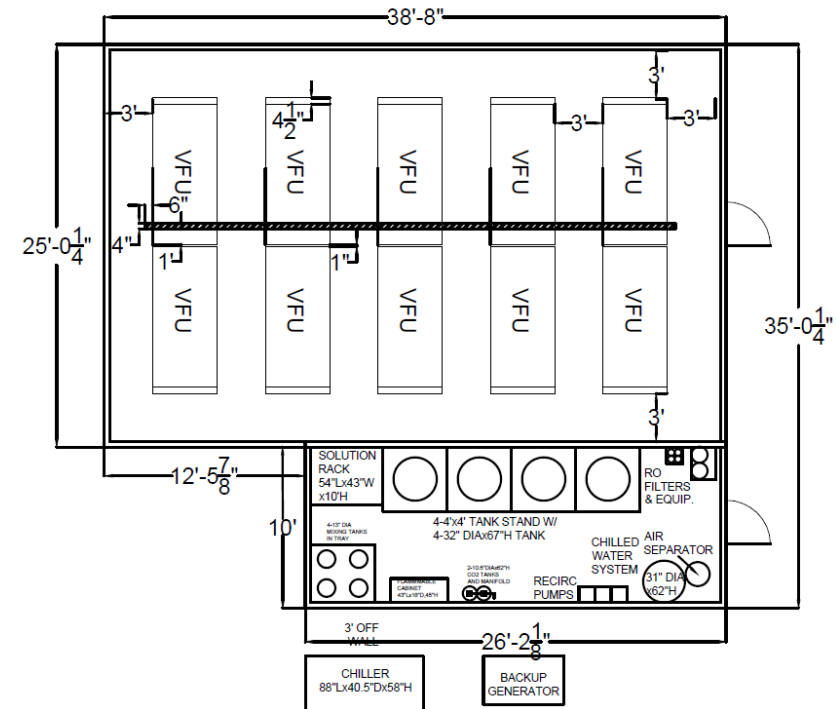
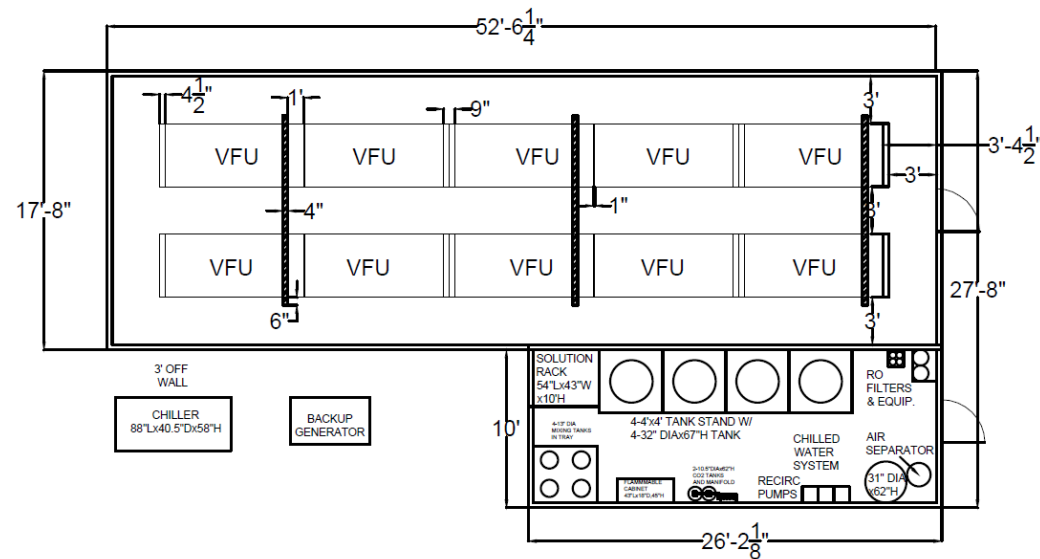


Product Architecture – Installation

Suggested Layout:

- ✓ 2 Rows of 5 VFUs per row
- ✓ 5 Rows of 2 VFUs per row.

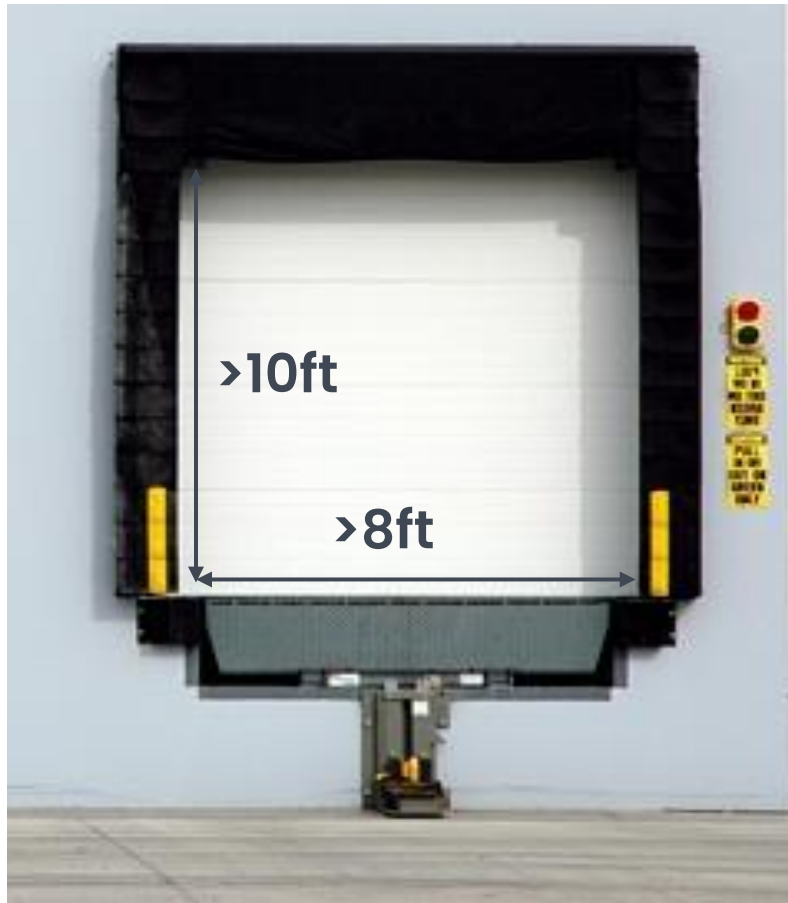
The layout and orientation of VFU would depend on size, shape, layout and any obstructions to contend.



Note:

- Infrastructure support to be in same or adjacent room.
- A minimum of 10ft ceiling clearance is required from the lowest obstruction point.
- Locations for trench drains are shown in the layout above. See the “drain” section for further information.

Product Architecture – Facility Requirements



Loading dock requirements

An opening with at least 10ft height and 8ft width is required for being able to bring VFUs into the facility for installation

Transportation method for VFUs to facility

Ground transport through trucks

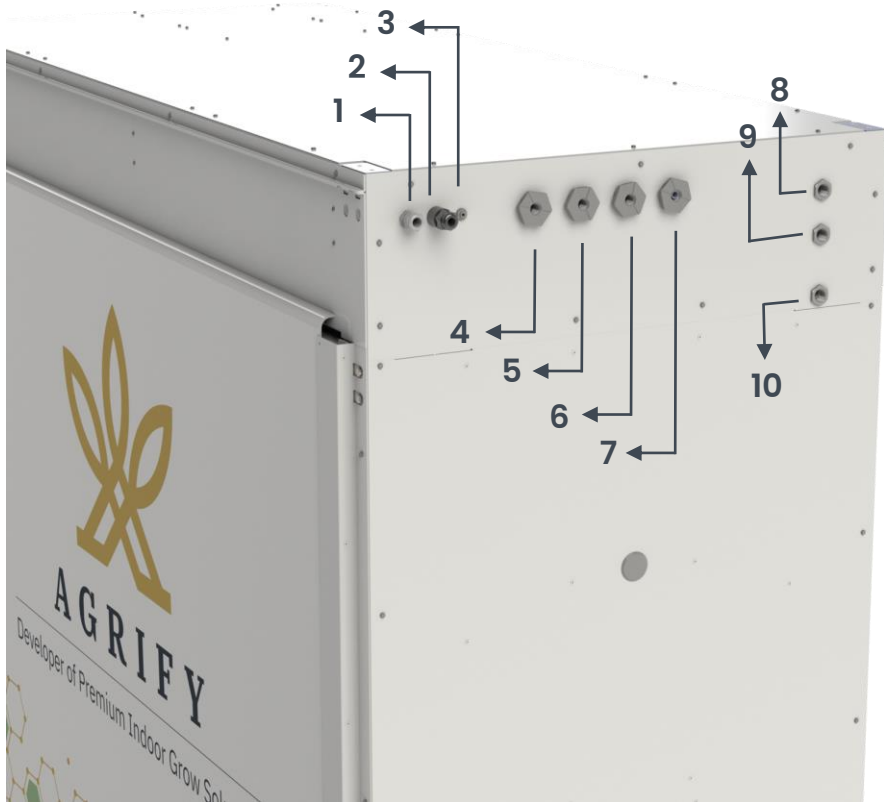
Equipment used to install VFUs

Forklifts

Typical VFU/catwalk installation time (without peripheral construction)

10 VFUs per day

Connections



11 (Not shown in the picture. Basin drain is located under the VFU)

Number	Connection	Material	Connection Type
1	Power Feed	Standard	277V NEMA 7-20P Plug
2	Network Connection	Polymer	CAT5/6 Ethernet
3	CO ₂ Supply	Polymer	0.25" Nylon PTF Bulkhead
4	Fertigation line	Polymer	1/2" NPT
5	Fertigation line	Polymer	1/2" NPT
6	Fertigation line	Polymer	1/2" NPT
7	RO Water line	Polymer	1/2" NPT
8	Chilled Water Outlet	Brass	3/4" NPT
9	Chilled Water Inlet	Brass	3/4" NPT
10	Condensate Drain	Brass	3/4" Barbed Connection
11	Basin Drain	Brass	3/4" Barbed Connection

Product Specifications - Electrical

Item IX. A.



Power Connection Type
277V Single Phase 60Hz

Estimated Total Consumption

200A Max. (Includes VFU only. See last section for peripheral equipment such as chillers and pumps)

The true power consumption for a VFU varies significantly during operation, depending on the grow recipe. The maximum power consumption shown here includes all VFU internal systems turned on at 100% functionality.

Reference VFU Power Calculation

Assumptions		
Number of VFUs		10
Flowering Stage	Number of VFUs	8 (80%)
	Lights on period	12 hrs.
Vegetative Stage	Number of VFUs	2 (20%)
	Lights on period	18 hrs.

Vegetation:

- **2 VFUs x 18 hours** (Note: photoperiod) x **2.15 kW** (Note: Stabilized VFU max power at 50% light intensity)
- **~77 kW** per day

Flower:

- **8 VFUs x 12 hours** (Note: photoperiod) x **3.5 kW** (Note: Stabilized VFU max power at 100% light intensity)
- **~336 kW** per day

Total VFU Approximate Power Consumption: 77 kW + 336 kW
413 kW per day*

*Please note that this is just an estimate and real-world consumption would vary based on usage. Electrical load calculations need to be based on max power consumption and not the reference power estimation.

Product Specifications - Lighting

- Twenty high-efficiency LED bar lights provide high levels of optimized light from the top to enhance plant growth.
- Eight additional bi-directional Inter-canopy lights provide lighting in-between the leaf canopy to boost inter canopy yield.
- Both types of lights use an optimized light spectrum with enhanced red and blue light to provide for optimal plant growth.

	Top-Down Canopy Lights	Inter-Canopy Lights
Light Intensity	2,460 $\mu\text{mol/s}$	1,008 $\mu\text{mol/s}$

Note:

- PPF ratings shown above are for each tier in the VFU.
- Every VFU allows for two tiers of canopy.

Driver Manufacturer	Inventronics
LED Manufacturer – White	Samsung
LED Manufacturer – Red	OSRAM



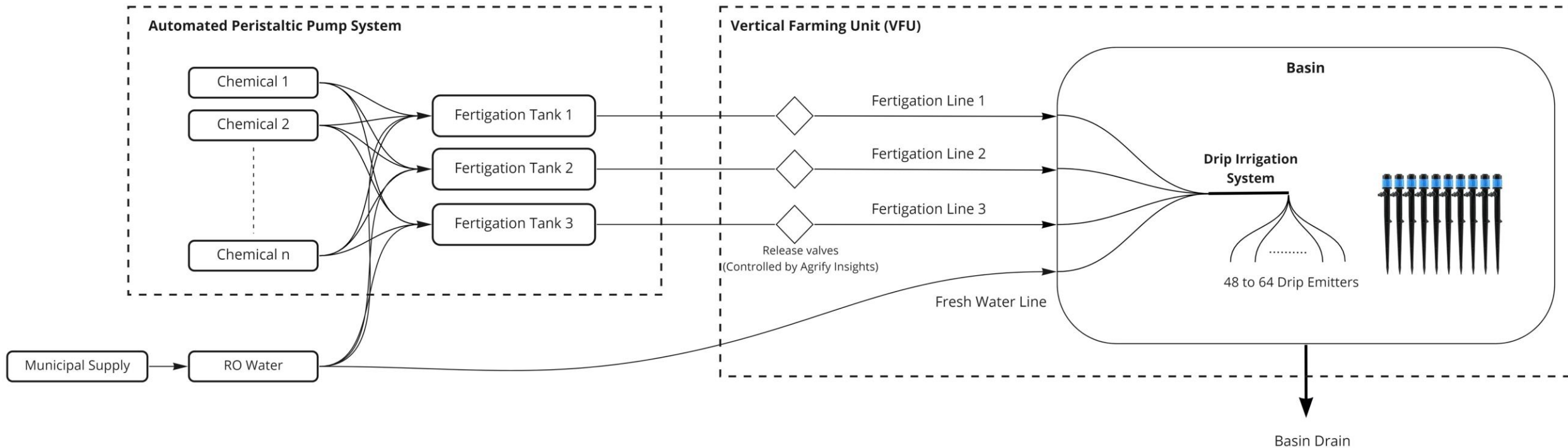
Product Specifications – Irrigation & Fertigation



- The process of loading various fertigation nutrients into the tanks through peristaltic pumps can be automated using the Autogrow® system.
- Agrify Insights integrates directly with the Autogrow® system to control the nutrient mix into the tanks.



Product Specifications – Irrigation & Fertigation



- The process of loading various fertigation nutrients into the tanks through peristaltic pumps can be automated using the Autogrow system.
- Agrify Insights integrates directly with the Autogrow system to control the nutrient mix into the tanks.

Product Specifications – Irrigation & Fertigation



(1) RO Water Line

Typical flow rate	1 GPH
Maximum flow rate	33 GPH
Flow Pressure	40 PSI

(3) Fertigation Mix Lines

Typical flow rate	1 GPH
Maximum flow rate	33 GPH
Flow Pressure	40 PSI

Product Specifications – Water Consumption

Please refer to Agrify for estimated water consumption calculations

Below are estimates through Agrify's consumption calculator

Note:

- A good estimate for typical water consumption is that 20% of VFUs will be in vegetation and 80% in flowering stage at any given time
- Please note that these are **estimates only**.
- Water consumption would be at the highest if all 10 VFUs are in the same vegetative stage simultaneously.

Total Approximate Water Consumption:

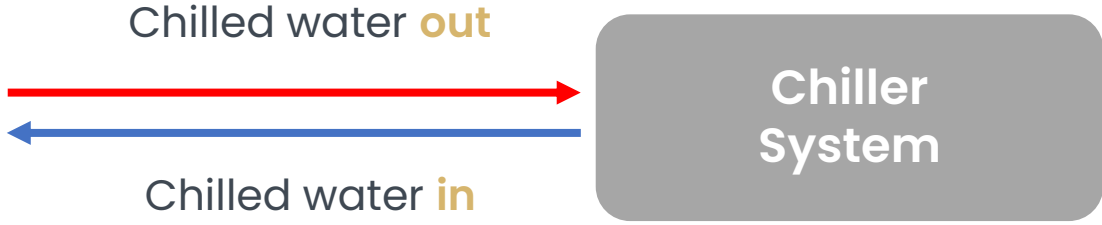
245 gpd (Typical)

325 gpd (Veg Only)

Product Specifications – Chiller

- Temperature control functionality in a VFU occurs through a chilled water system.
- Chilled water lines need to be insulated to maintain the water temperature.

Chiller sizing:
1.5-ton chiller per VFU including buffer



Typical flow rate	2.8 GPM
Maximum flow rate	3.4 GPM
Temperature set point	44°F

Product Specifications – Ambient Requirements

- Normal operation of VFUs require them to be placed in an environmentally conditioned room.
- While most of the heat generated by VFUs is removed by the chilled water system, some residual heat is released into the room that needs to be considered during facility HVAC sizing.

Facility HVAC Sizing Requirements:

- VFUs would need to be in an environment of 68F (+/-4F) & 50% RH (+/-5%) for normal operation
- 1 ton of cooling is required per every 0.75 sqft of floor area to compensate for the heat released from VFUs
- Additionally, the room should be conditioned per ASHRAE 55 Manual N requirements for standard human comfort at 1 ton of cooling required per every 350 sqft of floor area, or corresponding measurement required to match the ambient VFU temperature & relative humidity requirements

Product Specifications – Data



- All data collected by Agrify Insights is hosted on Amazon Web Services.
- In case of network outages, data is stored locally in the VFU and is uploaded back to the cloud upon reconnection.
- Bandwidth requirements: 100 Mbps or higher.

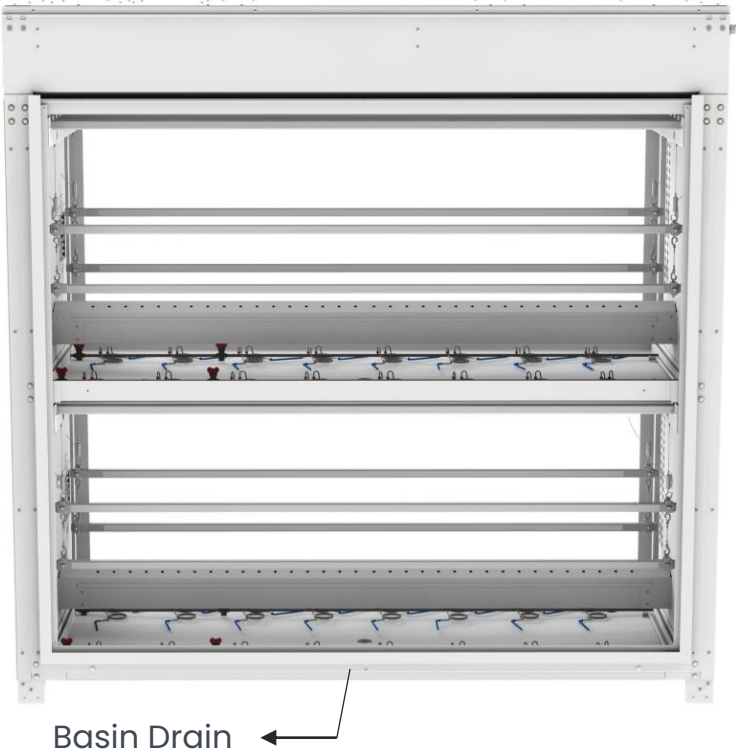
→ All VFUs need an RJ45 CAT5/6 ethernet connection

Product Specifications – Drain

Flow rate <i>per drain</i>	
Typical flow rate	Varies with usage ~10% of fertigation
Maximum flow rate	2 GPH

There are two drain locations per VFU as shown below:

- **Condensate drain** – Residual waste from dehumidification. Typically re-used for irrigation after the water treatment process
- **Basin drain** – Residual waste from irrigation & fertigation. Refer to local laws on how to handle residual waste from the basin drain. Some regulations require the user to treat the wastewater before it can be released to the sewer.



Note: Typical flow rate from the drains vastly varies with usage. Maximum flow rate of 2GPH per drain shown here is **not a constant flow throughout the day** and is only shown for sizing the plumbing connections appropriately.

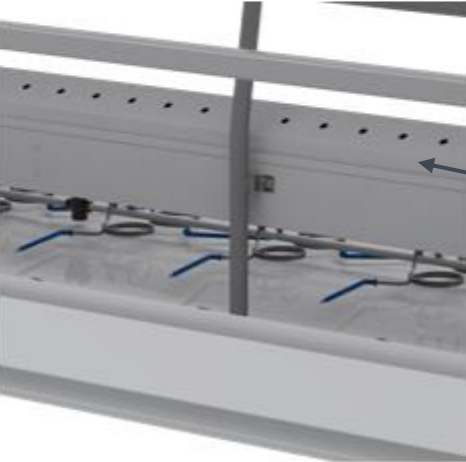
Product Specifications – Drain

- Upper basin drain is connected to the lower basin drain through a pipe as shown in the reference pictures below.

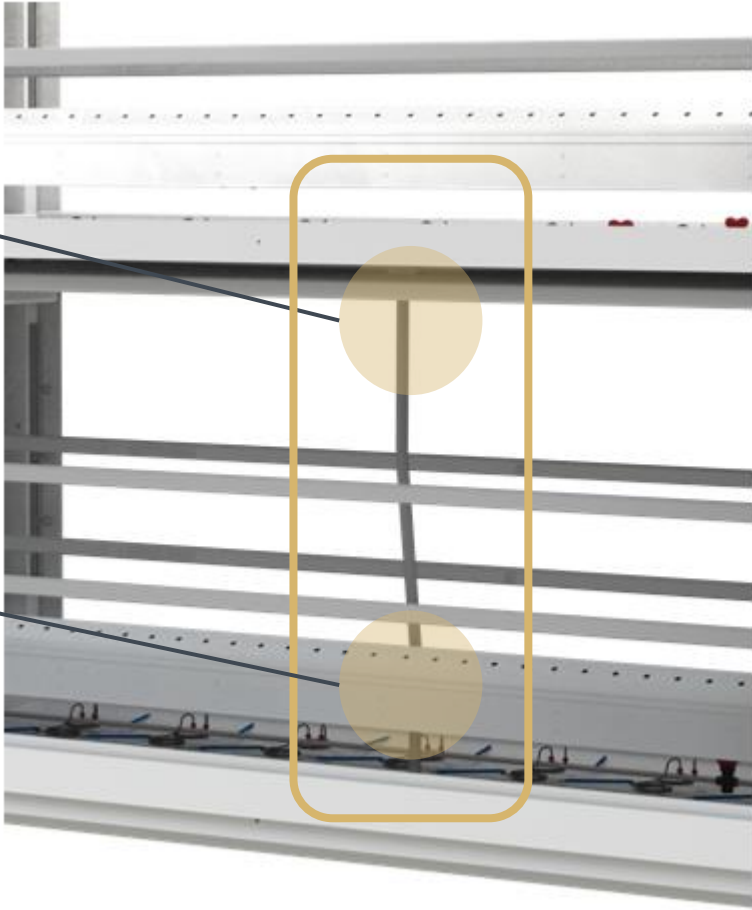
Plumbing connection under the upper basin



Plumbing connection to the bottom basin



(Pipe is not physically connected to the lower basin drain)



Product Specifications – Drain

- In a multiple VFU setup, the basin and condensate drains would need to be connected as shown here.
- The 10-VFU package is designed such that all the drainage either goes through a trench system or goes to a central sump tank that will need to be connected to the facility's drain collection system. Further details shown on later pages.



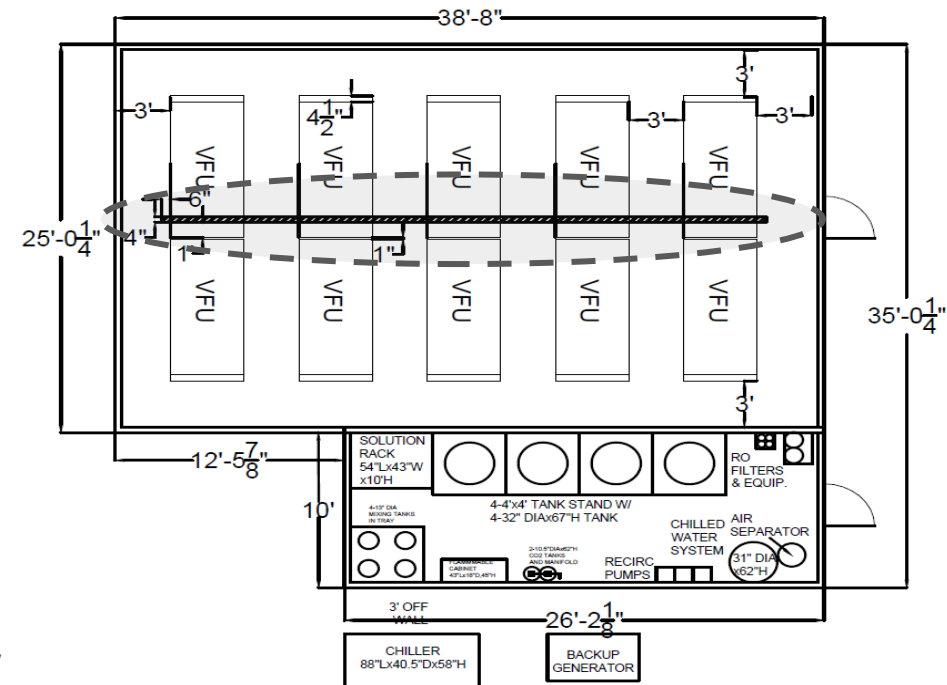
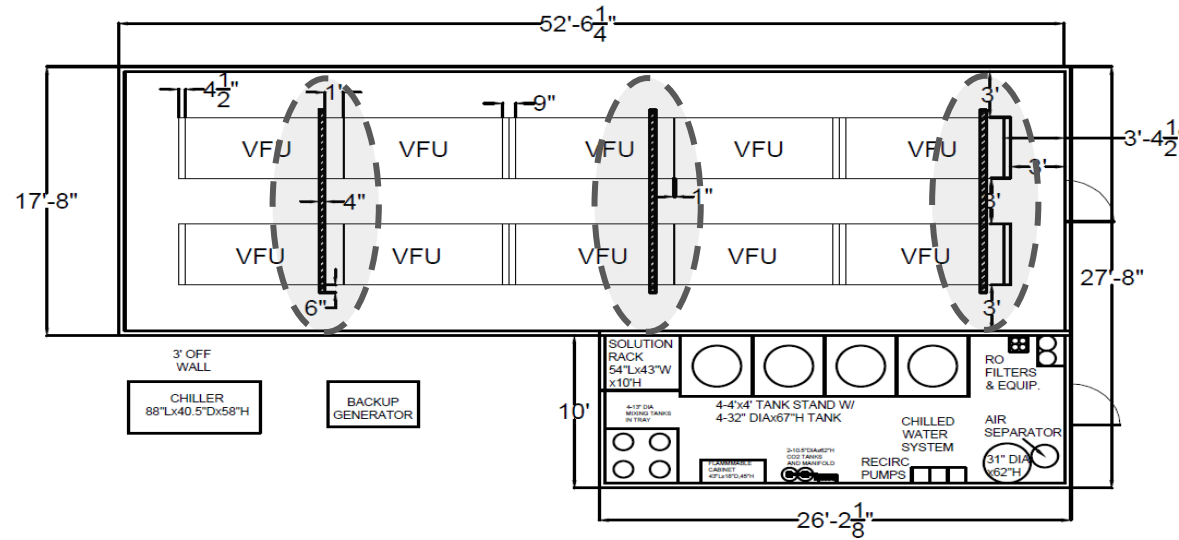
Estimated Total Wastewater: 47gpd (Typ) & 60gpd (Max)

Estimated Total Condensate Drain: 220 gpd

Product Specifications – Drain

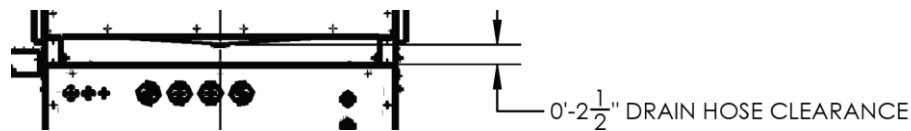
Option 1:

- Trench drain system under the VFUs, located in the highlighted sections shown below
- Agrify needs to be consulted for any deviations to this trench locations



VFU Drain Location Clearance

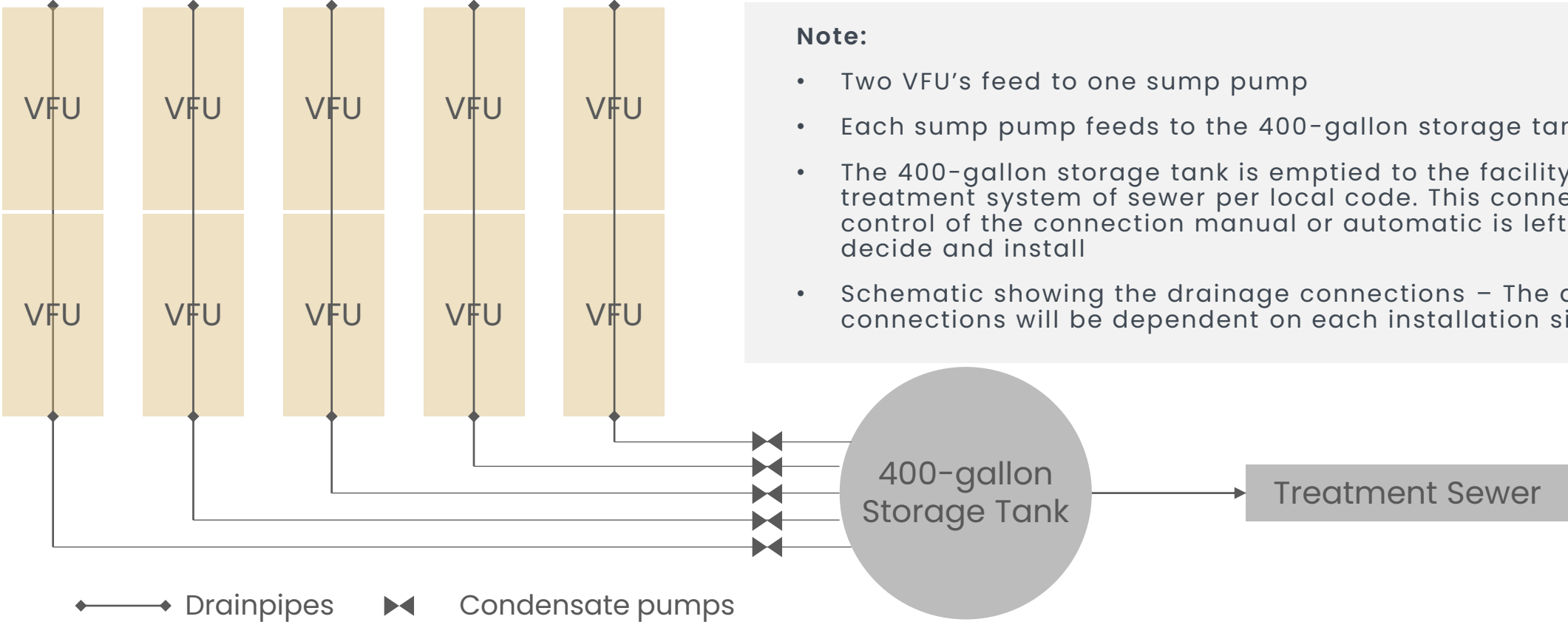
- VFUs have a 2.5" clearance for drain piping, as shown in the section below



Product Specifications – Drain

Option 2:

- All drain connections are connected to sump pumps and a central storage tank, that would need to be connected to the facility’s sewer handling system.



Note:

- Two VFU’s feed to one sump pump
- Each sump pump feeds to the 400-gallon storage tank
- The 400-gallon storage tank is emptied to the facility waste treatment system of sewer per local code. This connection and control of the connection manual or automatic is left to the owner to decide and install
- Schematic showing the drainage connections – The actual path of connections will be dependent on each installation site

Product Specifications – CO₂

VFU Interior Volume

308 cu ft.

CO₂ per VFU (Typical)¹

1100 ppm

CO₂ Consumption Total

22.3 lbs. per day

CO ₂ Line Ratings	40 PSI & 1.1 SCFM
CO ₂ Consumption per day (VFUs) ²	180.29 cu ft.
CO ₂ Consumption per day (Room) ³	14.52 cu ft.
CO ₂ Consumption per day (Total)	194.8 cu ft. or 22.3 lbs.

Assumptions:

¹ Nominal plant target is ~1500 ppm with ambient air at ~400 ppm

² CO₂ will last at enriched level for approximately 2 hours

³ Room size modeled at 55' x 20' x 12'

Note:

VFU curtains are not designed to be airtight, resulting in air exchange with the ambient room. As ambient CO₂ increases, the amount that is needed to be added to the VFUs will decrease.

Each VFU is managed by Agrify Insights software, which can partition the facility into zones and then using time division, manage max demand in a zone. This leasing mechanism is designed to limit the number of VFUs flowing CO₂ at any one time.

Hardware Component Breakdown

Note:
Plumbing materials for piping, valves and connections are not included in this package and are covered under the construction setup.

Components Included in the 10-VFU Package		Quantity	Description
VFU Assemblies		10	Agrify's Vertical Farming Unit assemblies
Chiller System	Chiller (20-ton)	1	A chiller is required to regulate the VFU temperature and minimize heat released into the ambient environment
	Storage Tank (119 gal)	1	
	Expansion Tank (7.4 gal)	1	
	Recirculation/Booster Pumps	2	
Fertigation/PAA Flush Package	Fill Tanks (160 gal)	3	VFUs have three inputs to deliver fertigation mix to the plants. While two of the inputs are typically used to deliver fertigation mix, the third input can be used either to deliver either fertigation mix or as a PAA flush system.
	Tank Stands (160 gal)	3	
	Concentrate Tanks (15 gal)	3	
	Recirculation/Booster Pumps	3	
	Autogrow Dose System	3	
RO Water Package	RO Water System	1	VFUs have a dedicated line for RO water to provide humidification in the system.
	Fill Tanks (160 gal)	1	
	Tank Stands (160 gal)	1	
	Recirculation/Booster Pumps	1	
Drain Package	Sump Pumps	5	This system includes a drain collection system from the VFU's condensation and basin drains that can be connected to the facility's drain collection system
	Storage Tank (400 gal)	1	
CO₂	CO ₂ Alarm System	1	CO ₂ tanks are not included in the package per the assumption that customer has an existing CO ₂ connection in the facility
Data/Network Package	24-port Data Switch	1	This system includes a network connection package, with more configuration details shown in the later slides. CAT 5/6 cables are not included in this package.
	Mounting Rack	1	
	Uninterrupted Power Supply	1	
	Unified Security Gateway	1	

Construction Breakdown

Package	Description
<p>Plumbing</p>	<p>Includes the following:</p> <ul style="list-style-type: none"> • Plumbing connections from the fertigation, RO tanks to the VFUs. • Plumbing connections from the chiller system • Dosing and mixing connections for the fertigation supply system • RO water connections for the RO filtration system
<p>Electrical</p>	<p>Includes adding electrical connections for each VFU, chiller system and automated fertigation pump system.</p> <p>Assumes the facility has an existing house panel with the required breakers to support the 10-VFU package’s electrical requirements.</p>
<p>Data</p>	<p>Includes pulling CAT5/6 data connections from the facility’s network hub.</p> <p>Assumes the facility has an existing network infrastructure to support the 10-VFU bandwidth requirements.</p>
<p>CO2</p>	<p>Includes the installation of a CO2 monitoring and detection system with multiple sensors placed across the room.</p>
<p>Installation & Commissioning</p>	<p>Includes installing and commissioning the VFU assemblies to be ready for operation</p>

Note:
 This package only includes the construction required for the VFU operation. Any facility level construction items are not included here.



AGRIFY™

10-VFU Equipment List

Hardware Component Breakdown

Note:
Plumbing materials for piping, valves and connections are not included in this package and are covered under the construction setup.

Components Included in the 10-VFU Package		Quantity	Description
VFU Assemblies		10	Agrify's Vertical Farming Unit assemblies
Chiller System	Chiller (20-ton)	1	A chiller is required to regulate the VFU temperature and minimize heat released into the ambient environment
	Storage Tank (119 gal)	1	
	Expansion Tank (7.4 gal)	1	
	Recirculation/Booster Pumps	2	
Fertigation/PAA Flush Package	Fill Tanks (160 gal)	3	VFUs have three inputs to deliver fertigation mix to the plants. While two of the inputs are typically used to deliver fertigation mix, the third input can be used either to deliver either fertigation mix or as a PAA flush system.
	Tank Stands (160 gal)	3	
	Concentrate Tanks (15 gal)	3	
	Recirculation/Booster Pumps	3	
	Autogrow Dose System	3	
RO Water Package	RO Water System	1	VFUs have a dedicated line for RO water to provide humidification in the system.
	Fill Tanks (160 gal)	1	
	Tank Stands (160 gal)	1	
	Recirculation/Booster Pumps	1	
Drain Package	Sump Pumps	5	This system includes a drain collection system from the VFU's condensation and basin drains that can be connected to the facility's drain collection system
	Storage Tank (400 gal)	1	
CO₂	CO ₂ Alarm System	1	CO ₂ tanks are not included in the package per the assumption that customer has an existing CO ₂ connection in the facility
Data/Network Package	24-port Data Switch	1	This system includes a network connection package, with more configuration details shown in the later slides. CAT 5/6 cables are not included in this package.
	Mounting Rack	1	
	Uninterrupted Power Supply	1	
	Unified Security Gateway	1	


Chiller System – Chiller

Manufacturing	Carrier
Type	AquaSnap 20-ton Air-Cooled Chiller
Model	30RAP0206D-02100
Product Web Link	https://www.carrier.com/marine-offshore/en/worldwide/products chillers/30rap/
Product Info Sheet	 <p>Adobe Acrobat Document</p>

Mark For	Qty	Model Number	Description
CH-1	1	30RAP0206D-02100	Carrier Air Cooled Chiller The following items are included: <ul style="list-style-type: none"> • Voltage: 460-3-60 • Unit Size: 20 Tons • Evaporator Heater • MCHX Condenser Coils • Digital Scroll Compressors • Fixed Speed Condenser Fan • Low Sound • Single Point Power • CCS Startup • 1st-Year Complete Unit Parts-Only Warranty, ending (12) months from start-up or (18) months from date of shipment, whichever occurs first. • Compressor Parts Only Warranty Years 2-5
CH-1	1	30RA-900---065	Wind Baffle Field Installed By Others (Required For Low Ambient Operation)
CH-1	1	38AP-900---021	MotomasterV Low Ambient Controller
CH-1	1	38AP-900---022	Energy Management Module (EMM)
CH-1	1	33CNTRAN485-01-R	Carrier Bacnet Translator
CH-1	1	30RA-900---058	Convenience Outlet Kit



Chiller System – Storage Tank

Manufacturing	State Industries
Type	119-gallon jacketed storage tank
Model	PVG-0120-0OVT
Product Web Link	https://www.statewaterheatersme.com/product/industrial-storage-tank-pvg/
Product Info Sheet	 <p>Adobe Acrobat Document</p>


SPECIFICATIONS

Model	Nominal Gallon Capacity	ASME	Standard Working Pressure	Approx. Ship. Wt.	Refer to Figure	Dimensions In Inches						
						A	B	C	D	E	F	G
PVG 0080 OOVTA125 - Jacketed Vertical Only	80	No	150	236	1	63½	25½	16	44½	3½	2	—
PVG 0120 OOVTA125 - Jacketed Vertical Only	119	No	150	320	3	62	29½	4½	6½	54	2	42
PVG 0080 OOVTA125	80	Yes	150	369	2	50½	25¼	10¾	42¾	9¾	2	—
PVG 0120 OOVTA125	120	Yes	150	411	4	63¼	28	11	6½	55¾	2	44½
PVG 0200 OOVTA125	175	Yes	150	560	5	77	32	12	6	63½	2½	—

Model #	Gal	Cap	A Dim	B Dim	Weight
PVG 0080 OOVTA125 - Jacketed Vertical Only	80	1.74	63-1/2	25-1/2	236
PVG 0120 OOVTA125 - Jacketed Vertical Only	119	3.00	62	29-1/2	320
PVG 0080 OOVTA125	80	-	50-1/2	25-1/4	369
PVG 0120 OOVTA125	120	-	63-1/4	28	411
PVG 0200 OOVTA125	175	-	77	32	560

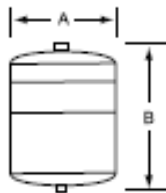


Chiller System – Expansion Tank

Manufacturing	Amtrol
Type	Extrol EX-60 7.4-gallon Inline
Model	EX-60
Product Web Link	https://www.amtrol.com/product/extrol-hydronic-expansion-tanks/
Product Info Sheet	 Adobe Acrobat Document



EX Series Specifications							
Model Number	Tank Volume (Gallons)	Max. Acceptance Factor (Gallons)	A Diameter (Inches)	B Height (Inches)	System Connection (NPTM)	Shipping Weight (lbs.)	
EX-15	2.0	1.0	8	13	1/2"	5	
EX-30	4.4	2.5	11	15	1/2"	9	
EX-60	7.4	2.5	11	23	1/2"	14	
EX-90	14.0	11.3	15	21	1/2"	23	



Chiller System – Recirculation / Booster Pumps


Manufacturing	Grundfos
Type	MAGNA3 Circulator Pump
Model	MAGNA3 40-180F 216 (PN: MAGNA3 40-180F 216)
Product Web Link	https://product-selection.grundfos.com/us/products/magna-north-america/magna3-north-america/magna3-40-180-f-98126836?tab=variant-curves
Product Info Sheet	 <p>Adobe Acrobat Document</p>

Specifications

Product name	MAGNA3 40-180 F	Installation	
Product No.	98126836	Range of ambient temperature	32 .. 104 °F
EAN	5710629499981	Maximum operating pressure	174.05 psi
Technical		Flange standard	GF
Rated flow	62.1 US gpm	Pipe connection	GF15/26/40/43
Rated head	31.5 ft	Pressure stage	PN12
Head max	59.06 ft	Port-to-port length	8 9/16 in
TF class	110	Liquid	
Approvals on nameplate	98544605	Pumped liquid	Water
Model	D	Liquid temperature range	14 .. 230 °F
Materials		Selected liquid temperature	140 °F
Pump housing	Cast iron	Density	61.35 lb/ft ³
	EN-GJL-250	Electrical data	
	ASTM A48-250B	Power input - P1	16 .. 600 W
Impeller	PES 30%GF	Main frequency	60 Hz
		Rated voltage	1 x 208-230 V
		Maximum current consumption	0.18 .. 2.65 A
		Enclosure class (IEC 34-5)	X4D
		Insulation class (IEC 85)	F



Fertigation System – Fill Tank


Manufacturing	Norwesco
Type	160-gallon 45-degree Cone Bottom Tank
Model	43845
Product Web Link	https://norwesco.com/products/above-ground-tanks/cone-bottom
Product Info Sheet	 <p>Adobe Acrobat Document</p>

Cone Bottom Tanks									
Gallon Capacity	Diameter	Overall Height	Slope	Fill Opening	Outlet/Drain Spec	Premium Weight Part No. White	Avail	Heavy Weight Part No. Blue	Avail
*125 w/stand	48"	41"	15°	8"-(63480)	2"-(60405) 2" street elbow (62199)	43161	B	NA	-
160	36"	52"	45°	16"-(63485)	2"-(60405)	43845	I	NA	-

2-inch threaded outlet with translucent molded liner



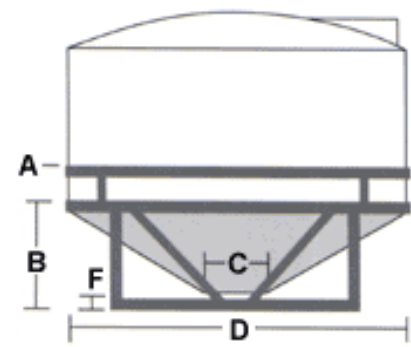
Fertigation System – Fill Tank Stand

Manufacturing	Norwesco
Type	160-gallon 45-degree Cone Bottom Tank Stand
Model	63932
Product Web Link	https://norwesco.com/products/above-ground-tanks/cone-bottom-stands
Product Info Sheet	 <p>Adobe Acrobat Document</p>

Steel Cone Bottom Stands

Norwesco cone bottom stands are manufactured from structural steel and offer a full dish for uniform support.

Steel Cone Bottom Stands						
Gallon Capacity	A	B	C	D	F	Part No.
160 - 45°	NA	29"	7"	43"	15"	63932



Fertigation System – Concentrate Drums

Manufacturing	ULINE
Type	15 Gallon Open Top Blue Drum with Lid
Model	S-24088
Product Web Link	https://www.uline.com/Product/Detail/S-24088/Drums/Plastic-Drum-with-Lid-15-Gallon-Open-Top-Blue
Product Info Sheet	<p>DIMENSIONS:</p> <ul style="list-style-type: none">• Diameter:<ul style="list-style-type: none">◦ Lid (Outside- Including Metal Band): 14 7/8"◦ Drum (Outside):<ul style="list-style-type: none">▪ Opening: 14 1/2"▪ Bottom: 12 3/4"◦ Drum (Inside):<ul style="list-style-type: none">▪ Opening: 14 1/8"▪ Bottom: 12 1/2"• Height:<ul style="list-style-type: none">◦ Drum With Lid: 27 3/4"◦ Drum Only (Outside): 27 1/2"◦ Drum Only (Inside): 27 1/4"◦ Each nested drum adds 11" to height. <p>THICKNESS:</p> <ul style="list-style-type: none">• Minimum: 2.2 mm <p>MATERIAL:</p> <ul style="list-style-type: none">• Lid & Drum: HDPE (High Density Polyethylene)• Lever Lock Ring: Galvanized steel <p>TEMPERATURE:</p> <ul style="list-style-type: none">• 0° - 120° F <p>COMPATIBILITY:</p> <ul style="list-style-type: none">• Compatible with H-1552 Drum Plug Opener. <p>FEATURES:</p> <ul style="list-style-type: none">• Openings:<ul style="list-style-type: none">• Caps are not vented.• Urethane rubber gasket to keep out moisture.• (1) 3/4" Fine/NPS threading• (1) 2" Fine/NPS threading <p>RECYCLING:</p> <ul style="list-style-type: none">• Recycling Code: #2• If local recycling center does not take drum:<ul style="list-style-type: none">◦ US/CAN:<ul style="list-style-type: none">▪ National Container (National Recycling Center) at 1-800-774-6956.◦ Mexico:<ul style="list-style-type: none">▪ National Container (National Recycling Center) at 800-774-6956.



Fertigation System – Recirculating / Booster Pumps

Item IX. A.

Manufacturing	Grundfos
Type	SCALA2 Booster Pump
Model	3-45 A (P/N: 98562818)
Product Web Link	https://product-selection.grundfos.com/us/products/scala/scala2/scala2-3-45-98562818?tab=variant-curves

Product Info Sheet



Adobe Acrobat Document

Product name	SCALA2 3-45 A	Installation	
Product No.	98562818	Range of ambient temperature	32 .. 113 °F
EAN	5711497233875	Maximum operating pressure	145 psi
Technical		Maximum permissible inlet pressure	87 psi
Rated flow	13.2 US gpm	Type of inlet connection	NPT(M)
Rated head	88.59 ft	Type of outlet connection	NPT(M)
Head max	147.6 ft	Size of suction port	1 inch
	147.6 ft	Size of outlet port	1 inch
Primary shaft seal	CARBON/CERAMIC	Pressure rating for connection	PN 10
Approvals	CULUS	Liquid	
Approvals for drinking water	cULus NSF372,cULus DW NSF61	Pumped liquid	Water
Curve tolerance	ISO9906:2012 3B	Liquid temperature range	32 .. 113 °F
Model	A	Selected liquid temperature	68 °F
Materials		Density	62.29 lb/ft³
Pump housing	Composite	Electrical data	
Pump	NORYL FE1630PW PPE+PS-GS30	Power input - P1	550 W
Impeller	Composite	Rated power - P2	0.603 HP
	NORYL FE1630PW PPE+PS-GS30	Main frequency	60 Hz
Material code	A	Rated voltage	1 x 115 V
		Rated current	4.9 A
		Enclosure class (IEC 34-5)	ENCLOSURE TYPE 3
		Insulation class (IEC 85)	F
		Length of cable	6.56 ft
		Power plug	Type B (NEMA 5-15) US plug 115V



Fertigation System – Autogrow Dosing

Item IX. A.

Manufacturing	Autogrow
Type	3 components – IntelliDose Kit, IntelliLink Kit, peristaltic pumps
Model	HKIT-ID-001-03 IntelliDose kit HACC-ILINK-001-01 Intellilink Kit HPMP-SING-002-01 peristaltic pump kit
Product Web Link	https://autogrow.com/products/intellidose-system https://autogrow.com/products/intellilink https://shop.autogrow.com/products/peristaltic-pump
Product Info Sheet	

IntelliDose specs

- > 9 outputs 24VDC
- > Nutrient measurement units EC, CF or TDS (500/640/700)
- > Measured range 0.00 to 9.99EC, 0.1 to 99.99CF, 0 to 7000PPM
- > Nutrient resolution to .01mS/cm, 0.1CF
- > Nutrient measurement accuracy +/-0.1EC, 1.0CF or 10PPM - Temperature compensated
- > Nutrient dosing range 0.00 to 5.99EC, 0.1 to 59.9CF, 0 to 4200PPM
- > pH resolution and accuracy - 0.1pH
- > pH measurement range 2pH to 12pH
- > pH dosing range 4.5 to 8 pH
- > Nutrient and pH dosing times settable from 1 second to 30 minutes
- > Dosing interval settable from 0 minutes (continuous dosing) to 244 minutes
- > Sequential dosing to prevent power surges
- > Temperature resolution and accuracy 1C/2F
- > Temperature range 0-50C/32-125F
- > Operating temperature range 0-50C/32-125F (not in direct sunlight)
- > Power source - mains supplied 24VDC with 120V pigtail... specify if mains voltage and pin type vary
- > Outputs will have the same voltage as the supplied voltage from the power pack
- > Nutrient sensor using DiPulse™ technique to resist fouling
- > Dosing shut off:
 - > if nutrient is below 0.1EC, 1.0CF, 10PPM
 - > if pH is below 4.5 or above 8.0
 - > if dosing effect is counterintuitive (by dosing pH lower, the measured pH goes up)
 - > if sensor fault is detected
- > Supplied with 3m USB cable

Intellilink specs

Overview	Tech Specs	Videos	Reviews
Features			
Brand	Autogrow Systems		
SKU	HACC-ILINK-001-01		
Weight (lb.)	3		
Lead Time	This product ships in 48 hours		
Length (in.)	3.9		
Width (in.)	4.7		
Height (in.)	4.7		
Prop 65	No		
UL Listed	No		

Peristaltic pump specs

Tech specs:

- Rated at 350ml/min
- Runs on 24V DC
- Pressure roller (2H+2R)
- PP made NPT fitting x2
- 1500mm PVC tube x2
- ABS enclosure x1
- DC power wire with 200+1800mm(L)
- Autogrow Rating Label
- 0.25" in/out tubing



RO Water System – RO Generator

Manufacturing	Watts
Type	Frame mounted LC series, 380 GPD Reverse Osmosis System
Model	LC-380PP
Product Web Link	https://www.watts.com/products/water-quality-rainwater-harvesting-solutions/filtration-solutions/backwashing-systems/lc

Product Info Sheet

The LC Series is suitable for the following applications:

- Manufacturing
- Pharmaceutical
- Food Processing industries
- Shopping centers
- Schools
- Hotels

Overview:

- Light Commercial RO System
- Free Standing
- Rated for 380 GPD
- Membrane elements: 3
- Membrane Type: Thin Film
- Operation Pressure: 0-125 psi
- Operation temperature: 40-110 F

Standard Features:


- Powder coated frame made of light weight and rust proof aluminum alloy with U shaped bracket for better support.
- High rejection thin film membrane, typical rejection rate of 99%. Each membrane is 100 gpd @ 100 psi.
- Two 20" pre-treatment filters: 5 microns sediment and extruded carbon block.
- One 20" post treatment filter, standard coconut shell granular carbon.
- Stainless Steel liquid filled pressure gauge.
- Electrical shut-off valve to prevent clogging following the sediment filter.
- Low energy high flow booster pump with transformer: fills product tank faster and saves waste water.
- Aluminum rivets to provide durable tightness
- Stainless Steel check valve to prolong membrane life

Models

MODEL NO.	GPD	PUMP	STAGE 1	STAGE 2	STAGE 3	STAGE 4	CARTON DIMENSIONS	SHIP WT. (LBS.)
LC-200P-MINI	200	1	FPMB5-978	FI-CTO010	W-1812-100 (2)	S7708	21 X 21 X 10	40
LC-200P	200	1	FPMB5-20	FI-CTO020/2	W-1812-100 (2)	FI-GAC020HP	36 x 21 x 10	46
LC-300P	300	1	FPMB5-20	FI-CTO020/2	W-1812-100 (3)	FI-GAC020HP	36 x 21 x 10	48
LC-380PP	380	2	FPMB5-20	FI-CTO020/2	W-1812-100 (3)	FI-GAC020HP	36 x 21 x 10	53



RO Water System – Fill Tank


Manufacturing	Norwesco
Type	160-gallon 45-degree Cone Bottom Tank
Model	43845
Product Web Link	https://norwesco.com/products/above-ground-tanks/cone-bottom
Product Info Sheet	 <p>Adobe Acrobat Document</p>

Cone Bottom Tanks									
Gallon Capacity	Diameter	Overall Height	Slope	Fill Opening	Outlet/Drain Spec	Premium Weight Part No. White	Avail	Heavy Weight Part No. Blue	Avail
*125 w/stand	48"	41"	15°	8"-(63480)	2"-(60405) 2" street elbow (62199)	43161	B	NA	-
160	36"	52"	45°	16"-(63485)	2"-(60405)	43845	I	NA	-

2-inch threaded outlet with translucent molded liner



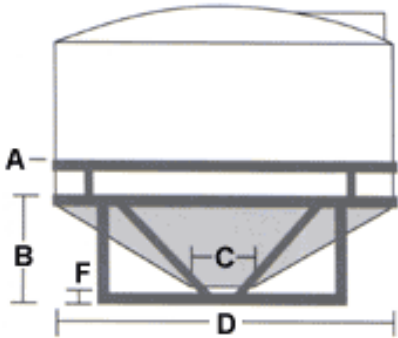
RO Water System – Fill Tank Stand

Manufacturing	Norwesco
Type	160-gallon 45-degree Cone Bottom Tank Stand
Model	63932
Product Web Link	https://norwesco.com/products/above-ground-tanks/cone-bottom-stands
Product Info Sheet	 <p>Adobe Acrobat Document</p>

Steel Cone Bottom Stands

Norwesco cone bottom stands are manufactured from structural steel and offer a full dish for uniform support.

Steel Cone Bottom Stands						
Gallon Capacity	A	B	C	D	F	Part No.
160 - 45°	NA	29"	7"	43"	15"	63932



RO Water System – Recirculating / Booster Pumps

Item IX. A.

Manufacturing	Grundfos
Type	SCALA2 Booster Pump
Model	3-45 A (P/N: 98562818)
Product Web Link	https://product-selection.grundfos.com/us/products/scala/scala2/scala2-3-45-98562818?tab=variant-curves

Product Info Sheet



Adobe Acrobat Document

Product name	SCALA2 3-45 A	Installation	
Product No.	98562818	Range of ambient temperature	32 .. 113 °F
EAN	5711497233875	Maximum operating pressure	145 psi
Technical		Maximum permissible inlet pressure	87 psi
Rated flow	13.2 US gpm	Type of inlet connection	NPT(M)
Rated head	88.59 ft	Type of outlet connection	NPT(M)
Head max	147.6 ft	Size of suction port	1 inch
	147.6 ft	Size of outlet port	1 inch
Primary shaft seal	CARBON/CERAMIC	Pressure rating for connection	PN 10
Approvals	CULUS	Liquid	
Approvals for drinking water	cULus NSF372,cULus DW NSF61	Pumped liquid	Water
Curve tolerance	ISO9906:2012 3B	Liquid temperature range	32 .. 113 °F
Model	A	Selected liquid temperature	68 °F
Materials		Density	62.29 lb/ft³
Pump housing	Composite	Electrical data	
Pump	NORYL FE1630PW PPE+PS-GS30	Power input - P1	550 W
Impeller	Composite	Rated power - P2	0.603 HP
	NORYL FE1630PW PPE+PS-GS30	Main frequency	60 Hz
Material code	A	Rated voltage	1 x 115 V
		Rated current	4.9 A
		Enclosure class (IEC 34-5)	ENCLOSURE TYPE 3
		Insulation class (IEC 85)	F
		Length of cable	6.56 ft
		Power plug	Type B (NEMA 5-15) US plug 115V



CO₂ Alarm System – Control Tablet

Manufacturing	CO2METER.COM
Type	8" Control Tablet
Model	CM7005
Product Web Link	https://www.co2meter.com/blogs/news/cm-7000-co2-multi-sensor-system-update-adds-new-sensor-groupings-features
Product Info Sheet	 <p>Adobe Acrobat Document</p>

CO₂ Multi-Sensor System Specifications

CO₂ Measurement Range	0-5% (0-50,000 ppm)
CO₂ Measurement	NDIR (Non-dispersive Infrared)
Alarms	5,000 TWA, 5,000 Instantaneous, 1.5%, 3% (fully customizable)
Measurement Interval	2 seconds (0.5 Hz)
Operating Temperature	32-122° F (0-50° C)
Calibration	Zero with Nitrogen or Factory Calibration
Connections	Input/Output/Strobe — CAT5 8-pin connector
Sensor Life Expectancy	>15 years

Electrical and Mechanical Specifications

Power Supply	110-220 VAC 50/60 Hz to 12 VDC power adapter
Power Input	4.5-5.25 VDC
Power Consumption	300 mA peak, 30 mA average
Horn Strobes	90-120 dB 3KHz, 110 cD



CO₂ Alarm System – CO₂ Sensor

Manufacturing	CO2METER.COM
Type	8" Control Tablet
Model	CM7003
Product Web Link	https://www.co2meter.com/blogs/news/cm-7000-co2-multi-sensor-system-update-adds-new-sensor-groupings-features
Product Info Sheet	 Adobe Acrobat Document

Sensor Specifications

- CO2 Measurement Range: 0-5% (400-50,000ppm)
- CO2 Measurement: Non Dispersive Infrared (NDIR)
- Sensor Reading Frequency: 0.5Hz
- Response time: 90% at 2 minutes
- Measurement Interval: 2 seconds
- Communication: UART Modbus
- Sensor Life Expectancy: > 15 years
- Maintenance Interval: no maintenance required
- Self-Diagnostics: complete function check on startup



CO₂ Alarm System – CO₂ Sensor

Manufacturing	CO2METER.COM
Type	Horn and Strobe add on
Model	CM7004
Product Web Link	https://www.co2meter.com/blogs/news/cm-7000-co2-multi-sensor-system-update-adds-new-sensor-groupings-features
Product Info Sheet	 Adobe Acrobat Document


Alarm Horn / Strobe

- Halogen Amber Lens Strobe
- Piezo Electric Horn
- Amber Lens Included
- Blue Lens Available for Purchase



Horn Strobe

Drainage System – Drainage Condensate Pumps

Manufacturing	Franklin Electric
Type	LittleGIANT VCCA-20ULS low-profile Condensate pump
Model	VCCA-20ULS
Product Web Link	https://www.littlegiant.com/products/condensate-removal-pumps/low-profile-condensate-pumps/vcca-20uls/
Product Info Sheet	 Adobe Acrobat Document

Features & Benefits

- 1/30 hp motor
- Float switch for automatic start/stop operation
- Safety switch
- 1/2-gallon tank capacity
- Motor thermal overload protection
- Low-profile condensate pump for small spaces



Drainage System – Storage Tank

Manufacturing	Snyder Industries
Type	400-gallon Plastic Horizontal Tank
Model	1350000C95003
Product Web Link	https://shop.snydernet.com/transport-tanks/400-gallon-white-plastic-horizontal-tank-snyder-1350000c95002.asp

Product Info Sheet




Adobe Acrobat Document

- Capacity: 400 Gal
- Diameter: 42 in
- Height: 42 in
- Weight: 99 lb
- Material: High Density Polyethylene (HDPE)
- Color: Natural
- Specific Gravity: 1.9 Heavy Duty



Data/Network System – Data Switch

Manufacturing	Ubiquiti Inc.
Type	UniFi Switch Pro 24 PoE data switch
Model	USW-Pro-24-PoE
Product Web Link	https://store.ui.com/collections/unifi-network-switching/products/usw-pro-24-poe
Product Info Sheet	 Adobe Acrobat Document


Features:

- (1) 1.3" LCM color touchscreen with AR switch management
- (16) GbE, 802.3at PoE+ RJ45 ports
- (8) GbE, 802.3bt PoE++ RJ45 ports
- (2) 10G SFP+ ports
- (1) USP RPS DC input
- 400W total PoE supply
- Near-silent cooling
- Layer 3 switching features

Managed with the UniFi Network application: Version 5.10.5 and later



Data/Network System – Power Supply

Manufacturing	Ubiquiti Inc.
Type	UniFi SmartPower USP-RPS Redundant Power System
Model	USP-RPS
Product Web Link	https://store.ui.com/collections/unifi-network-switching/products/usp-rps
Product Info Sheet	 Adobe Acrobat Document

Features:

- (6) USP DC output ports
- (1) GbE RJ45 port
- 1U-sized, rack-mountable device (kit included)
- 1.3" LCM color touchscreen that displays device status information
- (1) SmartPower Cable

Managed with the UniFi Network application: Version 5.12.11 and later



Data/Network System – Mounting Rack

Item IX. A.

Manufacturing	Dynotech
Type	DynoTech 9U - 600 x 450 x 500mm Wall Mount Rack Cabinet
Model	DYN-300705
Product Web Link	http://dynotechaudio.com/19-racks/wall-mount-rack-cabinet-9u-with-fan-black.html
Product Info Sheet	

Specifications:


Dimensions:	19" W x 24" L x 21" H
Included:	Pack of 10/32 Screws
Weight:	55 lbs

Features

- 600 x 450 x 500mm
- Key and Lock
- Tempered Glass Flat Door
- Single Section
- 2 L Styles
- 2 Fan Holes
- 1 Fan
- Pack of 10/32 Screws



Data/Network System – Security Gateway

Manufacturing	Dynotech
Type	USG Security Gateway
Model	USG
Product Web Link	https://store.ui.com/products/unifi-security-gateway
Product Info Sheet	 Adobe Acrobat Document

Model: USG

The USG features a compact form factor and fanless operation for discreet integration.

- (3) 10/100/1000 RJ45 Ports*
- (1) RJ45 Serial Console Port
- Quiet, Fanless Operation
- Wall-Mounting Capability
- Layer 3 Forwarding Performance
 - Packet Size of 64 Bytes: 1,000,000 pps
 - Packet Size of 512 Bytes or Larger: 3 Gbps (Line Rate)





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10-VFU R&D Pilot Connection-Layout Guide

Connection Layout Guide

[Document Link](#)



- **Plumbing (Fertigation/RO Water/CO2/Chilled Water)**
- **Plumbing Layout Plan (P2.0) Alternate Layout Plan (P2.1)**
- **Plumbing P&ID Plan (P2.2)**

- **Electrical**
- **Electrical Connection List**

- **Data/Networking**
- **Data Connection Schematic**

- **Drainage**
- **VFU Wastewater Drainage Schematic**

It will be the responsibility of the construction contractor to provide the actual piping and valves for connection of the various equipment pieces per the local plumbing codes.

It will be the responsibility of the construction contractor to provide the actual wiring connection of the various equipment pieces to supplies per the local electrical codes.

It will be the responsibility of the construction contractor to provide the Ethernet Cabling required to connect the VFU's to the customer servers/routers per the local electrical codes.

It will be the responsibility of the construction contractor to provide the piping and valves for connection of the VFU's to the wastewater collection tanks and the customer wastewater removal systems per the local plumbing codes.



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10 VFU
PROTOTYPE

REVISIONS:

Date	Description

FOR REVIEW

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Scale: 1/2"=1'-0"
Drawn By: JAC
Checked By: JAC
Date: 03/26/2023

PLUMBING
PLAN
LAYOUT 1

P2.0

CSI ENGINEERING LLC

PIPING LEGEND

	AG	ABOVE GROUND PIPING (SINGLE LINE)
	CW	COLD WATER PIPING
	HW	HOT WATER PIPING
	GG	GEON GENERATION
	CHWS	CHILLED WATER SUPPLY
	CHWR	CHILLED WATER RETURN
	CGS	CARBON DIOXIDE GAS
	RD	REVERSE OSMOSIS

GENERAL NOTES

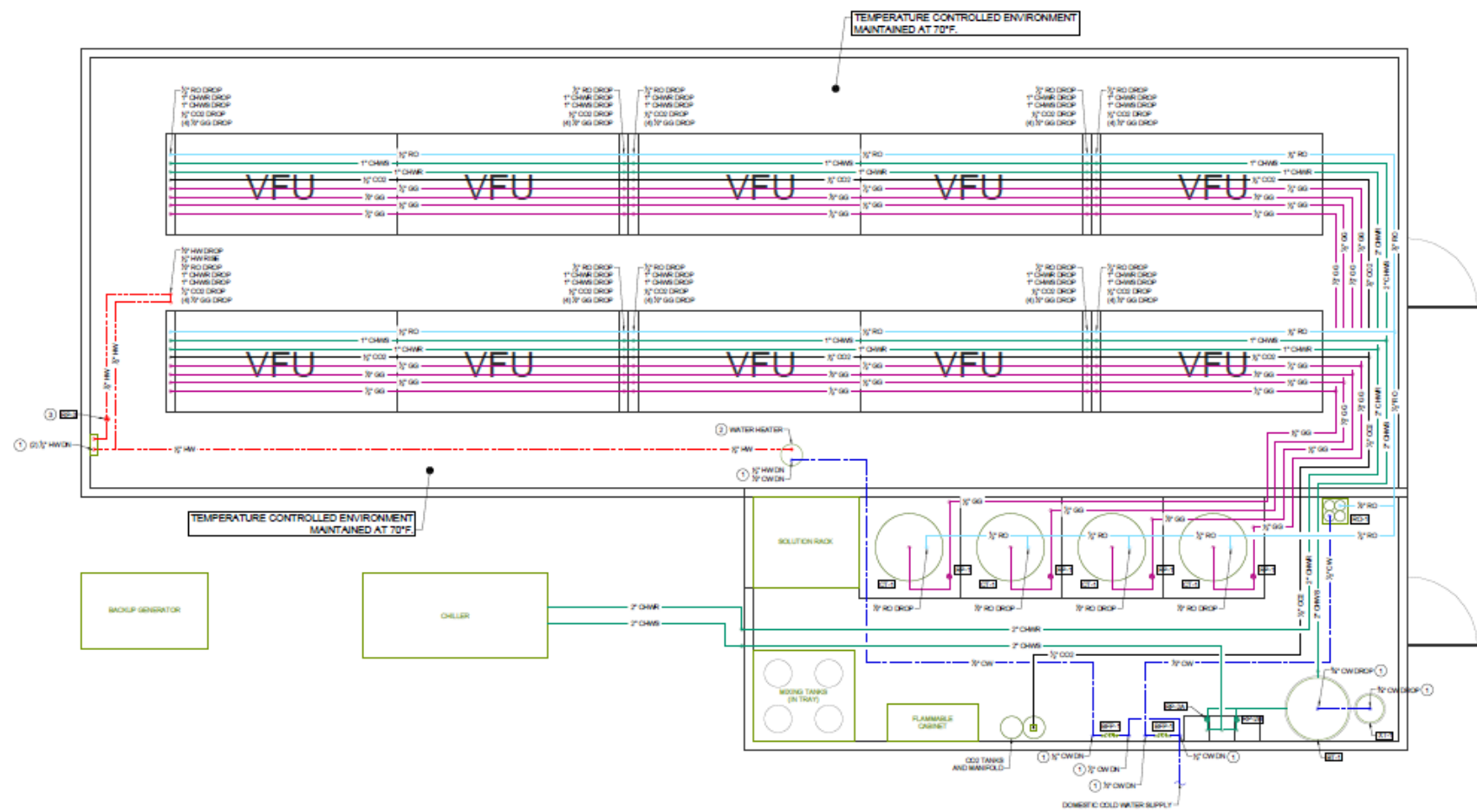
- REFER TO DRAWING P1.0 FOR GENERAL ASSUMPTIONS & GENERAL NOTES

PLAN NOTES

- VFUS TO BE LOCATED IN TEMPERATURE CONTROLLED ENVIRONMENT, MAINTAINED AT 70°F.

SHEET NOTES:

- ALL DOMESTIC COLD & HOT WATER CONNECTIONS BY FACILITY OPERATOR
- WATER HEATER AND ALL ASSOCIATED CONNECTIONS BY FACILITY OPERATOR
- HOT WATER RECYCLATORS PUMP #P-3 BY FACILITY OPERATOR



PLUMBING PLAN - LAYOUT 1
SCALE: 1/2"=1'-0"



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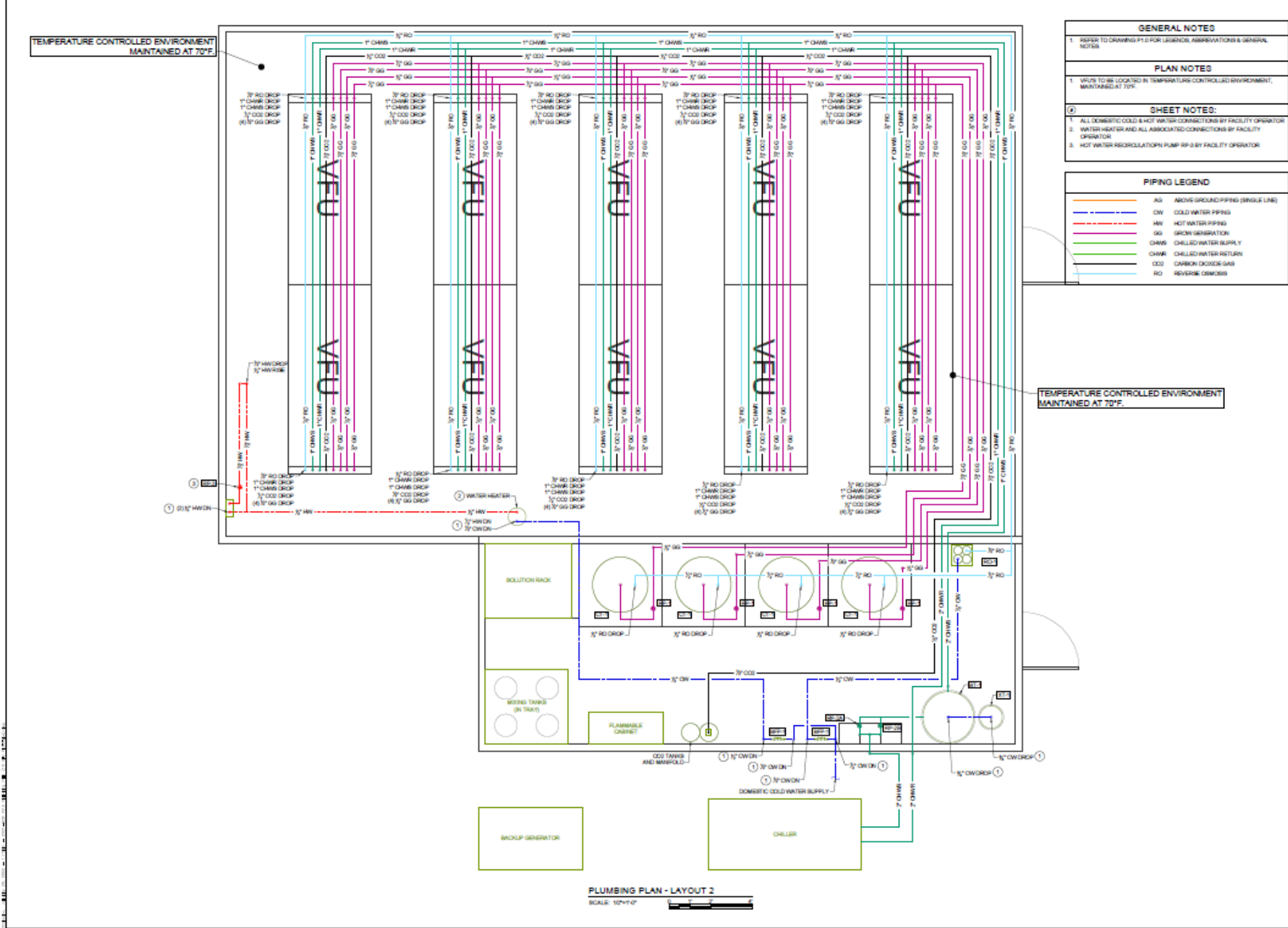
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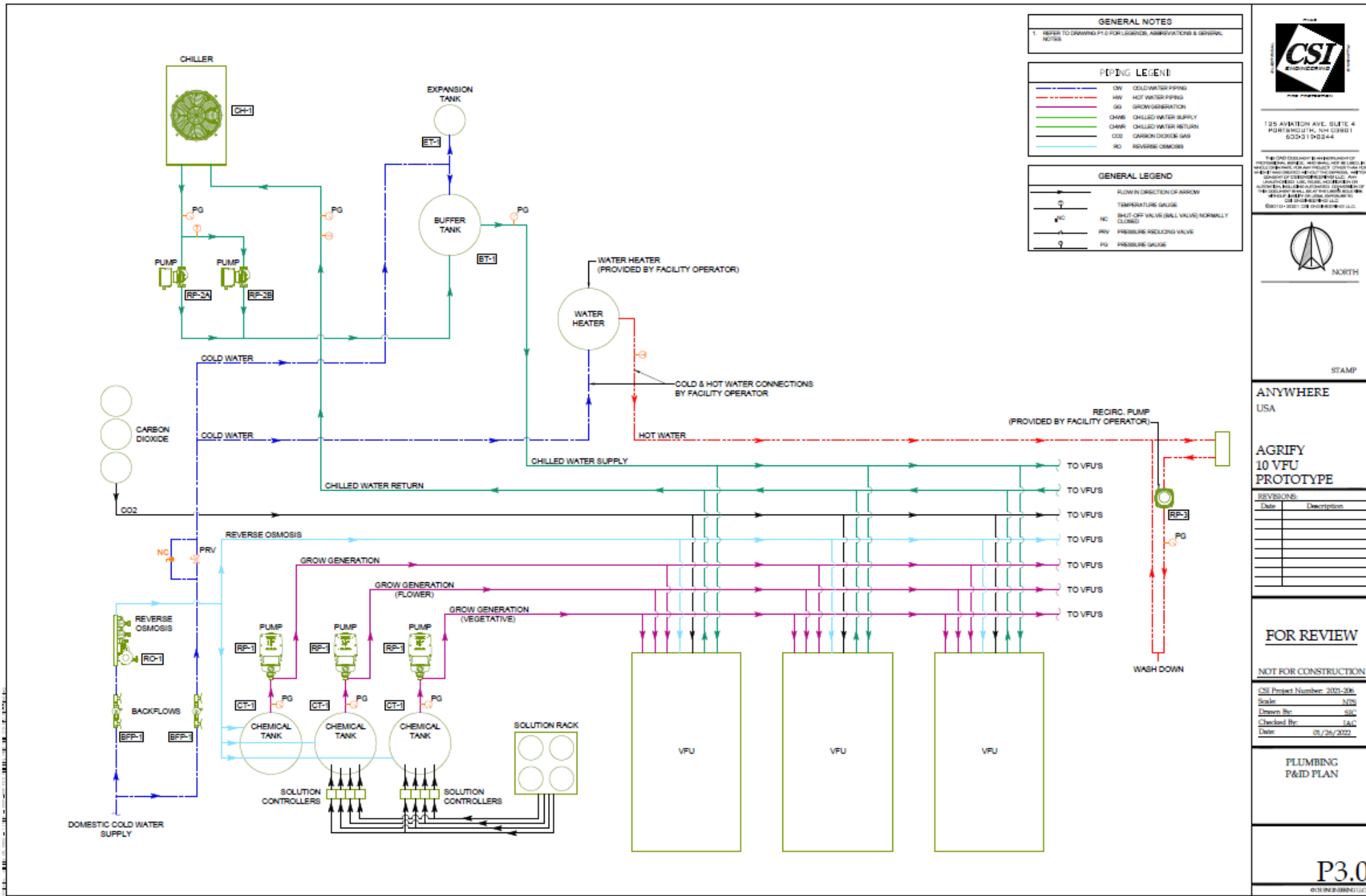
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PLUMBING
PLAN
LAYOUT 2

P2.1
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GENERAL NOTES

1. REFER TO DRAWING P&ID FOR LEGENDS, ABBREVIATIONS & GENERAL NOTES.

PIPING LEGEND

- CW — COLD WATER PIPING
- HW — HOT WATER PIPING
- GG — GROW GENERATION
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- CG — CARBON DIOXIDE GAS
- RO — REVERSE OSMOSIS

GENERAL LEGEND

- FLOW IN DIRECTION OF ARROW
- ⊖ TEMPERATURE GAUGE
- ⊕ BALL-OFF VALVE (BALL VALVE) NORMALLY CLOSED
- PRV PRESSURE REDUCING VALVE
- PG PRESSURE GAUGE



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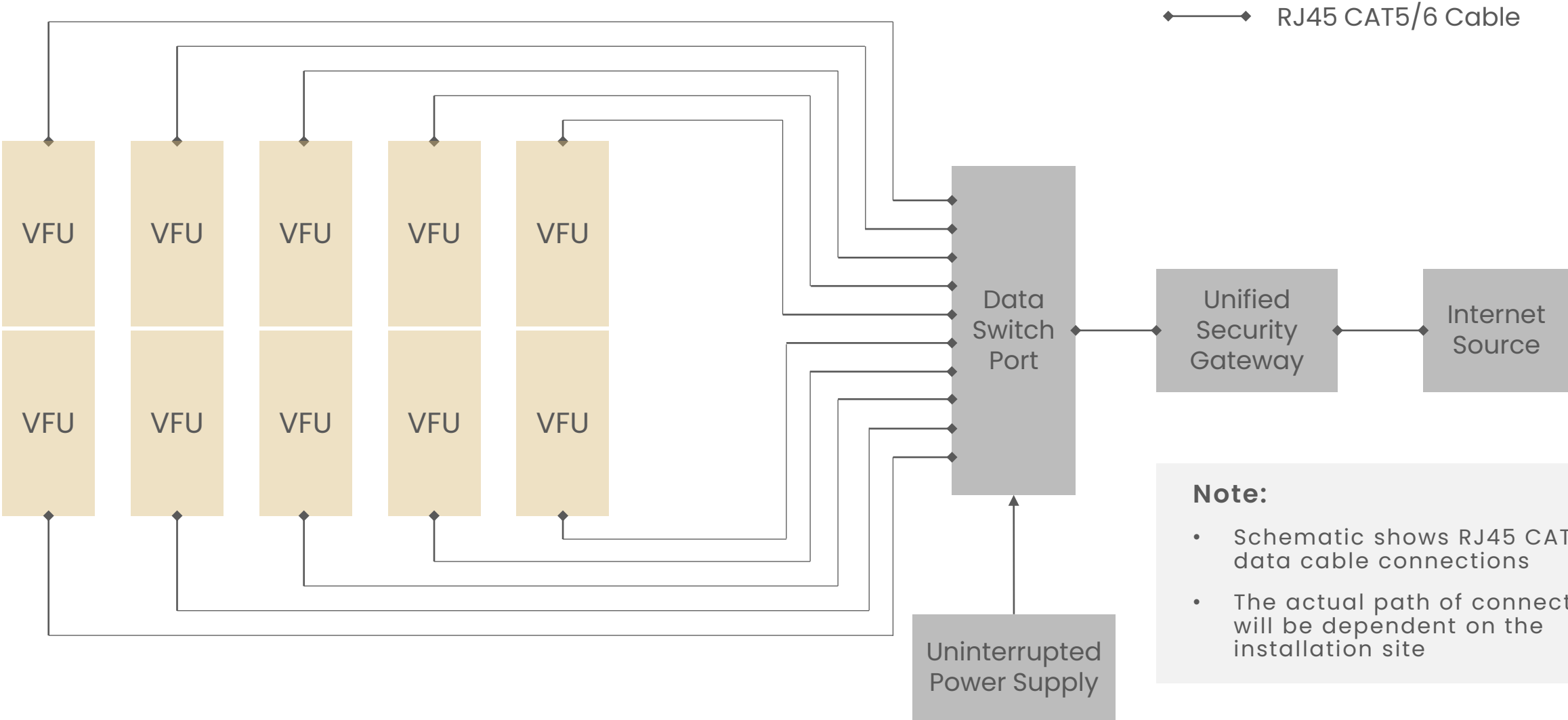
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PLUMBING
 P&ID PLAN

P3.0

Data/Network Connections

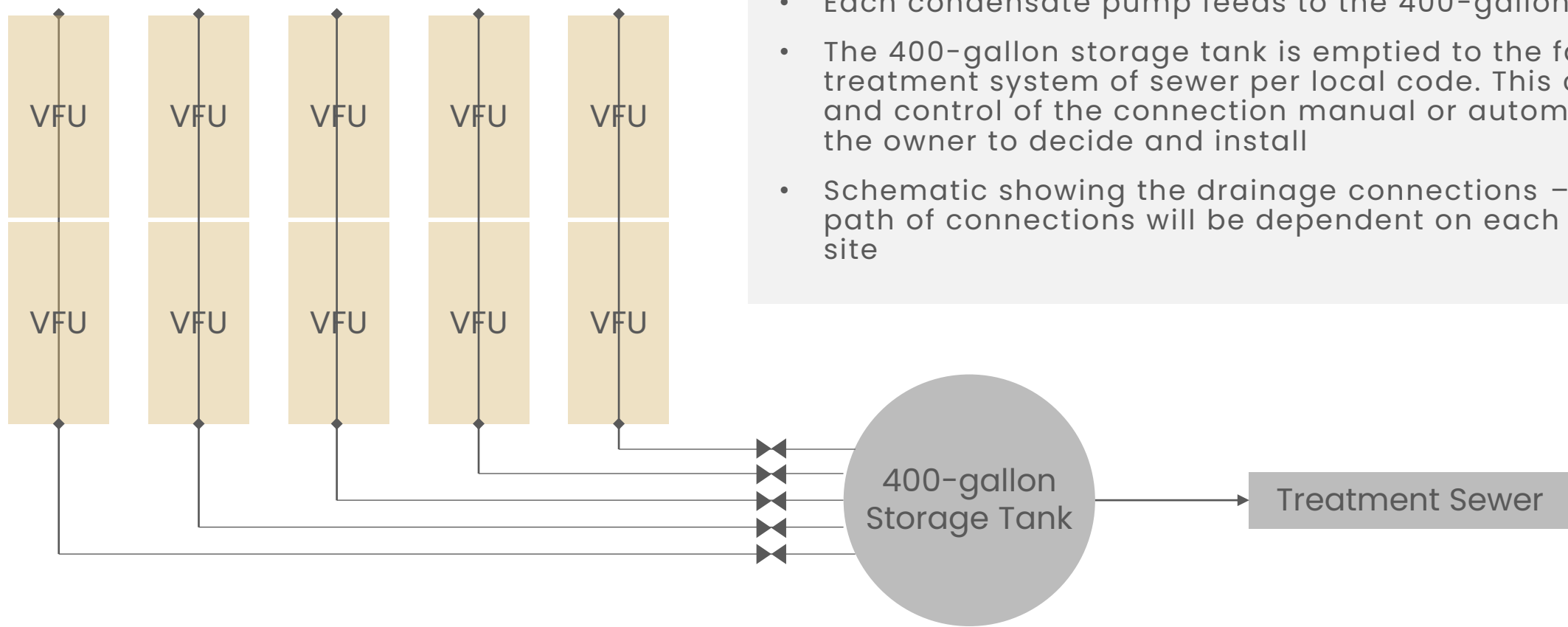


Note:

- Schematic shows RJ45 CAT5/6 data cable connections
- The actual path of connections will be dependent on the installation site

Drain Connections

◆—◆ Drainpipes
✕ Condensate pumps



Note:

- Two VFU's feed to one condensate pump
- Each condensate pump feeds to the 400-gallon storage tank
- The 400-gallon storage tank is emptied to the facility waste treatment system of sewer per local code. This connection and control of the connection manual or automatic is left to the owner to decide and install
- Schematic showing the drainage connections – The actual path of connections will be dependent on each installation site



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10-VFU Utility Guide

Electrical Connection List

Note:

This is the connection provided on the equipment – To connect in some instances the mating plug will be required – For example if Male 120V plug is listed then the corresponding Female 120V plug will be required to make the connection to the listed equipment.

Item	Input Voltage Required	Power Required	Max Current	Connection*
Model 3.6 VFU	277V _{AC} Single Phase 60Hz	35kW	Max 20 A per VFU (200 A total max)	Male – 277V NEMA 7-20P Plug
20-ton Chiller	460V _{AC} Three Phase 60Hz	21.9 kW	60 A	Single Point, Non-fused Disconnect, no cooler heater hardwired
Magna3 Chiller recirculation/booster pumps	115V _{AC} or 230V _{AC} 60Hz	606W @ 115V AC 600W @ 230V AC	0.26A - 5.26 A per pump @ 115V AC 0.18A - 2.65 A per pump @ 230V AC	M20 cable gland for hardwiring
SCALA2 Fertigation Recirculation/booster pumps	115V _{AC} or 230V _{AC} 60Hz	550W	4.9A	M20 cable gland for hardwiring
Autogrow Dose system	120V _{AC} or 240V _{AC}	NA (24V DC Voltage)	5A	Male 3-prong
RO Water system	No power required (Pressure based system)			
CO ₂ Alarm System Tablet	120V _{AC} or 220 V _{AC}	NA (12V DC Voltage)	300mA at peak	Male 3-prong
Drain/Condensate pumps	115V _{AC} or 230V _{AC} 60Hz	93W	1.5A	115V pig tail
24 Switch Data Port	100V _{AC} or 240V _{AC}	450W	8A	Male 3-prong
Uninterrupted Power Supply	100V _{AC} - 240V _{AC}	995W	< 15A	Male 3-prong
USG Security Gateway	100V _{AC} - 240V _{AC}	40W	2.5 A	Male 3-prong

Utility Guide

Note:

The information shown below regarding consumption are estimates only and could vary with usage

Item	Assumptions	Capacity	Connections	Notes
RO Water	<ul style="list-style-type: none"> 64 plants per VFU 120 ml fertigant dose per feeding 16 feedings /day (Veg) + 11 Feedings /day (Flower) Max 1 VFU irrigating at one time 	<p>Typical Consumption: 245 gpd</p> <p>Max Consumption: 325 gpd (All 10 VFUs in veg)</p>	Inlet of 160-gallon RO storage tank	160-gallon RO storage tank will require filling 4 times per day
Electricity	<ul style="list-style-type: none"> Electrical connections need to be provided 	<p>Typical Consumption: 62kW</p> <p>Max Current: 305A</p>	<p>120V Single Phase Required for VFUs</p> <p>460V Three Phase Required for Chiller</p> <p>120V Outlets Required for all the remaining equipment</p>	Breakdown of electrical information by equipment shown in the previous section
Drainage	<ul style="list-style-type: none"> 15% irrigation run through 10gpd consumption for VFU washdown Water consumption for VFU washdown not considered in the consumption calculation above, but included in the drainage calculation 	<p>Typical Generation: 267 gpd</p> <p>Max Generation: 280 gpd (All 10 VFUs in veg)</p>	Inlet of 400-gallon storage tank for Option 2	400-gallon storage tank – requires emptying approximately every 1.5 days
CO ₂	<ul style="list-style-type: none"> Typical CO₂ level in VFU – 1100ppm Room size modeled at 55' x 20' x 12' CO₂ will last at enriched level for approximately 2 hours 	<p>Typical Consumption 194.8 cuft or 22.3 lbs per day</p>	Outlet of facility's existing CO ₂ supply line	CO ₂ tanks are not included in the package
Data	<ul style="list-style-type: none"> Stable high-speed internet connection is required at the facility for VFU functionality 	<p>Bandwidth Requirements > 100 Mbps</p>	Through standard internet service provider	Connection configuration shown in the previous section

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)'	DESCRIPTION OF LOCATION
RM 1	733.55	Chiseled square in center of north headwall on box culvert, approximately 21 feet west of centerline of Bakertown Road and approximately 450 feet south of Terre Coupe Road along Bakertown Road.
RM 2	708.50	SCS disk and nail in power pole No. B594208, at bend in Post Road, east of Post Road in southeast corner of new Industrial Park.
RM 3	692.69	Chiseled and yellow painted square on southeast corner of wing wall at Chicago Street crossing of mill race.
RM 4	693.99	Chiseled and painted square on top of southeast wing wall at mill race crossing on Roe Street east of stream.
RM 5	680.87	SCS disk and nail in power pole No. 3570-28 northeast of intersection of Dewey Street and Red Bud Trail.
RM 6	689.90	SCS disk and nail in power pole No. B570657 southeast of intersection of Meadowside Drive and Schirmer Parkway.

*National Geodetic Vertical Datum of 1929

LEGEND

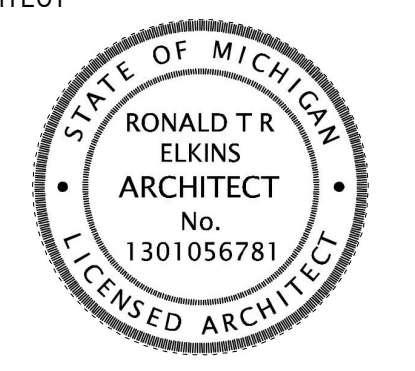


OVERALL FLOOD PLAIN MAP

CLOSEUP FLOOD PLAIN MAP

107 E ALEXANDER STREET

ARCHITECT



MICHIGAN LICENSED ARCHITECT 1301056781
 EXPIRATION DATE 10.31.2022

**Ronald TR Elkins
Architect**

1137 W. Webster Ave.
Chicago, IL 60614
312.268.1822 tel
elkinsron@gmail.com

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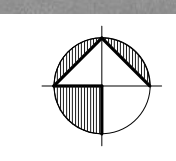
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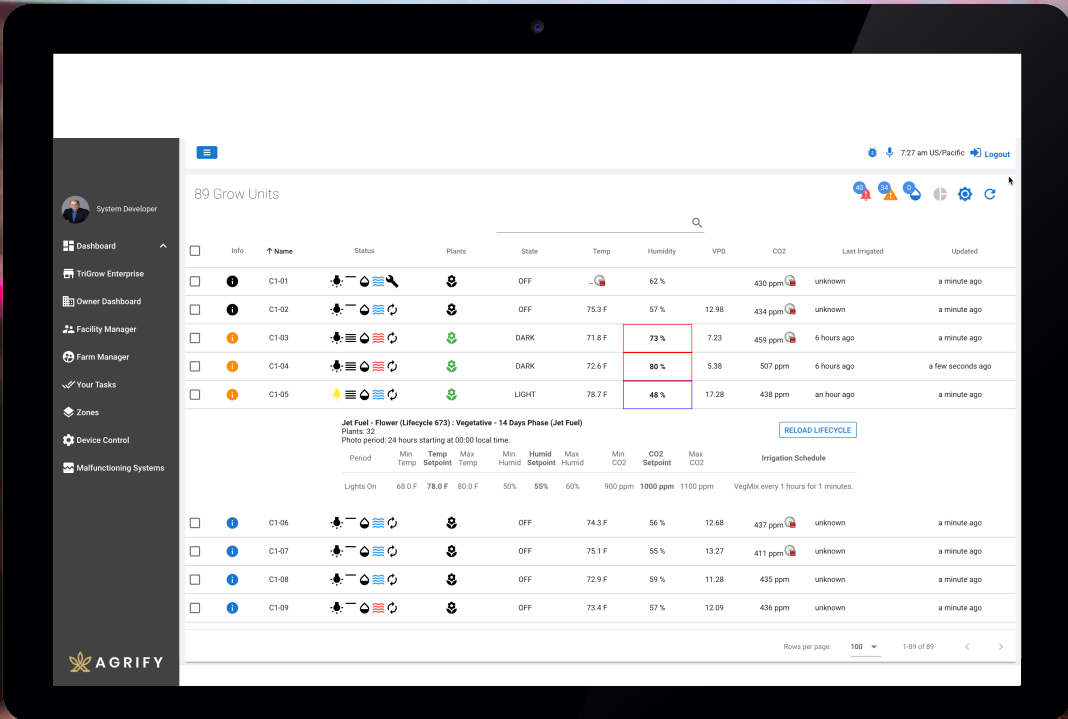
PERMIT APPLICATION No.
PROPERTY PIN

No.	Description	Date
1	Tenant Review	03.03.2022
1	Construction Revisions	
2	Construction Revisions	

Reviewed By _____ RE
 Drawn By _____ RE
 Project No. 2109

FLOOD PLAIN MAP





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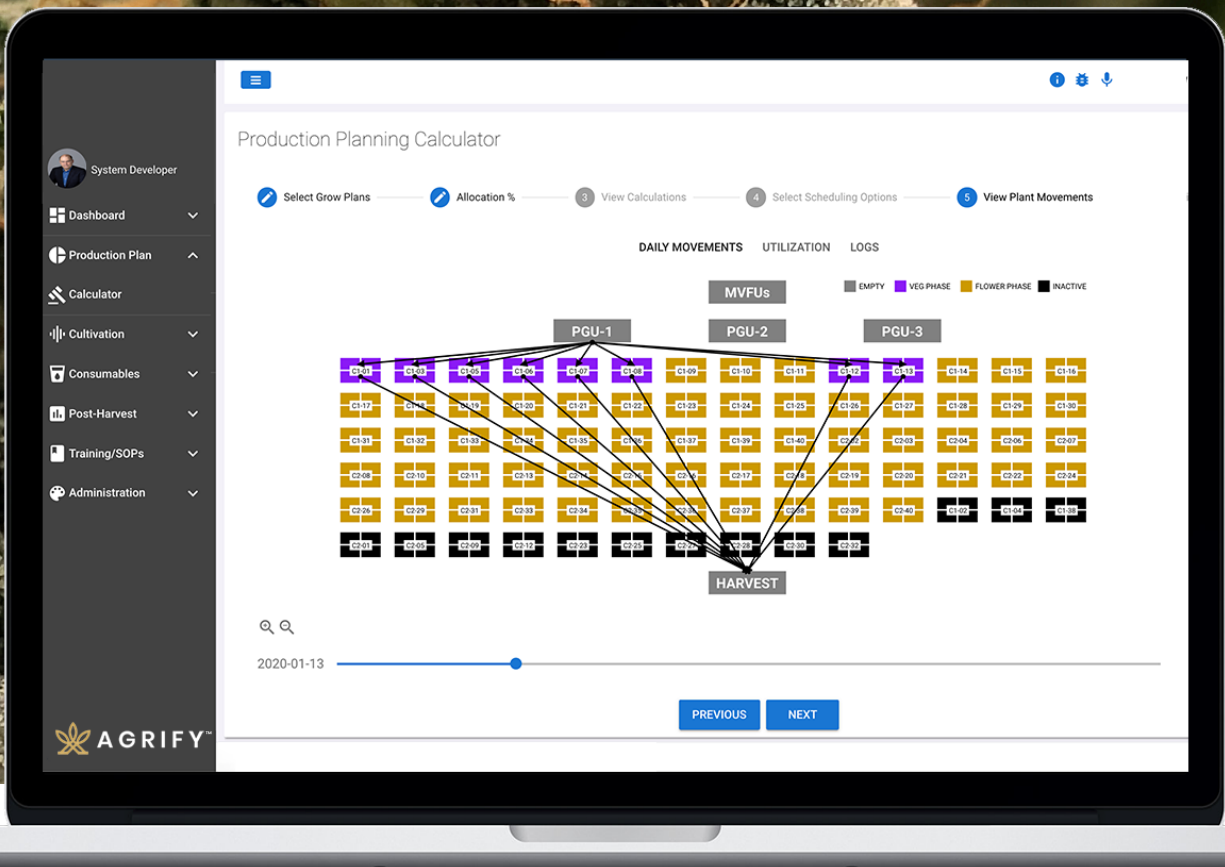
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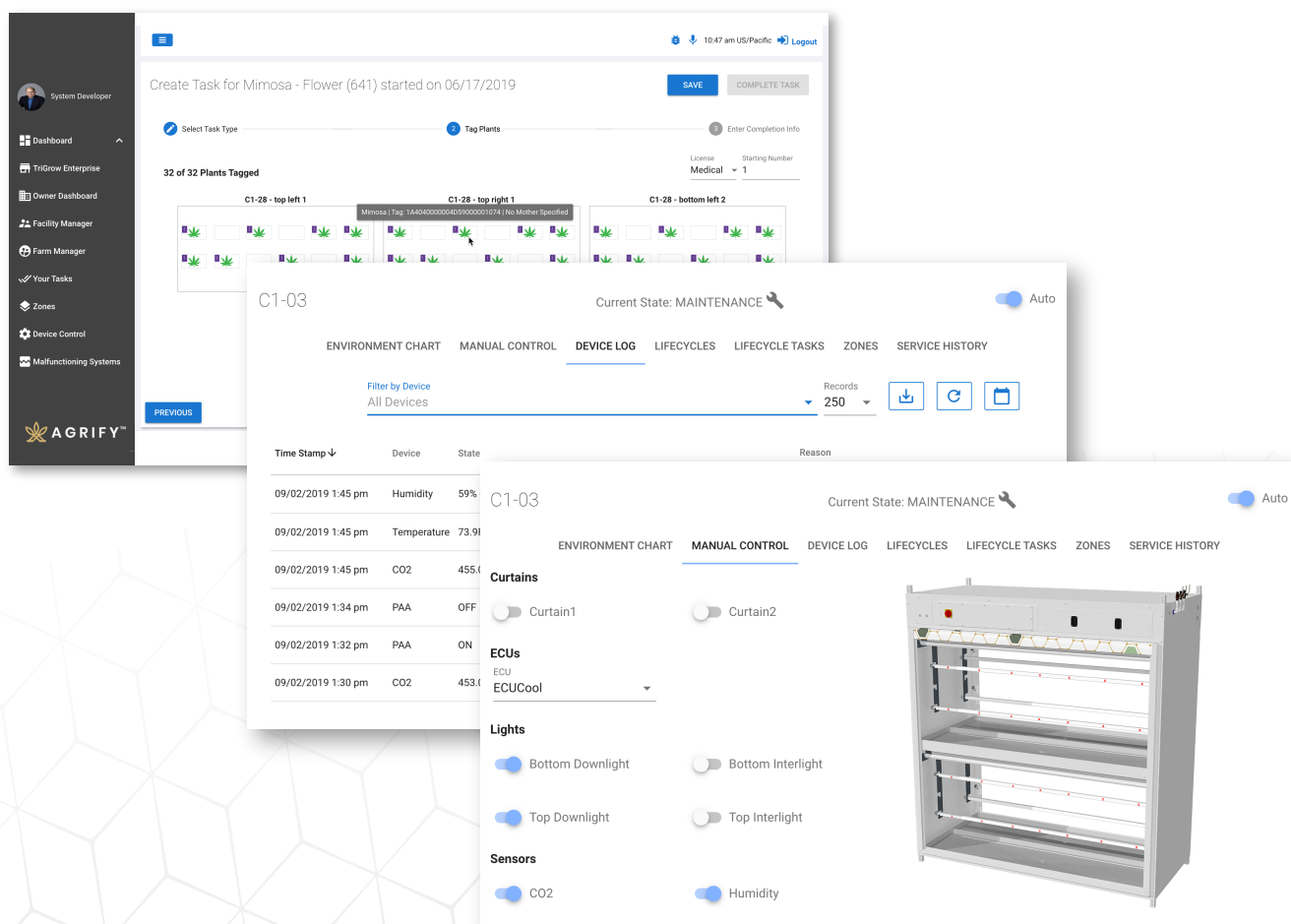
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Start by checking your crop status at a glance and then drill down to review current or historical irrigation times, temperature, humidity, CO2, vapor-pressure deficits (VPD), and more.

Plan ahead by auto-assigning plant-touching tasks to your workforce based on their availability, role, and abilities.

Need to course-correct your grow? Apply proven remediation plans to recover from pests, pooling water, excessive plant height, and more. Want to develop new cannabis strains? Define experimental grow phases and quickly parse through millions of data points to understand how different growing conditions can impact your crop yields and cannabinoid profile.



KEY FEATURES



Optimize Your Output and Workforce

GrowPlans calculate the "best fit" scenario to maximize yield and get the fastest ROI on your CAPEX and OPEX.



Monitor and Control Your Equipment

Inspect the operational status of your grow units including your plant's current growing environment and schedule preventative maintenance tasks.



Customizable Mobile Notifications

Define customizable notifications including calls, emails, and SMS for any exceptional event that can occur during the grow period.



Manage and Automatically Reorder Your Consumables

Automatically reorder consumables from our Agrify Supply e-commerce platform.



Capture and Compare Your Test Results

Define your lab tests and quickly enter and validate the results from each batch.



SOPs and Safety Datasheets

Access included Standard Operating Procedures and datasheets, or upload your own via our content management system.