



# WILLIAMS CREEK CONSULTING

*a V3 Company*

## NACD Permaculture Template Designs Report

*Marion County Indiana*

*Prepared For:*

**Marion County Soil and Water  
Conservation District**

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## TABLE OF CONTENTS

<b><u>NACD Permaculture Template Designs</u></b>		<b><u>Page</u></b>
1.0	PROJECT BACKGROUND	2
2.0	NATIONWIDE PROGRAMS AND BEST PRACTICES	4
3.0	DESIGN SITE SELECTION	5
3.1	UNWA SITES CHARRETTE	6
3.1.1	Groundwork Indy-Rader Street Lots	7
3.1.2	Groundwork Indy-W. 26th Street Lots	8
3.2	ENGLEWOOD COMMUNITY SITE CHARRETTE	9
4.0	RECOMMENDATIONS AND LESSONS LEARNED	11

### FIGURES

Figure 1 – UNWA Neighborhood Map

Figure 2-Near Eastside Neighborhood Map

Figure 3-2601 and 2603 Rader Street

Figure 4-965, 969 and 973 W. 26th Street

Figure 5-14,18 and 26 N. Oxford St (aerial view from north end of property)

Figure 6- UNWA Design Charrette Classroom Workshop

Figure 7- Groundwork Indy Rader Street Lot Design Development

Figure 8- Groundwork Indy W. 26th Street Lots Design Development

Figure 9- Englewood Nature Playspace Design Development

Figure 10- Englewood Nature Playspace No Mow Groundcover Candidate Areas

Figure 11- Englewood Nature Playspace Site Opportunities

### APPENDICES

Appendix A-Groundwork Indy Permaculture Concept Site Designs

Appendix B-Englewood Community Site Concept Site Design

Appendix C-City of Indianapolis Urban Horticulture Pilot Program Guidelines

Appendix D-City of Columbus, OH Vacant Lot Conversion Project Example

## 1.0 PROJECT BACKGROUND

Williams Creek Consulting, a V3 Company (Williams Creek) was hired by the Marion County Soil and Water Conservation District in December 2016 to provide Landscape Architecture Design Services for a vacant lot permaculture template program. The project was funded by the National Association of Conservation District's Urban Agriculture Conservation Grants Program and the goal of the project was to develop permaculture design templates for vacant lots in the service territories of two food desert areas in Indianapolis within the catchment areas of two community development corporations (CDCs)-United Northwest Area (UNWA) Corporation and Englewood Community Development Corporation (Englewood). The template designs were created as conceptual designs for implementation by the CDCs and as a resource for the City's land bank, local non-profits and neighborhood organizations in future permaculture applications on vacant lots. The neighborhoods were selected because they contained significant numbers of vacant lot properties and have a high number of census tracts that qualify as food desert tracts as defined by USDA. For example, in the Near Eastside, where the Englewood site is located, the poverty rate (40%) and children living in poverty (30%) is significantly higher than state and national averages. Renew Indianapolis, the City's land bank, currently owns over 1,000 vacant properties and of these 766 are located in the 46201 and 46208 zip codes that cover the UNWA and Englewood CDC catchment areas where the vacant lot permaculture templates were developed. These neighborhoods were also selected due to the presence of strong non-profit partners-Groundwork Indy in the UNWA neighborhood and Englewood CDC/Daystar Daycare in the Near Eastside. Two of the grower profiles completed for the educational outreach portion of the NACD grant are individuals representing these two non-profit organizations. Maps of the two neighborhoods are shown in Figures 1 and 2 below.



*Figure 1-UNWA Neighborhood Map*



*Figure 2-Near Eastside Neighborhood Map*

While food production is paramount in permaculture design, drainage is also a key consideration as vacant lots present an opportunity to reduce water pollution and flooding concerns through stormwater management using green infrastructure solutions such as rain gardens and rainwater harvesting. The City of Indianapolis is currently implementing a Stormwater Capital Improvement Master Plan to improve neighborhood drainage conditions across the county, and several projects are included in this plan for the selected zip codes. The City's Office of Sustainability is also partnering with Renew Indianapolis and the Department of Metropolitan Development to administer an Urban Garden Program whereby program participants can effectively "lease" city-owned vacant property for urban gardening if they adhere to prescribed guidelines for plot maintenance, material use, fencing and use of organic fertilizers. Annual reporting by program participants is also required (see Appendix C for more information about this program). At the time of this report, there are currently 184 properties available through the City's Urban Garden Program, including the properties in UNWA used for these designs.

Given the poverty, food desert and drainage challenges present in the UNWA and Englewood catchment areas, permaculture design principles were utilized to create the template designs provided in the report appendix. Permaculture is based on the principles of working with nature to integrate plant, food and water systems and eliminate the concept of waste, since nature "recycles" all waste through the process of decomposition and nutrient uptake. Permaculture design utilizes ecological engineering and an integrated "one water" management system. Water management, shade and aspect are key site design considerations in

permaculture design. The ecosystem layers described in permaculture design utilize soil health principles as a foundation and vacant lots represent a unique blank canvass for installation of permaculture projects.

## 2.0 NATIONWIDE PROGRAMS AND BEST PRACTICES

The City of Indianapolis secured a \$6.3 million federal grant in 2014 to demolish more than 300 blighted homes through the Hardest Hit Fund provided by the U.S. Department of Treasury. This local program and a variety of other vacant lot greening and reuse programs nationally were reviewed in order to help foster innovative ideas for the permaculture templates developed through this project. A summary of key program components is provided below:

City	Program Description	Additional Resources
Baltimore, MD	The City's Office of Sustainability developed a Green Pattern Book with potential greening treatments for lots on the over 4,000 vacant structures being demolished over the next 10 years.	<a href="http://www.baltimoresustainability.org/projects/growing-green-initiative/growing-green-initiative-competition/">www.baltimoresustainability.org/projects/growing-green-initiative/growing-green-initiative-competition/</a>  <a href="http://www.baltimoresustainability.org/wp-content/uploads/2015/12/Green_Pattern_Book.pdf">www.baltimoresustainability.org/wp-content/uploads/2015/12/Green_Pattern_Book.pdf</a>
Buffalo, NY	The city and the local sewer utility developed a protocol for assessing the potential for vacant lots to detain stormwater runoff based on five assessment areas.	<a href="http://www.epa.gov/green-infrastructure/buffalo-new-york-urban-vacant-land-assessment-protocol">www.epa.gov/green-infrastructure/buffalo-new-york-urban-vacant-land-assessment-protocol</a>
Detroit, MI	The Detroit Land Bank Authority and the sewer utility have partnered on construction of four pilot green infrastructure projects on vacant lots. A field guide for transforming vacant lots with seven lot typologies has been developed along with an inventory map.	<a href="https://dfc-lots.com/">https://dfc-lots.com/</a>  <a href="http://www.detroitmi.gov/Government/Departments-and-Agencies/Water-and-Sewerage-Department/Green-Infrastructure-Projects">http://www.detroitmi.gov/Government/Departments-and-Agencies/Water-and-Sewerage-Department/Green-Infrastructure-Projects</a>
Cleveland, OH	The Vacant to Vibrant (V2V Cleveland) is a demonstration program led by the Cleveland Botanical Garden piloting the impacts of greening vacant lots on local environmental, social and economic conditions.	<a href="http://www.cb garden.org/lets-learn/research/vacant2vibrant/about-vacant-to-vibrant.aspx">http://www.cb garden.org/lets-learn/research/vacant2vibrant/about-vacant-to-vibrant.aspx</a>
Columbus, OH	The City sewer department and county land bank piloted a vacant lot conversion program to zero runoff sites and other improvements.	<a href="https://www.columbus.gov/utilities/projects/blueprint/Vacant-Lot-Repurposing/">https://www.columbus.gov/utilities/projects/blueprint/Vacant-Lot-Repurposing/</a>  *See Appendix D for vacant lot conversion project example

### 3.0 DESIGN SITE SELECTION

A commonly cited best practice from vacant lot conversion programs in other cities was the desire to consolidate multiple parcels into a single project to optimize available space for visible, high impact projects and promote the use of green spaces for neighborhood activities. The properties selected were also adjacent to schools and located at or near the corner of intersections in primarily residential areas. The three properties utilized for the permaculture template designs included the following addresses and are show in figures 3, 4 and 5 below:

- 2601 and 2603 Rader Street (UNWA Neighborhood)
- 973, 969 and 965 W. 26<sup>th</sup> Street (UNWA Neighborhood)
- 14, 18 and 26 N. Oxford Street (Englewood Neighborhood)

The Rader Street addresses are two parcels totaling 5,760 square feet and the W. 26<sup>th</sup> Street addresses are three parcels totaling 11,400 square feet. Both UNWA neighborhood properties are currently owned by the City's Department of Metropolitan Development. The Oxford Street address in the Englewood Neighborhood is three formerly vacant parcels totaling 23,664 square feet. The three properties represent common parcel configurations and have the characteristics of typical vacant lots in the city including invasive species, existing tree canopy and evidence of previous land uses such as construction debris and old foundations. The Englewood property has been previously converted from three vacant lots into the Englewood Nature Playspace and Gardens, which has gradually developed over the last 15 years into a community gathering space and outdoor classroom for the Daystar Daycare facility housed in the adjacent building to the north on the Oxford Street.



*Figure 3-2601 and 2603 Rader Street*



*Figure 4-965, 969 and 973 W. 26th Street*



*Figure 5-14,18 and 26 N. Oxford St (aerial view from north end of property)*

### **3.1 UNWA SITES CHARRETTE**

A half day design charrette for the UNWA sites was held on July 13<sup>th</sup>, 2017 at the headquarters of Groundwork Indy, located at 1107 Burdsall Parkway within a few walking blocks from the target lots on West 26<sup>th</sup> and Rader Streets. Groundwork Indy is the local trust for Groundwork USA, a national non-profit whose mission is to change places and lives by working at the intersection of community renewal and environmental restoration. Formed in August 2015, Groundwork Indy's program areas include youth development, greenways and parks, brownfields and vacant land and healthy communities. The youth development component includes two youth development programs: the Green Team-focused on in-school youth ages 14-18-and GroundCorps, whose members are 18-24 and focus on landscape design-build and maintenance services.

Charrette attendees included Green Team and GroundCorps members and Groundwork Indy staff leadership, Williams Creek project managers, a Soil Health expert from the Marion County Soil and Water Conservation District and the NRCS District Conservationist. Also present was LaShawnda Crowe Storm, a local artist connecting Groundwork's neighborhood revitalization efforts and the citywide Reconnecting to Our Waterways initiative through The House Poem project ([www.housepoem.com](http://www.housepoem.com)). The charrette agenda included classroom training on permaculture design elements and techniques and a discussion on past initiatives considered for the Rader and W. 26<sup>th</sup> Street properties. The classroom portion is shown in Figure 6 below.



*Figure 6-UNWA Design Charrette Classroom Workshop*

Following the classroom training, charrette attendees were divided into two groups and visited the two vacant lot sites to develop design concepts for rendering. Both the Rader Street and W. 26<sup>th</sup> Street lots are relatively flat with high infiltration rates for urban soils, making them good candidates for various permaculture practices which keep water onsite for reuse or recharging the groundwater table through infiltration. The following summary of each site concept corresponds with the rendered concepts provided in the report appendix A.

### **3.1.1 Groundwork Indy-Rader Street Lots**

Medicinal gardens were a key program component desired by the Groundwork Indy design team and are seen in the rainbow gardens shown on the concept plan. Several medicinal plants were identified for potential use in the understory, shrub, herbaceous and flowering ground cover layers of the gardens and are listed below by common name:

- Understory/shrub layers: Willow, Witch Hazel, Lovage, and Rugosa Rose
- Herbaceous/flowering ground cover layers: Chamomile, Comfrey, Stinging Nettle, Yarrow, Dutch White Clover

The Rader Street lot also featured a more conventional vegetable gardening area as well as an art shed with a rain barrel to capture stormwater runoff for irrigation reuse. Per the rules of the City's Urban Agriculture Pilot Program, any facility constructed would need to measure less than 120 square feet, and based on the region's annual rainfall a total of 20 gallons of water will be generated for each square foot of roof space. Above ground cisterns up to 20,000 gallons are available and underground options up to 100,000-gallon capacity also exist, though it's recommended given the ongoing maintenance that a standard 55-gallon rain barrel be utilized for the art shed application.



A large existing tree was utilized as a rest area for gathering. Additional unique features included a water trough pond and bee hive adjacent to newly planted native fruit trees which might include Persimmon and Mullberry.



*Figure 7-Groundwork Indy Rader Street Lot Design Development*

### 3.1.2 Groundwork Indy-W. 26th Street Lots

The three lots comprising the W. 26<sup>th</sup> Street property faced illegal dumping activities via the alley running along the south end of the properties. Groundwork Indy participants expressed a desire to utilize existing dead tree branches found onsite to construct a split rail fence to prevent future dumping and this fence would need to be removed upon the expiration of the lease through the City's Pilot Program. Permaculture components included a Bee Guild Planting and trellis walls with plantings to screen the lot from the east. Trellising is only allowed in the City program during the growing season. Bee guilds were considered as a way to attract pollinators and compliment the bee hives found at the Rader Street lots. The Bee Guild considered would utilize the following vegetation: Linden Tree, rose apple, cup plant, compass plant, rosinweed, purple coneflower and turtleheads. Rainbow gardens planted with similar species as those found in the nearby Rader Street lot were considered, as well as a small art shed and resting area. A low spot would be utilized to manage overflow from the rain barrel capturing runoff from the art shed's roof.

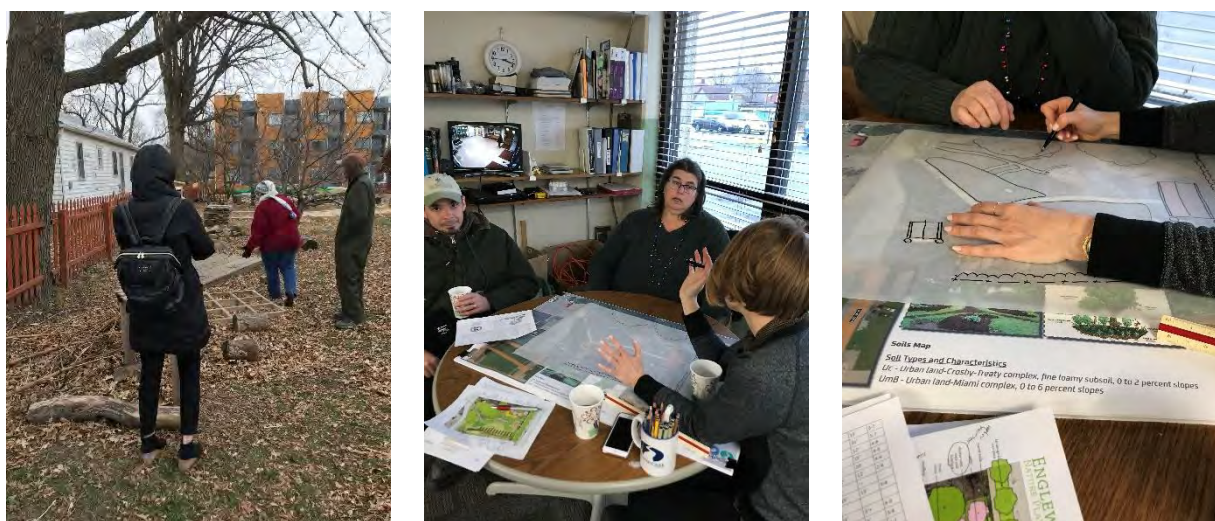


*Figure 8-Groundwork Indy W. 26th Street Lots Design Development*

### 3.2 ENGLEWOOD COMMUNITY SITE CHARRETTE

A smaller group charrette was held on December 13<sup>th</sup>, 2017 at the Daystar Daycare located at the headquarters of the Englewood Community Development Organization’s facility on the Near Eastside of Indianapolis. The charrette was attended by Williams Creek and SWCD staff as well as Deb Sluss, a Daystar employee who runs the Englewood Nature Playspace & Gardens located behind the facility. The playspace and gardens have transformed three previously vacant lots into a playspace for children attending Daystar and a neighborhood gathering area and includes dozens of newly planted trees, native grasses and flowers, 12 raised garden beds, a garden shed and compost bins as well as other amenities. The adjacent Englewood building includes many sustainable features including solar panels, a rainwater collection cistern and bee hives on the roof.

Given the variety of improvements to vacant lots that have already occurred to create the Nature Playspace & Gardens, the focus of the charrette was to find opportunities to integrate permaculture elements into the current space while also simplifying long term maintenance needs. The charrette included a site visit followed by an in depth discussion with Daystar staff as well as initial concept rendering. Pictures from the charrette are shown below in Figure 9.



*Figure 9-Englewood Nature Playspace Design Development*

Various permaculture design features were integrated into the Nature Playspace through the charrette process as shown on the concept rendering provided in Appendix B. The existing shelter on site currently doesn’t have gutters, which would allow rooftop water capture into a 55 -gallon rain barrel for use onsite. There is currently a drip irrigation system onsite but this water system is not being utilized currently. If all of the water captured onsite is not utilized for irrigating plants, native pollinator species including Marsh Milkweed, Wild Senna, Blue Flag and Monkey Flower could be introduced into the area where the rain barrel will overflow between the proposed mud pit play area and the shelter building. While the slope of the site is conducive to green infrastructure practices, the ability to infiltrate stormwater onsite is compromised by the existing soils (Hydrologic Groups C/D) and perched groundwater table as well as the fact that the vacant lots were previously parking lots so the native soil is severely compacted. Despite this fact, the Daystar representative noted the site drains relatively well and standing water is only seen in the area adjacent to the mounded areas currently planted with native trees and grasses. A no mow groundcover or fescue grass seed mix was recommended for this area to encourage additional infiltration with a preference for drought tolerant species to reduce watering needs after establishment. Figure 10 includes pictures of the area recommended for no mow groundcover.



*Figure 10-Englewood Nature Playspace No Mow Groundcover Candidate Areas*

In addition to various placemaking elements including new stone gabion seating, play tables and a decorative stone path, the introduction of an artful “living fence” was suggested to frame the site’s eastern and southern borders, as well as a pollinator hedgerow plant bed to support the existing food production operation. A trellis system in conjunction with the raised beds to provide additional food production opportunities was also discussed. The areas suggested for the pollinator hedgerow and trellis are show in Figure 21 below along with a shaded area on the northwest corner of the site envisioned as a woodland understory habitat and the existing mounded area for additional fruit trees.



*Figure 11-Englewood Nature Playspace Site Opportunities*

#### 4.0 RECOMMENDATIONS AND LESSONS LEARNED

The design concepts developed through this project demonstrate many of the best practices seen in other communities utilizing vacant lots for restoration, food production and placemaking opportunities including vacant lot assembly. The charrette process and permaculture designs reflect the following lesson learned which can be utilized in future deployment of designs on vacant lots in the City of Indianapolis:

- Assembling multiple lots into one project provides more design options and potential to utilize the broad array of water and resource management techniques represented by the practice of permaculture.
- Community Development Corporations and neighborhood based non-profits should be sought out for partnerships to elicit neighborhood feedback and participation in the design process, apply for funding opportunities to implement permaculture techniques and, depending on the organization, may potentially have the capacity to maintain permaculture installations to insure project success.
- Opportunities to connect vacant lot transformations with larger neighborhood placemaking efforts should be explored to leverage neighborhood scale investments for maximum benefit. For example, both the Groundwork Indy and Englewood lots are located close to two intersections featured in the Great Places 2020 Initiative ([www.greatplaces2020.org](http://www.greatplaces2020.org)).
- As demonstrated by the Englewood Nature Playspace and Outdoor Classroom, vacant lot transformations can occur over several years and phasing the implementation of improvements allows for organizations to better manage spaces based on an organization’s capacity and familiarity with new systems (i.e. rainwater harvesting, native plants).
- Future projects should utilize the latest Indiana NRCS guidance for multi-canopy plantings ([www.efotg.sc.egov.usda.gov/references/public/IN/379\\_Multi-Story\\_Cropping.pdf](http://www.efotg.sc.egov.usda.gov/references/public/IN/379_Multi-Story_Cropping.pdf)) and consult the “Useful Plants for Permaculture Guilds-Indiana NRCS Fact Sheet” currently under development.

Financial resources for implementation of the concept designs created through this project may be available through local neighborhood grants. A list of potential grant resources is provided below:

Source	Grant	More Information
Keep Indianapolis Beautiful	IPL Project Greenspace	<a href="http://www.kibi.org/programs/beautification/project-greenspace">www.kibi.org/programs/beautification/project-greenspace</a>
Marion County SWCD	Clean Water IN Cost share	<a href="http://www.marionswcd.org">www.marionswcd.org</a>
City of Indianapolis-Office of Sustainability	SustainIndy Community Grants	<a href="http://www.sustainindy.org">www.sustainindy.org</a>

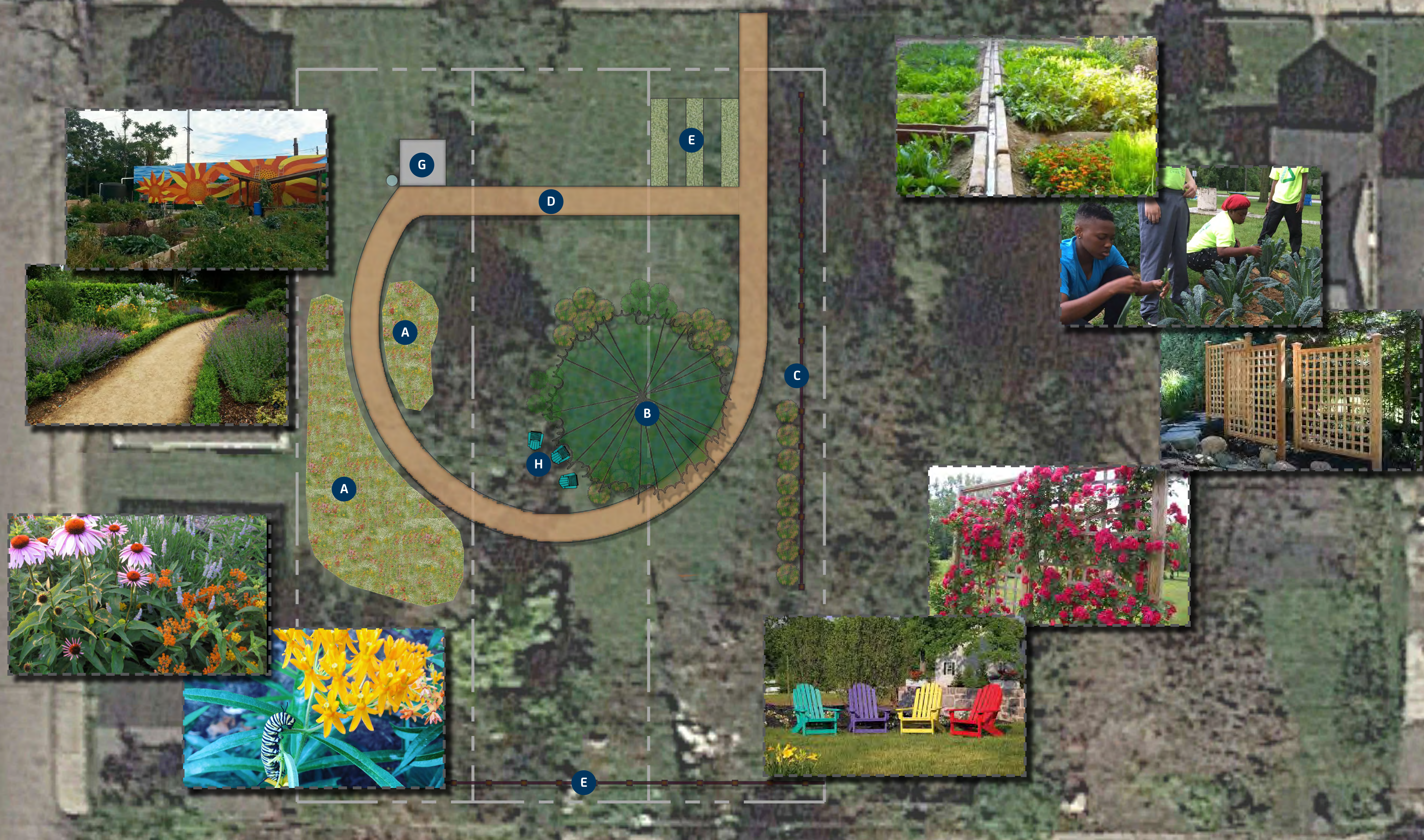


**Appendix A**

*Groundwork Indy Permaculture Concept Site Designs*



**WILLIAMS CREEK**  
CONSULTING

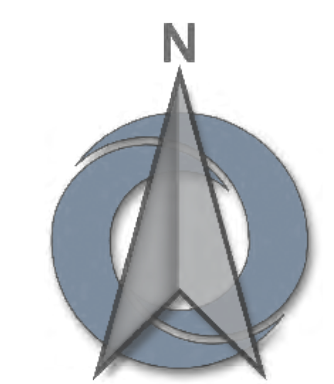


**Properties and Qualities**

Slope: 0 to 3 percent  
 Natural drainage class: Well drained  
 Infiltration rate: Moderately high to high (0.60 to 2.00 in/hr)  
 Depth to water table: More than 80 inches (6'-8")  
 Hydrologic Soil Group: B

**LEGEND**

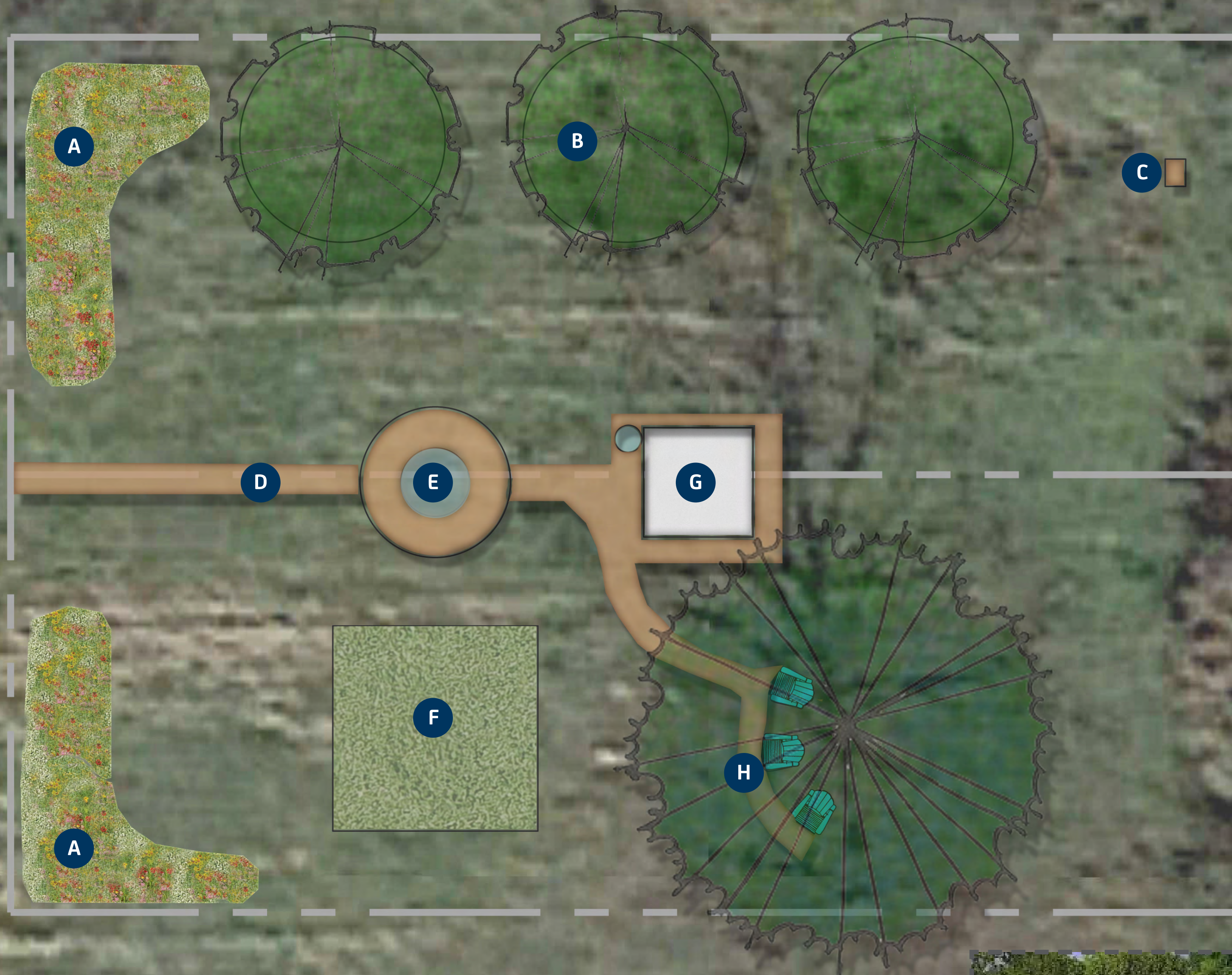
- A** Rainbow Gardens with Medicinal Focus
- B** Bee Guild Planting
- C** Trellis Wall with Plantings
- D** Stone Path
- E** Split Rail Fence
- F** Garden
- G** Art Shed w/ Rain Barrel
- H** "Chill Corner" with Seating



SCALE: N.T.S.

**GROUNDWORK INDY PERMACULTURE CHARRETTE**  
 965, 969, 973 W. 26TH STREET VACANT LOTS  
 UNWA Neighborhood - Indianapolis, Indiana

RADER STREET



**Properties and Qualities**

*Slope:* 0 to 3 percent

*Natural drainage class:* Well drained

*Infiltration rate:* Moderately high to high (0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches (6'-8")

*Hydrologic Soil Group:* B

**LEGEND**

- A** Rainbow Gardens with Medicinal Focus
- B** Native Fruit Trees
- C** Bee Hive
- D** Stone Path
- E** Water Trough Pond
- F** Garden
- G** Art Shed w/ Rain Barrel
- H** "Chill Corner" with Seating



SCALE: N.T.S.

## Appendix B

*Englewood Community Site Design*



**WILLIAMS CREEK**  
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ALLEY

OXFORD STREET

LEGEND

- A** Forest Grove
- B** No Mow Groundcover
- C** Stone Gabion Seating
- D** Garden Bed Trellis
- E** Pollinator Plant Bed
- F** Artful Fence
- G** Gutters + Rain Barrels
- H** Mud Pit
- I** Cable Reel Play Tables
- J** Decorative Stone Path
- K** Woodland Garden
- L** Music + Theatre Area



SCALE: 1" = 10'  
(24"x36")

## Appendix C

### *City of Indianapolis Urban Horticulture Pilot Program Guidelines*





**sustainindy**  
Mayor Gregory A. Ballard • City of Indianapolis

### How Do I Get Started?

#### Easy Steps to Participating in the Indy Urban Garden Program

A partnership of

The Office of Sustainability, the Department of Metropolitan Development, and the Indianapolis Land Bank

If you are interested in acquiring a vacant lot for the purpose of growing food for yourself or a community group, the following steps will help you along in the process. If you have any questions regarding the process, requirements of participation, or any other concern, please contact us at [urbangardens@indy.gov](mailto:urbangardens@indy.gov).

1. Identify an area for your garden space. This can be done by looking over the [map of vacant lots](#) available for the urban gardening program that are under the management of the Indianapolis Land Bank. A list of available properties, featuring specific addresses and areas, [can be found here](#). Each property listed is available for up to a five year term. Contact the Indianapolis Land Bank at 317-327-5614 regarding inquiries for properties that are not included on the list of available properties.
2. Contact the Urban Gardening Coordinator at the Office of Sustainability at [urbangardens@indy.gov](mailto:urbangardens@indy.gov) to determine if your desired lot is available.
3. [Review the rules of the program](#)
4. Fill out an Urban Garden Program Application, available at <http://www.sustainindy.org/indy-urban-garden-program.cfm>. Questions range from asking about accessibility of water, number of individuals involved, and tilling, to pest control and plot maintenance. Be sure to fill out the form thoroughly to help your project get off the ground more quickly! You may be asked to explain any answers provided during an in-person interview.
5. If your project is a good fit with the Indy Urban Garden Program, we will ask you and/or your organization to sign a license agreement. Each individual participating in urban gardening through the Urban Garden Program is required to fill out a waiver indemnifying the City of any injury or wrongdoing.
6. If you have any questions, contact [urbangardens@indy.gov](mailto:urbangardens@indy.gov).

## **Exhibit D**

### **City of Indianapolis Urban Horticulture Pilot Program - Rules**

Participating organization and individuals (collectively “Participants”) in the City of Indianapolis Urban Horticulture Pilot Program agree to adhere to the following rules and regulations when executing urban horticulture programs on the Plot(s), as defined in Exhibit B:

#### **Plot Maintenance**

Participants must consistently maintain the entire Plot throughout the year. Regular maintenance includes: keeping the Plot free of weeds, harvesting all ripe produce and removing all dead or diseased plants. Participants must make arrangements for weeding, watering, and harvesting in their absence. Plots must be maintained for the entire duration of the Agreement, including winter months.

#### **Tools, Trellising and other Materials**

Participants may construct storage facilities for tools and other agricultural items; however, the participants are responsible for removing these items and facilities upon the expiration or termination of the Agreement. All items must be stored in a way that does not collect water for a period of time long enough to provide a habitat for mosquitoes. Trellising, stakes, cages and other hardscaping materials are permitted for use during the growing season. Any facility constructed must measure less than 120 square feet, and must comply with all applicable laws, including all local ordinances, state and federal statutes, local, state and federal building, zoning, environmental, historic preservation and safety and sanitary codes.

#### **Plot Neglect/Abandonment**

If the Land Bank staff finds that the Plot is not being maintained in accordance with the rules described in this exhibit, City may revoke the license and retake possession of the property in accordance with Section 4 of the Agreement.

#### **Organic Guidelines**

Participants shall not use any inorganic fertilizers, pesticides or herbicides on their Plot.

#### **Fencing**

Participants are permitted to construct fences around the Plot; however, the participants are responsible for removing fences upon the expiration or termination of the Agreement.

#### **Theft and Damage**

Participants should report any vandalism, theft or suspicious behavior or activity on their Plot to the Land Bank staff. The City of Indianapolis and the Indianapolis Land Bank are not responsible for any damage to the Plot, theft of produce or personal belongings in the vicinity of the Plot or elsewhere.

#### **Annual Report**

Participants must submit an Annual Report regarding the state of the Plots and urban garden project by the 31<sup>st</sup> day of December each year. Participants will be provided with the necessary elements to include in the report. City may revoke the license and retake possession of the Plots in accordance with Section 4 of the Agreement if participants fail to submit the Annual Report in a timely and accurate fashion.

## Appendix D

*City of Columbus, OH Vacant Lot Conversion Project  
Example*





BEFORE



AFTER



HIGH PERFORMANCE DESIGN + NET ZERO WATER

## Columbus Vacant Lots Retrofit

**Owner** • City of Columbus, Ohio

**Client** • Department of Public Utilities

**Location** • Columbus, Ohio

**Year** • 2014 - current

### Project Highlights:

- The vacant lot conversions included installation and maintenance of the following green infrastructure elements:
- 193 native shrubs
- 61,380 SF of low mow turf
- 2,020 CF of bio soil
- 1,540 CF of mulch
- 380 LF of 3-rail fence

The City of Columbus Department of Public Utilities is investigating whether it can eliminate sewer overflows with green infrastructure through its Blueprint Columbus initiative. As part of this effort, the City is investigating repurposing vacant lots into stormwater control facilities in conjunction with the City's Land Bank. The City selected seven vacant lots totally 1.5 acres that were geographically diverse across the City. The average lot size was 5,000 square feet with an average width of 40 feet and average length of 125 feet.

Williams Creek designed landscape plans using native, non invasive plants and converted the vacant lots into zero stormwater discharge green infrastructure projects. Williams Creek is maintaining the lots through 2017 including mowing and trimming plants as needed, replenishing mulch, and replacing dead or stressed plants.

To determine the cost effectiveness of the program, Williams Creek is tracking all time and materials necessary to establish and maintain the lots, including before and after photo documentation. Williams Creek is also monitoring the sites after significant storms to verify the zero runoff effectiveness.