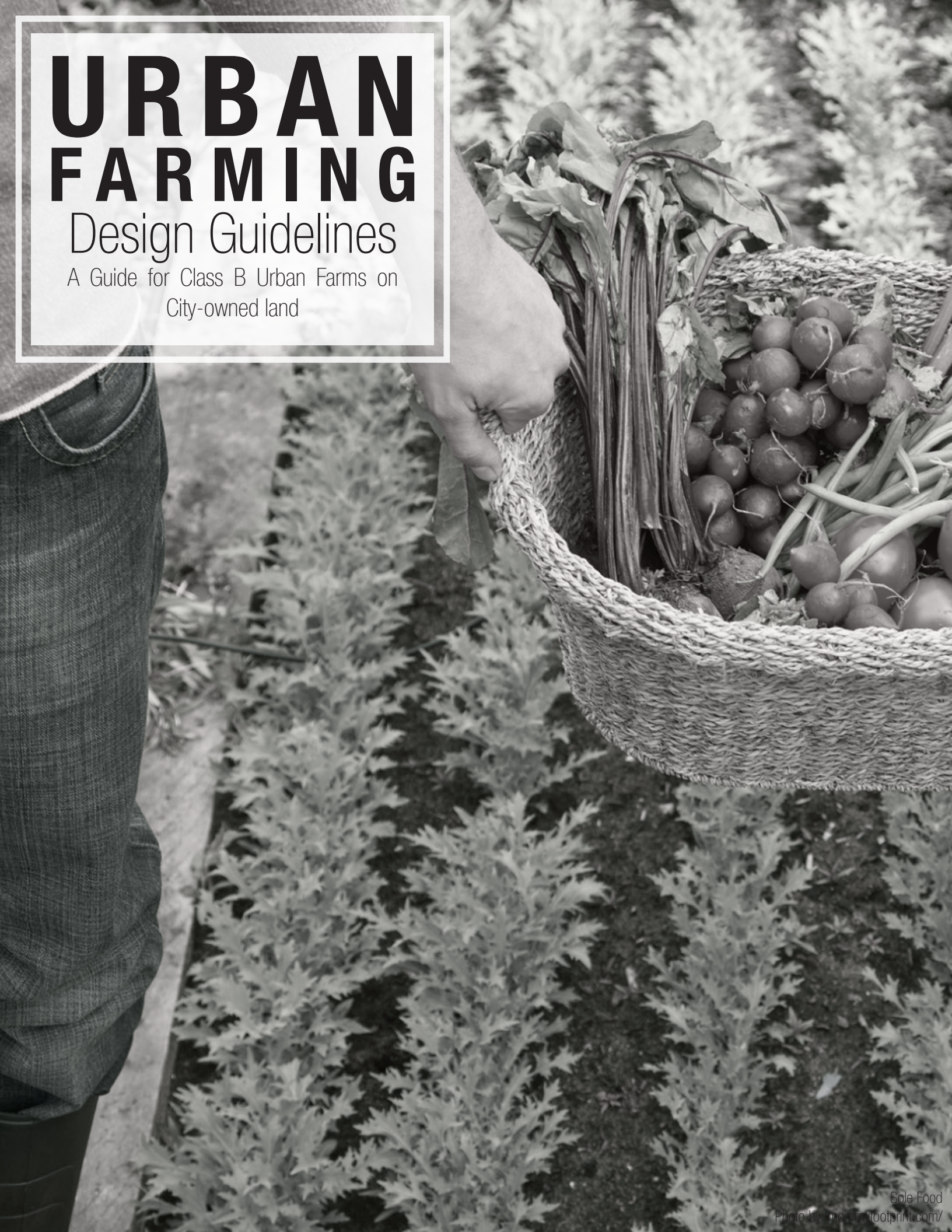


URBAN FARMING

Design Guidelines

A Guide for Class B Urban Farms on
City-owned land



“Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country and wedded to its liberty and interests by the most lasting bonds.”

~ Thomas Jefferson

GREENEST CITY SCHOLAR PROJECT FOR THE CITY OF VANCOUVER

The Urban Farming Design Guidelines were produced by Christopher Szymberski for the Department of Social Planning and the City of Vancouver as an initiative of the Greenest City Scholar Program in partnership with the University of British Columbia. It is a **living document** capable of being updated and edited to fit the needs of both urban farmers and the CoV.

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What is Urban Farming?

It's a growing business

Urban farming differs from other types of urban agriculture (i.e. community gardens), and is defined as **the production and cultivation of fruits and vegetables for the purpose of selling**, precluding honey, eggs, and other agricultural activities at this time. These operations may be operated on a for-profit, non-profit, and/or social enterprise model.

Why Urban Farming?

How food connects

Urban Farming provides many benefits, such as greening the city, improving biodiversity, making use of under-utilized spaces and producing food closer to home. Since food is grown primarily for sale, Urban Farming also enhances the local economy by creating green jobs (including food retail, distribution and processing), building skills and shortening food supply chains.



Urban Farming supports several goals of the **Greenest City Action Plan**, primarily by creating healthy ecosystems, a lighter footprint, and a greener economy:

Access to Nature: The landscapes and ecosystems of Urban Farms contribute to the City of Vancouver by increasing the number and diversity of planted spaces that other organisms depend on for habitation; filtering both air and water; enhancing the quality of urban life; creating new and more accessible food opportunities; and, acting as places of identity and pride for residents and communities.

Green Economy: Urban farming is inherently a green job, as the practices of cultivating, breeding, and propagating plants increases the biodiversity and abundance of nature in an often grey urban world. The ability of food to connect is undeniable, and this goes for its economic value as well. Growing, handling, processing, storing, delivering, cooking, and serving; food is at the center of a key energetic and resource cycle that nourishes the city, its people, and its businesses.

Lighter Footprint: The fossil fuels used to transport, cool, and store food is considerable, and is one of the largest contributors of GHG emissions – accounting for almost half of the City of Vancouver's ecological footprint. By shortening the supply chain and reducing the energy necessary to import food from abroad, urban farming can supply fresher food at a lower ecological cost to the city.

Local Food: Urban farming is a tangible and visible way of embedding food into the

City of Vancouver's urban landscape. What and how we eat serves as a reminder of our interconnection and dependence on the Earth's natural systems to provide for us what not just we need to survive, but also what we need to enjoy food of our place.



Urban Farming supports several goals of the **Healthy City Strategy**, primarily by addressing Feeding Ourselves Well, but also is applicable to the goals of *Cultivating Connections*; *Active Living and Getting Outside*; *Lifelong Learning*; and *Environments to Thrive In*.

Feeding Ourselves Well: Urban Farming can provide access to sufficient, safe and nutritious food. Food nourishes our bodies and our minds, and is often central to our social gatherings and cultural traditions. Additionally, Urban farming strengthens community connections, boosts local food production, and bolsters our resilience in the face of climate change and the disappearance of agricultural land.



The Vancouver Food Strategy: The City of Vancouver has set a goal to increase city and neighbourhood food assets by 50 per cent over the 2010 levels by the year 2020. Urban Farming supports all of the goals within this strategy:

Support Food Friendly Neighbourhoods: Urban farming will be located in diverse areas throughout the City of Vancouver, primarily in residential zones, but also in commercial and industrial zones. Regardless of its location in the city, urban farms can act as a place of connection and pride in the neighbourhood.

Empower Residents to Take Action: "The most effective community food systems are shaped by the people who live there" (The Vancouver Food Strategy) By having urban farms and supporting businesses in the neighborhood, connections are made between residents and identity of place and evolve around not just the farm as a place, but as an embodiment of people and their work.

Improve Access to Healthy, Affordable, and Culturally Diverse Food for all Residents: Urban Farms act as immediate places of interface between a neighbourhood's food system and its residents. Urban Farms enable the sale of produce directly from the farm to residents.

Make Food a Centerpiece of a Green Economy: Food and farming, with the support of the City of Vancouver, can offer skills-building and job opportunities in the larger green economy of the city.

Advocate for a Just and Sustainable Food System: Urban Farming is a small, but important, part of a larger network of agricultural activities at the regional, provincial and national levels. Its presence and local support have radiating effects though out the larger discourse on food security and agriculture.

Application & Intent

Who this document is for

While recognizing that there is a wide variety of farm operations, layouts, and designs, each with their own needs, the intent of this document is to outline the basic technical requirements for urban farms operating on City-owned land or those which may be developed or constructed in the City of Vancouver in regards to the City's Rezoning Policy For Sustainable Large Developments on privately owned land, which requires defined plans or studies to be conducted. Additionally, it is intended to inform and assist City of Vancouver staff in better understanding design considerations for Class B Urban Farms, as defined by the policy entitled *Urban Farm Guidelines*, passed by City Council on March 8th of 2016.

Site selection, site planning, layout design, and urban farm infrastructural components are addressed within this document. They are intended to outline the minimum design requirements for urban farms, as well as, provide other considerations that would further support the operations of farms in the City of Vancouver.

These guidelines are intended to be used by city staff in assessing urban farming proposals to ensure that urban farms operating on city owned land meet basic design considerations. The use of the following specifications is subject to interpretation and discretion by City staff.

Regulations & Standards

Approvals for Urban Farms

In addition to these guidelines, other approvals and permits are required for the design and construction of urban farms. The Food Policy Group in the Social Policy Department, must approve all urban farm plans, and should be consulted in the earliest planning phase. They will be responsible for evaluating urban farm applications against the technical design guidelines which follow in this document. They will assist in interpreting the guidelines for each situation. Additionally, the Facilities Planning Department will need to review all built structures and infrastructural components to ensure that a suitable level of quality and durability is achieved.

If the urban farm is sited on either City of Vancouver-owned or private land, Development, Building and other Permits may be required. For detailed information concerning these permits and other relevant codes and requirements, contact the City of Vancouver Development Permit Group of the Planning Department or the Permits and Licenses Department.

Urban Farming Design Guidelines:

The following document outlines the technical design guidelines for Class B Farms operating on City-owned land. The guidelines contained in this document outline the minimum required components for urban farms, while also putting forth other additional and ancillary components for consideration. As such, the focus of this document is on the productive spaces of urban farms, which are those used for the cultivation of market fruits and vegetables and are not directly open or accessible to the public. Where the public does have open access, guidelines are given. (The farm may choose to have or host social and public spaces, beyond the productive operations of the farm, for gatherings or educational/therapeutic activities)

Each farm will have a unique context and set of needs; including:

- Anticipated longevity of the farm's lease or use of the land;
- Operational intentions, whether as a full productive farm, or having educational or therapeutic components;
- Type of crops;
- Organizational structure;
- Production model;
- What financial models the farm may be using or financial resources that it has access to;
- What neighborhood or area of the city that the farm is located;
- Environmental context (tall buildings, presence of pavement, proximity to roads or public property etc.)

Design Guidelines for Urban Farming

1.0 Siting & Orientation

The siting and orientation of a farm is crucial. Because agricultural crops require a minimum of eight to ten hours of sunlight a day to flourish, it is important to situate farms in places that will provide adequate sun exposure. However, due to the nature of the urban environment, this may not always be possible.

Other important aspects in siting an urban farm are its proximity to other food assets and how it is situated in the community in relation to the larger landscape and functioning of the community. Urban farms have the potential to be a symbol of pride for a neighborhood, and can, therefore, bring people together, as well as, provide aesthetic and ecological benefits to the area.

1.1 Lot Size

- (a) The size of the site for Class B, whether in a single parcel or as multiple parcels operated jointly, may not exceed 7000 m², unless relaxed by the Director of Planning;

1.2 Siting

- (a) Urban Farms shall be located to maximize sunlight access; with full southern exposure;
- (b) It is recommended that spaces, which are accessible to the public, act as transition spaces between the public realm and the productive space(s) of the urban farm;

(c) It is recommended that communal or educational spaces be sited adjacent to publicly accessible spaces, such as streets, paths, plazas, etc when possible.

1.3 Orientation

(a) It is strongly suggested that a minimum of 8 hours of full sunlight shine on the site during the Spring/Fall equinox.

(b) Urban farms, their planting layout and structures, should be oriented toward the south so that beds and rows of annual plants, herbaceous perennials, and edible shrubs and trees do not shade out each other unnecessarily, with taller plantings on the northern end of the site.

1.4 Adjacencies

(a) It is recommended that urban farms be located in a place that provides easy access to a road or lane for the delivery and pick-up needs of the farm; garbage and recycling pick-up; etc.

(b) Consider locating urban farms near other community food assets, such as: community food markets, community kitchens, community gardens etc.

2.0 Landscaping

Landscaping is defined as the aesthetic appearance of the urban farm, but also includes the infrastructural components of the farm that define its boundaries, paths, planting beds, and the grades of its grounds. Unlike other agricultural operations in rural areas, urban farms operate in very different environments that require them to conform to the aesthetics of the urban environment.

2.1 Fencing and Boundaries

As many farms will be operating outside of the public realm, it is important that their boundaries are clear, and that, where needed or desired, fencing prevents access. Fences, which are linear structures that enclose an area, are usually constructed from secured posts with boards, chain link, or other material spanned between. As such, Fencing can be costly to install and maintain.

The adjacencies of the farm; its location in the city; the local demographics; zoning context; and operational intentions of the farm; etc. will determine whether there is a need or a desire to fence the perimeter of the farm. Additionally, the context of the urban farm will also determine the specifics of the fence's design (i.e. material, height, openness, etc.)

(a) The entire perimeter of an urban farm shall be enclosed or demarcated, providing visual boundaries, as well as, physical boundaries where needed or desired;

(b) Fences should be provided of sufficient height per security requirements and operators preference;

(c) Fences should be constructed with sufficient material strength to prevent access of trespassers;

(d) Fencing material should prevent the access of animals (i.e. dogs, skunks, raccoons, etc),

(e) Fences should be visibly porous;

2.2 Gates

2.2.1 Pedestrian Gates

(a) Urban farms should have two pedestrian gates which provides access to fenced areas;

(b) Pedestrian gates should be no less than 1 m (3'4") wide, to provide easy access of wheel barrows and wheel chairs;

(c) It is recommended that gates be self-closing with latching and locking mechanisms.

2.2.2 Vehicle Gates

(a) Urban farms should have a minimum of one vehicle gate, dedicated to the loading and unloading of materials;

(b) The vehicle gate should be a minimum of 3.5m (11'6") wide, and lockable;

(c) It is recommended that the gate be a rolling gate with a wheel, which slides along the length of the fence, providing an efficient use of space.

2.3 Border Plantings

Border plantings are the public 'face' of the farm, presenting the aesthetic quality of the farm to the surrounding area. As such, it is important that the farm take care in designing and planting this edge as a show of good will and as a positive addition to the public sphere.

(a) Plantings outside of the fenced urban farm, in the public sphere, should use edible perennial and herbaceous annual plants that produce edible fruits, nuts, vegetables, flowers, etc.

(b) Border plantings should be designed in such a way to be enable easy maintenance.

(c) It is suggested that border plantings use permacultural planting principles;

2.4 Drainage & Grading

(a) Drainage of surface water should be directed away from buildings, gates, entrances, and from going across sidewalks or onto neighboring properties;

(b) Ponding or pooling should be avoided.

2.5 Soil

Soil is the "Skin of the Earth". It is a mixture of minerals, organic matter, gases, liquids, and countless organisms that together support life on Earth. It is the medium in which plants grow, and its health and quality is essential for the successful cultivation of agricultural crops. The soils found in an urban environment are often disturbed, having been previously excavated, compacted, or polluted. Due to these conditions, sites for urban farming should ensure that they have appropriate soil on site, or import it from reputable sources if needed.

(a) It is recommended that existing on-site soils be tested for toxins (heavy metals, salinity and hydrocarbons) prior to being used in urban farming operatoins;

(b) Imported soil should be clean and produced with organic standards, and it is recommended that imported soil be obtained from local sources;

(c) If raised planting beds are used, it is recommended that soil depth be a minimum of 450mm (18");

(d) Toxic materials, such as pressure treated wood, should not be used where they will come into contact with soils that are growing food.

2.6 Public Spaces & Accessibility

Public space, as an extension of an urban farm, is separate from the productive operations of the farm, and offers unique opportunities for both the community and the farm. Their overlap can be a space for activities, classes, and social gatherings, and other hosted events. It is a place for the community to meet. It is a place where farm and community interact and exchange, amidst the daily operations of the farm's productive space.

It is the social focal point of the farm. As such, the space allows for a group of people to work on tables and benches; to share knowledge and skills; to host dinners and events; etc. It may also be connected to buildings or other spaces where the farm has an office, kitchen, or market.

(a) It is suggested that urban farms have or host a public space as an extension of the farm's operational space and activities;

(b) The social or public spaces of urban farms should be inviting and provide easy and direct access from the public sphere, particularly for older adults, people with disabilities, and young children;

(c) Selection of ground surface materials should result in easy access for older adults and people with disabilities.

(d) The spacing of paths and path width; placement of planters; and seating and handrails should further encourage easy wheelchair and pedestrian access;

(e) An outdoor work bench or table, for the potting of plants and other general farm or gardening activities and chores, should be provided with a height of at least 865 mm (34") high.

(f) A covered space, from the rain and sun, should be provided;

(g) Consider providing planting spaces for the public to use and plant as their own.

3.0 Utilities

Access to water is essential for the operation of farms. Other utilities, such as electricity and sewer, also serve the operations of farms and allow farms to function more smoothly, efficiently.

3.1 Water

Water is an essential resource for farming. Its wise use and conservation is important. While urban farms should have direct access to municipal water, it is important that other sources of water are also incorporated into a larger water resource plan. When possible, rainwater and greywater systems should be integrated into the water resource plan and be used for the watering need of a farm first, before relying on municipal sources.

3.1.1 Rainwater Harvesting

Rainwater harvesting provides an urban farm with an independent water supply. It is an important source, especially during regional water restrictions and during droughts. Rainwater is collected from roofs and stored in large tanks for later use. This provides a water supply that reduces the dependency on municipal water. Additionally, it prevents stormwater from entering the municipal sewer system and eventually entering and polluting freshwater bodies.

(a) It is recommended that rain water be harvested off of sheds, greenhouses, and other structures for storage and use in the productive space of the farm;

(b) When applying rain water to agricultural crops, urban farms should use drip irrigation or another method of application that prevents rain water from contacting the edible parts of the plants

3.1.2 Greywater Re-use

Greywater is recycled water from on-site sources, typically as municipal water which has been used in processing activities. Once used, the water is no longer potable, but it can still be used for the needs of the cultivated plants on the farm. Used water's redirection into a storage tank, instead of into the sewer system, preserves it for use later and reduces the demand on city sewer infrastructure.

(a) It is recommended that greywater (water that may be used on-site for washing and processing produce), be collected for storage and application onto the growing beds of the urban farm;

(b) When applying greywater to agricultural crops, urban farms should use drip irrigation or another method of application that prevents greywater from falling onto the edible parts of the plants

3.1.3 Water storage

A cistern is a large storage tank for holding water; potable municipal water, rain water, or greywater. Cisterns can be purchased or constructed. Water coming from roofs may be contaminated with pollutants such as dust, metals, dirt and debris, etc. Additionally, greywater may have dirt and debris which could clog irrigation lines. As such, it is important that cisterns are equipped with input and outtake filters, and that they are inspected and cleaned regularly

(a) Storage of rainwater should be held in a container constructed of a material safe for contact with potable water.

(b) Water storage tanks should be equipped with a screened vent, ensuring that the interior of the tank is not under pressure, facing downward to keep airborne contaminants out of the

water supply;

(c) Water storage tanks should be equipped with an access hatch, which allows for inspection, maintenance, and cleaning;

(d) To reduce the possibility of sediment intake, the point of withdrawal from the cistern should be at least 10–15 centimeters from the bottom of the tank;

(e) A It is recommended that the water storage tank be equipped with a pre-filter, to reduce the buildup of sediment and debris;

3.1.4 Municipal Water

Municipal water is clean and potable. It is important that a farm have access to municipal water, to ensure that its water needs are met.

(a) Potable water should be available on the site of the urban farm year round;

(b) Hose bibs should be installed at a minimum of 7.62m (25'0") apart;

(c) Hose bibs should be frost-free with a vacuum breaker for year round water access;

(d) It is suggested that drip irrigation and an irrigation controller, which controls timing, duration and zone-specific watering, be installed, as their combination provides an efficient means of applying water to cultivated plants;

(e) If on city-owned land, a ddc, direct digital control system, should be installed to monitor water usage

3.2 Electrical Access

(a) Weather-proof outlets are to be provided at all structures;

(b) It is suggested that additional weather-proof outlets be provided in other strategic locations on the farm site.

3.3 Lighting

(a) Motion sensor flood lights should be installed at all structures;

(b) All light fixtures should be high efficiency LED, and use fixtures that prevent unnecessary light-pollution;

3.4 Washrooms

(a) It is recommended that access to a washroom be considered when examining potential locations for an urban farm;

(b) In some cases it may be necessary that a washroom be provided.

3.5 Metering

(a) It is suggested that all urban farms have dedicated electrical and water metering and/or submetering to track the usage of utilities throughout the seasons;

4.0 Signage

The sign of a farm identifies it to the public and provides needed information in case the farm or farm manager should need to be contacted. Signs can also be used for a farm to also state what kind of operation they run; what they grow; etc.

4.1 Signage

(a) All urban farms should post at least one identification sign stating the name of the urban farm, contact information, with the option of further info about the farm and its operations at the primary entrance to the farm;

(b) The identification sign must comply with City of Vancouver Sign By-Law;

(c) It is suggested that multilingual signs be used;

(d) Consider interpretive signs that identify plants and their uses in public areas.

5.0 Waste Management

Urban farms produce green organic waste during daily and seasonal activities. These material cycles are an important aspect of any farm. It is strongly recommended that green organic wastes and other material cycles be managed in a way that endeavor to close the loop of materials and resources as much as possible, whether on the farm itself or as part of the larger cycles and processes within the city.

5.1 Organics Management

It is important and necessary for urban farms to have a plan for the organic refuse that their operation will invariably produce. Organic compost is beneficial for urban farms in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, etc. By composting on site, urban farms close the nutrient cycle and can retain valuable resources.

(a) It is recommended that an on-site organics composting system, one of sufficient size to match the needs of the urban farm, be constructed and utilized on site;

(b) It is suggested that the urban farms utilize aerated bin composting, an affordable and efficient method of producing compost in a timely manner, that uses an air pump and perforated pipes to oxygenate compost piles (other approved methods of composting are acceptable);

(c) It is recommended that easy access to power and water be provided;

(d) It is recommended that the location of the composting system and space for the storage of finished compost be covered from the elements, with proper ventilation;

(e) The organics storage and processing structures shall be constructed in such a way that prevents rodents;

(f) It is recommended that the location of the organics system and space for the storage of finished compost be placed on a relatively flat surface, and may require a concrete pad to facilitate easy removal of finished compost and the cleaning of the space;

(g) The organics system shall not be located near a storm drain;

(h) Any effluvium discharge, which may be produced as a result of the composting process, shall comply with Sewer and Watercourse By-law to prevent the contamination of natural water systems;

(i) Effluvium discharge from the composting process shall not drain towards garden beds.

(j) If on-site organics management is not possible, the design of the urban farm must enable easy curbside pick-up of organic material with an appropriately sized bin for temporary storage.

5.2 Recycling

(a) It is recommended that an on-site area for recycling be provided which can accommodate the needs of the urban farm;

(b) It is suggested that additional storage space be provided to temporarily store materials or resources that can be reused in different capacities by the urban farm or be incorporated into the CoV building material salvage plan.

5.3 Garbage.

(a) It is recommended that an on-site area for solid waste disposal, which is not capable of being composted, recycled or otherwise disposed of, be provided which can accommodate the needs of the urban farm, and allows for storage of such materials for a minimum of 14 days.

6.0 Greenhouses & Sheds

Structures for storage, working, and growing give a farm necessary functional space that can be versatile and multi purpose. Covered spaces also provide a surface from which rain water can be collected.

6.1 Greenhouses

Green houses are very most valuable and functional structures for farms. They are essential spaces which are used to start seeds and grow cool loving plants in the winter; grow container plants for the fields in the spring; fully cultivate heat loving crops through the summer and fall; and back again into the winter for seed starting, potted plant storage, and winter crops. (A greenhouse larger than 10m² requires a building permit and must conform with Vancouver Building By-law.)

(a) It is recommended that an urban farm have a minimum of one green house;

(b) Greenhouses should be capable of being securely locked to protect against potential vandalism or pest and wildlife access;

(c) The greenhouse should be constructed of material that can withstand warm and wet environments for prolonged periods of time without rotting or becoming structurally unsound;

(d) It is recommended that polycarbonate sheets be used for the glazing of greenhouses, which is economical, lightweight, diffuses lights, and shatter proof,

(e) It is recommended that the greenhouse be capable of being opened in multiple locations to allow cross ventilation, or be outfitted with a ventilation fan.

6.2 Equipment Sheds

Equipment sheds are indispensable structures for storing the necessary equipment of running a farm such as: rototillers, mowers, and wheelbarrows; as well as more simple tools such as: hoes, shovels, rakes, etc. (A storage shed larger than 10m² requires a building permit and must conform with Vancouver Building By-law.)

(a) Urban farms should have a minimum of one storage shed for tools and equipment;

(b) Sheds should provide protection from the elements;

(c) It is recommended that shed have a large entrance that enables easier movement of larger equipment (mower, rototiller, etc) in and out;

(d) Sheds should be securely lockable to protect against potential vandalism or pest and wildlife access;

(e) Sheds should be equipped with a hose bib and electricity;

(f) It is suggested that sheds be equipped with an awning that provides an outdoor covered area to work under;

6.3 Mobile Structures

Growing in an urban context can sometimes pose uncertain circumstances for farming operations. This may require for infrastructure and equipment to be movable. Movable sheds and shipping containers can be versatile, and are readily available and inexpensive. They can be adapted for multiple uses (i.e. storage of equipment; adapted for hydroponic, green house operations; or designed as a semi-mobile commercial kitchen for the processing of agricultural products).

(a) The specific adaption or renovation of mobile structures will require that they conform with specific building codes for the new use that they are intended;

(b) Mobile structures should be anchored to the ground.

7.0 Food Processing & Storage

After harvest, the processing of fruits and vegetables is an important stage in the agricultural cycle. Spaces can be simple enough for the cleaning, washing, and packaging of produce, with just sinks and counters, or they can be more fully equipped as a kitchen.

7.1 Processing Spaces

Urban farms must have an area to process produce. Processing spaces can be outfitted with a wide spectrum of equipment, but should, at a minimum, include the following:

- (a) Adequate space to accommodate the expected volumes of agricultural produce from the farm;
- (b) A produce wash station with two deep sinks with a minimum depth of 300mm (12");
- (c) A dedicated hand-washing sink;
- (d) An easy to wash floor with a number of floor drains sufficient for its size (if it is an outdoor processing space, then a washable floor with a place for the water to drain to, such as a rain garden, is sufficient);
- (e) Non-porous work surfaces, which are easy to sterilize, stainless steel is recommended;
- (f) Access to water;
- (g) Access to electricity;
- (g) Sufficient lighting, natural or otherwise;
- (h) That the space be rodent-proof;
- (i) A separate storage space for domestic supplies, etc;

7.2 Kitchen Spaces

The combination of an urban farm and a kitchen can be an effective asset. A kitchen space facilitates value added activities, cooking classes, and community gatherings, etc. If space allows, kitchen spaces can be outfitted with other amenities (stoves, ovens, etc.) to conduct additional activities to washing and processing products, such as drying, canning, catering; etc.

Proximity to and having access to other places that have community kitchen space is a good alternative to having a kitchen space on site. When possible, relationships between other community food assets should be considered and encouraged.

- (a) Consider having a stove top and oven;
- (b) Kitchen spaces with cooking equipment shall have ventilated exhaust hoods to prevent the build up of odors, smoke and condensation;
- (c) Be equipped with a minimum of three deep sinks, large enough to wash and rinse the biggest pots and utensils;
- (d) Consider also providing storage space for large volume pans and pots, as well as appropriate cooking utensils;

(e) Consider a commercial dishwasher.

7.3 Additional considerations for Processing and Kitchen Spaces

(a) Consider an outdoor processing space / kitchen, which conforms with the previous guidelines;

7.4 Food Storage

Storage, which is the act of preserving and keeping agricultural produce for future use without losing its quality, is often an essential component of the agricultural process. In all methods of storage, it is important that the products be stored in a place that is cool and dry, with good air circulation and that is rodent proof.

Because different agricultural products have different characteristics, such as different water content (tomatoes vs carrots), they require different temperature and relative humidity for optimal storage

Not all urban farms will need or have a storage or processing facility. However, the following guidelines are recommended for those farms that do.

(a) Adequate storage space should be provided for the expected volumes of produce for the farm;

(b) Food storage areas should be separate rooms from areas used for processing food;

(c) Products should not be stored directly on the floor, shelving must be at least 15cm above the floor, and away from walls to allow for adequate air circulation;

(d) It is recommended that storage areas be located in an easy to access location from the field of the farm;

(e) It is recommended that storage areas be equipped with thermometers and humidity meters.

7.4.1 Dry Storage

The guidelines vary for safe storage of vegetables under dry conditions (without refrigeration or freezing). Dry storage is typically recommended for canned goods, grains, cereals, seed, hard squash, root vegetables, and dried vegetables, herbs and fruits. Dry storage can otherwise be used for other products, but is not recommended for longer term storage.

(a) Dry storage areas should be dry and cool (temperature ranges of 10°C to 15°C);

(b) Relative humidity should be have a humidity level of 15% or less;

(c) The space should be closed from sources of heat and sunlight;

(d) The space should be rodent proof;

(e) Adequate air ventilation is essential and should be provided;

- (f) The area should be equipped with electrical lighting;
- (g) It is recommended that storage areas be located in an easy to access location from the field of the farm;
- (h) It is recommended that the space enable easy rearrangement and moving of goods to facilitate stock rotation;
- (i) It is recommended that aisles between shelving and other methods of storage be wide enough to allow for carts and dollies;

7.4.2 Refrigerated Storage

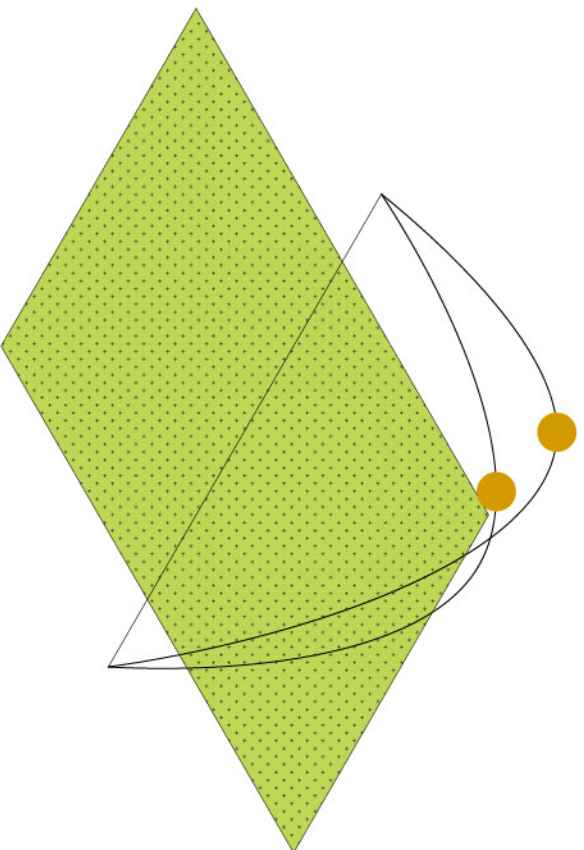
Most fresh produce must be stored in refrigerated spaces to delay their deterioration and decomposition. This can be a large refrigerator, to a walk-in cooler.

- (a) Refrigerated storage areas must be kept above freezing (temperature ranges of 2°C to 4°C);
- (b) Relative humidity should be 15% or less;
- (c) It is recommended that soft produce and other delicate vegetables such as lettuce should be harvested as needed and stored for as little time as possible;
- (d) Ensure that doors for refrigerators and refrigerated space have a good seal and close tightly to maintain temperature;

7.4.3 Frozen Storage

Some produce is suitable for freezing. In many cases, after harvest processing must be performed to the products to prepare them for freezing. This can be a deep frozen.

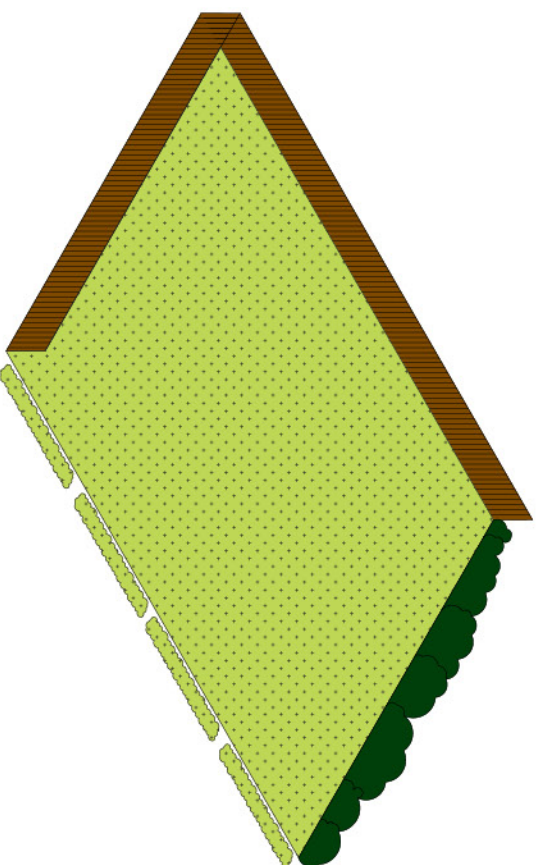
- (a) Frozen storage areas should be maintained at -18°C or lower to maintain it quality;
- (b) Relative humidity should be 15% or less;
- (c) Ensure that doors for freezer space have a good seal and close tightly to maintain temperature;



1.0 Siting and Orientation

1.2 Siting

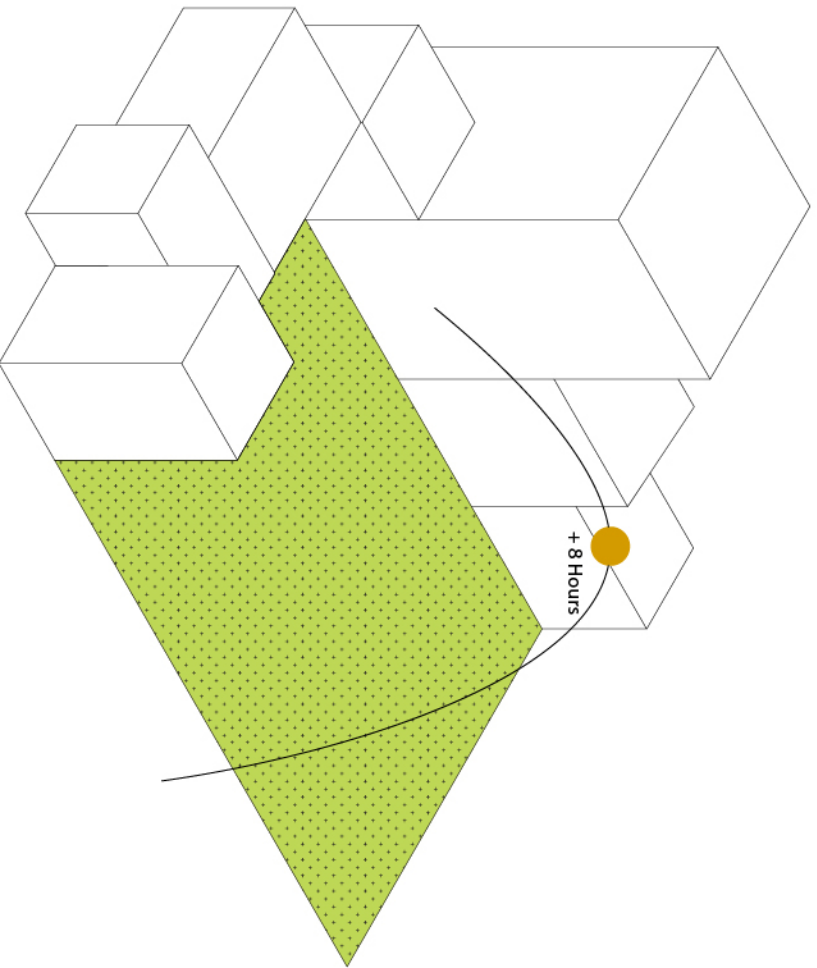
(a) Urban farms shall be located to maximize sunlight access; with full southern exposure;



2.0 Landscaping

2.1 Fencing and Boundaries

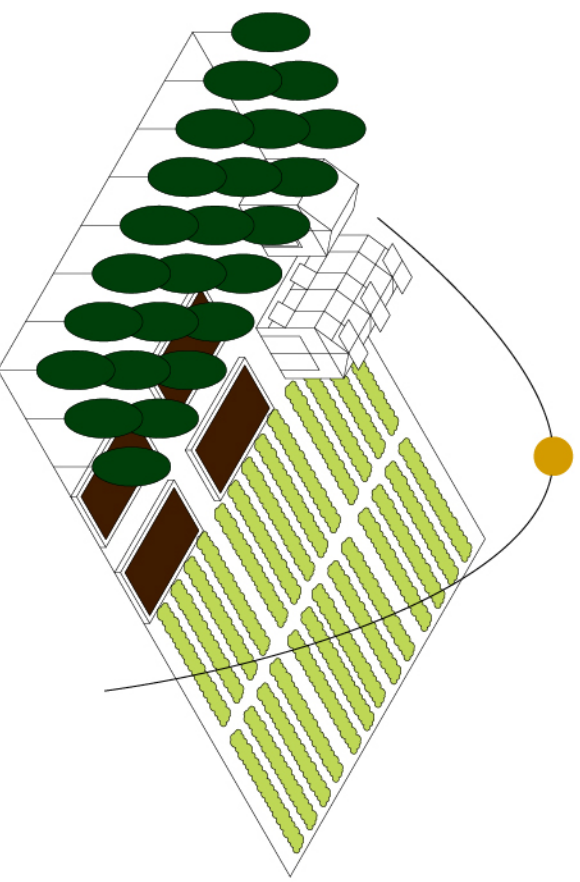
(a) The entire perimeter of an urban farm shall be enclosed or demarcated; providing visual boundaries, as well as, physical boundaries where needed or desired;



1.0 Siting and Orientation

1.3 Orientation

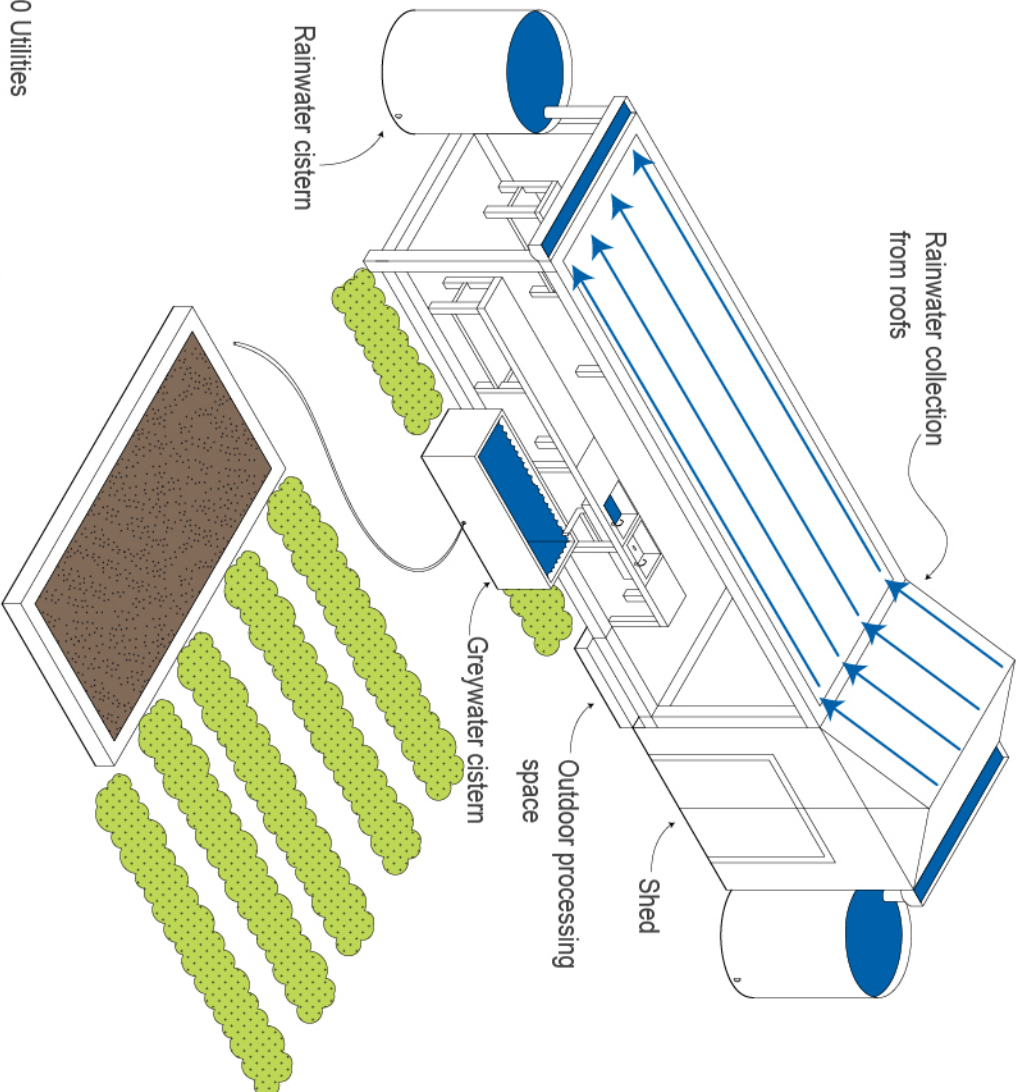
(a) It is strongly suggested that a minimum of 8 hours of full sunlight shine on the site during Spring/Fall equinox:



1.0 Siting & Orientation

1.3 Orientation

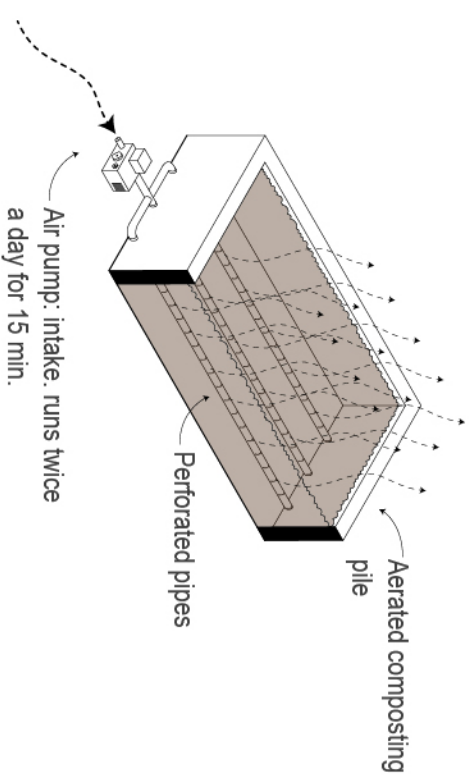
(b) Urban farms, their planting layout and structures, should be oriented toward the south so that beds and rows of annual plants, herbaceous perennials, and edible shrubs and trees do not shade out each other unnecessarily, with taller perennial plantings on the northern end of the site.



3.0 Utilities

3.1.2 Greywater Re-Use

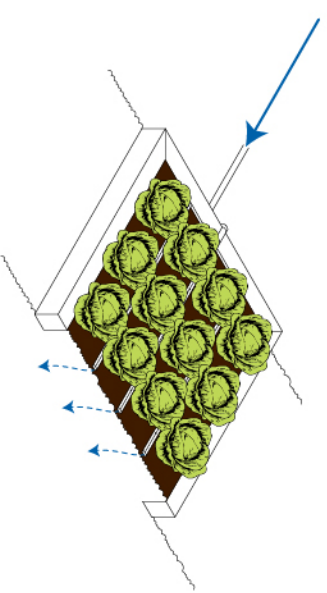
(a) It is recommended that greywater (water that may be used on-site for washing and processing produce), be collected for storage and application onto the growing beds of the urban farm;



5.0 Waste Management

5.1 Organics Management

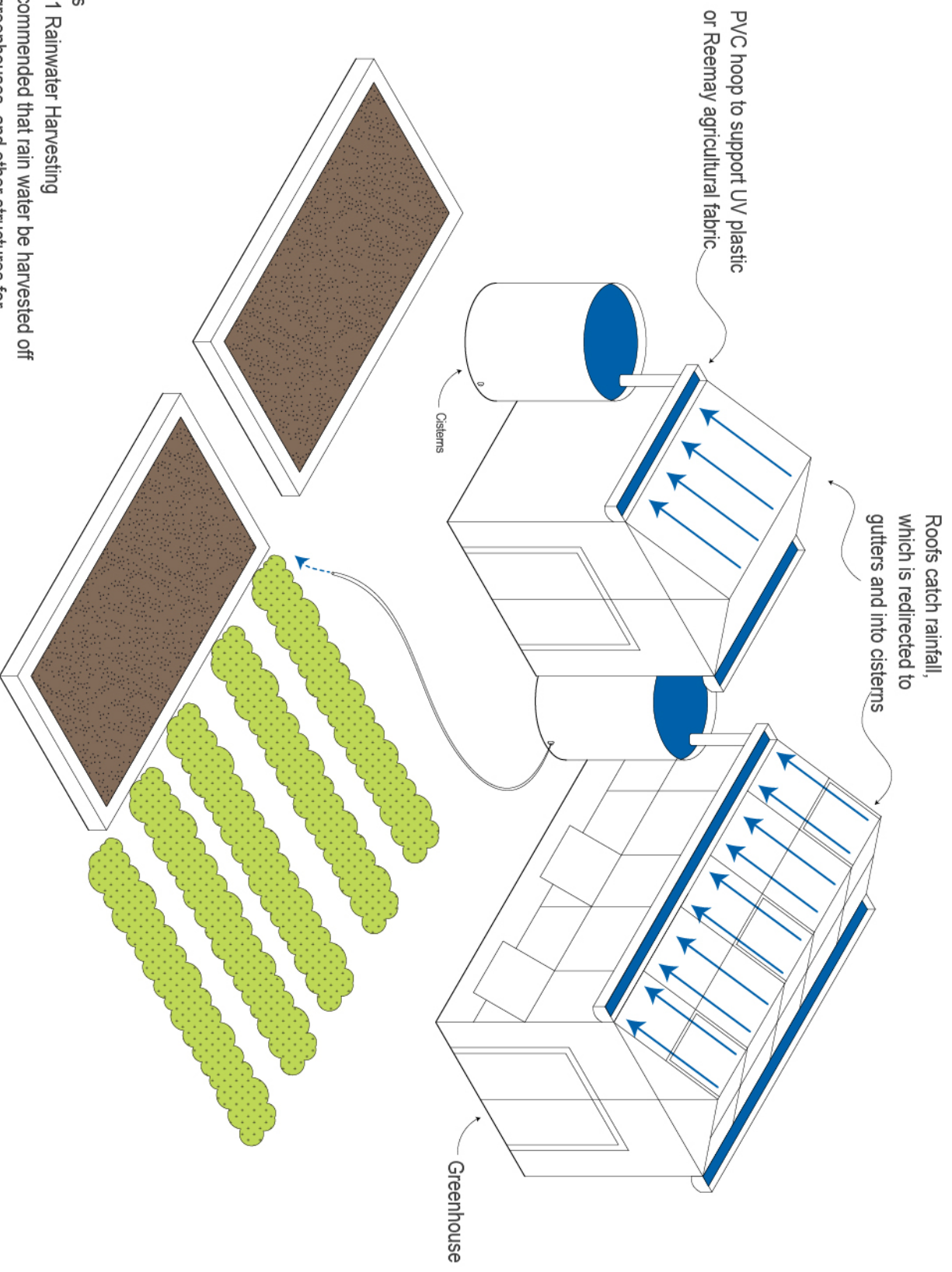
(b) It is suggested that urban farms utilize aerated bin composting; an affordable and efficient method of producing compost in a timely manner, that uses an air pump and perforated pipes to oxygenate compost piles;



3.0 Utilities

3.1.1-2 Water Harvesting

(b) When applying rain (grey) water to agricultural crops, urban farms should use drip irrigation or another method of application that prevents harvested water from falling onto the edible parts of the plants;



3.0 Utilities

3.1.1 Rainwater Harvesting

(a) It is recommended that rain water be harvested off of sheds, greenhouses, and other structures for storage and use in the productive space of the farm;