

THE PRESENTATION





Relocated Roots: An Urban Agriculture Facility

| Downtown Cincinnati, Ohio

This thesis examines the context of Downtown Cincinnati, Ohio: a city with strong economic growth but facing a stagnant population and high levels of obesity. With community-focused spaces and an emphasis on sustainable practices, Relocated Roots attempts to provide a design solution that is both an asset to the community and an viable investment for the client, Gotham Greens. It aims to prove that architecture can influence people's perceptions of concepts like city farming, community and sustainability by demonstrating these innovative technologies can revitalize a neighborhood.









THE BACKGROUND



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How can a new typological identity promote and advocate for social change through its revitalization of a neighborhood?

PROMOTE CULTURAL SHIFT



Z-Home: a sustainable townhome project in WA

The Nest-Phase II: a "living community" in ND

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ADVOCATE SOCIAL CHANGE



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ICONIC DESIGN

























What design characteristics can be taken away from the "Iconic Architecture" case studies?

Creative New Solution Innovations in Technology, Uses Unconventional Style/Technique

> Unique Element/Opportunity Atypical Form, Unique Site Conditions

Engages Community Tourism Opportunities, Creates Strong Identity

Makes an Impact

Bold Design, Seemingly Unattainable Goals

THE CONTEXT







PREMISE APPLICABILITY













THE DESIGN PROCESS



Name: Via Verde "The Green Way" Location: Bronx, NY Year: 2012

Iconic Characteristics:

- 3,700 sq meters of open space
- Won the First Juried Design Competition for Affordable and Sustainable Housing in NYC
- Utilizes Tax Deduction to Maintain Affordable Rent Prices

"Via Verde is a model for what affordable housing ought to be – a platform for opportunity, a source of stability, a building block with which we forge neighborhoods, put down roots, and build the communities that are the engines of our nation's economic growth."

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Evaluating the Performance of Greenhouse Design through Digital Simulation

A Case Study of a USDA Research Laboratory at the North Dakota State University

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SIMULATION RESULTS













The second design, the passive solar greenhouse, performs better than the other designs based on its CFD simulation. While its sloped massing leads to a decreased amount of workable floor space, its current thermal evaluation outperforms the others in air circulation and solar heat gain. Its site orientation and massing protect against overexposure to sun and its staggered floors allow for air circulation without limiting floor-by-floor air control.

INNOVATIVE PROCESS: STRUCTURE + MATERIAL



INNOVATIVE PROCESS: AQUAPONICS



INNOVATIVE PROCESS: A-GO-GRO TOWER





Water is directed into the pulley system on each tower, which relies on the flowing water and gravity to rotate the tower's racks.

GENERATOR

Used water is circulated into a generator to rotate a wheel. This powers a generator which pumps the water back into the storage tank for reuse.



An existing vertical farm called "Sky Greens" in Singapore provides an excellent precedent design of a hydroponic vertical growing system. This A-shaped tower measures up to six meters tall and can grow up to 5x more crops than the same amount of farmland. This system was selected for Relocated Roots due to its:

- modularity
- · relatively simple installation
- · ability to maintain individual units
- flexibility in size and cost
- rotating tray system based on gravity



According to Vertical Harvest, an urban agriculture facility in Wyoming, a traditional farm yields about 20,000 Ibs of crop per acre per year. Although crop yield varies, this is a consistent figure.



Vertical farming uses the same footprint, but in a denser way. Vertical Harvest reports producing 100,000 lbs of food for only 1/10th of an acre - a land use of 1/50 of traditional farming.

According to the product specs, the Relocated Roots' growing system located within the multi-story greenhouse can produce the same amount of yield per 100 towers as an entire football field.



With 80 A-Go-Gro towers and 40,000 sf, the Relocated Roots' vertical farm can produce as much yield as conventional farming, with a 15% decrease in footprint, and 90% decrease in water.

ITERATIVE MASSING



THE DESIGN















PEDESTRIAN SCALE



PSEUDO ALLEY



PROGRAMMATIC MASSING





1	Parking Garage (46 Spots)
2	Vehicular Visitors' Main Entry
3	Cafe/Bistro - Open to Public
4	Grocery Store Coolers + Storage
5	Grocery Store
6	Outdoor Patio: Farmer's Market
$\overline{)}$	Pedestrian Main Entry
8	Light-Controlled Growing Area
9	Warehouse Employee Main Entry
10	Warehouse Employee Lockers
(11)	Mechanical Space Including Boiler, Chiller, HVAC
(12)	Aquaponic Water Treatment Tanks
(13)	Service Core Including Stair, Service Elevator and Passenger Elevator
(14)	Warehouse Employee Break Room, Main Office and Restrooms
(15)	Shipping, Processing and Storage Coolers
(16)	Delivery, Loading and Unloading
(17)	Material, Equipment and Pallet Storage



1	Parking Garage (50 Spots)
2	Vehicular Visitors' Main Entry
3	Lease-able Space - Mixed Use
4	Open To Below
5	A-Go-Gro Vertical System (25 Units)
6	Material Storage
7)	Planting Tray Processing
8	Service Core Including Stair, Service Elevator and Passenger Elevator
9	Air Handling Unit
10	Light Wells
(11)	Germination/Growing Space (71 Units)
(12)	Pedestrian Access To Roof
(13)	Public Green Roof



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3	Gotham Greens Administrator Offices
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(5)	Waiting Area
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1	Community Rooftop Gardens
2	Assigned Planters (11 Units)
3	Community Rooftop Greenhouses
4	Hands-On Classroom
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6	Lecture/Traditional Classroom
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LEVEL FIVE + SIX



1	Germination/Growing Space (52 Total Units)
2	Planting Tray Processing/Workspace
3	Public Green Roof (Level 5)
4	Service Elevator for Levels 5-6
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6	A-Go-Gro Vertical System (20 Units)
7	Service Core Including Stair, Service Elevator and Passenger Elevator
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- 3 A-Go-Gro Vertical System (15 Units)
- (4) Service Core Including Stair, Service Elevator and Passenger Elevator
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DESIGN IMPACT: EDUCATION



DESIGN IMPACT: EMPOWERMENT



DESIGN IMPACT: INVESTMENT



DESIGN IMPACT: INNOVATION


DESIGN IMPACT: COMMUNITY







ARCHITECTURE AS A MEDIUM

TAXABLE PARTNERS OF

Questions / Comments / Suggestions?

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