VILLAGE OF NORTH BARRINGTON
SPECIAL
PLAN COMMISSION MEETING

111 Old Barrington Road,
North Barrington, IL 60010
July 18, 2022
7:30 P.M.

MEETING AGENDA

1. Call to Order
2. Roll Call
3. Pledge of Allegiance
4. Public Comment
5. Minutes
6. **Continued Public Hearing**

   Text amendments to the Village's Zoning Ordinance. The Proposed text amendments would, if adopted, 1) Add a definition for "Indoor Farm Horticulture Operations" and related definitions, 2) Add "Indoor Farm Horticulture Operations" in the R-1 (Residential) District, 3) Add operational regulations and parking requirements for Indoor Farm Horticulture Operations.

7. **Continued Public Hearing – 25815 W. Scott Road**
   PIN's: 13-25-100-026, 13-25-100-028, 13-25-100-029

   Zoning Map Amendment to rezone an approximately 4.43 acre parcel from R-1 Single Family Residential to R-1 Single Family Residential with Special Use for an Indoor Farm Horticulture Operation

8. Old/New Business
9. Adjournment

The Village of North Barrington is subject to the requirements of the Americans with Disabilities Act of 1990. Individuals with disabilities who plan to attend this meeting and who require certain accommodations so that they can observe and/or participate in this meeting, or who have questions regarding the accessibility of the meeting of the Village's facilities, should contact the Village's ADA Coordinator at (847) 381-6000, x. 10 promptly to allow the Village to make reasonable accommodations for those persons.

Posted by: _____ **Date:** 7/14/2022 **Time:** 11:00 A.M.

PLAN COMMISSION

PUBLIC HEARING

ZONING TEXT AMENDMENT

&

ZONING MAP AMENDMENT

WITH SPECIAL USE

To:	Chairman Gery Herrmann Plan Commission Members
From:	John A. Lobaito, Village Administrator
Hearing Date:	July 11, 2022
Time:	7:30 p.m.
Subject:	Public Hearing on proposed Zoning Text Amendment and Map Amendment with Special Use Request
Attachments:	1. Letter from Attorney Krysia W. Ressler dated June 10, 2022 2. Application for Zoning Text Amendment 3. Application for a Map Amendment (Rezoning) with a Special Use 4. Business and Operations Plan Document 5. Peter Snelten & Sons letter 6. Heizer Engineering, LLC letter dated May 9, 2022 7. Building Plans, Prepared by Joseph A. Meyer last revised June 10, 2022 8. Plat of Annexation 9. Draft Ordinance Amending Title 10 of the Zoning Code 10. Affidavit of Written Notification and Sign Posting

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Petitioner Information: Anoosh Varda and Aummunnouel Varda
25815 W. Scott Road
North Barrington, IL 60010

Subject Property: 25815 W. Scott Road. Located at the southwest corner of IL Route 59 and Scott Road. PIN 13-25-100-026; 13-25-100-028; 13-25-100-029

Subject Property Zoning: R-1 Single Family Residential.

Zoning Request:

Application No. 1 – *(Draft Ordinance Attached)*
1.) Zoning Text Amendments that include the following.

A.) Amendments to Municipal Code Title 10 to add a definition for "Indoor Farm Horticultural Operations", "Vermiculture", and related definitions. Also adds limitations to horticultural operations and provides certain limitations and adds parking limitations.

B.) Amendments to Municipal Code section 10-7-2 (Special Uses) by adding "Indoor Farm Horticultural Operations" in the R-1 Residential District.

Application No. 2
2.) Rezoning of the Subject Property from R-1 Single Family Residential Zoning to R-1 Single Family Residential with Special Use for an Indoor Farm Horticultural Operations, and Vermiculture.

Public Hearing Notice: *(Reference Enclosed Affidavit)*
Notice of the Two (2) Public Hearings were published in the Daily Herald on June 23, 2022. Copies of the Certificates of Publications are enclosed.

Posting of two (2) signs on the Subject Property were placed on June 24, 2022 in compliance with the Village Municipal Code.

Written notice for a Zoning Map Amendment to rezone the Subject Property to R-1 Single Family Residential with Special Use for Indoor Farm Horticultural Operations and Vermiculture was served by U.S. mail to all last known property taxpayers within 250 feet of the Subject Property. Mailing was post marked on June 29, 2022.

Background: The Subject Property is owned by Anoosh Varda and Alberta Varda and is improved with a single-family residential house and three accessory buildings and a detached garage. The property is served by a private sewage disposal system and private well.

The concept proposal was presented to the Village Board at its January 19, 2022 Village Board meeting. The Village Board consensus was to have the petitioner proceed through the public hearing process.

In 2017, the subject property was in unincorporated Lake County and the Owner was proposing the development of a chicken farm. On January 10, 2018, the property (excluding the single-family house) was annexed into North Barrington along with two other adjacent properties. That same year the Owner filed a zoning petition with North Barrington to operate a chicken farm. A public hearing was held before the Zoning Board of Appeals (ZBA) in May 2018. At the conclusion of the public hearing the

ZBA made an unfavorable recommendation on the petition to allow the subject property to be used for a chicken farm operation. The Owner abandoned the zoning petition, and the matter was never presented to the Board of Trustees for final action on the ZBA's recommendation.

Waiver Compliance: Section 10-7-1 of the Village Zoning Code relative to Special Uses provides that "In granting a special use, the corporate authorities may **waive compliance** with those provisions of this title which are specified in the special use ordinance."

Existing Zoning Non-conformities on the Subject Property

1. Lot Coverage Ratio
2. Building Setbacks
3. Fencing & Driveway Entryway Walls

Lot Coverage Ratio: Applying the lot coverage ratio requirements of Zoning Regulations Section 10-6-1(C), this 4.72-acre property is allowed a maximum lot coverage (total footprint area of buildings and accessory structures) of 11.47% or 23,614.71 s.f. Total footprint area of all existing buildings on the Varda property is approximately 24,701 s.f.

Building Setbacks: The Village Zoning Regulations Section 10-9-4 provides that accessory buildings and structures shall be located not less than 85 feet from the front of the lot or right of way. The East Building and North Building are both located less than 85 feet from the rights of way.

- The East Building is located 30.41 ft. from the IL Route 59 right-of-way and 30.87 ft. from the Scott Road right of way.
- The North Building is located 40.12 ft. from the Scott Road right-of-way.

Fencing & Driveway Entryway Walls: The existing 6 ft. high wire fencing around the entire perimeter of the property and the 5-6 ft. high masonry walls at the gated driveway entrance to the property do not comply with the Village zoning regulations pertaining to fencing.

- Section 10-11-2(A) provides that no fence shall be erected in a front yard.
- Section 10-11-2(B) provides that no fence shall be more than 42 inches in height.
- Section 10-11-2(C) prohibits wire mesh fencing.
- Section 10-11-6 provide that no fence located at a street intersection may exceed 3 ft. in height for a distance of 25 ft. in each direction from the intersection.
- Section 10-11-2(F) provides that all fences must be located completely within the property. The masonry walls at the gated driveway entrance and the adjoining wire fencing encroach from 0.3 ft. to 1.13 ft. into the Scott Road right of way.

Proposed Improvements: The petitioner plans to make improvements to the inside of the accessory buildings on the property to accommodate the vertical farming operations and vermiculture. The planned improvements are mostly mechanical including electrical, and HVAC. The most easterly building will be used for vermiculture and the most northerly building on the property will be used for growing microgreens. Plans are included in the Commissions packet.

Private Wastewater Treatment System (Septic System): Heizer Engineering, LLC has provided a letter verifying the Septic System is in "...acceptable condition." on the day of the site visit on June 5, and June 9, 2022. Presumably the septic system was originally designed for house on the property and presumably also based on the number of bedrooms. Although, Heizer Engineering represents that the septic system is in an acceptable condition today, the system was not handling the full operation of the proposed business at the time of the site visits.

The petitioners have represented that they will have up to 11 employees. It is unknown if the septic system can accommodate the addition of 11 employees. The Village Health Officer has advised me that new septic systems for business takes into consideration the number of employees so that the septic system is not overloaded.

Additional Considerations: As part of a Special Use the Village may place reasonable conditions on the Special Use. In this instance the Indoor Farm Horticulture and Vermiculture. The Commission may want to consider the following in their review and consideration of the petition.

1. Limitations on hours of operation.
2. Limitations on outside storage of materials and/or equipment.
3. Maximum number of employees.
4. Number of deliveries per day/week/month.
5. Type of vehicles used.
6. Private wastewater treatment system (Septic System).

Bernard Wysocki
Perry S. Smith, Jr.
Krysia Wysocki Ressler

WYSOCKI & SMITH
Attorneys at Law
Wysocki Law Building
403 Grand Avenue
Waukegan, IL 60085

Area Code – (847)
Telephone: 623-2200
Fax: 623-9242

June 10, 2022

VIA EMAIL & HAND DELIVERED
jlobaito@northbarrington.org

Mr. Gery Herrmann
Chairman of Plan Commission
Plan Commission
Village of North Barrington
111 Old Barrington Road
North Barrington, IL 60010

Re: 25815 W. Scott Road, North Barrington, IL 60010

Dear Mr. Herrmann and Plan Commission:

My name is Krysia Ressler of Wysocki & Smith Law Office and we represent Aummunnouel Varda and Anoosh Varda in their Request for Amendment to the Special Use Category for R-1 Zoning District.

Currently, the Varda's property is split between the County and the Village. The property in the Village is a located in a R-1 residential non-conforming use as it is approximately 3.33 acres. The Vardas' request a special use on the property to expand their business on the Village property as well. Currently, the business is only operated on the County property. In allowing the Vardas the Special Use, they would agree to annex the rest of their property into the Village so their property can return to legal conforming R-1.

The Vardas' business is vertical farming and vermiculture. Vertical farming is an environmentally progressive use in growing plants in a controlled building environment without the dependence of outside weather, threat of insects, or use of pesticides. Vertical farming is where plants grow on shelves with controlled lighting and temperature. It utilizes recycled water, LED lighting and omits herbicides and pesticides. The urban ecosystem offers lower emissions, provides higher nutrient produce and reduces water usage and runoff. The growing of microgreens does not use soil, but uses a hydroponic system that thrives without use of nutrients. Any system that does use nutrients will be a closed loop system that is not discarded into the environment or the sewage system. The benefit of vertical farming is the Vardas can farm all year round. Vermiculture is the cultivating of soil through worm casting. Worm casting soil is suitable for plants and vegetables inside and outside.

The Vardas currently harvest leafy sweet peas microgreen, radish microgreen, sunflower microgreen, and probiotic microgreen. The Vardas' harvest is not limited to microgreens but also includes, peas, sunflowers, radishes, mushrooms to name a few. The Applicant will **not** be growing marijuana.

There would not be any air, odor, water or noise pollution.

There are three buildings on the property to be used for the purpose of indoor farming year round. The height and square foot of each building

East Building – 10-foot ceilings, 6,250 square feet
Big Building – 10-foot ceilings, 12,500 square feet
West Building – 10-foot ceilings, 3,000 square feet

This proposed use is consistent with North Barrington's Comprehensive Plan.

The proposed use will not diminish the value of adjacent and nearby properties, but instead create value to the property.

The proposed use will not substantially increase traffic, cause traffic congestion or on-street parking. The property will consist of a parking lot that allows for eleven spaces.

The crops grown on site will be transported using a refrigerated sprinter van that weighs between 8,500-10,000 lbs. This van will be running daily shipments of crops which will be scheduled first thing in the morning. The vermiculture aspect of the property will require a single 6-yard dump truck, weighing at max 30,000 lbs.

The Vardas would employ a maximum of eleven employees to maintain the plants and vermiculture. The employees on site would be required during a span of 7:00am to 5:00p.m.

Any light used in the building will not be seen from the outside. There are no windows in the building so the Vardas can control the lighting and temperature.

The produce is currently sold to retailers such as Eurofresh, Garden Fresh Market, Montrose Market and at local farmers markets. The Vardas forecast that microgreens will continue on the trend of popularity. They expect to continue selling whole sale and retail through weekly shipping. There will not be a microgreen store on site for customers to buy. Any purchasing from individual patrons would be made on-line and shipped to the customer.

We have attached the Vardas' Text Amendment Application along with the following supporting documents:

- Site Plan
- Building Plan
- Business Plan of North Barrington Vertical Farm (NBVF)
- Warranty Deed
- Paid Property Taxes
- Plat of Annexation
- North Barrington Comprehensive Plan dated January 2015
- Peter Snelten & Sons Inc Water Well Contractors
- Heizer Engineering LLC Wastewater Treatment System Inspection

Enclosed please find the check number 1036 in the amount of $300.00 from Mr. Varda to for the Plan Commission filing fee.

If you require any further information please advise. We look forward to presenting the Vardas' request to the Planning Commission.

Yours very truly,

Krysia W. Ressler

WYSOCKI & SMITH

Enclosure
cc: Aummunnouel Varda and Anoosh Varda

APPLICATION FOR ZONING TEXT AMENDMENT

VILLAGE OF NORTH BARRINGTON
TEXT AMENDMENT APPLICATION

TO BE COMPLETED BY APPLICANT: DATE: 6-8-2022

Applicant Name: Aummunouel Varda and Anoosh Varda

Address: 25815 W. Scott Road, North Barrington, IL 60010

Phone: 312-208-3984 **Fax:** N/A **Email:** avarda67@gmail.com

Section(s) of Ordinance to be Amended: Title 10- Section 7

General Description of Requested Text Amendment and Proposed Language [attach additional pages, if necessary]

The applicant requests to amend Title 10- Section 7 of the Village code to include indoor farm horticultural operations as a special use within R-1 zoning district.

JUSTIFICATION OF PROPOSED TEXT AMENDMENT:

In evaluating the proposed text amendment, the Planning Commission and Village Board will make findings based on the standards imposed by the Zoning Ordinance. Please respond to each of the following criteria and describe how the proposed text amendment complies with each. [attach additional pages, if necessary]

1) **The extent to which the proposed amendment promotes the public health, safety, and welfare of the Village.**
The proposed amendments are for indoor farm horticultural operations that would allow the Vardas to produce sustainable plants year round without interfering in public health, safety, and welfare of the Village.

2) **The consistency of the proposed amendment with the Comprehensive Plan and any adopted land use policies.**
The proposed amendment is consistent with the Village's Comprehensive Plan. Pursuant to the Comprehensive Plan dated January 2015, the property is located in the Village Agricultural/Residential area.

3) **The consistency of the proposed amendment with the intent and general regulations of this Ordinance.**
The proposed amendments to the ordinance promote the intent of the special use Chapter as the indoor farm is in a contained area and promotes the development of a green community.

Applicant hereby certifies that: (1) All statements and other information submitted as part of this application are true and correct to the best of the applicants knowledge and further understand that this Application and attachments shall become part of the Official Records of the Village of North Barrington; (2) Applicant has read and understands all information in this application; and (3) Applicant understands the submittal of Inaccurate or Incomplete Information or plans may result in processing delays or denial of application.

Signature of Applicant — Date: 6-8-2022

Signature of Owner (if different from the applicant) — Date: 6-8-2022

APPLICATION FOR A MAP AMENDMENT REZONING THE SUBJECT PROPERTY FROM R-1 SINGLE-FAMILY RESIDENTIAL TO R-1 SINGLE-FAMILY RESIDENTIAL WITH A SPECIAL USE

VILLAGE OF NORTH BARRINGTON

ZONING MAP AMENDMENT (REZONING) APPLICATION

WITH SPECIAL USE

TO BE COMPLETED BY APPLICANT **DATE:** 07/06/2022

Address of Subject Property: 25815 W. Scott Road, North Barrington, IL 60010

PIN: 13-25-100-028-0000

Existing Use: R-1 Single Family

Proposed Use: The applicant requests to amend Title 10 – Section 7 of the Village code to include indoor farm horticultural operations as a special use within R-1 zoning district.
(attach additional pages if needed)

Existing Zoning District: R-1 Single Family

Proposed Zoning District: R-1 Single Family with Special Use

Applicant Name: Aummunnouel Varda and Anoosh Varda

Address: 25815 W. Scott Road, North Barrington, IL 60010

Phone Number: 312-208-3984 **Fax:** N/A

Email: avarda67@gmail.com

Property Owner Name (if different than applicant): N/A

Property Owner Address: 139 Old Barrington Road, Barrington, IL 60010

Phone Number: 312-208-3984 **Fax:** N/A

Email: avarda67@gmail.com

Applicant hereby certifies that: (1) All statements and other information submitted as part of this application are true and correct to the best of the applicants knowledge and further understand that this Application and attachments become part of the Official Records of the Village of North Barriagton; (2) Applicant has read and understands all information in this application; and (3) Applicant understands the submittal of inaccurate or incomplete information or plans may result in processing delays.

Signature of Applicant _____ **Date:** 7-7-2022

Signature of Owner (if different from the applicant) Anoosh Varda **Date:** 7-7-2022

SUBMITTAL REQUIREMENTS:

1. Proof of ownership of the zoning lot in question. If applicant is not the owner, a statement signed by the owner must be submitted certifying that the owner is jointly filing the application for an amendment to the zoning map.
2. A plat of survey of the parcel or parcels of land comprising the zoning lot or map drawn to scale, showing the actual dimensions of said zoning lot, including all parcels or lots contained therein, and drawn in accordance with the recorded plat of such land.
3. A written statement identifying the existing zoning district for the zoning lot in question, the zoning district requested, and the reason or reasons for the requested amendment to the zoning map.
4. A site location map drawn to an appropriate scale indicating existing land use and zoning of all property within three hundred (300) feet of the subject property.
5. Any other information or documentation requested by the Village Administrator and/or Building and Zoning Officer.

JUSTIFICATION OF PROPOSED ACTION:

In evaluating the proposed map amendment, the Planning and Zoning Board and Village Board will make findings based on information submitted at the public hearing. Please respond to each of the following criteria and describe how the proposed Map Amendment complies with each standard (attach additional pages, if necessary):

1) The compatibility with the existing use and zoning of nearby property.

The Applicants indoor farm horticultural operations will not interfere with the existing use and zoning of nearby properties.

2) The extent to which property values of the subject property are diminished by the existing zoning restrictions.

The Applicants do not believe that the property values of the subject property are diminished by the existing zoning restrictions.

3) The extent to which the proposed amendment promotes the public health, safety and welfare of the Village.

The proposed amendments are for indoor farm horticultural operations that would allow the Vardas to produce sustainable plants year round without interfering in public health, safety, and welfare of the Village.

4) The relative gain to the public, as compared to the hardship imposed upon the applicant.

The Applicants' business is vertical farming and vermiculture. Vertical farming is a progressive use in growing plants in a controlled building environment without the dependence of outside weather, threat of insects, or use of pesticides.

5) The suitability of the subject property for the purposes for which it is presently zoned.

The subject property is currently zoned R-1 Single Family. The property contains 3 large buildings that are consistent with the needs for vertical farming and vermiculture. With the approval of special use, the applicants will thrive in their business of vertical farming and vermiculture.

6) The length of time that the subject property in question has been vacant, as presently zoned, considered in the context of development in the area where the property is located.

The Applicant has owned the property since 2016 as presently zoned.

7) The consistency of the proposed amendment with the Comprehensive Plan and any adopted land use policies.

The proposed amendment is consistent with the Village's Comprehensive Plan. Pursuant to the Comprehensive Plan dated January 2015, the property is located in the Village Agricultural/Residential area.

8) That the proposed amendment will benefit the needs of the community.

The Applicants predict that vertical farming will become a necessary source of production of crops. This innovative way of producing crops will benefit the needs of the community.

BUSINESS AND OPERATIONAL PLAN

Contents

EXECUTIVE SUMMARY

For as long as I can remember, people have been hyping vertical farming — growing crops indoors, using vertical space to intensify production.

Its virtues, relative to conventional agriculture, have long been clear. Indoors, the climate can be controlled year-round. Pests can be minimized, and with them pesticides. Water and nutrients can be applied in precise quantities. By going up rather than out, a vertical farm can produce more food per acre of land. And by siting close to an urban area, it can reduce long distribution chains, getting fresher food to customers' tables, quicker.

Its drawbacks have become equally clear. They mainly come down to cost. Farming well requires deep know-how and expertise; it has proven extraordinarily difficult to expand vertical farms in a way that holds quality consistent while driving costs down. Optimizing production at a small scale is very different from doing so at a large scale. The landscape is littered with the corpses of vertical-farming startups that thought they could beat the odds (though several are still alive and kicking).

Our mission is to create an integrated, environmentally aware food production facility within our local communities to create jobs for the locals while enjoying a monopoly on supplying fresh, ultra-premium Micro-Greens. As Warren Buffet once said:

"Buy high quality businesses with a strong competitive advantage below their fair value and hold them until they lose their competitive advantage (which is hopefully never)."

Mr. Anoosh Varda

Chief Strategic Officer

North Barrington Vertical Farm (NBVF)

1. INTRODUCTION

In recent years, the phenomenon of urbanization, i.e., the continuous increase of population in cities and towns, has rapidly increased. Many metropolitan cities require fresh food hotspots to feed their populace. One of the most revealing examples of urbanization is the case of Lagos in Nigeria, which had about 300,000 inhabitants in 1950, but today, the city has reached 17.5 million inhabitants. Land in urban regions must be made more efficient and better organized to maximize space usage. The population increase in megacities (cities with more than 10 million people) is an inevitable fact that academia and businesses need to investigate to improve the quality of life overall.

The growing need for more food has escalated over the last few years, and as a result, it is of vital importance to adopt more sustainable and efficient food production solutions. In the Food and Agriculture Organization (FAO) report (2015), it is stated that the number of agribusinesses must increase up to 70% by 2050 to meet the food demand in megacities. In this context, it is also very important to mention that more sustainable ways of distributing food globally are needed to prevent the massive food waste. In fact, if food waste were a country, it would be the third-largest greenhouse gas emitter in the world with its four billion tons of food waste annually.

Research conducted by Tropp (2013) shows that demand for fresh, locally grown food was almost $12 billion in 2014, and was to reach $20 billion by 2019. Commercial GHs (Green Houses) are the major sources of fresh, locally grown food for cities. For this reason, the annual growth rate of these businesses

reached 8.8% in 2016, and the market's growth forecast is expected to exceed $29.64 billion by 2020. GH production is the oldest form of controlled farming, where plants can be cultivated in an isolated environment, which is partly independent of the outdoor weather conditions. GH production is an intensive cultivation method that uses air management techniques as well as cooling and heating processes to produce high crop yields. In recent years, GH growers have started to install artificial lighting and hydroponic cultivation methods that can further increase the yield of crops and reduce their water footprint.

Indoor Urban Vertical Farming (IUVF) is another way of allowing a fresh, locally grown food production, i.e., the possibility of a year-round crop production. The development of GHs has led to today's highly sophisticated, controlled agricultural systems. IUVF is the new promising technology that allows us to optimize agricultural production and convert it from traditional farming to an integrated urban network using the most innovative and sustainable technological achievements of our time. In IUVF, plants grow indoors by using hydroponic methods (aeroponic or fogponics in a few cases) and artificial lighting that simulates solar radiation. A plant factory with artificial lighting (PFAL)—an intensive type of vertical farming—refers to a massive plant production establishment equipped with thermal insulation. Its structure is completely isolated from the outdoor environment.

1.1. WHAT IS VERTICAL FARMING?

Unlike traditional agriculture, PFALs resemble a "production line" in a warehouse, where cultivation shelves are stacked several meters high to maximize the utilization of the vertical space. PFALs include seeding, transplanting, moving cultivation panels, harvesting, pollinating, weight control, packaging, metal

inspection, and panel cleaning. Companies that have implemented this type of technology use different methods, numbers, and applications of the above techniques according to their business plan and strategy. PFALs present many advantages that make them very competitive compared to conventional farming, especially for consumers located in the urban network. The use of pioneering systems in PFALs eliminates the use of fertilizers and pesticides in the green production although PFALs consume almost 2% water in comparison with open-field water footprint, as 95% of the water from plant evapotranspiration in this system is compressed in the air conditioning evaporator in the form of liquid water.

After this process, water is collected, sterilized, and then returned to the water tank to be reused. The water is enriched with a nutrient solution, and, as a result, the nutrient fluids in the cultivation area can be reused and recycled. Another benefit to be highlighted is that PFALs reduce CO2 emissions, as they are in urban or suburban areas, virtually eliminating food transportation and thus the carbon footprints of food. The nutritional value of fresh fruits and vegetables diminishes during the shipping process, even at very low refrigerating temperatures. B vitamins are very sensitive to freezing with a loss in the transportation process ranging from 20% to 60%.

2. OUR IDEOLOGY

Food production must remain sufficiently intensive to meet consumer and food demands. Cultivation methods must be made more efficient and sustainable but without further compromising land use and biodiversity. Farming techniques must be optimized, including waste processes. Globally, 40–50% of fruits and

vegetables are wasted or lost during the food supply chain. In Europe, 39% of food resources such as energy, land, and water are wasted in the manufacturing process (by-products, overproduction, and weather conditions) and almost 42% in the households (over-purchasing and disorganization). In Denmark, households waste around 260,000 tons, while the agriculture/food industry wastes 133,000 tons of the total 700,000 tons of food waste each year. We at NBVF do not want to make the same mistakes, we want our fellow beings to be responsible, and adopt sustainable food choices which will ultimately save millions if not billions in coming years.

Hence, our team at NBVF invested in the development of farming techniques that will perform under a finite and limited resource base. The use efficiency of our resources to reduce food waste, meet optimal demand with limited cost and sustainable profits has been optimized.

Next step for us is to expand our venture to our local community and not only meet their food requirement, but also aid in socio-economic growth by providing job opportunities and healthy food options readily available at minimal cost. With the support we would be able to expand NBVF to state and eventually to national scale.

2.1. OUR MISSION

Our mission is to, "create fresh local produce, and create jobs for the community while providing them with healthy fresh Microgreens, Leafy Greens and Mushrooms."

2.2. OUR VISION

Our Vision is to supply the entire state with Microgreens, Leafy Greens and mushrooms, and eventually expand to a national scale.

2.3. CORE VALUES

- To supply wholesalers with microgreens, leafy greens and mushrooms which will eventually end up in every household in our community and state.

- We are striving to attain sustainability, by adopting eco-friendly modes of production, and ensuring the demand for food is met at optimized cost.

- To ensure socio-economic development of our local communities by creating job opportunities and making a healthy diet affordable.

- Enforcing highest standards of operation and distribution to ensure high-quality products and employee satisfaction.

- Aligning our policies and procedures with the vision of our stakeholders, both internal (our team) and external (our community, distributors & suppliers).

3. MARKET SITUATION

According to the Food and Agriculture Organization (FAO), 1 in 7 people suffer from chronic hunger, caused by lack of enough food or nutrient deficient food which ultimately leads to an inactive and unhealthy lifestyle. Even though enough food exists in the world, there is still a capacity to grow more to meet the increasing demands. However, this increase in demand is met by utilizing additional natural resources such as land and water, damage to which is irreversible. According to FAO, by 2050 the economic and population growth will result in doubling the demand for food on the international scale.

3.1 GLOBAL SOLUTION

Vertical farming can be defined as a practice of producing food on vertically inclined surfaces instead of farming vegetables and food on a single level, such as in a field or a greenhouse. Through this method, foods are produced in vertically stacked layers commonly integrated into other structures such as a skyscraper, shipping container, or used warehouse. The modern ideas of vertical farming are focused on controlling all environmental factors by utilizing indoor farming techniques and controlled-environment agriculture (CEA) technology. The artificial control of light, temperature, humidity, and gasses makes producing foods & vegetables indoor possible. The primary goal of vertical farming is to increase the production of crops in a controlled space.

Vertical farms are classified as a form of controlled environment agriculture and further categorized into three types. The first type of farming refers to the

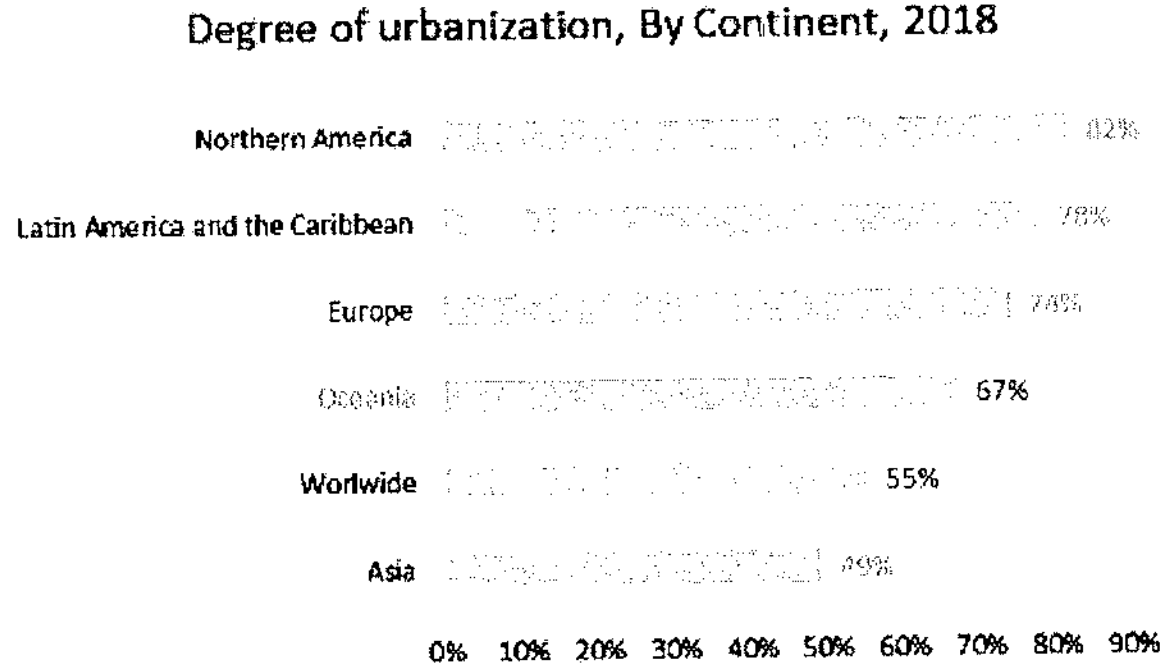
construction of tall structures with several levels of growing beds, that are lined with artificial lights. The second type of vertical farming takes place on the rooftops of buildings (such as commercial and residential structures), while the third type of vertical farming takes place in a multistory building. It provides a favorable environmental condition for the growth of fruits and vegetables and non-edible plants. Vertical farming strives to ensure sustainability by addressing food security issues to the growing urban population. Vertical farming can also feed more people than traditional farming, as they can grow 75 times more food per square foot. Vertical Farms does not use pesticides & fungicides, and by controlling plant fertilizing, the food produced is highly nutritious compared to traditional farming. Furthermore, indoor farms use 90 percent less water than outdoor farms, so having a wet or dry season does not matter.

Vertical farming technologies are still relatively new. Companies are focused on producing crops at scale, making it economically feasible to meet the growing food demand. In some environments such as the Middle East region, for instance, use solar energy to power LEDs at low cost without covering other farmland. At present, virtually all vegetables are imported into the country, so growing crops through this method is a big win.

3.2. GLOBAL MARKET OVERVIEW

With the increasing advancements in technology, factors such as automation and the implementation of artificial intelligence in various industry vectors are leading to an increased rate of urbanization. The concept of vertical farming has been developed based on its potential to provide large populations concentrated in urban areas with locally grown food – and to meet the

demands of an ever-growing worldwide population. Due to the challenges and costs of transporting fresh crops to larger cities, urban farmers have realized the potential in utilizing existing square meters in tall city buildings and producing crops locally.



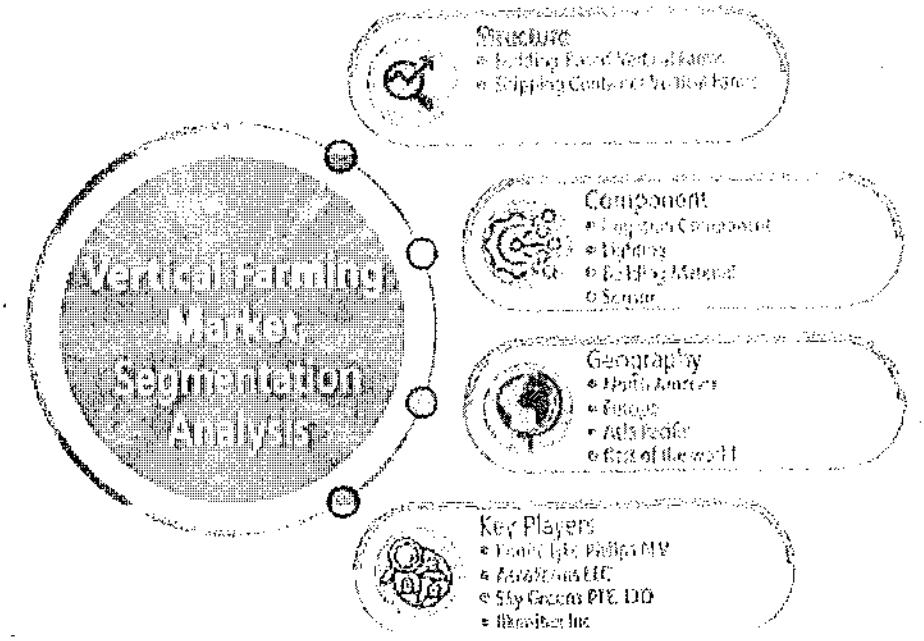
The degree of urbanization for every region is above 50% as of 2018, indicating the extent of urbanization that is occurring in regions worldwide. With this increasing urbanization in both developed as well as developing regions, the horizontal land area that can be used for applications such as farming are drastically reducing. The approach that can, therefore, be used to battle this limitation is vertical farming. Thus, it can be suggested that increasing urbanization is aiding the further progression and development of vertical farming.

Moreover, other factors such as growing demand for high-quality food without any pesticides or herbicides, an independent farming technique with very less impact of climatic conditions and the possibility of growing vegetables and fruits

in a limited space have been driving the market for the global vertical farming market. On the other hand, high initial investments, lacking technical knowledge and a limited variety of crops grown might hamper the overall market.

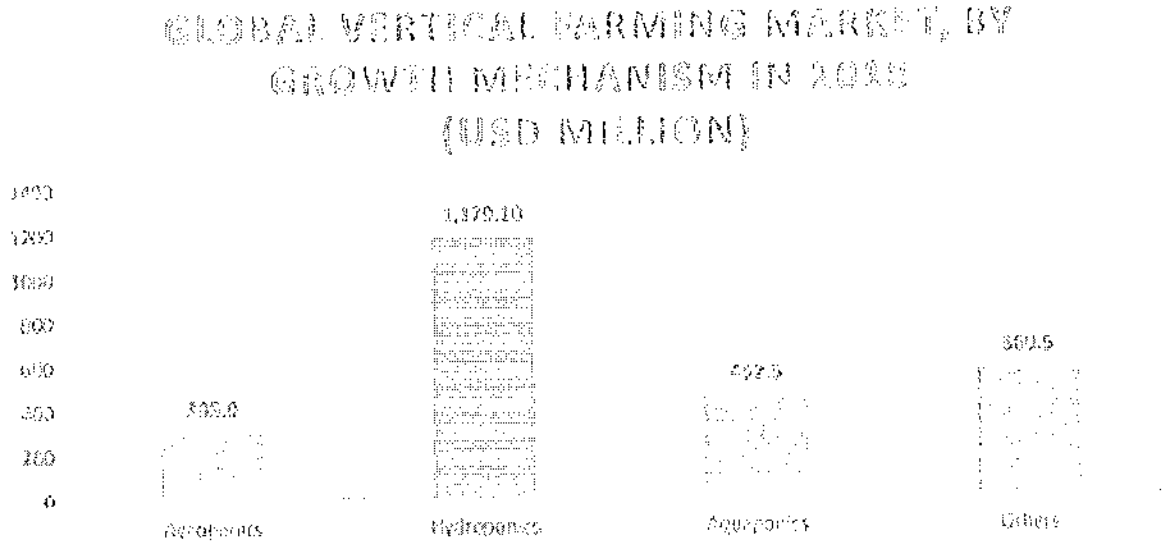
3.3. MARKET SEGMENTATION

The Global Vertical Farming Market is segmented based on Structure, Component, Growth Mechanism, and Geography.



The Vertical Farming market is segmented based on growth mechanism, structure, offering, crop type, and geography. On the basis of growth mechanism, it is bifurcated into Aeroponics, Hydroponics, Aquaponics, and Others. The Hydroponics segment is expected to dominate the market in 2017. In hydroponics, plants are grown in water or in an inorganic fabricated substrate. The conditions that affect the growth of the plant can be controlled through hydroponics in a sterile environment. The efficiency of the hydroponics system is

prevalent. This is the most popular segment due to lower installation cost and ease of operation and this eventually contributes to its dominance.



3.4. Vertical Farming Market by Structure

- Building-Based Vertical Farms
- Shipping Container Vertical Farms

Based on Structure, the market is bifurcated into Building-Based Vertical Farms, Shipping Container Vertical Farms. Shipping Container Vertical Farms are predicted to hold the most significant CAGR in the forecast period due to the benefits it provides which allows the crops to grow without the limitation of geographic location. Advantages like easy portability and less space required for cultivating the crops.

3.5. Vertical Farming Market by Component

- Irrigation Component
- Lighting
- Building Material

- Sensor
- Climate Control

Based on Components, the market is divided into Irrigation Component, Lighting, Building Material, Sensor, Climate Control, and Others. The lighting segment is anticipated to dominate the Vertical Farming Market with a significant market share as vertical farming is highly dependent on artificial lights that act as a substitute for the sunlight. Outdoor lighting conditions are achieved with the help of artificial light by varying the intensity output of the lamps

3.6. Vertical Farming Market USA

The US vertical farming market is projected to reach values of around $3 billion by 2024, growing at a CAGR of more than 24% during 2018-2024. The US vertical farming market by growth systems is categorized into hydroponics, aeroponics, and aquaponics. Hydroponics segment dominated around half of the total market share in 2018, growing at a CAGR of more than 22% during the forecast period. The use of hydroponics enables long-term cultivation of a wide range of crops in the market. The recent developments in the field of hydroponics to cater to the casual indoor grower, simplifying technology and economics is boosting the growth of this segment in the US market.

The US vertical farming market is highly fragmented, with more than 2,000 farms across the United States in 2019. Small indoor vertical farms are high in number, as compared to large-scale farms in the country. Around 61% of the indoor vertical farms in the country, currently, are of small scale, whereas large-scale farms account for a share of 39%.

The fruit and vegetable segment in the US vertical farming market held a share of 47% of the overall market in 2018. Tomato is one of the primary crops that is grown through vertical farming systems in the country. Hydroponic techniques have proven to be commercially successful for propagation, seed germination, and the production of tomato. Producers in the country have recognized this as an opportunity; thereby, increasing the production of fruits and vegetables through vertical farming.

The outdoor segment is the fastest growing sector in the US market, at CAGR of approximately 26% during the forecast period. The increasing adoption of the local food movement and growing demand for fresh produce is fueling the growth of the outdoor segment in the US market. Restaurants, housing complexes, schools, and supermarkets are using outdoor vertical agriculture practices to offer nutrient-rich and fresh produce in the US market.

4. OUR MARKET (CURRENT & ESTIMATED DEMAND)

The global vertical farming market size was valued at $2.23 billion in 2018, and is projected to reach $12.77 billion by 2026, growing at a CAGR of 24.6% from 2019 to 2026. Vertical farming is a revolutionary approach used to produce food and medicinal plants in vertically stacked layers such as in a skyscraper, used warehouse, or shipping container. It facilitates a huge quantity of nutritious and quality fresh food without relying on favorable weather, high water usage, skilled labor, and high soil fertility. Moreover, it ensures reliable yield and consistency in crop production round the year along with climate control, and no effects of

external environment factors such as diseases, pests, or predator attacks.

The demand for the vertical farming industry is expected to increase rapidly during the forecast period, owing to the rise in popularity of organic food. Furthermore, the vertically stacked structure of these farms reduces the demand for additional construction activity and land. Moreover, it reduces the intervention of machines required during conventional farming. Thus, optimum use of vertical space and balanced energy utilization contribute toward the vertical farming market growth. In addition, these facilities involve multiple technologies for growth of plants artificially. The technologies used in this farming enables to keep track of plants growth and harvesting, which further drives the market growth. However, high initial investment is required for setting the indoor vertical structure and setting up the lighting and irrigation systems. Also, the technologies involved in vertical farming are nascent, which is expected to have a negative impact on market growth. Nonetheless, rise in urban population and surge in adoption of technology driven agriculture are expected to provide lucrative growth opportunities to the vertical farming market players.

4.1. WHAT DOES FUTURE HOLDS?

Obviously, the decision whether to make the vertical farming switch depends on many different factors - including location, product type, human resources, potential profit levels and access to investment capital. Whilst new hydroponic growing techniques will never completely replace all traditional methods, the fact they are now being used to complement them is a massive step forward for the agricultural industry.

Of course, to make vertical farming an economically viable way to grow crops, it is important to keep a tight control on water and energy costs - whilst minimizing carbon production. With the right climate control system and energy center in place, it is possible to capture excess light and power so it can be reused, reducing hydroponic growing costs, and making it much more financially viable.

All the indoor growing experts here at NBVF passionately believe that vertical farming's ability to increase production and minimize land use is of massive value to society. As the global demand for food continues to rise, we have no doubt that controlled environment agriculture will present a unique opportunity because of its ability to grow higher-quality food which is sustainable and profitable.

5. OUR PRODUCTS/SERVICES

Becoming a vertical farmer is no easy task. For every vertical farming business that becomes successful, there are a dozen more vertical farms that fail. This ratio is not entirely surprising when you consider the many different variables, from lighting to location, that vertical farms must get just right. However, this failure rate is an increasing source of concern for the industry. After all, if vertical farming is going to help revolutionize our agricultural system and feed our rapidly growing global population — the industry's purported goal — then we are going to need more successful farms.

To help boost the likelihood of success for vertical farms, experience, competent staff, equipment, and ideal location needs to be chosen. By doing so NBVF will offer the following products & services to the local community.

5.1. MICROGREENS/LEAFY GREENS/MUSHROOMS/WORM CASTINGS

Since their introduction to the Californian restaurant scene in the 1980s, microgreens have steadily gained popularity. These aromatic greens, also known as micro herbs or vegetable confetti, are rich in flavor and add a welcome splash of color to a variety of dishes. Despite their small size, they pack a nutritional punch, often containing higher nutrient levels than more mature vegetable greens. This makes them a good addition to any diet.

Microgreens are young vegetable greens that are approximately 1–3 inches (2.5– 7.5 cm) tall. They have an aromatic flavor and concentrated nutrient content and come in a variety of colors and textures. Microgreens are considered baby plants, falling somewhere between a sprout and baby green. That said, they should not be confused with sprouts, which do not have leaves. Sprouts also have a much shorter growing cycle of 2–7 days, whereas microgreens are usually harvested 7–21 days after germination once the plant's first true leaves have emerged.

Microgreens are more like baby greens in that only their stems and leaves are considered edible. However, unlike baby greens, they are much smaller in size.

This means that the plants can be bought whole and cut at home, keeping them alive until they are consumed. Microgreens are very convenient to grow, as they can be grown in a variety of locations, including outdoors, in greenhouses and even on your windowsill.

We are currently producing 4 different kinds of microgreens that are selling in stores, they are:

- Sweet Peas Microgreens,
- Radish Microgreens,
- Sunflower Microgreens.
- Probiotic Mix

Leafy Greens, Also known as baby greens, are the young leaves of lettuce or other vegetables that are quickly replacing lettuce as the base ingredient in salads and sandwiches. Leafy Greens are a fast growing crop, they can be grown in very tight spaces, and have quickly become a staple in the kitchen. They are more nutrient dense than iceberg and romaine lettuces, have different flavors, and some are even more colorful.

Mushrooms have long been a staple in many households, especially the well known button mushroom which is a commercial God send. Recently their health benefits have been further studied and many different mushroom strains are quickly finding their way not only in the kitchen but also in the medicine cabinet. From mushroom supplements to mushroom coffee substitutes, mushrooms are finding their ways into different areas of our lives. Although we intend to sell mushrooms we will be using mushroom cultivation as our main method of CO2 production. Since leafy greens will be breathing all the CO2 from our grow rooms we need a steady and organic way to reintroduce CO2, and that's where mushrooms come into the picture.

Worm Castings are the end-products of worm digestion and are full of organic matter

and desirable microorganisms (aka microbes) that yield benefits far beyond what normal fertilizer ratios show. When added into potting mixes, or fertilizers, the microbes in the castings improve the structure of the soil. Castings have more humus than traditional compost or garden soil, they allow for more water retention in soil, improve soil aeration, and anchor plant nutrients that would otherwise be washed away with water. The microbes that are in the castings feed off the organic matter in the soil, they store then slowly release plant nutrition for optimal growth. Worm castings are suitable for indoor and outdoor gardens and for all vegetables, fruit trees, potted plants, flowers, and lawns.

5.2. RETAIL DISTRIBUTION

Currently we distribute microgreens through retailers to keep our products fresh. Once the local & regional wholesalers are able to present an infrastructure which will guarantee to keep our products fresh till it reaches the end user, we will strictly deliver our products to them to further lower the cost and increase job opportunities. Eventually, when we expand to other states and national markets, We will reinstate our own distribution channels which will further provide additional job opportunities for the local and regional communities, while promoting a healthy and sustainable lifestyle.

5.3. BENEFITS

By the year 2050, it is estimated that global food production will need to increase by around 70 per cent in developed countries to keep up with current consumption trends.

Increased climate variability with rising land prices - and a rural workforce which is becoming older and smaller in numbers - and it is easy to see why new methods of food production are attracting significant funds for research,

development and investment. Growers who see high-value crops put at risk because of adverse and unpredictable weather variations (rainfall, light, wind etc.) are also beginning to appreciate that the switch to vertical farming can remove the uncertainty posed by nature.

5.3.1. PROFITABILITY

Having recognized that global food production must increase to improve domestic food security; vertical farming is attracting widespread interest from individual investors and Private Equity firms who are now willing to take a long term view. According to predictions made by some of the industry's leading economists, the profit margins achievable from fresh produce could pay for the initial investment in seven years. Historically, this type of investment would not have held much appeal because returns are often delivered outside the traditional 5-year holding period. However, some larger funds have recognized the potential returns on offer and have lengthened this period to 10-15 years due to the long-term yields available.

At NBVF, we believe this sustainable profitability is one of the main reasons why indoor farming interest has surged in recent years. As a result, growers are now producing thousands of vertically farmed products which are cleaner, better quality, profitable - and competitively priced for consumers.

6. COMMUNITY DEVELOPMENT

If a hobby can be commercialized and benefit not only you or your family, but

ensure food security, and employment/training opportunity for your entire community, then it should be commercialized keeping the following in mind. However, before discussing commercializing our farm, let us elaborate how we will aid in the socio-economic growth and development of our community.

6.1. VOCATIONAL TRAINING

In the coming years, we are planning to expand our facility and provide vocational training in urban/ vertical farming. This will allow individuals to learn a unique skill set, demand for which is growing to increase rapidly in the coming years. Hence, the thorough market research has been provided for your review. This skill set will allow community members and us to develop a mutual partnership which results in socio-economic growth and development of our local community.

6.2. INTERNSHIP & JOB OPPORTUNITIES

Successful candidates from our training programs will be provided with internship and job opportunities in our expanded farm. In addition, with development of our own distribution channels and expansion, we would require significant human resources, not only to run our operations, but to market, manage and expand it to other regions. Possibilities are endless and priority will be given to the locals as they are aware of the local regions and their insight would streamline our operations to maximum efficiency.

7. MARKETING

Once we can identify desired audiences, and match products and services in

accordance with their needs, we will deploy adequate promotional strategies which will create awareness about our offerings in both local and international markets. To effectively market our campaigns, we will need to launch conferences and conventions which will invite environmental enthusiasts and developers. Our participants will be briefed on the initiative and will provide a platform for sharing knowledge to develop a more sustainable planet. Such conferences have been organized in the past and have inspired millions of individuals and hundreds of similar smart and green initiatives, which are striving towards achieving a carbon neutral world. The extent of such conferences is unquantifiable as they are not only allowing us to effectively market our offerings, but at the same time inspire others to do the same. These strategies will include:

- WEBSITE DEVELOPMENT
- SOCIAL MEDIA PRESENCE
- SEO & GOOGLE ADWORDS
- E-MAIL MARKETING (TARGET AUDIENCE)
- PPC MARKETING
- TELE-MARKETING
- TELEVISION MARKETING
- AFFILIATE MARKETING
- CONFERENCES

8. COMMERCIALIZATION

People often argue whether urban farming is a hobby, or a way of life, history on the contrary suggests that urban farming was developed in the middle ages due to necessity. It was the strike of hunger and famine during wars and sieges (which lasted several years), which forced soldiers to grow their own food and

meet their energy requirements. The earliest record can be found of the 1890s when the Detroit, Michigan government initiated a program "Potato Patch" encouraging its citizens to plant across urban lands, afterwards similar patterns were observed during the industrial revolution in the United Kingdom. Later during the second world war the US government made Victoria Garden, encouraging students, and parents to grow fresh fruits and vegetables within city spaces to meet their nutritional needs.

8.1. A SUSTAINABLE SOLUTION?

Within the framework of urban farming, there is a relatively new field which is winning the hearts of communities across the globe i.e. vertical farming. The system is a hybrid of traditional methods of farming, hydroponics and are irrigated in a vertical structure Thus, providing us with a sustainable agriculture system, which requires less space for irrigation and provides higher quality yields. Currently vertical farming is being treated as a hobby, however, with adequate infrastructure this method of farming can be commercialized to benefit a wider audience. Limited availability of resources is currently hindering the growth and deployment of this system across the globe. Furthermore, the lack of support and promotion of such modes of urban farming is still missing from our society.
The socio-economic benefits are beyond comprehension, yet people are still indulged in retrieving short term benefits and are unwilling to invest in the long run and sustainable solution. Vertical farming will ultimately provide us with a sustainable mode of farming which will not only provide farmers with a source of revenue, but at the same time minimize the risks associated with traditional mode of farming. So, in the big picture the government would only have to invest in the infrastructure and would save millions if not billions funding their medical sectors. Hence, an adequate infrastructure, backed by governments

across the globe and an impeccable marketing plan is all that is needed for commercialization of vertical farming.

In addition, commercialization of this system will enable each single individual to dedicate a couple of hours daily to operate their farms, thus ensuring sustainability to everyone. A communal infrastructure can then be formulated dedicating farming of different vegetables and fruits, which can ultimately be bartered within the community. This communal infrastructure will further aid in reducing the transportation cost, and ultimately allow communities to work together to eradicate carbon/fuel emersion. Hence, the ultimate achievement of vertical farming will not only be the creation of a sustainable community, but at the same time it will be one step further in the direction of developing a greener earth with zero carbon emission.

9. FINANCIAL OUTLOOK

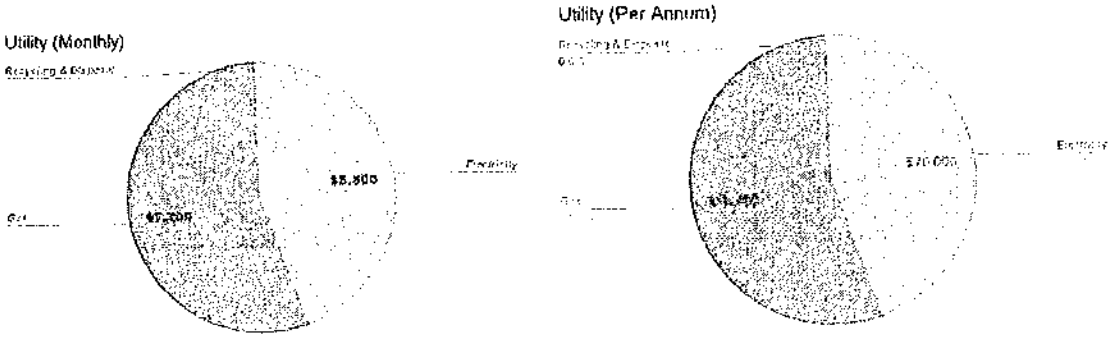
Indoor food production has long-been cited as the ideal way to help feed an ever-growing population. Currently, vertical farming is increasingly being the way forward to produce higher volumes of better-quality crops all year round, bring food production closer to customers, and into urban areas. For leafy produce growers, a move to vertical farming can massively reduce the reliance on conventional farming methods - which are affected by the weather - and ensure consistent, quality crops to keep customers happy. There's no hiding away from the fact that the upfront capital required to design and establish a vertical farm is substantial. However, the potential long-term future growth and profits offered by being at the forefront of this developing market is making it an attractive proposition for those with funds to invest. To date, high-profile

investors like Jeff Bezos (Amazon) and Eric Schmidt (Google) have invested heavily in this fast developing technology - and have been joined by various global Private Equity firms.

Whilst vertical farming start-up costs are high, the long-term benefits are increasingly being recognized and appreciated by everyone involved in the food supply chain - including retailers. Thankfully, technological advances and new innovations are continually helping to reduce capital costs and ongoing overheads. In the long term, this will make indoor vertical farming an attractive investment for any existing grower who wants to adopt a successful strategy for increasing the volume of their high-quality product. At present, vertical farming costs are probably between three to five times more expensive when compared to conventional outdoor farming.

9.1. OPERATIONAL COST

Vertical farming enables production throughout the year, and is not reliant upon climate conditions, rather on state-of-the-art equipment, gas, and electricity. In addition, we are producing 4 different types of microgreens (radish, sweet peas, sunflowers, Probiotic mix), as well as 4 different types of Leafy Greens (Lettuce, Kale, Spinach, Mustard/Beet). We will invest in acquisition of raw materials including seeds, burlap/rockwool (growing medium). Following chart will further illustrate our monthly and yearly costs for utilities:



Electricity Utility Charge:

Our farm will require electricity to maintain the temperature and light for the growth of our microgreens/baby greens and to accommodate 450 trays/week we will utilize 550 kWh/month. The base price 7.07 per kWh plus Service Charges which add up to 39% of the usage, and Taxes and Fees that add up to 7%. This brings our total cost to $5,800 per month and $70,000 per year.

Gas Utility Charges:

Similarly, our farm will also utilize gas to maintain the ideal condition for growth of our microgreens/baby greens and our consumption will increase significantly during the coldest months of the year. The estimated cost of which will be approximately $7,200 per month and about $86,400 per year.

Recycling & Disposal:

We would also need a 2-yard disposal unit that will cost $75 per month and $900 per

year.

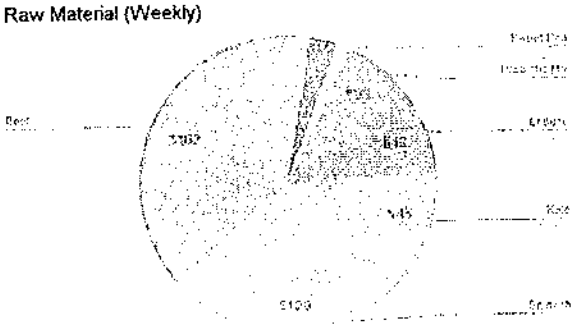
Raw material

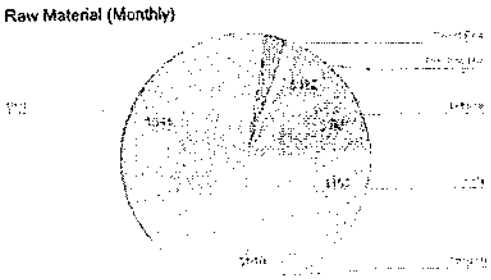
For raw materials, we will require Burlap and Rockwool, which is utilized as a growing medium for our greens. Our farms will accommodate 450 growing trays per week, and operations will run 6-days/week, which will account for 24,000 trays/year. The total cost for burlap and rockwool will be $2737/week & $131376/annum.

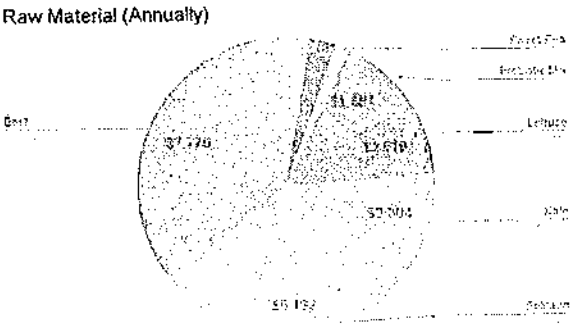
In addition, we will also require raw material in the form of seeds for our greens. With our estimate of manufacturing 460 trays per week, while dedicating 40 trays to each type of microgreen, and 75 trays of each baby green, and operating 6-days in a week our cost for raw material is as follows:

- Radish currently costs $120/50 pounds of seed, and to dedicate 40 trays/week to radish, we will spend $12/week, $48/month & $576/annually on its seeds.
- Sweet Peas currently costs $67/50 pounds of seed, and to dedicate 40 trays/week to Sweet Peas, we will spend $13/week, $52/month & $624/annually on its seeds.
- Sunflower currently costs $55/50 pounds of seed, and to dedicate 40 trays/week to Sunflower, we will spend $7/week, $28/month & $336/annually on its seeds.
- Probiotic mix is a blend of 4 different seeds and costs $75/4 pounds of seed and to dedicate 40 trays/week to Probiotic mix, we will spend $33/week, $132/month & $1584/annually on its seeds.
- Lettuce currently costs $165/1 pound of seed, and to dedicate 75 trays/week to Lettuce, we will spend $42/week, $168/month & $2016/annually on its seeds.

- Kale currently costs $40/pound of seed, and to dedicate 75 trays/week to Kale, we will spend $48/week, $192/month & $2304/annually on its seeds.
- Spinach currently costs $43/pound of seed, and to dedicate 75 trays/week to Spinach, we will spend $129/week, $516/month & $6192/annually on its seeds
- Beet currently costs ~$29/pound of seed, and to dedicate 75 trays/week to Beet, we will spend ~$162/week, ~$648/month, ~$7776/annually on its seeds.







Operational Cost		Weekly	Monthly	Annually
1	**Utilities**			
	Electricity	$ 1,450.00	$ 5,800.00	$ 70,000.00
	Gas	$ 1,800.00	$ 7,200.00	$ 86,400.00
	Recycling & Disposal	$ 18.75	$ 75.00	$ 900.00
2	**Raw Material**			
	Burlap	$ 37.00	$148.00	$ 1,776.00
	Rockwool	$2,700.00	$10,800.00	$129,600.00
	Seeds			
	Radish	$12.00	$ 48.00	$ 576.00
	Sweet Peas	$ 13.00	$ 52.00	$ 624.00
	Sunflower	$ 7.00	$ 28.00	$ 336.00
	Probiotic Mix	$33.00	$132.00	$1584.00
	Lettuce	$42.00	$168.00	$2016.00
	Kale	$48.00	$192.00	$2304.00
	Spinach	$129.00	$516.00	$6192.00
	Beet	$162.00	$648.00	$7776.00
3	**Labor**	$ 7,920.00	$ 31,680.00	$ 380,160.00
	Total	**$14,371.75**	**$57,487.00**	**$690,244.00**

9.2. Startup Cost

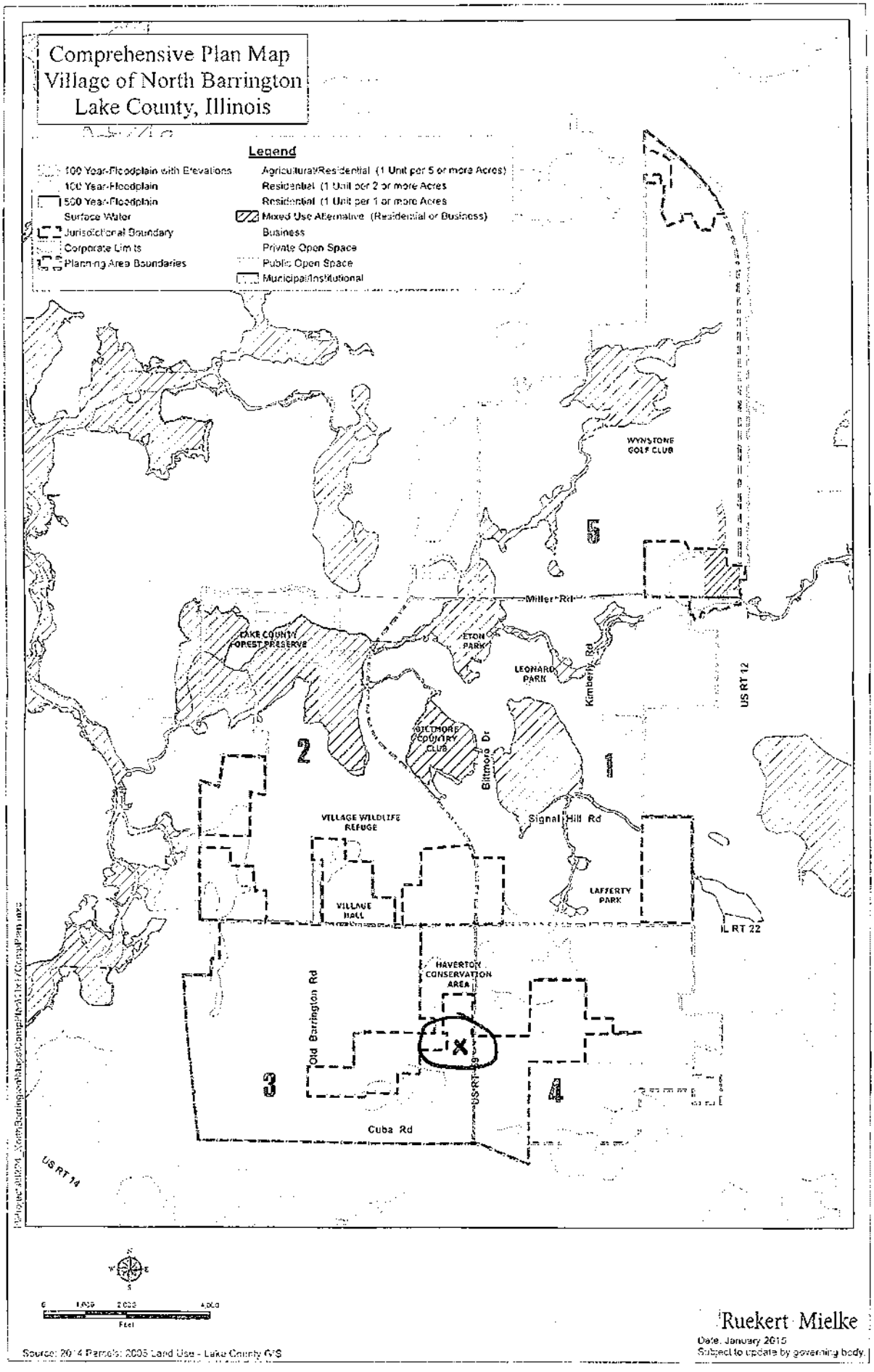
Our team at NBVF was able to optimize the operational cost and we will effectively operate the farm with 11 Employees working along with automated machinery. However, purchase and installation of these automated machinery is expensive and brings up our startup cost to the following:

Start Up Cost		
1	Equipment	
	Seeder	$ 17,500.00
	Harvester	$ 31,000.00
2	Building	
	HVAC	$ 234,500.00
	Drywall	$ 33,000.00
	Insulation	$ 89,810.00
	Com Ed	$ 45,000.00
	Nicor Gas	$ 20,000.00
	Total	**$ 470,810.00**

9.3. ESTIMATED REVENUE

We have installed 1000 beds in NBVF farms, which can produce 2600 pounds of greens each week. The graph below demonstrates how much revenue we can generate. The first graph will illustrate potential revenue we will generate on a weekly basis, followed by our gross & net income (annually)

Package size in oz.	**5oz**	**16oz**	**Total Income**
# of packages produced/week	6,267	653	-
Price Per Package	$2.50	$7.50	-
Weekly income	$15,667.5	$4897.5	$20,565
Monthly Income	$62,670.00	$19,590.00	$82,260.00
Annual Income	$752,040.00	$235,080.00	$987,120.00


Comprehensive Plan Map
Village of North Barrington
Lake County, Illinois
Legend
100 Year-Floodplain with Elevations
100 Year-Floodplain
500 Year-Floodplain
Surface Water
Jurisdictional Boundary
Corporate Limits
Planning Area Boundaries
Agricultural/Residential (1 Unit per 5 or more Acres)
Residential (1 Unit per 2 or more Acres
Residential (1 Unit per 1 or more Acres
Mixed Use Alternative (Residential or Business)
Business
Private Open Space
Public Open Space
Municipal/Institutional
WYNSTONE GOLF CLUB
Miller Rd
LAKE COUNTY FOREST PRESERVE
ETON PARK
LEONARD PARK
Kimberly Rd
US RT 12
BITTMORE COUNTRY CLUB
Bittmore Dr
Signal Hill Rd
VILLAGE WILDLIFE REFUGE
VILLAGE HALL
LAFFERTY PARK
IL RT 22
HAVERTON CONSERVATION AREA
Old Barrington Rd
US RT 14
Cuba Rd
1
2
3
4
5
Feet
Source: 2014 Parcels; 2005 Land Use - Lake County GIS
Ruekert Mielke
Date: January 2015
Subject to update by governing body.

PETER SNELTEN & SONS INC

LETTER OF OPINION ON FARM OPERATIONS IMPACT ON SURROUNDING WELLS

PETER SNELTEN & SONS Inc.

Water Well Contractors

- ESTABLISHED 1923 -

25000 S. Old Rand Road Wauconda, Illinois 60084

Office: 847-526-3500 or 847-255-4551 Fax: 847-381-0048

www.waterwellcontractor.com

To Whom It May Concern:

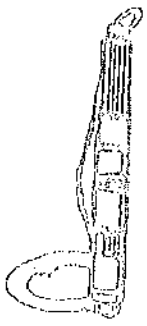
We were contacted about information on the existing well at 25815 W. Scott Road in North Barrington and whether or not a proposed hydroponic farm would affect the surrounding homes. The above mentioned well is a 4 – ½ inch diameter well with a 10 GPM motor installed at 200 feet. The well itself is 251 feet deep. It was stated that the farm would need 200 – 300 gallons of water each day. Larger homes in this area, between normal usage, softener regeneration and irrigation systems use twice that amount each day. It is our opinion that the water required for the farm would not have a detrimental effect on the surrounding homes.

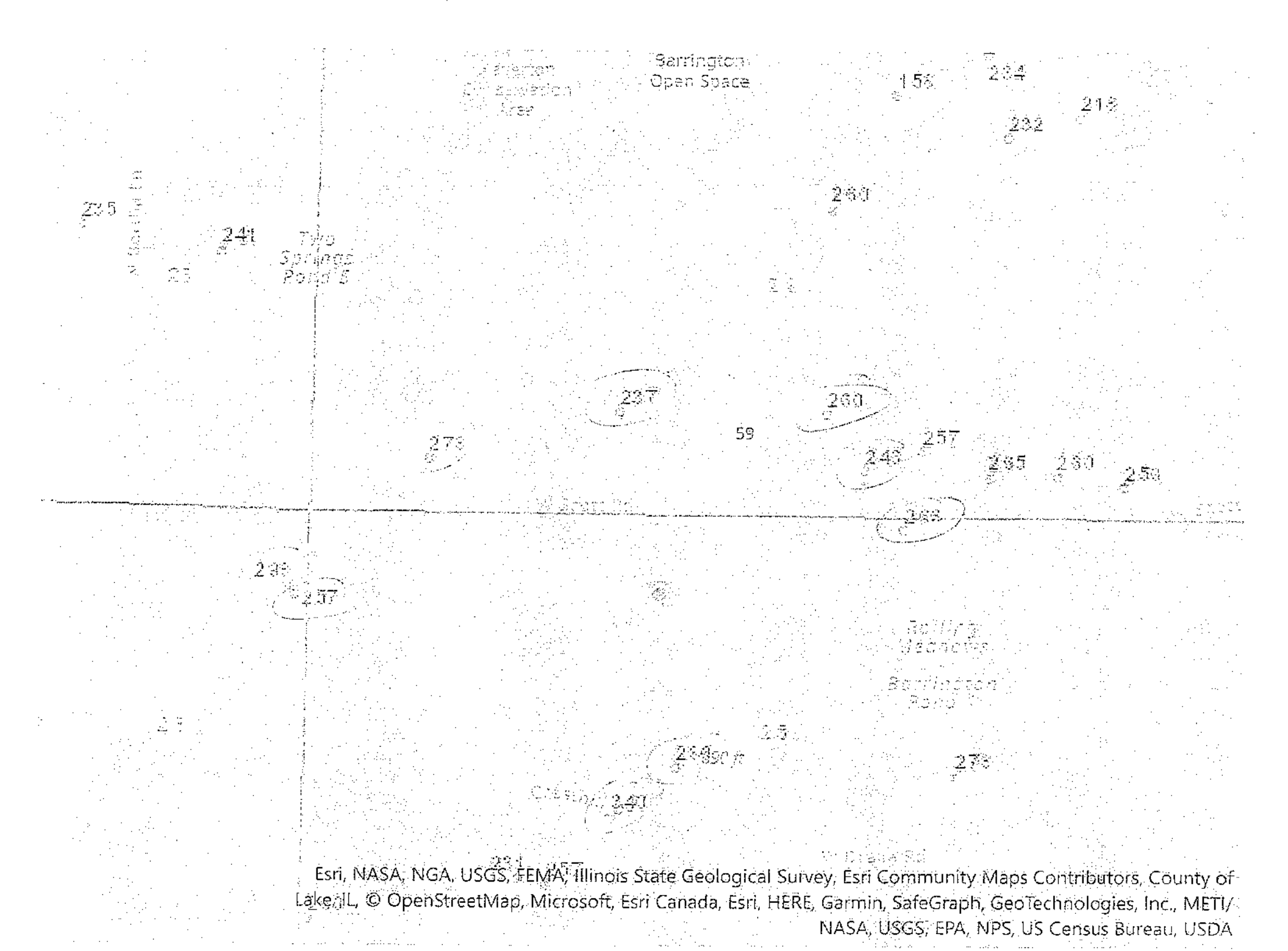
If you have any questions, please contact the office.

Respectfully submitted:

PETER SNELTEN & SONS, INC.

Ryan Snelten – Secretary/Treasurer




Barrington
Open Space
Two
Springs
Pond 5
Barrington
Woods
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ILLINOIS STATE GEOLOGICAL SURVEY

Semi-Private Water Well	Top	Bottom
brown clay	0	15
blue clay	15	140
gravel	140	160
sand & gravel	160	206
blue clay	206	250
gravel	250	257
Total Depth		257

Casing: 5" PVC ASTM D-2241 from 0' to 254'
5" STAINLESS STL SCREEN from 254' to 257'

Screen: 3' of 5" diameter 25 slot

Grout: BENTONITE from 0 to 253.

Water from gravel at 254' to 257'.
Static level 130' below casing top which is 1' above GL
Pumping level 160' when pumping at 30 gpm for 1 hour

Permanent pump installed at 220'
on May 30, 2008, with a capacity of 30 gpm

Remarks: Driller's Estimated Well Yield 50+ gpm

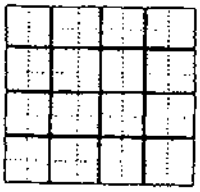
Owner Address: 4052 E. Main St St. Charles, IL

Address of well: 21800 N. Old Barrington Rd
Barrington, IL

Location source: Location from permit

Permit Date: January 23, 2008 **Permit #:** 097-162

COMPANY Shelton, Greg
FARM Oakbrook Construction
DATE DRILLED March 31, 2008 **NO.** 2
ELEVATION 854 **COUNTY NO.** 51632
LOCATION NE NE NE
LATITUDE 42.182317 **LONGITUDE** -88.140967
COUNTY Lake **API** 120975163200 **26 - 43N - 9E**



ILLINOIS STATE GEOLOGICAL SURVEY

Semi-Private Water Well	Top	Bottom
brown clay	0	15
blue clay	15	135
sand & gravel	135	150
blue clay	150	230
sand & gravel	230	250
hardpan gravel	250	257
limestone	257	298
Total Depth		**298**

Casing: 6" PVC from 0' to 253'
6" STAINLESS STL SCREEN from 253' to 257'
5.75" ROCK from 257' to 298'

Screen: 4' of 6" diameter 20 slot

Grout: BENTONITE from 0 to 252.

Water from gravel & rock at 253' to 298'.
Static level 130' below casing top which is 1' above GL
Pumping level 168' when pumping at 50 gpm for 1 hour

Permanent pump installed at 220'
on May 30, 2008, with a capacity of 50 gpm

Remarks: Driller's Estimated Well Yield 60 gpm

Owner Address: 4052 E. Main St St Charles, IL

Address of well: 21800 N Old Barrington Rd
Barrington, IL

Location source: Location from permit

Permit Date: January 23, 2008 **Permit #:** 097-162

COMPANY Snelten, Greg
FARM Oakbrook Construction
DATE DRILLED March 26, 2008 **NO.** 1
ELEVATION 884 **COUNTY NO.** 51631
LOCATION NE NE NE
LATITUDE 42.1824 **LONGITUDE** -88.141017
COUNTY Lake **API** 120975163100 **26 - 43N - 9E**

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown clay	0	10
blue clay	10	150
sand & gravel	150	200
blue clay	200	260
sand & gravel	260	280
limestone at	280	280
Total Depth		280

Casing: 5" STEEL A53B SCH 40 from 0' to 280'

Grout: BENTONITE from 0 to 280.

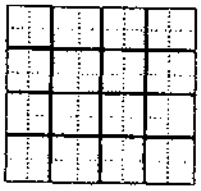
Water from limestone at 280' to 280'.
Static level 150' below casing top which is 1' above GL
Pumping level 150' when pumping at 20 gpm for 1 hour
Permanent pump installed at 200'
on August 20, 2015, with a capacity of 20 gpm
Remarks: Driller's Estimated Well Yield 60 gpm

Owner Address: 25810 W. Crest Hill Dr. Barrington, IL
Address of well: same as above
Location source: Global Positioning System verified

Verified by: VJA on February 2, 2017.

Permit Date: March 5, 2015 **Permit #:** 097-206

COMPANY Snelten, Greg
FARM Born, Kristin Trustee
DATE DRILLED March 27, 2015 NO. 2
ELEVATION COUNTY NO. 52289
LOCATION SE NW NW
LATITUDE 42.180792 **LONGITUDE** -88.136386
COUNTY Lake **API** 120975228900 **25 - 43N - 9E**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay	0	138
clay & gravel	138	164
stoney clay	164	208
clay	208	278
clay mix gravel	278	287
limestone	287	320
limestone shale mix	320	340
Total Depth		340

Casing: 5" A53 ST T/C from -1' to 288'

Grout: BENTONITE from 0 to 287.

Water from limestone at 288' to 340'.
Static level 185' below casing top which is 1' above GL
Pumping level 220' when pumping at 15 gpm for 2 hours
Permanent pump installed at 300'
on October 3, 2000, with a capacity of 15 gpm
Remarks: driller's estimated well yield 20 gpm

Owner Address: 25890 Cresthill Dr. Barrington, IL
Address of well: 21740 North Highway 59
Barrington, IL
Add'l loc. info: Subdivision: Barrington Heights

Location source: Digital Orthophoto Quad Verified by: VJA on October 30, 2006.

Permit Date: May 11, 2000 **Permit #:** 097-021

COMPANY Kerry, Charles M.
FARM Doherty, Tom
DATE DRILLED October 2, 2000 **NO.**
ELEVATION 0 **COUNTY NO.** 27213
LOCATION SE NW NW
LATITUDE 42.180355 **LONGITUDE** -88.137158
COUNTY Lake **API** 120972721300 **25 - 43N - 9E**

ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
topsoil	0	2
blue clay	2	125
sand	125	235
gravel	235	237
Total Depth		237

Casing: 5" GALV 15# from 0' to 237'

Size hole below casing: 5"

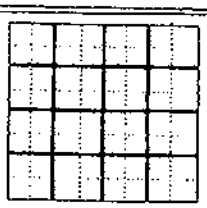
Water from gravel at 237' to '.
Static level 120' below casing top which is 1' above GL
Pumping level 120' when pumping at 15 gpm for 28 hours

Driller's Log filed

Owner Address: 81 N. Honey Lake Rd. Barrington, IL
Location source: Location from permit Verified by: WJA on October 23, 2006.

Permit Date: January 24, 1969 **Permit #:**

COMPANY Pilgard, Peter & Sons
FARM Lohman, Floyd
DATE DRILLED February 7, 1969 NO.
ELEVATION 0 COUNTY NO. 02830
LOCATION SE SW SW
LATITUDE 42.183958 **LONGITUDE** -88.137075
COUNTY Lake **API** 120970283000 **24 - 43N - 9E**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown clay	0	8
blue clay	8	122
sand & gravel	122	267
limestone	267	278
Total Depth		278

Casing: 5" PVC from 0' to 267'
4.75" ROCK from 267' to 278'

Grout: BENTONITE from 0 to 220.

Water from limestone at 138' to 278'.
Static level 138' below casing top which is 1' above GL
Pumping level 145' when pumping at 10 gpm for 2 hours

Permanent pump installed at 160'
on October 6, 1999, with a capacity of 10 gpm

Remarks: driller's estimated well yield 40 gpm

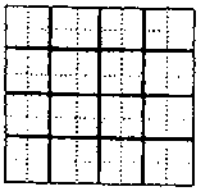
Owner Address: 25962 W. Scott Rd. Barrington, IL

Address of well: same as above

Location source: Digital Orthophoto Quad Verified by: VJA on October 23, 2006.

Permit Date: September 24, 1999 **Permit #:**

COMPANY Snelten, Jeffrey
FARM McQueen, Berna
DATE DRILLED September 30, 1999 **NO.** 2
ELEVATION 0 **COUNTY NO.** 42374
LOCATION SW SW SW
LATITUDE 42.183529 **LONGITUDE** -88.139359
COUNTY Lake **API** 120974237400 **24 - 43N - 9E**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay	0	118
gravel	118	127
clay	127	191
sand	191	242
gravel	242	266
Total Depth		**266**

Casing: 5" GALV. 15# from 0' to 266'

Size hole below casing: 5"

Water from gravel at 0' to 0'.
Static level 148' below casing top which is 1' above GL
Pumping level 148' when pumping at 10 gpm for 4 hours

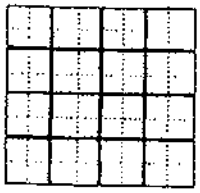
Driller's Log filed

Owner Address: .
Address of well: 25679 W. Scott Rd.
Barrington, IL
Add'l loc. info: Lot: 1 Subdivision: Rolling Meadows

Location source: Digital Orthophoto Quad Verified by: VJA on November 20, 2006.

Permit Date: August 17, 1972 **Permit #:** NF 1606

COMPANY Snelten, Arthur Charles
FARM Flint, John
DATE DRILLED November 1, 1973 NO. 64
ELEVATION **COUNTY NO.** 03830
LOCATION NE NE NW
LATITUDE 42.162905 **LONGITUDE** -88.133683
COUNTY Lake **API** 120970383000 **25 - 43N - 9E**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown clay	0	9
blue clay	9	130
hardpan sand	130	215
sand & gravel	215	242
limestone	242	246
Total Depth		**246**

Casing: 5" PVC ASTM D-2241 from 0' to 242'
4.75" ROCK from 242' to 246'

Grout: BENTONITE from 0 to 242.

Water from limestone at 242' to 246'.
Static level 142' below casing top which is 1' above GL
Pumping level 166' when pumping at 20 gpm for 1 hour
Permanent pump installed at 200'
on May 21, 2003, with a capacity of 20 gpm
Remarks: gamma file: classic.aa0

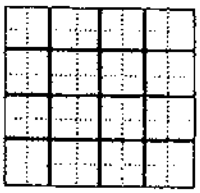
Owner Address: 502 S. Prairie Barrington, IL
Address of well: 110 Scott Rd.
North Barrington, IL
Add'l loc. info: Lot: 27 Subdivision: Grassmere Farms

Location source: Global Positioning System verified — Verified by: ADW on May 1, 2003.

Image viewing help: New users please read this.
GET FILE Natural Gamma Log
GET FILE Related File -

Permit Data: August 12, 2002 **Permit #:**

COMPANY Snelton, Jeffrey
FARM Classic Homes, Jeff Murdy
DATE DRILLED April 28, 2003 **NO.** 1
ELEVATION 865 **COUNTY NO.** 47825
LOCATION SW SE SW
LATITUDE 42.183435 **LONGITUDE** -88.134151
COUNTY Lake **API** 120974782500 **24 - 43N - 9E**



ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
fill	0	7
brown clay	7	14
blue clay	14	123
sand & gravel	123	232
limestone	232	260
Total Depth		**260**

Casing: 5" PVC ASTM D-2241 from 0' to 232'
4.75" ROCK from 232' to 260'

Grout: BENTONITE from 0 to 232.

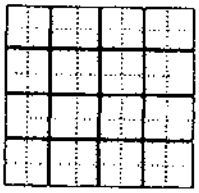
Water from limestone at 232' to 260'.
Static level 133' below casing top which is 1' above GL
Pumping level 164' when pumping at 15 gpm for 1 hour
Permanent pump installed at 200'
on May 8, 2006, with a capacity of 20 gpm
Remarks: driller's estimated well yield 65 gpm

Owner Address: PO Box 1514 Barrington, IL
Address of well: 100 Scott Rd.
North Barrington, IL
Add'l loc. info: Lot: 26 Subdivision: Grassmere Farms
13-24-301-022
Location source: Digital Orthophoto Quad Verified by: VJA on September 22, 2006.

Image viewing help: New users please read this.
GET FILE Related File -

Permit Date: March 15, 2006 **Permit #:**

COMPANY Snelten, Jeffrey
FARM Meese, J. & Assoc.
DATE DRILLED April 20, 2006 **NO.** 1
ELEVATION 854GL **COUNTY NO.** 50294
LOCATION SW SE SW
LATITUDE 42.163944 **LONGITUDE** -88.134608
COUNTY Lake **API** 120975029400 **24 - 43N - 9E**



HEIZER ENGINEERING LLC LETTER DATED MAY 9, 2022 REGARDING CONDITION OF EXISTING PIVATE SEWAGE DISPOSAL SYSTEM

HEIZER ENGINEERING LLC
8404 WIUM ROAD
CARY, ILLINOIS 60013

847-846-1723 (Cell)
reheizer@yahoo.com

May 9, 2022

Mr. Anoosh Varda
25815 W. Scott Road
North Barrington, Illinois

Dear Mr. Varda:

RE: Wastewater Treatment System Inspection at 25815 W. Scott Road, North Barrington, IL

Based on a visit to the above address on June 5 and June 9, 2022, I believe the private sewage disposal system is in acceptable condition. A dye test was performed. The septic tank is in good condition and the absorption system does not have actual or indications of sewage on the ground surface.

This report is made for the conditions observed on the days of visitation and does not reflect future performance.

Thank you and your family for the kindness rendered during my visit.

Should you have any questions, please contact me at the above numbers.

Sincerely yours,

Richard Heizer

Richard Heizer, P.E.

NORTH BARRINGTON VERTICAL FARM BULDING PLANS

25815 SCOTT ROAD

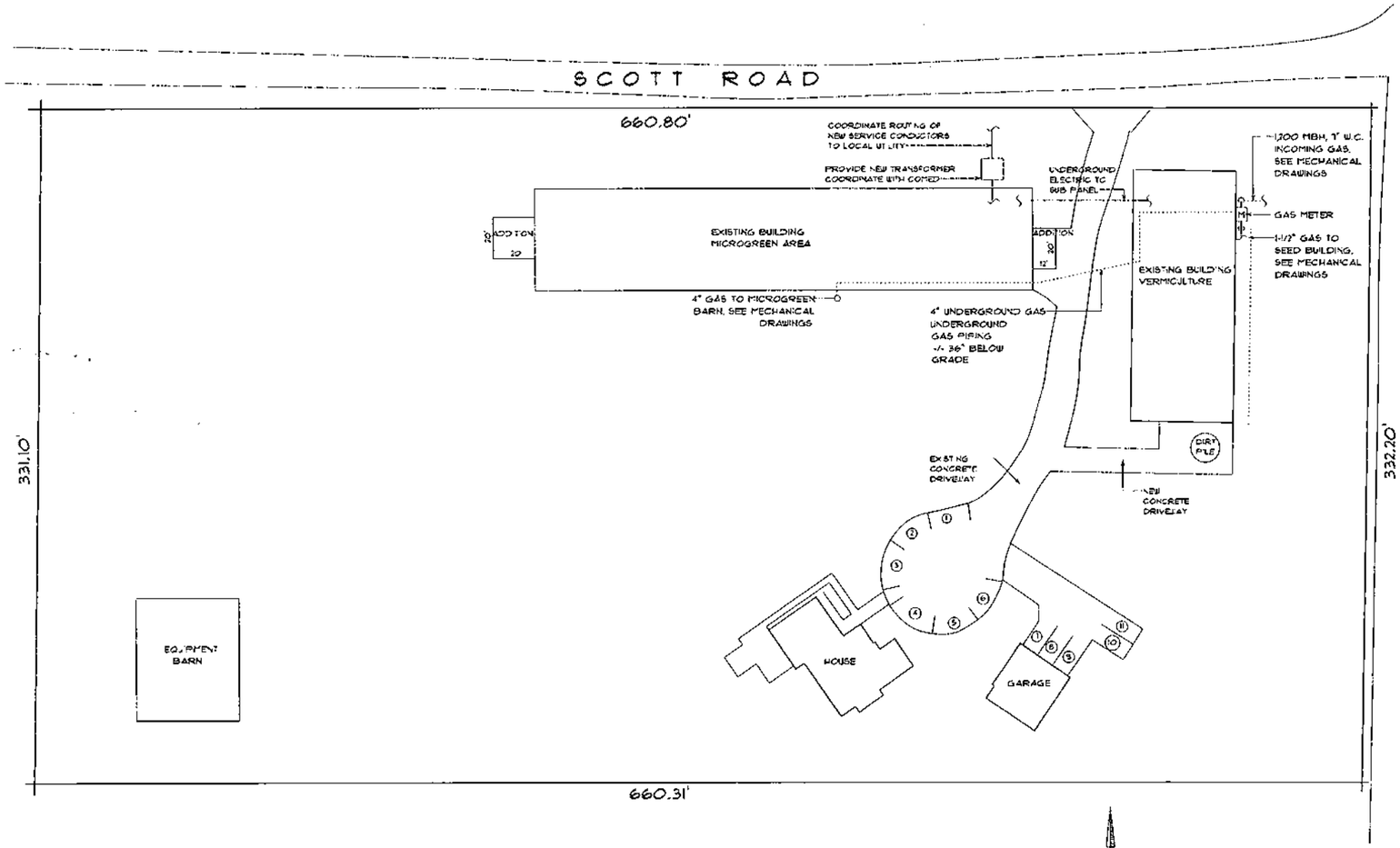
PLANS PREPARED BY JOSEPH A. MEYER

LAST REVISED

JUNE 10, 2022

PROPOSED MICROGREEN FARM FOR:

NORTH BARRINGTON VERTICAL FARM



SITE PLAN SCALE 1"=30'-0"

LOCATION MAP

SHEET INDEX

BUILDING CODES

INTERNATIONAL RESIDENTIAL CODE 2012 EDITION
NATIONAL ELECTRICAL CODE 2011 EDITION
STATE OF ILLINOIS PLUMBING CODE 2004 EDITION
INTERNATIONAL BUILDING CODE 2012 EDITION
INTERNATIONAL FIRE CODE 2012 EDITION
INTERNATIONAL MECHANICAL CODE 2012 EDITION
INTERNATIONAL FUEL GAS CODE 2012 EDITION
INTERNATINAL SWIMMING POOL & SPA CODE 2012 EDITION
ILLINOIS ACCESSIBILITY CODE
ILLINOIS ENERGY CONSERVATION CODE 2012 EDITION

SIGNED:

STRUCTURAL ENGINEER LICENSE NO. 081-002641

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION AND TO THE BEST OF MY PROFESSIONAL KNOWLEDGE THEY CONFORM TO VILLAGE OF NORTH BARRINGTON.

EXPIRES 11/30/2022

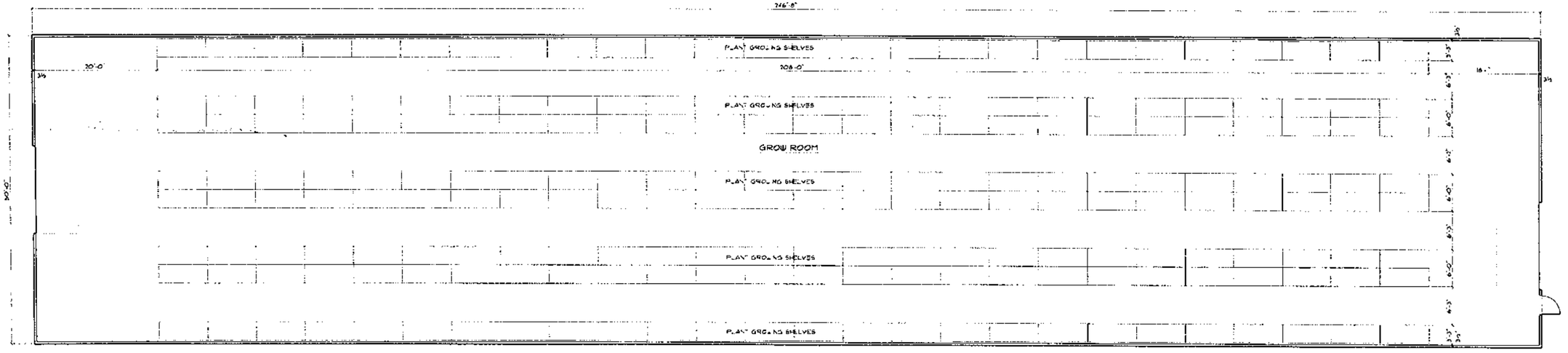
JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE. BARRINGTON IL. 60010 847-382-0200

MICROGREEN FARM FOR:
NORTH BARRINGTON VERTICAL FARM
25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010

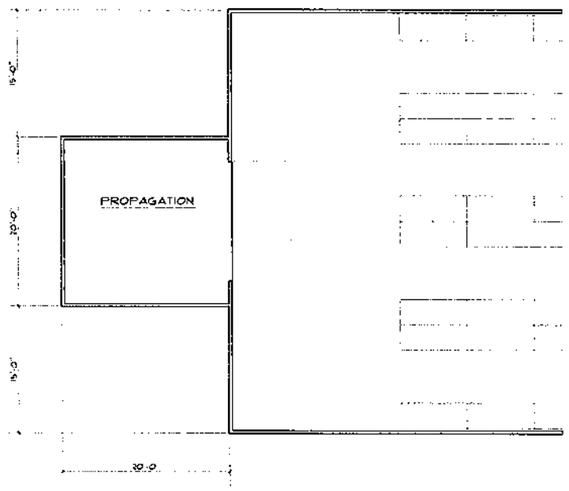
DATE
SEPT 25, 2019
OCT 8, 2021
JUNE 10, 2022
REVISION

JOB #

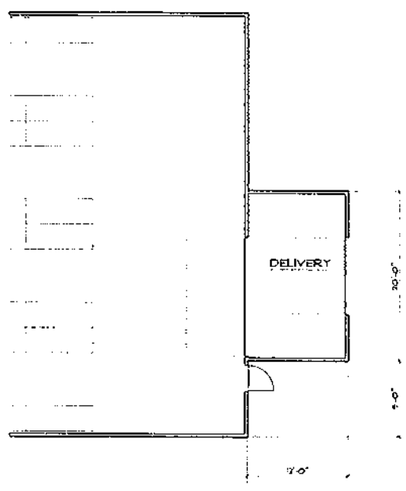
SHEET #
CS



EXISTING BUILDING
MICROGREEN BUILDING SCALE 1/8"=1'-0"



WEST ADDITION
MICROGREEN BUILDING
SCALE 1/8"=1'-0"



EAST ADDITION
MICROGREEN BUILDING
SCALE 1/8"=1'-0"

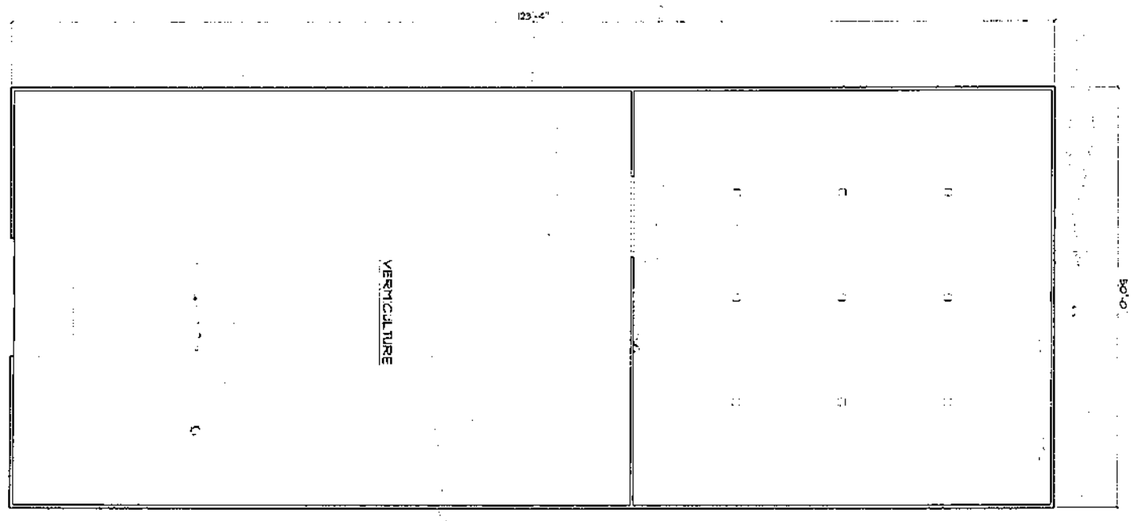
JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE BARRINGTON IL. 60010 847-382-0200

MICROGREEN FARM FOR:
NORTH BARRINGTON VERTICAL FARM
25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010

DATE
SEPT 25, 2019
OCT 8, 2021
JUNE 10, 2022
REVISION

JOB #

SHEET #
A1



EXISTING BUILDING
VERMICULTURE BUILDING

SCALE 1/8"=1'-0"

MICROGREEN FARM FOR:
NORTH BARRINGTON VERTICAL FARM
25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010

DATE
SEPT 25, 2019
OCT 8, 2021
JUNE 10, 2022
REVISION

JOB #

SHEET #
A2

JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE. BARRINGTON IL. 60010 847-382-0200

ELECTRICAL SPECIFICATIONS

PRIOR TO SUBMITTING HIS BID, THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND THOROUGHLY ACQUAINT HIMSELF WITH ALL EXISTING CONDITIONS AND DETERMINE HOW THEY AFFECT HIS WORK. HE SHALL INCLUDE IN HIS BID ANY ALTERATIONS, RELOCATION, REROUTING, ETC. OF EXISTING FACILITIES, WIRING, CONDUIT, PANELBOARDS, ETC. USED FOR INSTALLATION OF NEW WORK. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR BE GIVEN CONSIDERATION FOR ADDITIONAL COMPENSATION DUE TO HIS NEGLECT TO COMPLY WITH THE FOREGOING REQUIREMENTS.

ALL WORK SHALL BE DONE IN ACCORDANCE WITH LATEST NATIONAL ELECTRICAL CODE, FIRE PREVENTION CODES, LOCAL CODES AND ANY OTHER REQUIREMENTS APPLICABLE TO THE JOB. ELECTRICAL CONTRACTOR SHALL SUBMIT ANY REQUIRED DRAWINGS FOR APPROVAL TO ANY AGENCIES REQUIRING THEM AND OBTAIN NECESSARY PERMITS AT NO ADDITIONAL BID COSTS. ALL EQUIPMENT FURNISHED SHALL BE NEMA STANDARDS AND SHALL BE U.L. LISTED.

THESE DRAWINGS ARE DIAGRAMMATIC AND DO NOT INDICATE EVERY JUNCTION BOX, FITTING, ETC. REQUIRED.

THE ELECTRICAL CONTRACTOR SHALL INCLUDE IN HIS BID ANY VARIANCES REQUIRED BY APPLICABLE CODES.

PROTECT EXISTING BUILDINGS, STRUCTURE AND GROUNDS FROM ANY DAMAGE WHICH MAY OCCUR DURING INSTALLATION OF NEW WORK. ANY DAMAGE TO EXISTING FACILITIES SHALL BE REPLACED OR RESTORED TO THE ORIGINAL CONDITION AND SATISFACTION OF THE WORK BY THE OWNER.

PROVIDE COMPLETE AND OPERATING NEC COMPLIANT ELECTRICAL SYSTEMS. PROVIDE OTHER TRADES ASSISTANCE IN STARTING EQUIPMENT, ROOFTOP UNITS, EXHAUST FANS, WATER HEATERS, ETC. ALL EQUIPMENT INSTALLED BY ELECTRICAL CONTRACTOR SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. ELECTRICAL CONTRACTOR SHALL ASSUME LIABILITY FOR ANY COST.

ALL CONDUCTORS SHALL BE COPPER TYPE THHN/THWN 600 VOLT, MINIMUM SIZE #12 AWG AS MANUFACTURED BY GENERAL CABLE, SOUTHWIRE, COLLYER OR ANACONDA.

PROVIDE ALL LABOR AND MATERIAL REQUIRED FOR COMPLETION OF THE WORK. THIS INCLUDES WORK NOT SPECIFICALLY INDICATED BUT REASONABLY REQUIRED FOR PROPER COMPLETION OF THE WORK.

ALL LOCAL, STATE AND FEDERAL TAXES APPLICABLE TO THIS PROJECT SHALL BE INCLUDED.

REMOVE RUBBISH DAILY AT THE END OF EACH SHIFT.

PROVIDE ALL CUTTING, DRILLING AND PATCHING. DO NOT CUT PIERCE OR PERFORM ANY FORM OF SEARCH WORK ON THE STRUCTURE.

UNLESS OTHERWISE SPECIFIED, THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL CONDUIT, WIRING AND DISCONNECTS FOR ALL ELECTRICALLY OPERATED EQUIPMENT INCLUDING FINAL CONNECTIONS TO SAME.

ALL TRANSFORMERS, PANELBOARDS, STARTERS AND DISCONNECT SWITCHES SHALL BE LABELED BY USE OF PLASTIC LAMINATED NAME PLATES.

ALL CONDUITS SHALL BE ALUMINUM, MINIMUM 3/4" AS REQUIRED AS NOTED ELSEWHERE ON PLANS.

DISCONNECT SWITCHES SHALL BE HEAVY DUTY FUSED OR NON-FUSED AS REQUIRED BY LOCAL CODE, NEMA TYPE 3R WHEN LOCATED OUTDOORS.

CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, WIRE AND CABLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL INSTALLATION DRAWINGS AND WIRING DIAGRAMS FROM THE EQUIPMENT MANUFACTURER. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATION AND RECOMMENDATIONS. CONTRACTOR SHALL MAKE FINAL CONNECTIONS AND TERMINATIONS TO ALL COMPONENTS TO PROVIDE COMPLETE AND OPERATING SYSTEMS.

RECEIVE, HANDLE AND STORE ELECTRICAL ITEMS AND MATERIALS AT THE PROJECT SITE IN A LOCATION DIRECTED BY OWNER. MATERIALS AND ELECTRICAL ITEMS SHALL BE SO PLACED THAT THEY ARE PROTECTED FROM DAMAGE AND DETERIORATION.

PROTECT CONDUIT AND WIREWAY OPENINGS AGAINST THE ENTRANCE OF FOREIGN MATTER BY MEANS OF PLUGS OR CAPS. COVER MATERIALS, EQUIPMENT AND DEVICES TO PROTECT AGAINST DAMAGE FROM ANY CAUSE BOTH BEFORE AND AFTER INSTALLATION. MATERIALS, EQUIPMENT OR DEVICES DAMAGED PRIOR TO FINAL ACCEPTANCE OF THE WORK SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR REPLACED.

CONTRACTOR SHALL TEST ALL CIRCUITS, EQUIPMENT, ETC. FOR POLARITY, GROUND CONTINUITY, GROUND FAULTS, SHORTS, ETC. PRIOR TO OPERATING ANY ELECTRICAL ITEM OR EQUIPMENT. UPON INSTALLATION IN OPERATION, TEST FOR EACH PROPER FUNCTION AND SHOW SYSTEMS AND EQUIPMENT TO BE FREE OF DEFECTS. RECORD AND DOCUMENT LOAD AMPERAGE AND TERMINAL VOLTAGE OF EACH PANELBOARD, MOTOR, ETC. WHERE APPLICABLE. FURNISH COPIES TO OWNER.

UPON CONNECTING ALL CIRCUITS TO PANELS, THE CONTRACTOR SHALL BALANCE THE LOAD WITHIN 10% BETWEEN PHASES FOR EACH PANEL.

IN GENERAL THE FOLLOWING MANUFACTURERS ARE CONSIDERED ACCEPTABLE: SQUARE D, GENERAL ELECTRIC, SIEMENS, PHILIPS, SYLVANIA, HUBBELL, LITHONIA, LUTRON, LEVITON, PASS & SEYMOUR, RACO, REPUBLIC, ALLIED STEEL, SOUTHWIRE. OTHER MANUFACTURERS MAY BE PROVIDED AS LONG AS THEY ARE FROM REPUTABLE MANUFACTURERS WITH STRONG BRAND RECOGNITION.

NO SUBSTITUTIONS SUBSEQUENT TO THE ACCEPTANCE OF THE CONTRACTOR SHALL BE MADE EXCEPT BY THE WRITTEN CONSENT OF THE OWNER. SHOULD THE CONTRACTOR DESIRE TO SUBSTITUTE ANOTHER MATERIAL OR ARTICLE FOR A MATERIAL OR ARTICLE SPECIFIED HE SHALL APPLY FOR SUCH PERMISSION AND STATE THE CREDIT OR EXTRA INVOLVED BY THE USE OF SUCH MATERIAL OR ARTICLE. HE SHALL ALSO PROVIDE SAMPLES AND DATA FOR THE OWNER'S ENGINEERS UPON REQUEST.

ANY VARIATION, MODIFICATIONS OR SUBSTITUTIONS FROM THE CONTRACT DOCUMENTS BECAUSE OF SHOP PRACTICES STANDARD WITH THE SUPPLIER SHALL BE SPECIFICALLY MENTIONED BY THE CONTRACTOR TO THE OWNER FOR REVIEW IN ORDER THAT, IF ACCEPTED BY THE OWNER, SUITABLE ACTION MAY BE TAKEN FOR PROPER ADJUSTMENT OF ENGAGING MATERIALS. OTHERWISE THE CONTRACTOR WILL NOT BE RELIEVED OF THE RESPONSIBILITY FOR EXECUTING THE WORK IN ACCORDANCE WITH THE CONTRACT. APPROVAL OF ANY MODIFICATIONS WILL BE MADE IN THE INTEREST OF THE OWNER AND TO EFFECT AN IMPROVEMENT IN THE WORK WITH THE UNDERSTANDING THAT IT DOES NOT INVOLVE ANY INCREASE IN THE CONTRACT PRICE EITHER DIRECTLY OR INDIRECTLY, DOES NOT INVOLVE ANY INCREASE IN THE COMPLETION TIME, THAT IT IS SUBJECT TO ALL CONTRACT STIPULATIONS AND COVENANTS AND THAT IT IS WITHOUT PREJUDICE TO ANY AND ALL RIGHTS OF THE OWNER UNDER THE CONTRACT BOND OR BONDS. THE CONTRACTOR SUBMITTING CHANGES OR MODIFICATIONS FOR REVIEW SHALL ASSUME ALL RESPONSIBILITY IN CONNECTION WITH THE ENGAGEMENT OF THE WORK IN QUESTION WITH THAT OF THE CONTRACTOR OR SUBCONTRACTORS AND SHALL REIMBURSE THEM FOR THE COST OF ANY CHANGE TO THEIR WORK WHICH MAY ARISE THEREFROM.

THE REVIEW OF DRAWINGS, SCHEDULES OR DATA WILL BE GENERAL AND WILL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY FOR ADHERENCE TO THE CONTRACT, NOR SHALL IT RELIEVE HIM OF THE RESPONSIBILITY FOR ERRORS IN DIMENSIONS OR ERRORS OF ANY OTHER SORT. CONTRACTOR SHALL TAKE ACTUAL FIELD MEASUREMENTS WHERE POSSIBLE BEFORE SUBMITTING OR ORDERING PRODUCTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE EQUIPMENT, DEVICES AND OTHER ELECTRICAL INFRASTRUCTURE TO ACCOMMODATE A COMPLETE AND WORKING INSTALLATION.

THE CONTRACTOR SHALL MAINTAIN ONE MASTER DRAWING SET ON THE JOB SITE TAGGED "CONTRACT RECORD DRAWINGS". THE CONTRACTOR SHALL DAILY, AT MINIMUM, REVIEW THE DRAWINGS AND MARK FIELD REQUIRED CHANGES OR REVISIONS IN RED, INITIAL AND DATE. ALL DELETIONS ARE TO BE MARKED IN GREEN, INITIALED AND DATED. FINAL PAYMENT TO THE CONTRACTOR WILL NOT BE MADE OR ANY RETAINMENT UNTIL THE OWNER RECEIVES AND APPROVES THE FIELD RECORD DRAWING SET. THE CONTRACTOR SHALL HAVE RESPONSIBILITY TO ACCURATELY RECORD DRAWING DEVIATIONS DUE TO FIELD CONDITIONS, AND APPROVED DEVIATION FROM THE DRAWING.

ALL MATERIALS SHALL BE NEW AND FREE OF DEFECT. ALL EQUIPMENT SHALL BE U.L. LISTED AND LABELED FOR THE PURPOSE OF INSTALLATION. ALL WIRING 120 VOLT OR GREATER SHALL BE HOUSED WITHIN CONDUIT. ALL FIRE ALARM WIRING SHALL BE RED.

CLEARLY IDENTIFY ALL FEEDERS AS TO THE PHASE THEY ARE CONNECTED, GROUND OR NEUTRAL. PANEL SCHEDULES SHALL BE TYPED AND SHALL BE LEGIBLE. PANEL SCHEDULES SHALL BE ADHERED TO THE PANEL DOOR.

THE CONTRACTOR AGREES TO INDEMNIFY AND SAVE HARMLESS THE OWNER, THE ENGINEER, THEIR AGENTS AND EMPLOYEES FROM AND AGAINST ALL LOSS OR EXPENSE NOT OTHERWISE INSURED AGAINST (INCLUDING COSTS AND ATTORNEYS FEES) BY REASON OF LIABILITY IMPOSED BY LAW UPON THE OWNER OR ENGINEER IN CONNECTION WITH THE CONTRACT WORK FOR DAMAGES BECAUSE OF BODILY INJURY INCLUDING DEATH AT ANY TIME RESULTING THEREFROM SUSTAINED BY ANY PERSON OR PERSONS OR ON ACCOUNT OF DAMAGE OF PROPERTY, INCLUDING LOSS OF USE THEREOF WHETHER SAID LIABILITY IS CAUSED BY OR CONTRIBUTED TO BY SAID OWNER, ENGINEER, THEIR AGENTS OR EMPLOYEES, ANY SUBCONTRACTOR OR A SUBCONTRACTOR OR THEIR AGENTS OR EMPLOYEES OR BY OTHERS.

THIS INDEMNITY AGREEMENT SHALL IMPOSE LIABILITY ON CONTRACTOR ONLY TO THE EXTENT PERMITTED BY THE LAWS OF THE STATE GOVERNING PERFORMANCE THEREOF AND ANY PROVISION HEREOF NOT PERMITTED BY SUCH LAWS IS EXPRESSLY DELETED FROM SAID CONTRACT.

SAID INDEMNIFICATION SHALL BE INSURED BY THE CONTRACTOR'S CARRIER OR CARRIERS, PRIMARY AND EXCESS, IF APPLICABLE. CERTIFICATES OF INSURANCE SHALL IDENTIFY SPECIFICALLY THE AGREEMENTS COVERED. LIMITS OF LIABILITY FOR THIS COVERAGE SHALL BE NO LESS THAN THOSE REQUIRED FOR THE COMPREHENSIVE GENERAL LIABILITY POLICY. HOWEVER ANY SUCH LIMITS ON LIABILITY FOR THIS COVERAGE SHALL NOT LIMIT THE CONTRACTOR'S INDEMNIFICATION OBLIGATION UNDER THE SUBPARAGRAPH ABOVE.

THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A DETAILED REPORT ON EACH AND EVERY ACCIDENT TO EITHER HIS WORKMEN OR TO OTHERS, IN ORDER THAT INFORMATION MAY BE AVAILABLE TO THE OWNER IN CASE OF A THIRD PARTY SUIT BROUGHT AT A LATER DATE.

THE CONTRACTOR IS RESPONSIBLE FOR BEING FAMILIAR WITH THE NEC AND GENERAL COMPLIANCE OF THE CODE. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE LOCAL UTILITY AND SHALL COORDINATE ALL ITEMS REQUIRED TO PROVIDE POWER TO THE FACILITY. THE CONTRACTOR IS RESPONSIBLE FOR FILLING OUT ALL FORMS, ATTENDING MEETINGS, COMMUNICATING WITH THE OWNER, ETC. FOR ANY AND ALL ITEMS REQUIRED BY THE UTILITY.

THE PERMIT FOR THIS PROJECT SHALL BE PROCURED BY THE CONTRACTOR. PRIOR TO THE PROJECT COMMUNICATE WITH THE LOCAL AUTHORITY TO ESTABLISH ANY SPECIFIC ITEMS THEY LOOK FOR WHEN INSPECTING A PROJECT TO MAKE SURE THESE ITEMS ARE ADDRESSED IN THE INSTALLATION. VERIFY THE SCHEDULING OF INSPECTIONS AND COMMUNICATE WITH THE AUTHORITY TO INSPECT THE INSTALLATION IN A TIMELY MANNER SO AS TO NOT HOLD UP OTHER TRADES.

THE INTENT OF THE DRAWINGS IS TO IDENTIFY AN INSTALLATION IN A MANNER THAT MEETS THE INTENT OF THE CODE, ESTABLISHES SIZING OF THE SERVICE AND POWERS NECESSARY EQUIPMENT. IT IS UP TO THE CONTRACTOR TO PROVIDE SUFFICIENT WIRE AND CONDUIT SIZES TO ACCOMMODATE THE LOADS OF THE EQUIPMENT. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO JUNCTION BOXES AND OTHER EQUIPMENT NEEDING MAINTENANCE.

PROVIDE FIRE ALARM SYSTEM TO ACCOMMODATE SPRINKLERS AND ELEVATOR RECALL.

FURNISH AND INSTALL CIRCUIT BREAKER PANELBOARDS AS INDICATED ON THE DRAWINGS. ALL PANELBOARDS SHALL MEET THE REQUIREMENTS OF THE LATEST NATIONAL ELECTRICAL CODE AND APPLICABLE UL AND NEMA STANDARDS. PANELBOARDS SHALL BE OF DEAD FRONT CONSTRUCTION EQUIPPED WITH THERMAL MAGNETIC MOLDED CASE CIRCUIT BREAKERS OF FRAME SIZE AND TRIP RATINGS AS SHOWN ON THE DRAWINGS. PANELBOARDS SHALL BE 600 VOLT RATED.

A. CIRCUIT BREAKERS SHALL BE BOLT-ON THERMAL-MAGNETIC MOLDED CASE CIRCUIT BREAKERS. BREAKERS SHALL BE 1, 2 OR 3 POLE WITH AN INTEGRAL CROSSBAR TO ASSURE SIMULTANEOUS OPENING OF ALL POLES IN MULTIPOLE CIRCUIT BREAKERS. BREAKERS SHALL HAVE AN OVER CENTER, TRIP-FREE, TOGGLE-TYPE OPERATING MECHANISM WITH QUICK-MAKE, QUICK-BREAK ACTION AND POSITIVE HANDLE INDICATION. HANDLES SHALL HAVE "ON" AND "OFF" AND "TRIPPED" POSITIONS. SWITCHING DUTY CIRCUIT BREAKERS SHALL BE MARKED "SWD".

B. PANELBOARD BUS STRUCTURE AND MAIN LUGS OR MAIN CIRCUIT BREAKERS SHALL HAVE CURRENT RATINGS AS SHOWN ON THE DRAWINGS. SUCH RATINGS SHALL BE ESTABLISHED BY HEAT RISE TESTS CONDUCTED IN ACCORDANCE WITH UL STANDARD 67. BUS STRUCTURE SHALL BE INSULATED. BUS BAR CONNECTIONS TO THE BRANCH CIRCUIT BREAKERS SHALL BE THE "DISTRIBUTED PHASE" OR PHASE SEQUENCE TYPE AND SHALL ACCEPT BOLT-ON CIRCUIT BREAKERS. ALL CURRENT CARRYING PARTS OF THE BUS STRUCTURE SHALL BE 98% CONDUCTIVITY COPPER AND PLATED. NEUTRALS SHALL BE FULLY RATED.

C. THE PANELBOARD BUS ASSEMBLY SHALL BE ENCLOSED IN A STEEL CABINET. THE RIGIDITY AND GAUGE OF STEEL TO BE AS SPECIFIED IN UL STANDARD 50 FOR CABINETS. WIRING GUTTER SPACE SHALL BE IN ACCORDANCE WITH UL STANDARD 67 FOR PANELBOARDS. THE BOX SHALL BE FABRICATED FROM GALVANIZED STEEL OR EQUIVALENT RUST RESISTANT STEEL. EACH FRONT SHALL INCLUDE A DOOR AND HAVE A FLUSH, CYLINDER TUMBLER-TYPE LOCK WITH CATCH AND SPRING-LOADED STAINLESS STEEL DOOR PULL. ALL PANELBOARD LOCKS SHALL BE KEYED ALIKE. FRONTS SHALL HAVE ADJUSTABLE INDICATING TRIM CLAMPS WHICH SHALL BE COMPLETELY CONCEALED WHEN THE DOOR IS CLOSED. DOORS SHALL BE MOUNTED WITH COMPLETELY CONCEALED STEEL HINGES. FRONTS SHALL NOT BE REMOVABLE WITH DOOR IN THE LOCKED POSITION. A CIRCUIT DIRECTORY FRAME AND CARD WITH A CLEAR PLASTIC COVERING SHALL BE PROVIDED ON THE INSIDE OF THE DOOR. EACH CIRCUIT USED SHALL BE TYPED WITH CIRCUIT USE AND LOCATION USED. SPARE CIRCUITS SHALL BE LABELED "SPARE".

D. EACH PANELBOARD, AS A COMPLETE UNIT, SHALL HAVE A SHORT CIRCUIT RATING EQUAL TO OR GREATER THAN THE INTEGRATED EQUIPMENT RATING SHOWN ON THE DRAWINGS. THIS RATING SHALL BE ESTABLISHED BY TESTING WITH THE OVERCURRENT DEVICES MOUNTED IN THE PANELBOARD. THE SHORT CIRCUIT TESTS ON THE OVERCURRENT DEVICES AND ON THE PANELBOARD SHALL BE MADE SIMULTANEOUSLY BY CONNECTING THE FAULT TO EACH OVERCURRENT DEVICE WITH THE PANELBOARD CONNECTED TO ITS RATED VOLTAGE SOURCE. METHOD OF TESTING SHALL [illegible] PANELBOARD SHORT CIRCUIT CURRENT OR GREATER. TESTING OF PANELBOARD OVERCURRENT DEVICES MOUNTED IS NOT ACCEPTABLE. ALSO TESTING OF THE BUS STRUCTURE BY APPLYING A FIXED FAULT TO THE BUS STRUCTURE ALONE IS NOT ACCEPTABLE. PANELBOARDS SHALL BE MARKED WITH THEIR MAXIMUM SHORT CIRCUIT CURRENT RATING AT THE SUPPLY VOLTAGE AND SHALL BE UL LISTED.

E. PANELBOARDS SHALL BE LISTED BY UNDERWRITERS LABORATORIES AND SHALL BEAR THE UL LABEL. WHEN REQUIRED, PANELBOARDS FOR USE AS SERVICE ENTRANCE EQUIPMENT SHALL BE SO LABELED.

COSTS OF SERVICE AND FACILITIES: THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, LICENSES, ETC. AND SHALL PAY ALL COSTS INCIDENT TO THE FURNISHING, INSTALLATION AND MAINTENANCE OF SERVICES AND FACILITIES REQUIRED FOR THE DURATION OF THE WORK. OWNER SHALL OBTAIN THE GENERAL BUILDING PERMIT IF REQUIRED.

ALL POWER CONDUCTORS ARE TO BE TERMINATED, SPLICED, OR CONNECTED UTILIZING "PRESS" OR EQUAL MECHANICALLY COMPRESSED LUGS, SPLICES OR TAPS. ONLY THE CORRECT DIE IS TO BE USED FOR THE COMPRESSION.

> A. EXCEPTION - NO. 10 AWG AND SMALLER TERMINATED ON CIRCUIT BREAKERS, SWITCHES, DEVICES OR CABLE TERMINATED DIRECTLY ON CIRCUIT BREAKER LUGS PROVIDED. LIGHTING AND RECEPTACLE BRANCH CIRCUITS MAY BE "WING NUTS" OR "WIRE NUTS" INSTALLED IN AN APPROVED MANNER.

ELECTRICAL CONTRACTOR SHALL FURNISH TO ARCHITECT SHOP DRAWINGS FOR ALL ELECTRICAL SWITCHGEAR, PANELBOARDS, LIGHTING FIXTURES, WIRING DEVICES, FIRE ALARM SYSTEM, ETC. FOR TO THE AUTHORITY HAVING JURISDICTION.

ALL SWITCHBOARDS, DISTRIBUTION PANELS AND PANELBOARDS SHALL BE MANUFACTURED BY ONE MANUFACTURER. ALTERNATE PANEL MANUFACTURERS WILL BE APPROVED ONLY IF THEY DO NOT EXCEED THE DIMENSIONS INDICATED ON THE DRAWINGS. ALTERNATE MANUFACTURERS: I.T.E., SQUARE D, GENERAL ELECTRIC, SIEMENS.

DISTRIBUTION PANELS SHALL BE BRACED AND RATED FOR 65,000 AIC WITH COPPER BUS ONLY.

PANELBOARDS SHALL BE BRACED AND RATED FOR THE AVAILABLE FAULT CURRENT, MINIMUM 10,000 AIC WITH COPPER BUS ONLY.

ALL CIRCUIT BREAKERS FOR PANELBOARDS SHALL BE OF THE BOLT-ON TYPE, RATED FOR SWITCHING DUTY AND RATED FOR THE AVAILABLE FAULT CURRENT (MINIMUM 10,000).

ALL DIRECTORIES SHALL BE TYPED WITH PROPER DESIGNATION OF EQUIPMENT SERVED.

ALL FUSES FEEDING HVAC EQUIPMENT SHALL BE BUSSMANN DUAL ELEMENT FUSETRON TYPE FRN OR FRS. ALL FUSES FEEDING DISTRIBUTION AND PANELS SHALL BE BUSSMANN "LPS-RK" OR "LPN-RK" UNLESS NOTED OTHERWISE.

CIRCUIT BREAKER SIZES AND QUANTITIES ARE FOR THE CONVENIENCE OF THE BIDDERS ONLY. THE E.C. SHALL BE RESPONSIBLE FOR VERIFYING AND SUPPLYING ALL REQUIRED BRANCH CIRCUITS.

BRANCH CIRCUIT BREAKERS OF 2 POLE AND 3 POLE CONFIGURATION SHALL HAVE A COMMON TRIP.

E.C. SHALL REFER TO ALL MECHANICAL, PLUMBING AND ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND CHARACTERISTICS OF ALL EQUIPMENT. ANY MODIFICATION AND/OR ADDITIONAL WORK NECESSARY SHALL BE INCLUDED IN THE BASE BID. VERIFY LOCATION AND ELEVATIONS OF ALL RECEPTACLES, LIGHTS, SWITCHES AND OTHER DEVICES WITH FINISHES, CEILING CONSTRUCTION, WALL CONSTRUCTION AND THE GENERAL CONTRACTOR TO AVOID CONFLICTS. NO DEVICE SHALL BE INSTALLED SUCH THAT IT BRIDGES THE INTERSECTION OF 2 DIFFERENT FINISHES.

E.C. SHALL CHECK THE ROTATION OF ALL THREE PHASE MOTORS AND CORRECT THE ROTATION IF REVERSED.

ALL TEMPERATURE CONTROL AND INTERLOCK WIRING SHALL BE BY HVAC CONTRACTOR UNLESS NOTED OTHERWISE. E.C. SHALL FURNISH AND INSTALL FLUSH JUNCTION BOX AND CONDUIT RACEWAY FROM THERMOSTAT TO RESPECTIVE UNIT FOR WIRING BY HVAC CONTRACTOR. VERIFY ADDITIONAL CONDUITS FURNISHED BY E.C. REQUIRED FOR INTERLOCK WIRING FURNISHED BY HVAC CONTRACTOR.

E.C. SHALL PROVIDE LOCAL REMOTE DISCONNECTING MEANS FOR ALL ELECTRIC HEATING EQUIPMENT IF REQUIRED BY LOCAL CODE.

E.C. SHALL WIRE AND INSTALL MAGNETIC MOTOR STARTER F.B.O. E.C. SHALL COORDINATE WITH OTHER CONTRACTS SO THAT STARTER IS FURNISHED WITH HAND-OFF-AUTO SELECTOR SWITCH, RED "RUNNING" PILOT LIGHT AND ENGRAVED PLASTIC NAMEPLATE, INDICATING THE EQUIPMENT SERVED ON THE COVER AND INCLUDE ALL COSTS IN BASE BID. ENSURE SAME. E.C. SHALL ROUTE POWER WIRING FROM EQUIPMENT THRU STARTER TO PANEL SERVING EQUIPMENT. INTERLOCK WIRING BY E.C. UNLESS OTHERWISE NOTED.

ELECTRICAL CONTRACTOR SHALL FURNISH & INSTALL A DUCT SMOKE DETECTOR IN THE RETURN AIR PLENUM AND A FAN SHUTDOWN RELAY FOR EACH AIR SUPPLY ROOFTOP UNIT GREATER THAN 2000 CFM. PROVIDE FAN SHUTDOWN RELAYS AS REQUIRED. VERIFY EXACT REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.

THIS CONTRACTOR SHALL REVIEW ENTIRE SET OF CONTRACT DOCUMENTS, INCLUDING BUT NOT NECESSARILY LIMITED TO ALL ARCHITECTURAL, ALL STRUCTURAL, ALL MECHANICAL, ALL ELECTRICAL, ALL PLUMBING, ALL KITCHEN DRAWINGS AND ENTIRE PROJECT MANUAL. THIS CONTRACTOR SHALL ACKNOWLEDGE AND INCLUDE IN HIS SCOPE OF WORK CONTRACTUAL CONDITIONS PERTINENT TO THE COMPLETION OF HIS WORK. HE SHALL FULLY COORDINATE HIS WORK WITH THE INSTALLATION OF WORK BY OTHER TRADES AND MAKE NECESSARY FIELD ADJUSTMENTS AS REQUIRED TO ACCOMMODATE HIS WORK. ALL OF THE ABOVE SHALL BE INCLUDED IN THE SCOPE OF WORK AT NO ADDITIONAL CHARGE TO OWNER.

THIS CONTRACTOR SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS, VISIT THE SITE OF WORK AND FULLY INFORM HIMSELF AS TO THE CONDITIONS AND MATTERS THAT CAN IN ANY WAY AFFECT THE WORK OR THE COST THEREOF. SHOULD THE CONTRACTOR FIND DISCREPANCIES IN, OR OMISSIONS FROM THE DRAWINGS, SPECIFICATIONS, OR OTHER DOCUMENTS OR SHOULD HE BE IN DOUBT AS TO THEIR MEANING, HE SHOULD NOTIFY THE ARCHITECT AT ONCE AND OBTAIN CLARIFICATION PRIOR TO SUBMITTING ANY BID.

THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE FIRE PREVENTION BUREAU THE DOCUMENTS, INCLUDING DRAWINGS AND SUBMITTALS REQUIRED TO OBTAIN APPROVAL OF EMERGENCY LIGHTING, FIRE ALARM, LIFE SAFETY AND EXIT SIGN SYSTEMS, TYPES AND LOCATIONS. A COPY OF THE APPROVED DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AND ENGINEER BEFORE THE START OF CONSTRUCTION.

THE CONTRACTOR SHALL PROVIDE TEMPORARY POWER AND WIRING AS REQUIRED FOR THE PERFORMANCE OF ALL TRADES, FOR THE ENTIRE PERIOD OF CONSTRUCTION AND SHALL REMOVE ALL TEMPORARY WIRING AT THE COMPLETION OF CONSTRUCTION. THE E.C. SHALL PROVIDE AN ALLOWANCE FOR SEPARATELY METERING ALL TEMPORARY CONSTRUCTION POWER VIA A METER UNIT FROM THE LOCAL UTILITY OR A PORTABLE GENERATOR UNTIL UTILITY POWER IS AVAILABLE. THIS CONTRACTOR IS RESPONSIBLE FOR PROVIDING FUEL FOR THE GENERATOR.

REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF ELECTRICAL EQUIPMENT. COORDINATE WITH APPLICABLE TRADES AND ADJACENT FINISHES, HARDWARE, ETC. NO DEVICES SHALL BE INSTALLED SUCH THAT THEY BRIDGE 2 DIFFERENT FINISHES.

PROVIDE AS-BUILT CADD DISKETTES AND HARD COPY REPRODUCIBLE DRAWINGS AND SUBMIT TO ARCHITECT AND ENGINEER. AS-BUILTS SHOULD INDICATE EXACT CIRCUIT NUMBERS, LOCATIONS OF ALL DEVICES, CEILING FIXTURES, CONDUIT RACEWAY FOR TELECOMMUNICATIONS AND POWER DISTRIBUTION SYSTEMS AS INSTALLED.

ELECTRICAL METALLIC TUBING (EMT) SHALL BE USED FOR ALL WALL OUTLETS & TELEPHONE OUTLETS RUNNING IN PARTITIONS, BELOW RAISED FLOORS OR ABOVE CEILINGS. EMT FITTINGS SHALL BE OF THE STEEL COMPRESSION TYPE. CONDUITS LARGER THAN 2" DIAMETER OR CONDUITS OF ANY SIZE ROUTED OUTDOORS SHALL BE INTERMEDIATE METAL CONDUIT (IMC).

MINIMUM CONDUIT SIZE SHALL BE 3/4" FOR GENERAL LIGHTING AND POWER CIRCUITRY UNLESS OTHERWISE INDICATED AND/OR REQUIRED BY CODE.

FLEXIBLE CONDUIT CONNECTIONS TO RECESSED LIGHTING FIXTURES SHALL BE MADE WITH FLEXIBLE STEEL CONDUIT 3/8 INCH MINIMUM, APPROVED FOR PLENUM CONDITIONS PER LOCAL CODE. USE LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT OUTDOORS.

ALL RACEWAYS SHALL BE CONCEALED FROM VIEW BEHIND CEILING OR WALL CONSTRUCTION WITH EXCEPTION TO AREAS WITHOUT CEILINGS, THE HOUSE UTILITY ROOM AND HOUSE STORAGE ROOMS. RESIDENTIAL AND TENANT AREAS SHALL NOT HAVE EXPOSED CONDUITS. TENANT SPACES WITH NO FINISHED CEILINGS: EXPOSED RACEWAYS ARE ACCEPTABLE HERE.

E.C. SHALL COORDINATE ALL EXACT CORE LOCATIONS WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL AND FURNITURE PANEL DRAWINGS PRIOR TO MAKING CORE LOCATIONS ON FLOOR SLAB. COORDINATE LOCATIONS WITH GENERAL.

WIRE NO. 8 AND SMALLER FOR USE IN INTERIOR DRY LOCATIONS SHALL BE TYPE THHN THERMOPLASTIC 600 VOLT INSULATED COPPER CONDUCTORS. FEEDERS AND POWER WIRING NO. 6 OR LARGER SHALL BE TYPE THW 600 VOLT INSULATED COPPER. WIRE WHICH IS INSTALLED IN RACEWAY IN MOIST OR DAMP LOCATIONS SHALL BE THW 600 VOLT INSULATED COPPER CONDUCTORS. NO WIRE SMALLER THAN NO. 12 AWG SHALL BE USED FOR LIGHTING OR POWER WIRING. WIRING 10 AND SMALLER MAY BE SOLID. WIRE NO. 8 AND LARGER SHALL BE STRANDED. ALL WIRE AND CABLE SHALL BE COPPER.

BRANCH CIRCUIT HOMERUN WIRING.

A. GENERAL PURPOSE BRANCH CIRCUIT HOMERUNS CONSISTING OF TWO NETWORKS SHALL HAVE PHASE, NEUTRAL AND GROUND CONDUCTORS INCREASED TO #10 AWG. THE MINIMUM WIRE HOMERUN (ONE OR TWO NETWORKS) EXCEEDS 100 LINEAR FEET, CONDUCTOR SIZE SHALL BE INCREASED ONE WIRE GAUGE.

B. WHERE TWO NETWORKS ARE CONTAINED IN A SINGLE HOMERUN CONDUIT, INCREASE CONDUCTOR SIZE ONE WIRE GAUGE GREATER THAN REQUIRED ABOVE.

C. WHERE ISOLATED GROUND CIRCUITS ARE INDICATED, NEUTRAL CONDUCTORS SHALL NOT BE USED FOR NETWORK WIRING IN COMBINATION WITH GENERAL PURPOSE CIRCUIT CHOICES.

D. HOMERUN LENGTH SHALL BEGIN AT THE CENTRAL POINT OF ALL DISTRIBUTED CIRCUITS TO THE PANELBOARD CIRCUIT BREAKER.

THE CONTRACTOR SHALL VERIFY THE CEILING CONSTRUCTION TYPE BEFORE ORDERING LIGHTING FIXTURES WITH ARCHITECTURAL DETAILS TO CONFIRM PROPER MOUNTING.

ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SPECIAL OUTLET BOXES THAT MAY BE REQUIRED TO ENCLOSE RECEPTACLES.

IN SUSPENDED CEILINGS, SUPPORT CONDUIT AND JUNCTION BOXES DIRECT FROM THE STRUCTURAL SLAB, DECK OR FRAMING PROVIDED FOR THAT PURPOSE. LIGHTING BRANCH CIRCUIT CONDUITS SHALL NOT BE CLIPPED TO THE CEILING SUPPORT WIRES OR SPLINE UNLESS THE CEILING SYSTEM HAS BEEN SPECIFICALLY DESIGNED FOR THAT PURPOSE AND APPROVAL GRANTED BY LANDLORD AND ARCHITECT.

WHERE FLOOR FITTINGS REQUIRE PENETRATION OF THE FLOOR SLAB, THERE SHALL BE A STANDARD DEVICE LISTED BY UL FOR THE PURPOSE AND HAVE A UL FIRE RATING EQUAL TO THE FLOOR RATING. ALL CORE SIZES AND LOCATIONS SHALL BE SUBMITTED TO LANDLORD FOR APPROVAL AND SUBMISSION TO STRUCTURAL ENGINEER PRIOR TO CORING.

E.C. SHALL PROVIDE FIRE SEAL SYSTEMS FOR ALL CORES AND RACEWAY PENETRATIONS IN FIRE RATED WALLS AND FLOORS, FIRE RATE WALL AND CEILING PENETRATIONS, ETC. USING "DOW CORNING 3-6548 SILICONE RTV FOAM" OR "3M FIRE BARRIER CAULK, PUTTY AND/OR FLAMESEAL PUTTY" AS PER MANUFACTURER INSTRUCTIONS TO MAINTAIN EXISTING AND NEW FIRE RATINGS. VERIFY FIRE RATING CONDITIONS AND LOCATIONS PRIOR TO FINAL BIDS. ALL OPEN CONDUIT SLEEVE PENETRATIONS SHALL BE FIRESEALED INSIDE BY E.C. AFTER CABLES ARE COMPLETELY INSTALLED. SEALING METHODS SHALL BE PROVIDED BY E.C. SUBJECT TO APPROVAL OF CABLE CONTRACTOR.

NUMBERED CIRCUITS SHOWN ON PLANS ARE FOR THE CONVENIENCE OF DESIGN ONLY. ACTUAL FIELD CONDITIONS WILL AFFECT CIRCUITRY. INDICATE THE ACTUAL CIRCUIT NUMBERS INSTALLED ON THE "AS-BUILT" DRAWINGS.

ALL HANGERS AND/OR ROD SUPPORT SYSTEMS SHALL BE SUPPORTED TO THE BOTTOM RIB OF THE METAL DECK WHERE APPLICABLE.

PROVIDE A WRITTEN GUARANTEE THAT THE ELECTRICAL INSTALLATION IS FREE FROM MECHANICAL AND ELECTRICAL DEFECTS. CONTRACTOR AT HIS COST SHALL REPLACE AND/OR REPAIR TO THE SATISFACTION OF THE TENANT AND/OR MANUFACTURER INSTALLATION INSTRUCTIONS ANY PARTS OF THE INSTALLATION WHICH MAY FAIL WITHIN A PERIOD OF 12 MONTHS FROM CONSTRUCTION ACCEPTANCE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS PROVIDED THAT SUCH FAILURE IS DUE TO DEFECTS IN MATERIAL, WORKMANSHIP OR FAILURE TO FOLLOW THE SPECIFICATIONS AND DRAWINGS.

CONTRACTOR SHALL PROVIDE ALL NECESSARY PROPERLY SIZED WALL, DRYWALL, WOOD MOUNTING BOXES, RINGS, SUPPORTS AND DEVICES AS REQUIRED VIA COORDINATION WITH ARCHITECTURAL WALL SECTIONS AND MILLWORK DETAILS.

PROVIDE GFI OUTLETS AND FLASH BREAKERS AND OUTLETS AS NECESSARY IN LOCATIONS PRESCRIBED BY THE NEC.

PROVIDE ANY TESTING OR INSPECTION EFFORTS NECESSARY TO COMPLY WITH NEC, NFPA AND LOCAL CODES. PROVIDE SAFETY LABELS ON NEW PANELS, INDICATE DATES TESTED.

SYMBOLS

SWITCHES

$	TOGGLE SWITCH, MOUNTED AT 44" AFF, U.N.O.
$OS	WALL MOUNTED SWITCH WITH OCCUPANCY SENSOR, MOUNTED AT 44" AFF, U.N.O.
$T	THERMAL OVERLOAD TOGGLE SWITCH
$D	TOGGLE SWITCH, DIMMABLE, MOUNTED AT 44" AFF, U.N.O.
$3W	3-WAY TOGGLE SWITCH, MOUNTED AT 44" AFF, U.N.O.
DS	DAYLIGHTING SENSOR
OS	CEILING MOUNTED OCCUPANCY SENSOR
☐	30 A NON-FUSED DISCONNECT SWITCH, SIZED AS INDICATED OR AS REQUIRED
☐	SINGLE FUSED DISCONNECT SWITCH, SIZED AS INDICATED OR AS REQUIRED
○	DUCT SMOKE DETECTOR

○	FEEDER CONDUIT - TAG INDICATES PANEL FEEDER NUMBER, REFER TO FEEDER SCHEDULE

RECEPTACLES

⊕	DUPLEX 20A GFI RECEPTACLE, MOUNTED 6" ABOVE COUNTER
⊕⊕	QUADRUPLEX 20A RECEPTACLE, MOUNTED 6" ABOVE COUNTER
●	SPECIAL USE RECEPTACLE, SIZED AS INDICATED OR AS REQUIRED

LOW VOLTAGE

◁	DATA OUTLET, MOUNTED AT 18" AFF U.N.O.
TV	CABLE TELEVISION (CATV) OUTLET, LOCATED AT 18" AFF U.N.O.

POWER DISTRIBUTION

○	JUNCTION BOX, SIZED AS REQUIRED
○	MOTOR CONNECTION, 1Ø OR 3Ø AS INDICATED
▬	PANELBOARD, SIZED AS INDICATED
☒	COMBINATION STARTER/DISCONNECT
☒	MOTOR STARTER, SIZED AS REQUIRED
M	METER
○	LOW VOLTAGE THERMOSTAT (BY OTHERS), 4x4 BOX JUNCTION BOX WITH 3/4" CONDUIT STUBBED INTO ACCESSIBLE CEILING SPACE
HD	HAND DRYER, COORDINATE MOUNTING HEIGHT IN FIELD
TC	TIME CLOCK

ABBREVIATIONS

AC	ALTERNATING CURRENT	FLUOR	FLUORESCENT	REV	REVISE/REVISION
AFCI	ARC FAULT CIRCUIT INTERRUPTER	FT	FOOT/FEET	RM	ROOM
AFF	ABOVE FINISHED FLOOR	FUT	FUTURE	SCHED	SCHEDULE
AMP OR A	AMPERE	GFI OR GFCI	GROUND FAULT CIRCUIT INTERRUPTER	SEC	SECONDARY
APPROX	APPROXIMATELY	GEN	GENERATOR	SECT	SECTION
ARCH	ARCHITECTURAL	GRD	GROUND/GROUNDING	SN	SOLID NEUTRAL
ATS	AUTOMATIC TRANSFER SWITCH	HGT	HEIGHT	SOL	SOLENOID
AV	AUDIO/VISUAL	HID	HIGH INTENSITY DISCHARGE (LAMP)	SP	SPARE
AUTO	AUTOMATIC	HORIZ	HORIZONTAL	SPDT	SINGLE POLE DOUBLE THROW
AUX	AUXILIARY	HP	HORSEPOWER	SPEC	SPECIFICATION
BLDG	BUILDING	HPS	HIGH PRESSURE SODIUM	SPST	SINGLE POLE SINGLE THROW
C	CLOCK OR CONDUIT	HTR	HEATER	SUPV	SUPERVISORY
CAB	CABINET	HV	HIGH VOLTAGE	SQ FT	SQUARE FEET
CB	CIRCUIT BREAKER	HVAC	HEATING, VENTILATING AND AIR COND	STD	STANDARD
CKT	CIRCUIT	HZ	HERTZ (CYCLES PER SECOND)	SUSP	SUSPENDED
CCTV	CLOSED CIRCUIT TELEVISION	IG	ISOLATED GROUND	SW	SWITCH
CLG	CEILING	IN	INCH, INCHES	SWBD	SWITCHBOARD
CO	CARBON MONOXIDE DETECTOR	INCAND	INCANDESCENT	SYNC	SYNCHRONIZATION
COMB	COMBINATION	JB	JUNCTION BOX	SYS	SYSTEM
CONC	CONCRETE	KV	KILOVOLT	TEL OR T	TELEPHONE
CONN	CONNECTED, CONNECTION	KVA	KILOVOLT AMPERE	TEMP	TEMPERATURE
CT	CURRENT TRANSFORMER	KW	KILOWATT	T	THERMAL OVERLOAD OR THERMOSTAT
dB	DECIBEL	LTG	LIGHTING	TP	TWISTED PAIR
DC	DIRECT CURRENT	MAX	MAXIMUM	STP	SHIELDED TWISTED PAIR
DET	DETAIL	MC	MECHANICAL CONTRACTOR	XFMR	TRANSFORMER
DIA	DIAMETER	MCC	MOTOR CONTROL CENTER	TTB	TELEPHONE TERMINAL BOARD
DIAG	DIAGRAM	MECH	MECHANICAL, MECHANISM	TV	TELEVISION
DIM	DIMENSION	MFR	MANUFACTURER	TYP	TYPICAL
DISC	DISCONNECT	MH	MANHOLE OR MOUNTING HEIGHT	V	VOLT
DIST	DISTRIBUTION	MIN	MINIMUM	VA	VOLT AMPERE
DIV	DIVISION	MISC	MISCELLANEOUS	VERT	VERTICAL
DN	DOWN	MTD	MOUNTED	VOL	VOLUME
DPDT	DOUBLE POLE DOUBLE THROW	MTG	MOUNTING	W	WATT OR WIRE
DPST	DOUBLE POLE SINGLE THROW	NC	NORMALLY CLOSED	W/	WITH
DW	DISHWASHER	NEUT	NEUTRAL	WM	WASHING MACHINE
DWG	DRAWING	NIC	NOT IN CONTRACT	WP	WEATHERPROOF
EA	EACH	NL	NIGHT LIGHT	X	EXISTING TO REMAIN
EC	ELECTRICAL CONTRACTOR	NO	NORMALLY OPENED OR NUMBER	XP	EXPLOSION PROOF
EL	ELEVATION OR ELEVATOR	NOM	NOMINAL	Z	IMPEDANCE
ELEC	ELECTRICAL	NTS	NOT TO SCALE		
ELEV	ELEVATOR	OC	OVER CURRENT OR ON CENTER SPACING		
EM OR EMERG	EMERGENCY	OD	OUTSIDE DIAMETER		
ENCL	ENCLOSURE	PIR	PASSIVE INFRA-RED		
EQ OR EQUIP	EQUIPMENT	P	POLE		
EWC	ELECTRIC WATER COOLER	PA	PUBLIC ADDRESS SYSTEM		
EWH	ELECTRIC WATER HEATER	PB	PULL BOX OR PUSH BUTTON		
EXIST	EXISTING	PF	POWER FACTOR		
EXP	EXPOSED	PH OR Ø	PHASE		
FA	FIRE ALARM	PL	PILOT LIGHT		
FBO	FURNISHED BY OTHERS	PNL	PANEL		
FC	FOOT CANDLE	PR	PAIR		
FDR	FEEDER	PRI	PRIMARY		
FIG	FIGURE	PVC	POLYVINYL CHLORIDE		
FIXT	FIXTURE	REC	RECESSED		
FL	FLOOR	RECEP	RECEPTACLE		
FLA	FULL LOAD AMPERE	REF	REFERENCE OR REFRIGERATION		
FLEX	FLEXIBLE	REQD	REQUIRED		

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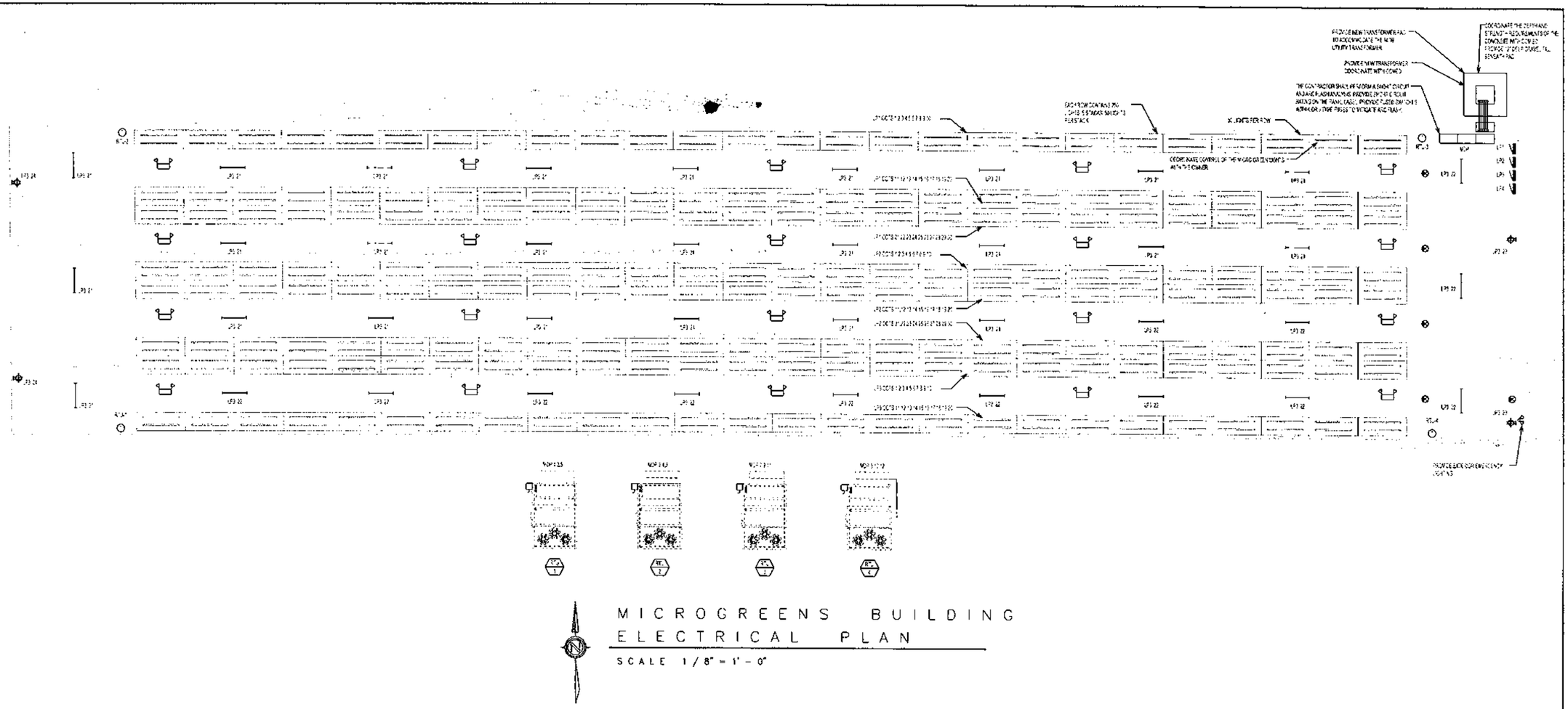
MICROGREEN FARM FOR:
TRINITY FARMS
25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010

DATE
SEPT 27, 2019

REVISION

JOB #

SHEET #
E1



MICROGREENS BUILDING
ELECTRICAL PLAN

SCALE 1/8" = 1'-0"

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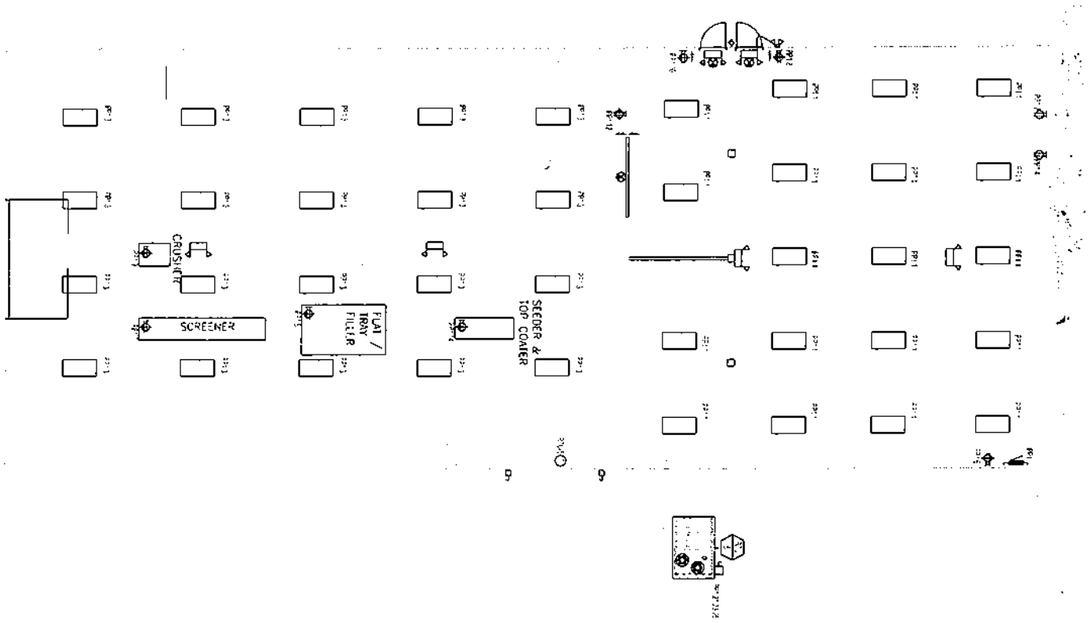
E2

SEED BUILDING
ELECTRICAL PLAN

SCALE 1/8" = 1'-0"



JOB #	DATE SEPT 27, 2019	MICROGREEN FARM FOR: TRINITY FARMS 25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010	JOSEPH A. MEYER STRUCTURAL & PROFESSIONAL ENGINEER 135 PARK AVE. BARRINGTON ILLINOIS 60010 847-382-0200
SHEET # E3	REVISION		

LOAD CALCULATIONS

HOP CONNECTED LOAD: 175 AMPS
1200 AMP SERVICE IS ACCEPTABLE FOR 360 AMPS OF LOAD.

MOTOR AND EQUIPMENT SCHEDULE

	EQUIPMENT DESIGNATED TAG	LOCATION	LOAD VOLTS	PHASE	HP	MCA	KW	FEEDER	SOURCE OF POWER PANEL	CKT NO	PROTECTION (AMPERES)	STARTER SIZE	STARTER TYPE	DISCONNECT SIZE	DISCONNECT TYPE	REMARKS
RT-1	ROOF TOP HVAC	ROOF	208	3	-	71.4	-	4	MDP	1,3,5	90A 3P	N/A	N/A	200A 3P	-	NEW ROOF TOP UNIT, FACTORY PROVIDED DISCONNECT
RT-2	ROOF TOP HVAC	ROOF	208	3	-	71.4	-	1	MDP	2,4,6	90A 3P	N/A	N/A	200A 3P	-	NEW ROOF TOP UNIT, FACTORY PROVIDED DISCONNECT
RT-3	ROOF TOP HVAC	ROOF	208	3	-	71.4	-	4	MDP	7,9,11	90A 3P	N/A	N/A	200A 3P	-	NEW ROOFTOP UNIT, FACTORY PROVIDED DISCONNECT.
RT-4	ROOF TOP HVAC	ROOF	208	3	-	71.4	-	4	MDP	8,10,12	90A 3P	N/A	N/A	200A 3P	-	NEW ROOFTOP UNIT, FACTORY PROVIDED DISCONNECT.
RT-5	ROOF TOP HVAC	ROOF	208	3	-	41.5	-	4	PDP	1,3,5	50A 3P	N/A	N/A	60A 3P	-	NEW ROOFTOP UNIT, FACTORY PROVIDED DISCONNECT

GENERAL NOTES
EQUIPMENT SHALL BE PROVIDED AND A DISCONNECT FROM THE FACTORY.
STARTERS SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER.
COORDINATE THE LOCATION OF ALL CONNECTIONS WITH ALL OTHER TRADES

NOTE: 120V RECEPTACLES ON THE ROOF SHALL BE PROVIDED BY THE UNIT MANUFACTURER WIRED BY THE FACTORY. DISCONNECTS SHALL BE FURNISHED WITH EQUIPMENT. COORDINATE LOCATION OF POWER CONNECTIONS WITH EQUIPMENT. ROUTE THE CONDUIT AND WIRE THROUGH THE EQUIPMENT CURB, NOT THROUGH THE ROOF.

NOTE: COORDINATE WITH COMED TO PROVIDE NEW SERVICE TO THE BUILDING. THE CONTRACTOR IS RESPONSIBLE FOR COMPLETING ALL DOCUMENTATION, FORMS, ETC TO PROVIDE THE NEW SERVICE. COORDINATE THE TRANSFORMER PAD REQUIREMENTS WITH COM ED AND ACCOMMODATE ALL PROVISIONS OF THEIR REQUIREMENTS. COORDINATE WITH COMED, OTHER TRADES AND FIELD CONDITIONS TO PROVIDE A COMPLETE, APPROVED AND OPERATING SYSTEM.

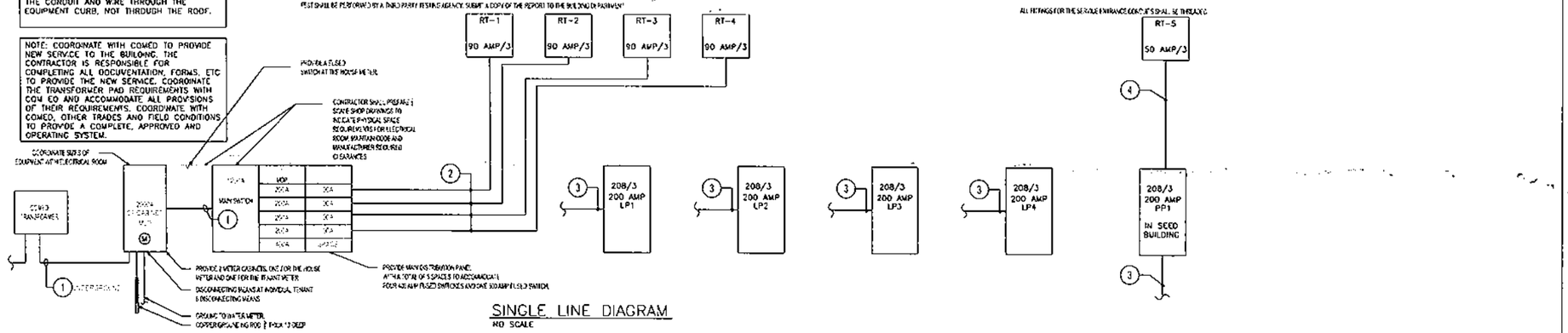
SCCR AND AIC NOTES
THE AVAILABLE FAULT CURRENT AT THE TRANSFORMER IS 22,400 AMPS
MAXIMUM MOTOR CONTRIBUTION IS 24.0 AMPS
THE MAXIMUM SPECIFIC SHORT CIRCUIT AMPERAGE IS 24,424 AMPS
PROVIDE EQUIPMENT WITH AIC RATINGS OF AT LEAST 30,000 AMPS OR 30KA

GROUND FAULT PROTECTION NOTES
PROVIDE GROUND FAULT PROTECTION FOR THE SERVICE DISCONNECT. PROVIDE A PERFORMANCE TEST OF THE GROUND FAULT PROTECTION FOR THE EQUIPMENT. TEST SHALL BE PERFORMED BY A THIRD PARTY TESTING AGENCY. SUBMIT A COPY OF THE REPORT TO THE BUILDING DEPARTMENT

INSULATION NOTE
CONDUCTOR INSULATION SHALL BE RATED FOR THE HIGHEST AMBIENT TEMPERATURE OF EQUIPMENT INSIDE FOR CT CABINETS, PANELS, ETC

CONDUIT
PROVIDE EMT IN THE BUILDING WITH COMPRESSION FITTINGS.
PROVIDE WEATHERPROOF EXPOSED ELEMENTS.
UNDERGROUND CONDUCTORS OUTSIDE THE FOUNDATION WALLS SHALL BE PVC SCHEDULE 80. PROVIDE RIGID BENDS OR ELBOWS TO TRANSITION TO THE GROUND. UNDERGROUND CONDUCTORS WITHIN THE FOUNDATION WALLS SHALL BE RMC.

ALL FITTINGS FOR THE SERVICE ENTRANCE CONDUITS SHALL BE THREADED

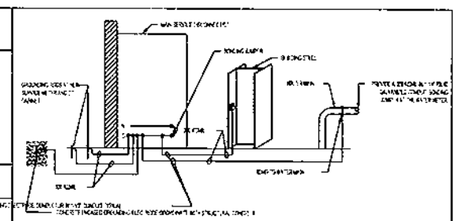


SINGLE LINE DIAGRAM
NO SCALE

LIGHTING FIXTURE SCHEDULE-INTERIOR

SYMBOL	DESCRIPTION	FLUORESCENT	WATTS	INSTALLATION (RECESSED, SURFACE, SUSPENDED)	MANUFACTURER	REMARKS & ACCESSORIES
	2X4 TROFFER FIXTURE	LED	42	SF	PHILIPS	SURFACE MOUNTED DIM
	4' STRIP FIXTURE	LED	42	SF	PHILIPS	1 42 WATT LINEAR FIXTURE
	EMERGENCY LIGHT	LED	5	SW	PHILIPS	COORDINATE WITH OWNER PRIOR TO ORDER OF LIGHTFIXTURES
	EXIT SIGN	LED	5	SW	PHILIPS	COORDINATE WITH OWNER PRIOR TO ORDER OF LIGHTFIXTURES

1. FIXTURES SHALL BE FACTORY MARKED TO INDICATE THE MAXIMUM WATTAGE AS INDICATED IN THE ABOVE SCHEDULE.
2. FIXTURES ALL BE 120VOLT
3. FIXTURES IN KITCHEN SHALL SWITCHING TO REMAIN OR RELOCATED EXISTING FIXTURES
4. PROVIDE A UNIT AS WITH THE OWNER AND MANUFACTURERS REPRESENTATIVE TO FINALIZE FIXTURE SELECTION. PROVIDE A MINIMUM OF 3 FIXTURES FOR EACH OF THE ABOVE ITEMS.



FEEDER SCHEDULE--FOR MOTOR AND EQUIPMENT SCHEDULE AND SINGLE LINE DIAGRAM--THHN

No.	WIRE QTY. + SIZE	CONDUIT	CB
1	4 SETS OF 4 400kcmil & 1 #350kcmil G SERVICE GROUND CONDUCTOR #350 kcmil	3" (6) 1-1/4" RIGID GALV.	1200A 3P N/A
2	4 #3 & 1 #8G	2" (1)	90A 3P
3	4#4/0 & 1 #0G	2"	200A 3P
4	4#1/0 & 1#6G	2"	50A 3P

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PANELBOARD SCHEDULE — LP-3

LOCATION: MICROGREENS BUILDING

VOLTAGE	120/208V-3 PHASE 4 WIRE	MAIN (A)	MCB	MLO	MOUNT: SURFACE
		200			TYPE: NEMA 4X
		WITH GROUND BUS			

USE/AND OR AREA SERVED	C/B	CIR. NO.	A	B	C	CIR. NO.	C/B	USE/AND OR AREA SERVED
HORTICULTURE LIGHTING	20/1	1	1800			2	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	3	1800			4	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	5		1800		6	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	7	1800	1800		8	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	9	1800	1800		10	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	11			1800	12	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	13	1800		1800	14	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	15	1800	1800		16	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	17		1800	1800	18	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	19	1800		1800	20	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	21	1800	1800		22	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	23			1800	24	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	25	1800	1800		26	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	27		1800	1800	28	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	29			1800	30	20/1	HORTICULTURE LIGHTING
TOTAL LOAD PER PHASE			18 000	18 000	18 000	TOTAL KVA		54
MICROGREENS			DATE	10/03/19		AMPS		149.9	208V

PANELBOARD SCHEDULE — LP-2

LOCATION: MICROGREENS BUILDING

VOLTAGE	120/208V-3 PHASE 4 WIRE	MAIN (A)	MCB	MLO	MOUNT: SURFACE
		200			TYPE: NEMA 4X
		WITH GROUND BUS			

USE/AND OR AREA SERVED	C/B	CIR. NO.	A	B	C	CIR. NO.	C/B	USE/AND OR AREA SERVED
HORTICULTURE LIGHTING	20/1	1	1800			2	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	3	1800			4	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	5		1800		6	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	7	1800	1800		8	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	9	1800	1800		10	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	11			1800	12	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	13	1800		1800	14	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	15	1800	1800		16	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	17		1800	1800	18	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	19	1800		1800	20	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	21	1800	1800		22	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	23			1800	24	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	25	1800	1800		26	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	27		1800	1800	28	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	29			1800	30	20/1	HORTICULTURE LIGHTING
TOTAL LOAD PER PHASE			18 000	18 000	18 000	TOTAL KVA		54
MICROGREENS			DATE	10/03/19		AMPS		149.9	208V

PANELBOARD SCHEDULE — LP-1

LOCATION: MICROGREENS BUILDING

VOLTAGE	120/208V-3 PHASE 4 WIRE	MAIN (A)	MCB	MLO	MOUNT: SURFACE
		200			TYPE: NEMA 4X
		WITH GROUND BUS			

USE/AND OR AREA SERVED	C/B	CIR. NO.	A	B	C	CIR. NO.	C/B	USE/AND OR AREA SERVED
HORTICULTURE LIGHTING	20/1	1	1800			2	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	3	1800			4	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	5		1800		6	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	7	1800	1800		8	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	9	1800	1800		10	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	11			1800	12	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	13	1800		1800	14	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	15	1800	1800		16	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	17		1800	1800	18	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	19	1800		1800	20	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	21	1800	1800		22	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	23			1800	24	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	25	1800	1800		26	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	27		1800	1800	28	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	29			1800	30	20/1	HORTICULTURE LIGHTING
TOTAL LOAD PER PHASE			18 000	18 000	18 000	TOTAL KVA		54
MICROGREENS			DATE	10/03/19		AMPS		149.9	208V

PANELBOARD SCHEDULE — PP

LOCATION: MICROGREENS BUILDING

VOLTAGE	120/208V-3 PHASE 4 WIRE	MAIN (A)	MCB	MLO	MOUNT: SURFACE
		WITH GROUND BUS	X	X	TYPE: MAIN BREAKER

USE/AND OR AREA SERVED	C/B	CIR. NO.	A	B	C	CIR. NO.	C/B	USE/AND OR AREA SERVED
LP-1	20/1	1	12009			2	20/1	RG-1
	20/1	3	3453			4	20/1	
	20/1	5		18000		6	20/1	
				8408				
LP-2	20/1	7	18000			8	20/1	RT-2
	20/1	9	8408	18000		10	20/1	
	20/1	11		8408	18000	12	20/1	
					8408			
LP-3	20/1	13	18000			14	20/1	RT-3
	20/1	15	8408	18000		16	20/1	
	20/1	17		8408	18000	18	20/1	
					8408			
LP-4	20/1	19	14400			20	20/1	RT-4
	20/1	21	8408	14400		22	20/1	
	20/1	23		8408	12000	24	20/1	
					8408			
PP-1	20/1	25	10977			26	20/1	
	20/1	27	0	8577		28	20/1	
	20/1	29		0	8177	30	20/1	
					0			
	20/1	31	0			32	20/1	
	20/1	33	0	0		34	20/1	
	20/1	35		0	0	36	20/1	
	20/1	37	0		0	38	20/1	
	20/1	39	0	0		40	20/1	
	20/1	41		0	0	42	20/1	
					0			
TOTAL LOAD PER PHASE			113 009	110 609	105 709	TOTAL KVA		329 327
MICROGREENS			DATE	10/03/19		AMPS		915.5	208V

PANELBOARD SCHEDULE — PP1

LOCATION: SEED BUILDING

VOLTAGE	120/208V-3 PHASE 4 WIRE	MAIN (A)	MCB	MLO	MOUNT: SURFACE
		200	X		TYPE: MCB
		WITH GROUND BUS			

USE/AND OR AREA SERVED	C/B	CIR. NO.	A	B	C	CIR. NO.	C/B	USE/AND OR AREA SERVED
GENERAL LIGHTING	20/1	1	1200			2	20/1	REFRIGERATOR
GENERAL LIGHTING	20/1	3		300		4	20/1	REFRIGERATOR
BRAY FILLER	20/1	5		800	450	6	20/1	HOUSEKEEPING RECEPTACLE
SURFACE PUMP	20/1	7	1000		450	8	20/1	HOUSEKEEPING RECEPTACLE
GRAPHER	20/1	9	300	400		10	20/1	HOUSEKEEPING RECEPTACLE
				8439				
RT-1C	50/1	11			4977	12	20/1	HOUSEKEEPING RECEPTACLE
		13	4977	1600	2599	14	20/1	SEEDER AND INSPECTOR
		15	0	0977		16	20/1	
				0	0			
	20/1	17			0	18	20/1	
	20/1	19	0			20	20/1	
	20/1	21		0		22	20/1	
				0	0			
	20/1	23			0	24	20/1	
	20/1	25	0			26	20/1	
				0				
	20/1	27			0	28	20/1	
	20/1	29		0		30	20/1	
				0	0			
	20/1	31	0			32	20/1	
	20/1	33		0		34	20/1	
				0	0			
	20/1	35			0	36	20/1	
	20/1	37	0			38	20/1	
				0				
	20/1	39	0			40	20/1	
				0	0			
	20/1	41			0	42	20/1	
TOTAL LOAD PER PHASE			10 977	8 577	8 177	TOTAL KVA		25.731
MICROGREENS			DATE	10/03/19		AMPS		71.4	208V

PANELBOARD SCHEDULE — LP-4

LOCATION: MICROGREENS BUILDING

VOLTAGE	120/208V-3 PHASE 4 WIRE	MAIN (A)	MCB	MLO	MOUNT: SURFACE
		200			TYPE: NEMA 4X
		WITH GROUND BUS			

USE/AND OR AREA SERVED	C/B	CIR. NO.	A	B	C	CIR. NO.	C/B	USE/AND OR AREA SERVED
HORTICULTURE LIGHTING	20/1	1	1909			2	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	3	1909	1800		4	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	5		1800	1800	6	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	7	1909			8	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	9	1800	1800		10	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	11			1800	12	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	13	1800		1800	14	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	15	1800	1800		16	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	17		1800	1800	18	20/1	HORTICULTURE LIGHTING
HORTICULTURE LIGHTING	20/1	19	1800		1200	20	20/1	HORTICULTURE LIGHTING
GENERAL LIGHTING	20/1	21		1800		22	20/1	GENERAL RECEPTACLES
HOUSEKEEPING RECEPTACLES	20/1	23		1200	600	24	20/1	HOUSEKEEPING RECEPTACLES
					720			
	20/1	25	0			26	20/1	
			0					
	20/1	27		0		28	20/1	
				0				
	20/1	29			0	30	20/1	
					0			
TOTAL LOAD PER PHASE			12 400	12 400	12 400	TOTAL KVA		41.2
MICROGREENS			DATE	10/03/19		AMPS		114.4	208V

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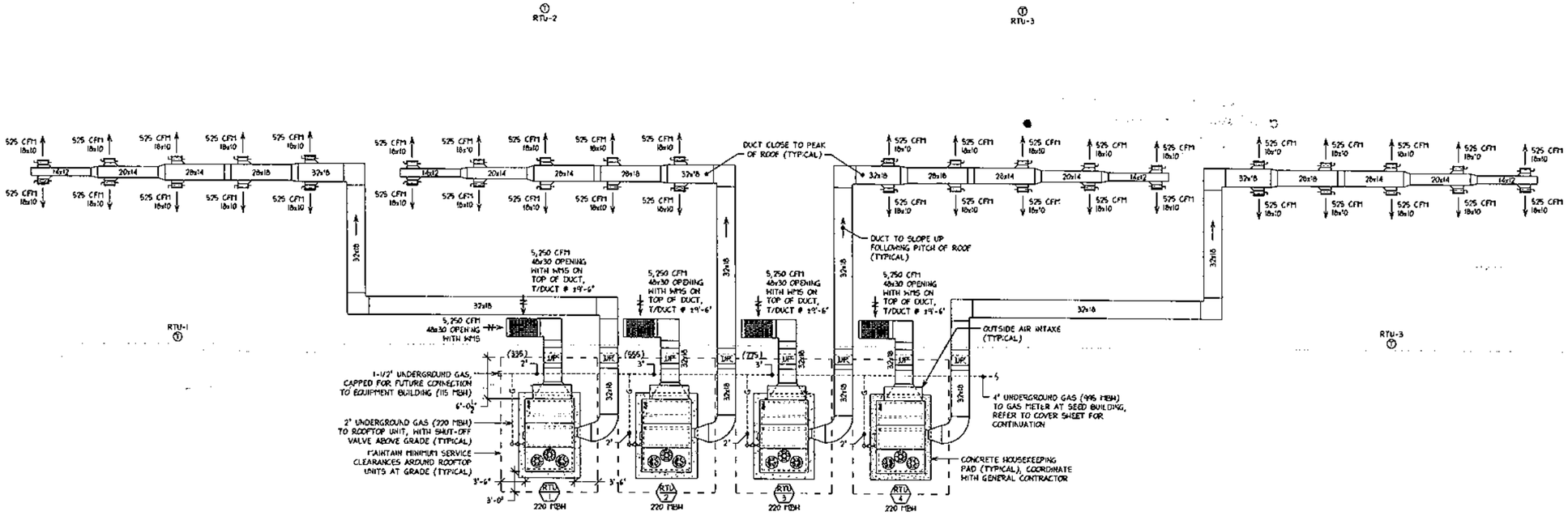
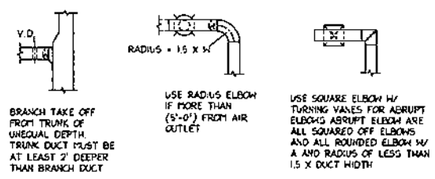


MICROGREENS BUILDING MECHANICAL PLAN

SCALE 1/8" = 1'-0"



DUCT CONNECTIONS

NOT TO SCALE

VENTILATION DATA

ROOM NAME	VENTILATION AREA (SQ. FT.)	VENTILATION AREA (CU. FT.)	OCCUPANT DENSITY PEOPLE PER 1,000 SQ. FT.	NUMBER OF PEOPLE	OUTSIDE AIR CFM PER PERSON	PEOPLE OUTSIDE AIR CFM	AREA OUTDOOR AIR CFM/SQ. FT.	AREA OUTDOOR AIR CFM	OUTDOOR AIR CHANGE PER HOUR RATE	OUTDOOR ACH CFM	TOTAL OUTSIDE AIR CFM	EXHAUST AIRFLOW RATE CFM/SQ. FT.	TOTAL EXHAUST AIRFLOW CFM	ACTUAL SUPPLY AIR CFM	ACTUAL RETURN AIR CFM	ACTUAL EXHAUST AIR CFM	EQUIPMENT
MICROGREENS BUILDING	12,161	152,013	-	5	5	25	-	-	0.30	760	785	-	-	21,000	21,000	-	RT-1, RT-2, RT-3, RT-4
PACKAGING	2,134	26,675	-	2	5	10	-	-	0.30	133	143	-	-	930	930	-	RT-5
SMALL SEED ROOM	296	3,700	-	1	5	5	-	-	0.30	19	24	-	-	140	-	-	RT-5
LARGE SEED ROOM	3,609	45,113	-	2	5	10	-	-	0.30	226	236	-	-	1,555	1,696	-	RT-5
TOTAL											1,188	-	-	23,625	23,625	-	

NOTE: VENTILATION REQUIREMENTS BASED ON 2015 INTERNATIONAL MECHANICAL CODE.

ROOFTOP AIR CONDITIONING SCHEDULE (RTU)

UNIT TAG	AREA SERVED	SUPPLY FAN PERFORMANCE						HEATING CAPACITY			WEIGHT (LBS)	COOLING CAPACITY						FILTER		ELECTRICAL SERVICE				EFFICIENCY RATING			REMARKS
		TOTAL CFM	OUTSIDE AIR CFM	OUTSIDE AIR %	RPM	ESP IN. W.C.	FAN BHP	4.5" W.G. MIN. GAS PRESS. OUTPUT MBH HI/LOW	4.5" W.G. MIN. GAS PRESS. INPUT MBH HI/LOW	4.5" W.G. MIN. GAS PRESS. AIR TEMP. RISE °F		NOM. TONS	DESIGN MBH TOTAL MBH	DESIGN MBH SENS. MBH	COOLING COIL ENT. AIR °F D.B.	COOLING COIL ENT. AIR °F W.B.	COOLING COIL LVG. AIR °F D.B.	COOLING COIL LVG. AIR °F W.B.	TYPE	% EFFICIENCY	VOLTS	PH	MCA	MOCP	SEER	EER	IEER	BASED ON CARRIER
1, 2, 3, 4	MICROGREENS BUILDING	5,250	200	4	-	0.75	-	178/142	220/176	65	2,100	15	153.6	144.3	78.3	61.5	52.3	50.7	TA	30	208	3	71.4	90	-	11.5	13.0	48HCD017 (1)(2)
5	SEED BUILDING	2,625	425	16	-	0.75	-	148/98	180/120	65	1,100	7.5	72.1	57.5	78.0	66.0	58.1	56.9	TA	30	208	3	41.5	50	-	12.0	13.8	48HCED08 (1)(3)

(1) ROOFTOP UNIT MOUNTED ON 12" INSULATED ROOF CURB AT GRADE - COORDINATE CONCRETE HOUSEKEEPING PAD WITH GENERAL CONTRACTOR. HORIZONTAL SUPPLY AND RETURN AIR DISCHARGE, ASHRAE 90.1 COMPLIANT, COMPRESSOR CYCLE DELAY, ECONOMIZER WITH BAROMETRIC RELIEF, TWO SPEED INDOOR FAN, TWO STAGES OF HEATING, TWO STAGES OF COOLING, 7 DAY PROGRAMMABLE THERMOSTAT CAPABLE OF CONTROLLING TWO STAGES OF HEAT AND TWO STAGES OF COOLING WITH TWO HOUR OCCUPANT OVERRIDE. PROVIDE INSULATED BACKPLATE FOR MOUNTING OT THERMOSTAT ON EXTERIOR WALL. MEDIUM STATIC MOTOR. PROVIDE 3/4" SCHEDULE 40 PVC PIPING WITH P-TRAP/CLEANOUT FOR CONDENSATE TO SPILL TO GRADE

(2) SYSTEM DESIGNED FOR 66°F & 40% RELATIVE HUMIDITY. (3) SYSTEM DESIGNED FOR 75°F & 50% RELATIVE HUMIDITY.

JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE. BARRINGTON ILLINOIS 60010 847-382-0200

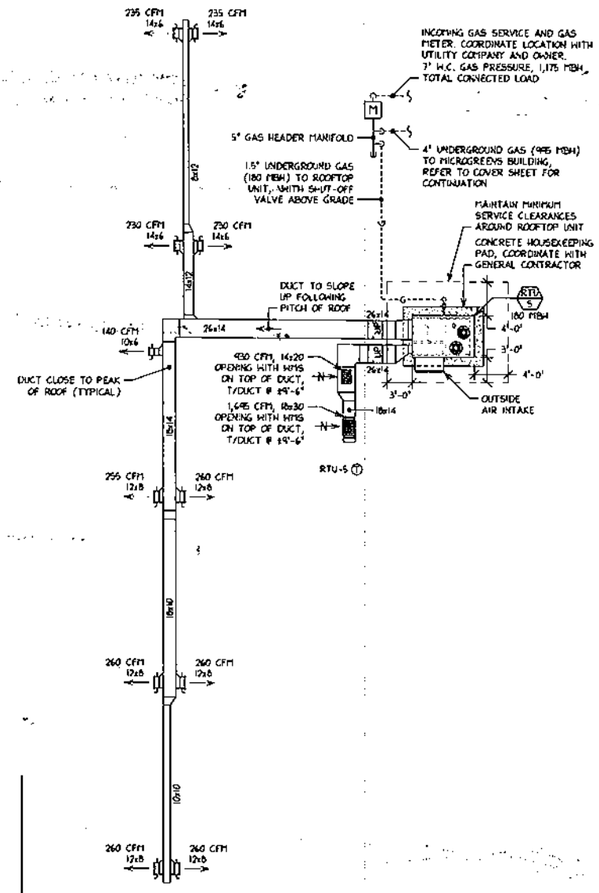
MICROGREEN FARM FOR:
TRINITY FARMS
25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010

DATE
SEPT 27, 2019

REVISION

JOB #

SHEET #
M1



SEED BUILDING
MECHANICAL PLAN

SCALE 1/8" = 1'-0"

SYMBOLS & ABBREVIATIONS

	EQUIPMENT LABEL
	SUPPLY GRILLE
	RETURN OPENING
T	THERMOSTAT
	NEW SUPPLY/RETURN/EXHAUST DUCT
	VOLUME DAMPER
	PIPE DN
	PIPE UP
10X8	DUCT SIZE
50 CFM	AIR QUANTITY
AP	ACCESS PANEL
COND	CONDENSATE
G	GAS
NR	NO REQUIREMENT
N.T.S.	NOT TO SCALE
PCF	POUNDS PER CUBIC FOOT
RTU	ROOFTOP UNIT
V.I.F.	VERIFY IN FIELD
WMS	WIRE MESH SCREEN

AIR DEVICE SCHEDULE

SUPPLY REGISTER, DOUBLE DEFLECTION, STEEL CONSTRUCTION, OPPOSED BLADE DAMPER, 3/4" BLADE SPACING, FRONT BLADES PARALLEL TO LONG DIMENSION, ARCHITECT TO SELECT COLOR, PROVIDE A SQUARE TO ROUND TRANSITION, VERIFY BORDER/MOUNTING WITH ARCHITECT, TITUS MODEL 300RL

REFER TO PLANS FOR SIZES.

MECHANICAL STANDARDS

1. ALL DUCT SIZES NOTED ON DRAWINGS REFER TO ACTUAL AIRWAY SIZES (SOUND LINING AND/OR INSULATION IS NOT INCLUDED).
2. ALL DUCT COVERINGS AND LININGS SHALL HAVE A FLAME SPREAD RATINGS NOT TO EXCEED 25 AND A SMOKE DEVELOPMENT RATING NOT MORE THAN 50.
3. COORDINATE ALL FINAL LOCATIONS OF SUPPLY AIR DIFFUSERS, RELIEF AIR GRILLES, THERMOSTATS, SENSORS, ETC. WITH ARCHITECT AND ARCHITECTURAL REFLECTED CEILING PLANS.
4. MECHANICAL CONTRACTOR TO COORDINATE WITH ALL OTHER TRADES INVOLVED, ALL WORK WHICH IS IN THE CEILING SPACE AS INDICATED ON THE DRAWINGS WITHOUT CONFLICT AND TO REVISE AS WORK TO AVOID CONFLICTS AND OBSTRUCTIONS AS NECESSARY AND AS REQUIRED.
5. ALL DUCTS PENETRATING FULL HEIGHT WALLS ABOVE CEILING SHALL BE SEALED TO WITHIN 1/8" OF DUCT WITH WALL MATERIAL ON EACH SIDE OF WALL.
6. COORDINATE ALL ROOF PENETRATIONS, ROOF CURB DETAILS, ROOF SUPPORTS FOR EQUIPMENT WITH ARCHITECT, STRUCTURAL AND GENERAL CONTRACTOR.
7. COORDINATE EXACT LOCATIONS OF TEMPERATURE SENSORS FOR HVAC EQUIPMENT WITH FINAL INTERIOR DESIGN/ARCHITECTURAL DRAWINGS.
8. ALL ROOF THERMOSTATS AND WALL SWITCHES FOR CEILING EXHAUST FANS SHALL BE LOCATED 48" A.F.F. OR TO MATCH ARCHITECTURAL REQUIREMENTS.
9. DUCT CONSTRUCTION AND INSTALLATION SHALL COMPLY WITH CURRENT SMACNA STANDARDS. DUCTS SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL.
10. ALL INSULATION TO MEET THE LATEST ENERGY CODE REQUIREMENTS. PROVIDE 2" THICK EXTERNAL DUCT WRAP FOR MAKE-UP AIR DUCTWORK. PROVIDE 1-1/2" THICK INTERNAL SOUND LINING FOR INTERIOR RECTANGULAR SUPPLY AND RETURN AIR DUCTWORK. PROVIDE 2" THICK DUCT WRAP FOR ALL CONCEALED ROUND SUPPLY AND RETURN AIR DUCTWORK.
11. ALL CONSTRUCTION DOCUMENTS, INSTALLATION MANUALS, MANUFACTURERS CATALOG CUTSHEETS ARE TO BE SUBMITTED TO THE BUILDING DEPARTMENT AND TO BE PROVIDED AT TIME OF INSPECTIONS. ALL MATERIALS AND EQUIPMENT ARE TO BE LISTED AND LABELED AND SUITABLE FOR USE.
12. FIRE CAULK ALL DUCT SYSTEMS WHICH PENETRATE THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS, FLOORS, OR CEILINGS TO MAINTAIN 1 HOUR RATING.
13. HVAC SYSTEMS SHALL BE BALANCED ACCORDING TO HVAC PLANS AND SCHEDULES. SUBMIT WRITTEN REPORT TO BUILDING DEPARTMENT.
14. INSTALL ALL EQUIPMENT AND ASSOCIATED MATERIALS AND ACCESSORIES PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
15. ELECTRICAL CONTRACTOR SHALL FURNISH SMOKE DETECTOR, MECHANICAL CONTRACTOR SHALL INSTALL SMOKE DETECTOR IN THE RETURN AIR DUCT OF ALL SYSTEMS OVER 2,000 CFM. WIRING PROVIDED BY ELECTRICAL CONTRACTOR. SMOKE DETECTORS SHALL SHUT DOWN FAN UPON DETECTION OF SMOKE.
16. FIELD VERIFY THAT THE FRESH AIR INTAKE IS A MINIMUM OF 10' FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANTS, SUCH AS VENTS, CHIMNEYS, AND PLUMBING VENTS.
17. DUCT JOINTS, SEAMS AND CONNECTIONS SHALL BE SECURELY FASTENED AND SEALED WITH TAPE AND/OR MASTICS LABELED AS UL 181A (RIGID DUCTS) OR UL 181B (FLEXIBLE DUCTS). DUCT TAPE IS NOT PERMITTED.
18. RIGID DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS THAT ARE SPACED AT NO MORE THAN 10'-0". FLEXIBLE DUCTS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER

GAS PIPING NOTES:
GAS PIPING SYSTEM SHALL INCLUDE SHUTOFF COCKS, GAS PIPING FOR ROOFTOP UNITS, METERS, VENTS, SLEEVES, DRAINS, DIRT LEGS, PRV, ETC., AS REQUIRED. SCHEDULE 40 BLACK IRON GAS PIPING FOR DISTRIBUTION. 2.5" AND SMALLER PIPING SHALL BE THREADED AND 3" AND LARGER PIPING SHALL BE WELDED. EXTERIOR PIPING SHALL BE CLEANED AND GIVEN ONE COAT OF RUST-INHIBITING PRIMER AND ONE COAT OF BLACK FINISH PAINT, OR COLOR AS REQUIRED BY THE VILLAGE OF NORTH BARRINGTON. PROVIDE PIPING LAYOUT WITH ATPLE 90 DEGREE ELBOW LEGS FOR PIPING FLEXIBILITY TO TAKE CARE OF PIPE EXPANSION. PROVIDE GAS PIPING SUPPORTS AS REQUIRED BY THE INTERNATIONAL FUEL GAS CODE

BUILDING CODES:

ALL CONSTRUCTION SHALL COMPLY WITH THE VILLAGE OF NORTH BARRINGTON ADOPTED BUILDING CODES AND ORDINANCES AND LOCAL AMENDMENTS.

- 2012 INTERNATIONAL BUILDING CODE
- 2012 INTERNATIONAL RESIDENTIAL CODE
- 2012 INTERNATIONAL MECHANICAL CODE
- 2012 INTERNATIONAL FUEL GAS CODE
- 2012 INTERNATIONAL FIRE CODE
- 2012 INTERNATIONAL PROPERTY MAINTENANCE CODE
- 2011 NFPA 70 NATIONAL ELECTRIC CODE
- 2006 INTERNATIONAL ENERGY CONSERVATION CODE
- 2014 ILLINOIS PLUMBING CODE
- 2000 NFPA LIFE SAFETY CODE
- 1997 ILLINOIS ACCESSIBILITY CODE

JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE. BARRINGTON ILLINOIS 60010 847-382-0200

MICROGREEN FARM FOR:
TRINITY FARMS
25815 W. SCOTT RD NORTH BARRINGTON ILLINOIS 60010

DATE
SEPT 27, 2019

REVISION

JOB #

SHEET #
M2

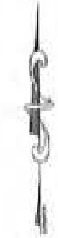
PLAT OF ANNEXATION

PLAT OF ANNEXATION TO THE VILLAGE OF NORTH BARRINGTON, IL.

LEGAL DESCRIPTION FOR PROPERTY COMMONLY KNOWN AS 25815 W. SCOTT ROAD, NORTH BARRINGTON, IL 60010

[illegible]

OWNERS: [illegible]
COMMONLY KNOWN AS: 25815 WEST SCOTT ROAD, [illegible], BARRINGTON, IL [illegible]
PERMANENT INDEX NO.: 13-25-100-028 – PREVIOUSLY ANNEXED
AREA OF PIN NO. 13-25-100-028 (PREVIOUSLY ANNEXED) = [illegible] ACRES
AREA OF PIN NOs 13-25-100-[illegible], 13-25-100-[illegible], 13-25-100-[illegible], 13-25-100-[illegible] & 13-25-100-[illegible] = [illegible] ACRES



PARCELS HEREBY ANNEXED:

PARCEL 1:

THE NORTH 50.00 FEET OF THE WEST 422.08 FEET OF THE FOLLOWING DESCRIBED PROPERTY:
[illegible]

SAID PARCEL CONTAINS 21,[illegible] SQ. FT. = 0.48 ACRES, MORE OR LESS

PARCEL 2

THE WEST 50.00 FEET OF THE SOUTH 281.77 FEET OF THE FOLLOWING DESCRIBED PROPERTY:
[illegible]

SAID PARCEL CONTAINS 14,052 SQ. FT. = 0.32 ACRES, MORE OR LESS

PARCEL 3

THE SOUTH 85.00 FEET OF THE EAST 410.62 FEET OF THE SOUTH 281.77 FEET OF THE FOLLOWING DESCRIBED PROPERTY:
[illegible]

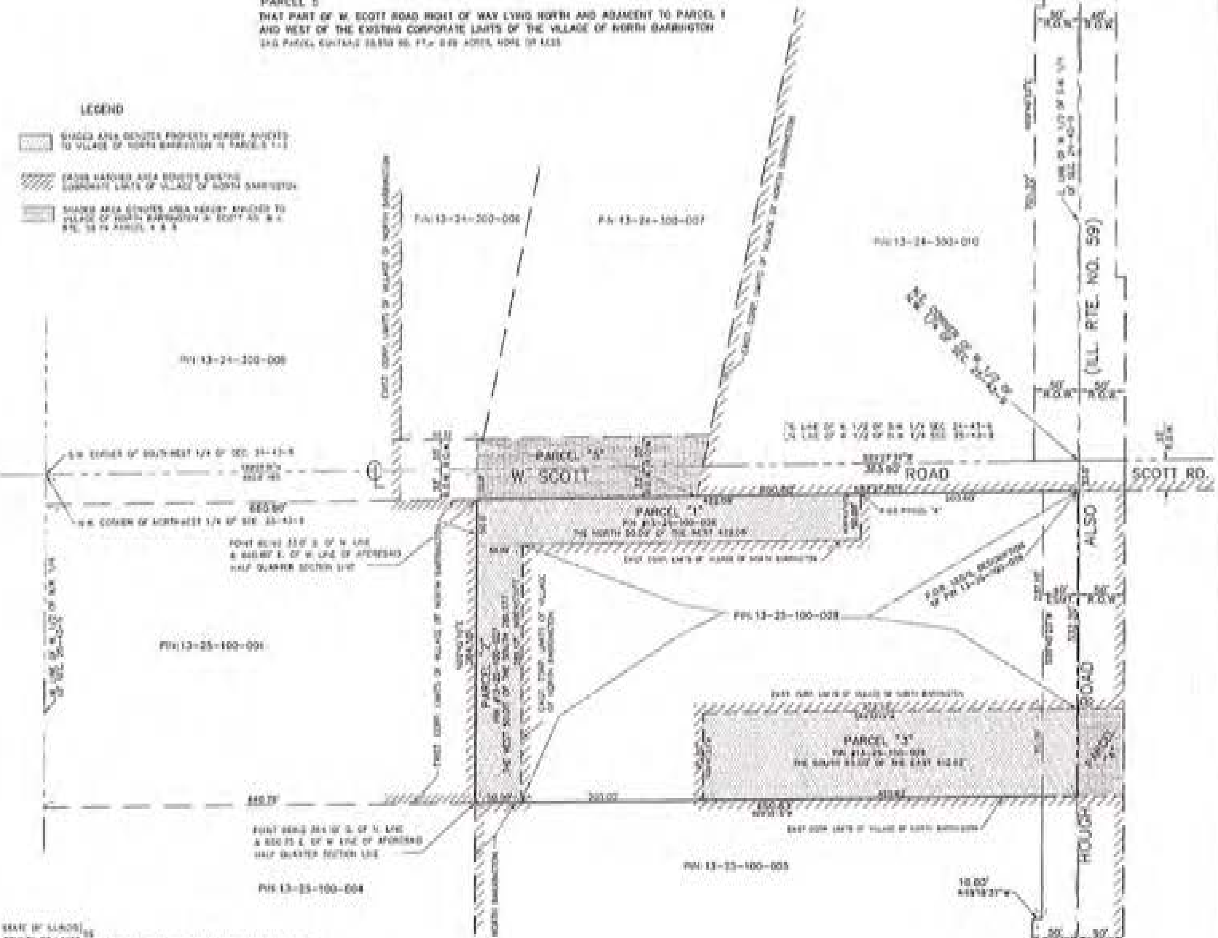
SAID PARCEL CONTAINS [illegible] SQ. FT. = [illegible] ACRES, MORE OR LESS

PARCEL 4

THAT PART OF HOUGH STREET RIGHT OF WAY LYING EAST AND ADJACENT TO ABOVE DESCRIBED PARCEL 3
SAID PARCEL CONTAINS 4,[illegible] SQ. FT. = 0.11 ACRES, MORE OR LESS

PARCEL 5

THAT PART OF W. SCOTT ROAD RIGHT OF WAY LYING NORTH AND ADJACENT TO PARCEL 1 AND WEST OF THE EXISTING CORPORATE LIMITS OF THE VILLAGE OF NORTH BARRINGTON
SAID PARCEL CONTAINS [illegible] SQ. FT. = [illegible] ACRES, MORE OR LESS



STATE OF ILLINOIS)
COUNTY OF LAKE) SS

[illegible]

[signature]

PROJECT NO.: 22-137

ACCURATE SURVEY SERVICE, INC.
22159 N. PEPPER ROAD, SUITE 1 S.
BARRINGTON, IL 60010
PHONE: (847) 381-8730

PROFESSIONAL LAND SURVEYORS LICENSE # [illegible]
PROFESSIONAL DESIGN FIRM LICENSE [illegible]

ORDINANCE TO AMEND CODE

VILLAGE OF NORTH BARRINGTON
ORDINANCE NO. _____

AN ORDINANCE TO AMEND CHAPTER 10 OF THE VILLAGE CODE TO ADD INDOOR FARM HORTICULTURAL OPERATIONS AS A SPECIAL USE WITHIN THE R-1 ZONING DISTRICT

WHEREAS, with the development of innovative indoor agricultural production practices in nontraditional urban settings, including indoor farm horticultural operations, the Village would like to update Chapter 10 of the Village Code (the "Zoning Code") to permit this use as a special use within the Village; and,

WHEREAS, the Village would like to amend the Zoning Code to permit indoor farm horticultural operations within the Village, in which vegetables, herbs, fruits, flowers, other plants and vermiculture can be cultivated within the Village; and,

WHEREAS, such operations would be limited to completely enclosed buildings or greenhouses to (1) secure the space and provide a controlled environment, (2) protect against harsh weather conditions and allow year-round operation, (3) reduce water usage, (4) eliminate site runoff, and (5) keep pollutants, such as fertilizers, from entering the groundwater and soil; and,

WHEREAS, at its _____, 2022 meeting, the Village Planning Commission reviewed this Ordinance and recommended the proposed amendments to the Zoning Code contained in this Ordinance; and,

WHEREAS, Village Board deems it appropriate to amend the Zoning Code to (1) define indoor farm horticultural operations and related terminology, (2) permit such operations as a special use within the R-1 zoning district, and (3) establish operational regulations and parking requirements for such operations.

NOW, THEREFORE, BE IT ORDAINED by the President and Board of Trustees of the Village of North Barrington, Lake County, Illinois, as follows:

SECTION 1: Title 10 of the Village Code is hereby amended by amending Section 10-7-2 thereof by adding the underlined language to read as follows: (single underlines, denote inserted language and strikethroughs, denote deleted language):

10-7-2: SPECIAL USES ENUMERATED:
The following uses shall be special uses:

A. Cellular, personal wireless communications services (PCS) and other wireless telecommunications service facilities in the R-1 district; provided, that such facilities shall be a permitted zoning use when located on Village Hall site if, at the time of placement of any such facility, there are no existing primary residential structures within

a radius of one and three-tenths (1.3) times the height of any proposed antenna or tower and, notwithstanding any other provisions of this code or of this title, in no event less than two hundred twenty five feet (225') as measured from the point of installation and that said facilities, whether located in the R-1 district or on Village Hall site, shall comply with the provisions of title 3, chapter 5 of this code.

B. Churches.

C. Golf clubs pursuant to sections 10-6-8 and 10-6-9 of this title.

D. Indoor farm horticultural operations pursuant to Sections 10-7-10 et. seq., but only in R-1 district.

E. Parks, playgrounds and forest preserves publicly owned and operated.

F. Planned developments described in chapter 8 of this title.

G. Publicly owned libraries.

H. Schools, public and private, elementary and high, nonboarding and including playgrounds and athletic fields incidental thereto.

I. Trailers and mobile homes designed, equipped and installed for use as a permanent residence, but only in an R-3 district.

J. Village Hall, Village garages, parking areas, storage buildings, other Village facilities, and uses appurtenant to any of the foregoing uses; also buildings or structures and parking areas for use by any other public body, and uses appurtenant to any of the foregoing uses. (1977 Code § ZR-6-2; amd. Ord. 818, 10-25-1999)

SECTION 2: Title 10 of the Village Code is hereby amended by adding Sections 10-7-10 through 10-7-13, which shall read as follows:

10-7-10 Definitions. Indoor Farm Horticultural Operations and Related Terms:

A. Indoor farm horticultural operation means a farm operation that grows and cultivates vegetables, herbs, fruits, flowers, other plants and vermiculture, which are not deemed illegal to grow, possess, or distribute under federal or Illinois law. The operation must take place wholly within completely enclosed buildings or greenhouses, in a manner that does not create, emit, or discharge noxious or offensive odors. These operations include plant nurseries, hydroponic farms, and vertical farms.

B. Greenhouse means a permanent structure made of glass, plastic, steel or fiberglass, in which plants may be cultivated year-round under controlled temperature and humidity settings.

C. Hydroponic means a method in which plants are propagated using a mechanical system designed to circulate a solution of nutrients in a water solvent.

D. Hydroponic farm means an operation that grows plants using hydroponic growing methods.

E. Plant nursery means an operation where plants are grown and propagated.

F. Vertical farm means an operation that grows plants in vertically stacked layers.

G. Vermiculture means the breeding of any species of earthworms in organic waste media, which produces incidental amounts of vermicompost.

10-7-11 Indoor Farm Horticultural Operations Ancillary to Farm Residence

A. All Special Use Indoor Farm Horticultural Operations are ancillary to a farm residence. No ancillary indoor farm horticultural buildings shall be located on a lot not containing a principal farm residence. If a principal farm residence on a lot is removed any ancillary buildings on the lot must be removed within one year to make the premises compliant with this code.

B. Not more than three assessor indoor farm horticultural buildings shall be located on a single lot with a maximum square footage of all accessory buildings not to exceed an aggregate square footage limit, calculated at a rate of 5,000 square feet per acre based on the total acreage of a single lot.

10-7-12 Indoor Farm Horticultural Operation Limitations

All Special Use Permits issued to allow indoor farm horticultural operations are required to comply with the following standards, which shall be addressed and set forth within any Special Use Ordinances granted under this Chapter:

A. Dust, Fumes, Vapors, Gases and Other Forms of Air Pollution. No emission shall be permitted that can cause damage to health or property caused by excessive emissions released into the air.

B. Exterior Illumination of buildings and open areas shall be subject to the provisions of the Village Code, but in no event shall the light exceed 0.0 Footcandles at any point along the front, rear, or side property line. Exterior lighting must be designed to prevent light pollution including the following components: glare, skyglow, light trespass, or clutter when viewed from adjoining properties or a public street.

C. Liquids, Solid Waste and Wastewater Treatment Systems (Septic Systems). No waste shall be discharge into the streets, drainageways or on property creating danger to the public, health and safety. All Wastewater Treatment Systems (Septic Systems) shall be designed, constructed, and maintained in accordance with the provisions of the Village

and Lake County Codes.

D. Noise. The sound level of from any operations shall not exceed the limits permitted by Illinois State Statute.

E. Odor. Emission of gases or other odors shall not be permitted in such quantities as to be offensive to owners or occupants of adjoining property or in such a manner as to create a nuisance or hazard beyond the property lines.

F. Heavy Machinery. The use of heavy machinery weighing five tons or greater is prohibited.

10-7-13 Maximum number of Accessory Parking Spaces.

The total number of accessory parking spaces permitted pursuant to a Special Use Permit for indoor farm horticultural operations shall not exceed one parking space for each 2,000 square feet of indoor floor area devoted to the special use of indoor farm horticultural operations. When determining the number of accessory parking spaces allowed under this provision, if a calculation of total permitted spaces result in a fractional space, any fraction of 1/2 or less shall be disregarded while a fraction in excess of 1/2 shall be counted as one permitted accessory parking space.

SECTION 3: If any section, paragraph, subdivision, clause, sentence or provision of this Ordinance shall be adjudged by any Court of competent jurisdiction to be invalid, such judgment shall not affect, impair, invalidate or nullify the remainder thereof, which remainder shall remain and continue in full force and effect.

SECTION 4: All ordinances or parts of ordinances in conflict herewith are hereby repealed to the extent of such conflict.

SECTION 5: This Ordinance shall be in full force and effect from and after its passage and approval in the manner provided by law.

Passed this ____ day of _____ 2022 by roll call vote as follows:

	Ayes	Nays	Absent	Abstain
Trustee Kevin Horcher	_____	_____	_____	_____
Trustee Robin R. Kelleher	_____	_____	_____	_____
Trustee Vanessa G. Kerrigan	_____	_____	_____	_____
Trustee Martin Pais	_____	_____	_____	_____
Trustee Greg Rogus	_____	_____	_____	_____
Trustee Lawrence Weiner	_____	_____	_____	_____
President Sweet McDonnell	_____	_____	_____	_____

APPROVED THIS ___ DAY OF _____ 2022.

Eleanor Sweet McDonnell, Village President

(SEAL)

ATTEST: _____
Village Clerk or Deputy Clerk

Published: _____, 2022

CERTIFICATION

I, _____, do hereby certify that I am the duly elected, acting and qualified Clerk of the Village of North Barrington, Lake County, Illinois, and that as such Clerk, I am the keeper of the records and minutes and proceedings of the President and Board of Trustees of said Village of North Barrington.

I do further certify that at a regular meeting of the President and Board of Trustees of the Village of North Barrington, held on the ____ day of _____ 2022, the foregoing Ordinance entitled **"AN ORDINANCE TO AMEND CHAPTER 10 OF THE VILLAGE CODE TO ADD INDOOR FARM HORTICULTURAL OPERATIONS AS A SPECIAL USE WITHIN THE R-1 ZONING DISTRICT"**, as duly passed by the President and Board of Trustees of the Village of North Barrington.

The pamphlet form of Ordinance No. _____, including the Ordinance and a cover sheet thereof, was prepared, and a copy of such Ordinance was available in the Village Hall, commencing on the ____ day of _____ 2022, and will continue for at least 10 days thereafter. Copies of such Ordinance are also available for public inspection upon request in the office of the Village Clerk.

I do further certify that the original, of which the attached is a true and correct copy, is entrusted to me as the Clerk of said Village for safekeeping, and that I am the lawful custodian and keeper of the same.

Given under my hand and seal of the Village of North Barrington this ___ day of _____ 2022.

_____
Village Clerk or Deputy Clerk
Village of North Barrington,
Lake County, Illinois

(SEAL)

AFFIDAVIT OF COMPLIANCE

STATE OF ILLINOIS

COUNTY OF LAKE

Planning Commission Case: Varda, 25815 W. Scott Road, North Barrington, IL 60010

AFFIDAVIT OF COMPLIANCE FOR WRITTEN NOTIFICATION AND SIGN POSTING

The undersigned, being duly sworn on oath deposes and states as follows:

A. That a copy of the legal notice, attached hereto as **Exhibit A**, was served by mail to all person(s) listed in **Exhibit B** attached hereto, in accordance with the procedures of the Village of North Barrington. Said mailing being post marked on June 29th, 2022.

B. That the posting requirements of the Village of North Barrington have been complied with by placing the required public notice sign on the subject property on June 24th, 2022.

By: _____

Print Name: John A. Lobaito

OFFICIAL SEAL
SUZANNE E MURDY
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission Expires 7/20/25

Subscribed and Sworn to me before

This 30th day of June, 2022

Suzanne E. Murdy
Notary Public

EXHIBIT A

NOTICE OF A PUBLIC HEARING
VILLAGE OF NORTH BARRINGTON
111 OLD BARRINGTON ROAD

Notice is hereby given that the Plan Commission of the Village of North Barrington, Lake County, Illinois will hold a Public Hearing, Monday, July 11, 2022 at 7:30 P.M., at the North Barrington Village Hall, 111 Old Barrington Road, North Barrington, Illinois to consider the petition of Ammunnouel and Anoosh Varda for a Zoning Map Amendment to rezone an approximately 4.43 acre parcel from R-1 Single Family Residential to R-1 Single Family Residential with Special Use for an Indoor Farm Horticultural Operations and such other relief as may be necessary to accomplish the applicants development plan.

The subject property is located at the southwest corner of IL Route 59 and Scott Road intersection with the street address of 25885 W. Scott Road, North Barrington, IL 60010.

Property Index Number (PIN): 1325100026; 1325100028; 1325100029

The Plan Commission may also consider such other relief as may be necessary or desirable in connection with the application. Said petition and request is on file and available for examination at the Administrative Offices at the North Barrington Village Hall, 111 Old Barrington Road, North Barrington.

All persons interested are invited to attend said hearing and be heard. The public hearing may be continued to another date, time, and place without the publication or delivery of another notice such as this one.

Dated: June 20, 2022

John Lobaito
Village Administrator
VILLAGE OF NORTH BARRINGTON

Planning and Zoning Case: Varda, 25815 W. Scott Road, North Barrington, IL 60010

LIST OF SURROUNDING OWNERS NOTIFIED

EXHIBIT B

NAME	ADDRESS
Gerald F. and Robin T. Celano	21900 N. IL Route 59 North Barrington, IL 60010
Grant R. Born Trust and Kristin R. Born Trust	25810 Cresthill Dr., North Barrington, IL: 60010
Rick A. Damato and Dean C. Miller	25890 Cresthill Dr., North Barrington, IL 60010
Gumulak, Krzysztof and Krystyna	21837 N. IL Route 59, North Barrington, IL 60010
Jack Leya, Trustee	25597 W. Scott Road, North Barrington, IL 60010
Old Barrington Road, LLC	4601 Garden Point Trl., Wellington, FL 33414
Miroslaw and Malgorzata Dobrowolski TTEES	25679 W. Scott Road, North Barrington, IL 60010
Mauro Passarelli	25848 W. Scott Road, North Barrington, IL 60010
Clancy M. Potts and Michael Hayes	25886 W. Scott Road, North Barrington, IL 60010
Jaroslaw and Krzysztof Iciek	22032 N. IL Route 59, North Barrington, IL 60010
Waseem Hashlamoun	4617 N. Kedzie Ave., Chicago, IL 60625-4404