***Food Forest Virginia:* Design Narrative**

Client: THRIVE Peninsula

Created By: Charles J. Lawson

Location: 12749 Nettles Drive,
Newport News, Virginia

Last Edit Date: 3/8/23

Goals

The client wishes to grow fresh healthy produce for the benefit of the local community that frequents their food pantry THRIVE Peninsula, Newport News, Virginia. Growing area is predominantly the existing concrete patio, and some adjacent ground. Foods grown should include those frequently asked for and/or used by the pantry, including but not limited to culturally appropriate selections.

***Scope of Work:* Order of Operations**

1. Install Rainwater Catchment, Receptacles, and Drainage
    a. Recommended: Install drainage basin for patio
    b. Install 4 outdoor use GFCI power receptacles, covered, for 6 grow towers.
    c. Install rain barrels or other cistern to collect rainwater. Prop container(s) up (on cinder blocks), at least 1' off of the ground, for easy dispensing and increasing the possibility of using gravity to water plants.
    d. Direct overflow channel toward berry trellis and trees.
2. Install Wicking Beds & Grow Towers
    a. All beds in your design are wicking beds. Wicking beds are raised, self-watering and self-contained beds. Each bed has a waterproof lining, allowing for a basin of water in the bottom, from which the soil "wicks" up on an as-needed basis, creating a self-contained, self-watering, low maintenance system. Basins should include an overflow pipe to mitigate excess water/rainfall.
    b. Grow towers are a great way to take advantage of vertical space when horizontal space is limited, producing a lot of food in a small footprint. They are self-watering, and especially useful for growing various leafy greens, herbs, or strawberries. Recommended: The Farmstand or Aerospring Hydro Tower. Use newly installed electrical outlets for power.

3. Install Trees & Trellises, Compost
    a. Loosen soil for each fruit tree in a 4’ square area, 2’ deep. Amend each hole with compost & mycorrhizal fungi.
        i. Trees must be on dwarf rootstock. Trees should be mulched to a depth of at least 3”, and with a radius of at least 2’. Avoid contact between mulch and trunk. Water immediately and regularly until the tree is established. Install a wire cage (at least 3’ tall wide enough to not touch the tree) around each tree to protect it from accidental damage. Keep this cage in place for at least 1 year.
    b. Loosen soil for each *rubus* shrub in a 3’ square area, 1’ deep. Amend each hole with compost & mycorrhizal fungi. Install trellis & plant shrubs. Mulch at least 3” deep and at least 1’ radius.
        i. Genus *Rubus* consists of raspberries, blackberries, and other similar plants like boysenberry and blackcap raspberry. These perennial fruiting plants should be annually pruned and trained to trellises for greatest yield and easy management. *Rubus* trellises are simple and easy to construct. See: Additional Resources.
    c. Recommended: Install 3-bin style compost, with lids to cover, *like* this. It is best practice to use plant waste/debris, fallen leaves, rotten produce, etc. to process and add to your beds before spring planting. Ideally located in full sun to part shade.
4. Install Grow Wall and Vining Vegetable Trellises
    a. Use anchored screws to install eyelets in the wall. Use silicone sealant to waterproof entry. Pull metal wire through eyelets to create wall trellis and pull taught before tying to eyelets.
    b. Use lumber, eyelets, and wire to construct similar trellises, in the center of the bed, for the two vining vegetable beds.
5. Install Containers
    a. Recommend: Fabric grow bags are tough and inexpensive. Will need hand watering. Glazed ceramic pots are more expensive but will provide more insulation, allowing some tender plants to live through winter.
    b. Useful for herbs, strawberries, and small vegetables. See: Additional Resources.
6. Maintain
    a. Creating fruiting bodies takes a lot of energy for our plants. They need healthy nutritious soil to produce the fruiting bodies we want. *In order to keep your soil productive you need to continually give back to it. In a forest this means a diverse biology and selective decomposition. For gardeners it means adding compost and organic matter, and mulch (it decomposes into soil). Always keep bare soil covered with ample mulch at all times of the year.
    b. Healthy fertile soil will keep plants happy in the long term. Organic slow-release fertilizers will help, *like* Espoma. Fast-acting water soluble fertilizers will keep plants happy in the short term. Use compost tea, or products *like* Neptune’s Harvest.
7. Observe and Interact (see 12 Permaculture Principles)
    a. Use slow and small solutions
    b. Apply self-regulation and accept feedback
    c. Creatively use and respond to change

- Annual vegetable growing can begin whenever appropriate (refer to Additional Resources for a vegetable planting calendar). Recommend: Succession planting - This means rather than planting many crop x at one time (and thus receiving only 1 harvest of x), continually plant crop x over time, thereby ensuring a continual harvest of x over time. *This is especially important for “determinate crops”, which are crops that give 1 harvest (like carrot, radish, onions, etc.). This is not so necessary for “indeterminate crops”, which are crops that provide more than one harvest (like tomato, cucumber, squash, zucchini, melons and peppers).

- Suggested: Initiate a rewards system for clients who bring their own kitchen scrap compost materials. Add their compost to your bins in exchange for some special harvest or greater quantities of harvest.

- Trees should be purchased in pots no smaller than 1.5 gallons. Recommend: buy trees already 4-6 feet tall. Strawberries may be purchased in 4” pots, installed at 1 per square foot. Always apply mulch over the rootzone of each new planting. Always cover bare soil with mulch.

Additional Notes

- In order to extend your growing season for annual vegetables, you may incorporate “low tunnels” onto any number of your beds. Their function is to create a microclimate that increases the temperatures inside the “tunnels” relative to the surrounding climate, like a greenhouse. These microclimates can be designed according to the wants of the owner. A simple form may include “hoops” of PVC as a frame and frost cloth or shade cloth draped over. A more elaborate form may include a “cold frame”-type, made with old windows (hinge and meet at the top of the “A”) that can be propped open for ventilation.

- Compost bins can be designed in several ways, and with several different materials, but the most important feature is to allow each pile/bin be at least 3’x3’x3’ (three cubic feet) in volume. Your design features a classic “3-bin compost”.

- (Not applicable, but helpful info:) “Sheet Mulching”: When making a new bed out of an existing lawn, we do not recommend removing existing sod. We recommend covering the grass in order to kill it and build up the topsoil. This includes applying at least a single layer of biodegradable cardboard over the area to be planted, held down with heavy objects like bricks, or landscape pins. This will kill existing grass whilst keeping the topsoil fertile. This application should be repeated if the cardboard breaks down or if weeds appear. Leaves may also be spread over cardboard. The length of time the cardboard lays before mulch is put on can vary. The goal is to kill the grass. If too little cardboard is applied, weeds will appear. If a sufficient amount of cardboard is applied, no weeds will appear - This usually means at least 2 layers of

cardboard for most sites. Mulch can be applied immediately after cardboard *if* you are sure that the cardboard is sufficient to kill grass. Permaculture-ists ("Permies") tend to over-cardboard and over-mulch to ensure competitive weeds and grass are killed. This is not a waste of our energies, because we are building up the topsoil in doing so. In any case, mulch is applied after cardboard or compost/top soil. At least 3 inches of hardwood "chip" mulch is recommended, but any biodegradable mulch is acceptable. *At least 3 inches of mulch should cover the soil of every bed at all times.

- Raised beds are recommended to grow root crops (potatoes, carrots, beets, alliums (onion, garlic, leek, etc.). These plants prefer the loose and uncompacted soil texture that raised beds provide.

- Tree widths in the design are generalized to a 10' mature canopy width for dwarf varieties. These are a reasonable size that fruit trees may reach over several years. *It is recommended that purchased trees be 4-6' tall, but their mature size depends on the rootstock of the tree. Annual pruning is an important and necessary task for a healthy and productive fruit tree or vine. For dwarfs, a mature canopy width of 6-10 feet is to be expected. Any trees in this design that are to be dwarf varieties will be explicitly listed as such in the Plant List.

- The supplied Plant List includes recommended fruit varieties chosen for your food forest. "Cultivars" are trees with a specific genetic makeup that was developed for a specific climate. Cultivar names sometimes appear within single apostrophes, i.e. 'Stella' cherry. Some cultivars selected are self-pollinating and do not need a pollination partner. *It is recommended that all high-value fruit trees be bird-netted during the ripening stage to prohibit crop loss from wildlife. Care should be used to ensure fruit trees are planted vertically. Some fruit trees, especially when exposed to high winds or weighed down by fruit, benefit from stabilization via staking, which should be utilized wherever appropriate.

- Permaculture designs aim to avoid the application of synthetic pesticides, herbicides and fungicides. In the case that a pest, weed, or fungus problem presents itself, it is recommended to resolve such problems as naturally as possible. Additional Resources are provided in this Narrative.

- Cool season crops can enjoy the temperatures of spring *and* fall. Do not underestimate the potential productivity of the fall weather.
- Perennial plant list includes dwarf trees, rubus, and some additional suggested companion plants. All plants listed "shade tolerant" are suggested for additional in-ground plantings near treeline.

- Use intensive gardening and companion planting to maximize yield. See: Additional Resources. Incorporate edible pollinator plants like dill, basil, parsley, oregano, anise hyssop, and more, into beds to encourage pollination and thus fruiting.

- Notes for VIP plants:
    1. Strawberries - Dedicate at least one bed to these. Interplant with bush beans, spinach, borage, lettuce, onions. Avoid Cabbage.

2. Apples - 2 needed for pollination. Dwarf variety. See: Additional Resources.
3. Onions - Grown over winter from fall to late spring. Treated much the same as garlic. Companion plant with beets, strawberries, tomatoes, lettuce ,summer savory, leeks, some chamomile. Avoid peas and beans.
4. Broccoli - Brassica family. Cool season crop. Companion plant with aromatic plants, potatoes, celery, dill, chamomile, sage, peppermint, rosemary, beets, onions. Avoid strawberries, tomatoes, and pole beans.
5. Potatoes - Warm season crop. "Hill" them for most production. Companion plant with beans, cabbage, horseradish, marigolds, eggplant. Avoid pumpkins, squash, cucumbers, and tomatoes.
6. Lettuce/Greens - Generally cool season crop. Companion plant with carrots, radishes, strawberries, cucumbers, onions.
7. Cucumbers - Cool-Warm season crop. Cucurbit family. Vining. Companion plant with beans, peas, radishes, lettuce. Avoid potatoes and aromatic herbs.
8. Peppers - Warm season crop. Companion plant with basil, okra, southern peas.
9. Tomato - Warm season crop. Nightshade family. Companion plant with chives, onion, parsley, marigolds, nasturtium, carrot. Avoid kohlrabi, potatoes, fennel, and cabbage.
10. Pears - Dwarf variety. See: Additional Resources.
11. Cabbage - Brassica family. Cool season crop. Treat the same as broccoli.
12. Carrots - Cool season crop. Companion plant with peas, lettuce, chives, onions, leeks, rosemary, sage, tomatoes. Avoid dill.
13. Sweet Potatoes - Sprawling. Warm season crop. Edible leaves will spread and cover ground.

- African-American culturally appropriate foods: from *Availability of commonly consumed and culturally specific fruits and vegetables in African-American and Latino neighborhoods*. All are possible to grow in your zone.
    - Acorn Squash - Sprawling fall crop.
    - Beets
    - Black Eye Peas - (southern peas aka cowpeas)
    - Buttercup Squash - Sprawling fall crop
    - Butternut Squash - Sprawling fall crop
    - Chard
    - Collards
    - Kale
    - Kidney Beans - (*Phaseolus vulgaris*) Vining
    - Mustard Greens - Vining
    - Okra
    - Pinto Beans - Vining
    - Red Beans - (variety of *Phaseolus vulgaris*) Vining
    - Spinach
    - Sweet Potatoes - Sprawling
    - Turnip Greens (leaves of turnip plant)
- Latino culturally appropriate foods: from *Availability of commonly consumed and culturally specific fruits and vegetables in African-American and Latino neighborhoods*.
    - Black Beans - (*Phaseolus vulgaris*) Vining.
    - Chayote - (*Sechium edule*) Vining. May be perennial in zone 8.
    - Chili Peppers - (several species available)

- Garbanzo Beans - (*Cicer arietinum*) Vining. May be possible in your zone.
- Green Peas - Vining.
- Passion Fruit - (aka Maypop)
- Tomatillo

Additional Resources: *Care & Maintenance*

12 Permaculture Principles; Organic Pesticides and Biopesticides; Biopesticides for Organic and Conventional Disease Management in Vegetables; Vegetable Gardening in Containers; Container and Raised Bed Gardening; Intensive Gardening Methods; Sprouting Seeds for Food; Apples in VA; Tree Fruit in the Home Garden; *Small Fruit in the Home Garden, *Vegetable Planting Calendar; Low Tunnels in Vegetable Crops; *Virginia's Home Garden Vegetable Planting Guide; Starting Plants From Seed; *Growing Herbs; *Cucumbers, Melons, Squash; Leafy Green Vegetables; Onions, Garlic, Shallots; *Root Crops; Tomatoes; Mid-Atlantic Commercial Vegetable Production Recommendations; 2022 Southeastern US Vegetable Crop Handbook; Getting More Hot-Season Veg from your Cool-Climate Garden; Cool vs Hot Season Vegetables; *Raised Wicking Beds; Self-Watering Wicking Container; Veg in Containers; Sweet Potatoes;