

2022 GREEN BUILDING CHALLENGE WINNERS





OHIO

Cleveland 2030 District partners with USGBC Ohio's Northeast Ohio team to host a friendly green building challenge. We want to recognize the exemplary new construction and renovation projects happening in our area. We asked for submissions in four categories: Energy, Water, Transportation, and Healthy Buildings. When reviewing the entries, our judges added an additional category, Small Projects, to recognize projects with a smaller scale than most of the entries. Several projects submitted an entry for all categories and our judges awarded an overall winner for the project that best exemplified contributions in all four categories.

Cleveland 2030 District and USGBC invited five judges to review the submissions and award the winners. Our sincere thanks to these esteemed professionals who devoted their time and expertise, reading through the many entries, and with thoughtful deliberation, they determined the winners. Every project submitted was meritorious and it was a difficult task. Judges considered many factors such as innovation in addition to environmental impact. They decided on a winner and an honorable mention in each category. Many thanks to our judges:

Claire Markwardt Bank, AIA, NCARB, ThenDesign Architecture

Brian Brainard, P.E., HFDP, LEED AP, Senior Mechanical Engineer, Heapy Engineering

Regan Everhard, AIA, LEED AP BD+C, Project Manager, Hasenstab Architects, Inc.

Anand Natarajan, Energy Manager, City of Cleveland, Mayor's Office of Sustainability

Megan Pros, AIA, WELL AP, Project Architect, PERSPECTUS

2022 Green Building Challenge Winners

Overall Winner

INTRO

Energy

Oberlin College Sustainable Infrastructure Program South Phase - Winner
Progressive Campus 2 Solar Array Project - Honorable Mention
**Case Western Reserve University Maltz Performing Arts Center -
Honorable Mention**

Water

Waterloo Arts Green Roof and Alley Renovation Project Phase I - Winner
Rocket Mortgage FieldHouse Transformation - Honorable Mention

Transportation

Oberlin EV Car Share - Winner
LGBTQ Community Center Greater Cleveland - Honorable Mention

Healthy Buildings

LGBTQ Community Center Greater Cleveland - Winner
The Lincoln - Honorable Mention

Small Project

Ohio City Farm Bee Barn - Honorable Mention
**Fairmount Presbyterian Church Electricity Use Reduction - Honorable
Mention**



Overall Winner



INTRO

Owner: Harbor Bay Ventures

LEED Consultant: Emerald Built Environments
(Cleveland 2030 District Partner)

Architect: Hartshorne Plunkard Architecture

General Contractor: Panzica

Structural Engineer: Forefront

Timber Supplier: Binderholz GmbH

Civil Engineer: GPD

Timber Engineer: Fast & Epp

MEP: Windsor MEP

MEP (schematic energy model): Dunham
Engineers

MEP Engineer/Supplier: P&R Companies

Geotech Engineer: PSI

Acoustic Engineer: Shiner and Associates

Landscape Architect: SITE

Project Rationale:

Harbor Bay is committed to raising the bar through innovative design, materiality, and construction techniques to create something “spectacular, engaging, sustainable, and built to last.” This project epitomizes the team’s prioritization of place-making to create an innovative and transformative space in a transit-oriented, vibrant, and livable urban neighborhood. “Buildings are the top cause of global emissions, yet construction methodology has traditionally been very slow to adapt over time. Harbor Bay is an industry pioneer and thought leader in the use of mass timber construction for dense, urban, multifamily projects in the U.S. INTRO Cleveland is the first residential mixed-use project in Ohio to achieve a LEED Gold standard – and that doesn’t even take into account benefits from using a renewable resource or the emissions reduction over the project’s lifecycle. We believe that it will take large-scale projects like INTRO to move the needle on environmental benefits in urban areas throughout the country. And we want to lead this charge.”

“We’re creating a sense of place that feels like a complement to the historic district while also innovating in a way that can set a new precedent for building beautifully with sustainable materials.” – Dan Whalen, Vice President of Design and Development at Harbor Bay Ventures.

Overall Winner



Project Highlights:

- At the time of completion, the largest mass timber project in the United States by SF
- Transformational project in historic Ohio City neighborhood – across the street from the West Side Market in a walkable, transit-rich area
- Variable Refrigerant Flow mechanical systems serving the common areas and first floor offices paired with a central Dedicated Outdoor Air System created a highly efficient ventilation, heating and cooling system
- VRF also helps reduce fan loads and greatly reduced the heat rejection from the building by trading heating and cooling to different places in the building based on demand
- With a high glazing percentage (68%) high performance windows helped the building still operate efficiently
- Energy Star dishwashers, clothes washers and reduced flow rates for showers and residential bathrooms help reduce the energy needed to meet the domestic hot water load
- Innovative Stormwater Control Measures (SCMs) projected to capture up to 100% of stormwater on site
- Rapid Red Line Station 0.1 mi from project site
- Multiple Bus Lines within 0.1 mi from project site
- 8 parking spaces with EV supply equipment
- Health Benefits of Mass Timber: Lower stress levels, Improved focus & attention, cognitive ability, Increased creativity, Reduction in pain perception, Connection to nature, even in urban context
- Low VOC materials
- IAQ strategies including CO2 and VOC monitors throughout the building
- LEEDv4 BD+C Gold

Project Impact:

- 21% less CO2 emissions than equivalent steel or concrete building based on life cycle analysis
- 34% energy savings annually compared to baseline (based on energy model-equivalent of 131 households or 1.25 football fields covered in solar, using EPA data conversions.)
- 30% reduction in lighting power density throughout the building reduced the electricity consumption
- 35% indoor water use reduction compared to a traditional baseline building (equivalent to 5.3 Olympic-sized swimming pools)
- 100% of stormwater capture projected using Stormwater Control Measures (SCMs)

Energy - Winner



Oberlin College: Sustainable Infrastructure Program: South Phase

Architect: Makovich & Pusti

MEP Engineering: Salas O'Brian Engineering

Utility Advisor: Ever-Green Energy, Inc,

Builder/Developer: Mortenson Construction

Project Rationale:

In 2006, Oberlin College made a commitment to its student body to become a carbon neutral campus by 2025. The Sustainable Infrastructure Program is a 140 million dollar project which was commissioned as a major part of this effort. Besides the motivation of becoming carbon neutral, a sense of urgency was applied to the project by the impending deterioration of the hundred year old steam lines which connect the entire campus to its central steam plant.

Project Highlights:

The Oberlin College Sustainable Infrastructure Program replaces one of the school's largest producers of carbon, its campus wide, steam driven heating system, with a new, low temperature hot water system driven by approximately 850, geothermal wells, each being over 600 feet in depth. The project also replaces over 9 miles of dated steam lines and systems in and between nearly every building on campus. Many buildings have had cooling, electrical, data, and other systems added and/or updated with modern, energy efficient systems within the scope of the project, also bringing cooling to several buildings which previously lacked it. This has improved the level of comfort of these buildings for the occupants, while adding to the longevity of the buildings themselves.

Project Impact:

- Water saved: 5 million gallons per year
- Sewer saved: 4 million gallons per year
- Improved campus energy efficiency by 30%
- Energy operations savings of over \$1 million per year

Energy - Honorable Mention



Progressive Campus 2 Solar Array Project

Owner: Progressive Insurance

Engineering: Progressive Insurance PRE Engineering

Solar Installation: YellowLite

Subcontractor: Karpinski Engineering (Cleveland 2030 District Partner)

Project Rationale:

Progressive continuously looks to decrease their environmental impact and reduce energy use. They have stated a goal of becoming carbon neutral on Scope 1 and Scope 2 carbon emissions by the end of 2025. With electricity consumption making up a significant portion of their Scope 2 emissions, they began looking for ways to reduce consumption and for on-site green generation. As photovoltaic solar became more financially viable, they reached out to a number of vendors for proposals.

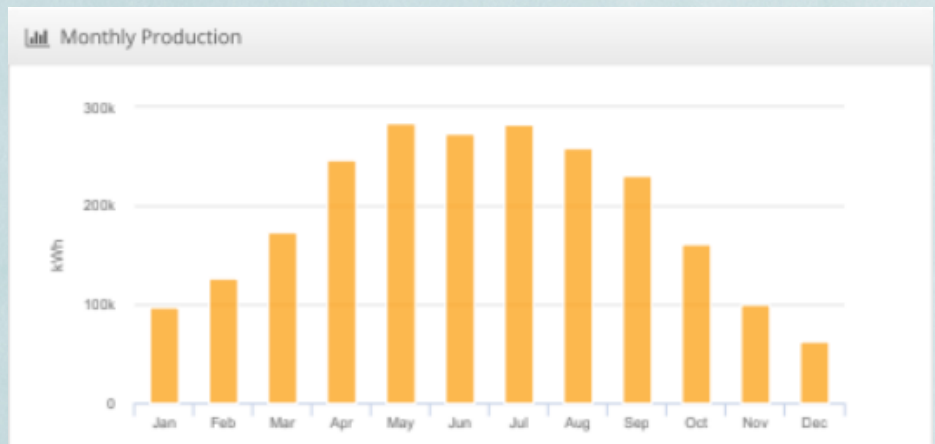
Project Highlights:

The solar array at Campus 2 is innovative because it's tied directly to the utility substation that feeds their entire campus and data center. At 1.78 MW, the solar array will help to significantly offset their consumption from the grid and assist with their peak shaving efforts on hot summer days when demand on the regional grid is at its highest. The project utilized land that was otherwise not developable since it was so close to the interstate. They utilized a panel mounting system from Preformed Line Products that was less environmentally invasive than other systems to protect the environment.

Project Impact:

-Annual production: 2.298 GWh

-Performance ratio: 84.4%



Energy - Honorable Mention



Case Western Reserve Maltz Performing Arts Center

Owner: Case Western Reserve University (Cleveland 2030 District Member)

Architecture, MEP/ Structural Engineering/ Theatrical, Acoustics, Audiovisual and Lighting Design: DLR Group (Cleveland 2030 District Partner)

Contractor: Turner Construction

Commissioning: Heapy (Cleveland 2030 District Partner)

Civil Engineer: Osborn Engineering (Cleveland 2030 District Partner)

Project Rationale:

The Maltz Performing Arts Center is the result of an innovative partnership between The Temple-Tifereth Israel and Case Western Reserve University, which purchased the iconic 1924 synagogue at the edge of campus with the intent to consolidate the University's music and performing arts programs at one location. The multi-phased project renovated the historic sanctuary to accommodate music performances, lectures, and continued use as a place of worship and gathering, and expanded the facility with a sizable addition for the University's Theater and Dance Departments. DLR Group's design for the expansion complements rather than competes with the temple's distinctive golden-hued dome. This new consolidated home for the University's Music, Dance, and Theater programs terminates the western edge of CWRU's Nord Greenway project, visually positioning the performing arts at one end with the Cleveland Museum of Art and the visual arts at the other end of the Greenway.

Project Highlights:

The project has achieved exemplary energy performance in large part due to a thorough HVAC system selection process and life cycle cost analysis that informed not only the HVAC system but the building envelope as well. In addition to energy performance, the project focused on connectivity: both of the addition to the existing historic Maltz Center in a way that would be sensitive and complementary and of the addition to CWRU's campus through maximized views to the adjacent Nord Family Greenway. These views as well as a focus on acoustic performance, thermal comfort, interior lighting and indoor air quality produced a welcoming and healthy interior environment for students, faculty, performers and patrons. Major program elements reside within largely opaque boxes sheathed in panels of limestone reminiscent of the stonework on the original temple. Stone-faced portions, including lobbies and faculty offices, are separated by sections with floor-to-ceiling glass, creating the effect of a geode – a solid form with a crystalline core. A holistic approach to design and construction ensured not only meeting some of the performance targets set early in the design of the project but also that CWRU was engaged in the decision-making process through all stages of design. The project achieved LEED Gold certification under the recent v4 rating system.

Project Impact:

- The project targeted a 30% reduction in annual energy cost savings from the ASHRAE 90.1-2010 baseline with an estimated annual cost reduction of \$36,000.
- The use of low flow fixtures reduced water consumption by 35%.
- The Predicted Energy Use Intensity of the building was 104 kBtu/sf-yr (using an energy model). However, the building is operating at a much lower average EUI of 55kBtu/sf-yr. The difference can be attributed to not only efficient operations of the different mechanical systems but also reduced number of performances than anticipated/designed to.

Water - Winner



Green Roof



Alley Renovation



Rain Harvest



Green Wall



Waterloo Arts Green Roof and Alley Renovation Project Phase I

Grant: Northeast Ohio Regional Sewer District Green Infrastructure Grant (Cleveland 2030 District Partner)

Landscape Architect: James McKnight

Project Rationale:

Waterloo Arts is a small non-profit art center in the Collinwood neighborhood of Cleveland and by 2019 the building was many years overdue for a roof replacement. The interior of the building was starting to deteriorate from persistent leaking and to secure funding for such a large capital repair had been challenging. They applied to the NEORSD Green Infrastructure Grant program for a green roof and the project allowed them to replace their second story roof with a new rubberized roof and 2200 sf of modular green roof trays. While the initial motivation for the project was to solve their roof leaks, the process of installing green infrastructure, sparked excitement about sustainable building practices and they are now looking at other ways they can use natural building and improve energy conservation to create a healthier environment and a more sustainable building.

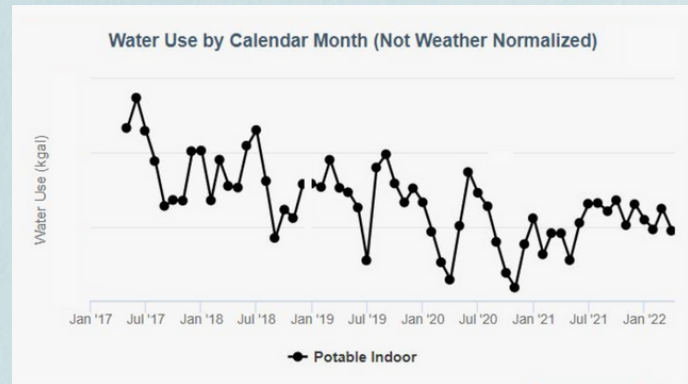
Project Highlights:

Waterloo Arts' green roof was the first green roof funded by NEORSD and the project included the following LID treatment train; a 2200 sf extensive modular living roof, a 1060 gallon cistern, and 1500 sf of permeable pavers. Waterloo Arts' building has a 3000 sf first story roof and a second story roof of equal size. The second story of the building consists of art studios and the dividing walls provide enough support for the roof to bear the weight of 2200 sf of sedum plant trays. Rainwater that is not absorbed by the roof plants, flows into a 1060 gallon cistern which is used to irrigate planters at Waterloo Arts and the commercial district. The 1500 sf alley was excavated and then paved with permeable pavers creating more outdoor program space for the art center and less runoff for the Sewer District. During the alley excavation, an original 1916 basement storefront was uncovered and six previously bricked over windows were replaced with vented glass block, improving air circulation and natural light in the building. During installation of the green roof, the existing skylight was replaced and the previously boarded up roof access was replaced with a new skylight. In addition, a skylight hatch was installed to provide easy access for maintenance of the green roof. The incandescent lights were replaced with LED lights on a smart timer. During the day, the skylights provide ample natural light and the LED lights are only needed at night. Finally, the most visible aspect of the project is a 6x8 ft plant wall which is irrigated with the harvested rainwater. This wall provides an easy way to initiate conversation with visitors about the less visible green infrastructure improvements to the building. They are planning a second phase to install a deck and intensive green roof of native plants on the first story of the building. They are researching blue roofs, cistern flushing systems and possibly bringing the cistern water in for toilet flushing.

Project Impact:

-(Runoff Reduction (in.) / 12 x Treated Drainage Area (acre) x 325,851.433 = (gal/yr.) 96,712.705
-63% reduction in water runoff

Water - Honorable Mention



Rocket Mortgage FieldHouse (Cleveland 2030 District Member)

MEP Engineering: McHenry & Associates and Smith Seckman Reid, Inc.

Architects: Gensler and R.P. Madison International

Construction Manager: Whiting-Turner Contracting

Plumbing Contractors: EB Katz and Gorman-Lavelle

Project Rationale:

Rocket Mortgage FieldHouse is the most significant driver of economic activity of any venue in Cuyahoga County and home to NBA's Cleveland Cavaliers, AHL Cleveland Monsters, over 175+ ticketed events and thousands of private events each year. Located in the Gateway District of downtown Cleveland, the FieldHouse was opened in October 1994 and has been carefully maintained ever since. As part of the Transformation Project, which ran from 2017 – 2019, water conservation was identified as an opportunity where the FieldHouse could excel in resource conservation. The existing plumbing fixtures were of the 1994 vintage and used roughly twice the water that modern fixtures use. While they had been well maintained and could continue to serve for years more, it was decided to replace all of the plumbing flush valves, manual sink faucets and many of the fixtures to reduce water usage.

Project Highlights:

The FieldHouse has 52 public restrooms distributed among its five guest levels and each of the restrooms can have up to 30 or more plumbing fixtures. Since the restrooms are public and guest facing, the replacement fixtures and valves needed to display a high level of reliability. Working with the MEP Engineers, McHenry & Associates and Smith Seckman Reid, several different options were vetted to help achieve the water reduction usage goal.

Project Impact:

-Since the implementation of these improvements, the water use intensity of the FieldHouse has been reduced by 11-points from 2017 levels or 36%.

-This equates to a yearly reduction of roughly 4.3 million gallons of water or 6.5 Olympic swimming pools.

Transportation - Winner



City of Oberlin EV Carshare

Project Design/Implementation/Operation: Sway Mobility Inc.

Installation: Oberlin Municipal Light and Power

Consulting: Sharon Pearson (Lorain County Mobility Manager, United Way of Lorain County)

Collaborator: Oberlin College

Project Rationale:

This project was designed to address several goals in the City of Oberlin's Climate Action Plan, including reducing greenhouse gas emissions, increasing access to mobility, and accelerating the adoption of electric vehicles.

Project Highlights:

Oberlin EV Carshare is the first all-electric community carshare program in Ohio, and the first one in a rural location in the Midwest. Carshare has been limited to large metro areas with high population density and income; however, this project demonstrates that a program designed by and for the community it serves can be extremely successful even when there is low density and a mix of incomes. The City's commitment to its Climate Action Plan and willingness to try innovative approaches to implementing deserve recognition and to serve as an inspiration to other rural communities. The City installed six public charging ports as part of this effort

Project Impact:

- Reduction in the amount of fuel consumed (EVs are far more efficient per mile than internal combustion cars).
- Reduction of the carbon content of fuel consumed (Oberlin's electricity mix is 85% renewable).
- Education and encouragement for residents to drive EVs through public charging and carshare.
- Reduced emissions (EVs have no tailpipe emissions and use predominantly renewable electricity).
- Increased access to shared transportation options (such as carshare).
- Since the program began in April 2021, over 2,100 trips covering over 77,800 miles have been driven with an estimated CO2 reduction of over 50,000 pounds.

Transportation - Honorable Mention



LGBTQ Community Center Greater Cleveland

Architect/Interior Design/Landscape Architect: Weber Murphy Fox

Consultants: Denk Associates, I.A. Lewin and Associates, Weber Engineering Services and The Construction Green Team

CM: &build, a PCS company

Project Rationale:

The LGBTQ Community Center of Greater Cleveland's new home complements their mission "to enrich the lives of the diverse LGBTQ+ community through advocacy, support, education, and celebration."

Project Highlights:

There was a thorough search for the best site location. The Center's vision includes being an integral part of the thriving Northeast Ohio region and their goal led them to remain within the heart of the Gordon Square Arts District. It was very important to be accessible via varied modalities of transportation, including walking, bicycling, bus routes and walking distance from rapid transit lines. Building on an existing urban site, reduced environmental impacts and enabled the utilization of existing infrastructure while promoting walkability, bicycling and transportation lines. The parking footprint was reduced, and the specified concrete drive and pervious pavers resulted in a heat island reduction effect. The center included sculptural bicycle racks which matched the district's bicycle racks, tying into the neighborhood district. The site setting was critical for the new building to contribute to the overall desire for density located along the sidewalk's edge and comply with zoning requirements of this neighborhood designated Pedestrian Retail Overlay District. While maximizing the new building's location and design along the sidewalk's edge, a minimal opening along Detroit Avenue was maintained for a pedestrian walkway and vehicular drive leading to parking located at the rear of the building. The resulting solution was recognized by the Detroit Shoreway District for filling the gap of the former 50' of open area and parking immediately adjacent to the sidewalk and promoting walkability/preserving pedestrian-oriented character of the Gordon Square Arts District. The project attained LEED Silver certification, Version 4. BD+C: NC.

Project Impact:

- Achieved 9/16 points under LEED V4 Location and Transportation
- Building location / High Priority Site
- Alternate transportation (public transportation, bicycle, walking, vehicle sharing) o Location of community infrastructure/amenities (Achieved 5/5 points in Surrounding Density and Diverse Uses credit)
- Encourage alternate transportation
- Bike storage
- Reduced parking footprint (71.93% reduction in parking capacity)
- Preferred parking for carpools (6.25% provided)

Healthy Buildings - Winner



LGBTQ Community Center Greater Cleveland

Architect/Interior Design/Landscape Architect: Weber Murphy Fox

Consultants: Denk Associates, I.A. Lewin and Associates, Weber Engineering Services and The Construction Green Team

CM: &build, a PCS company

Project Rationale:

The LGBTQ Community Center of Greater Cleveland's new home complements their mission "to enrich the lives of the diverse LGBTQ+ community through advocacy, support, education, and celebration."

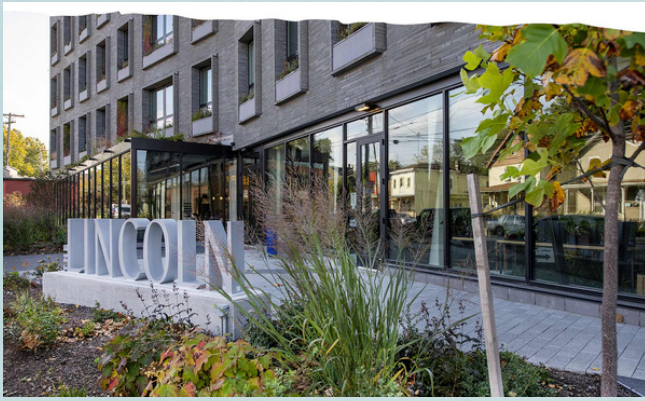
Project Highlights:

The building façade's large expanses of glass connects the building's interior to the street and vice versa. It was critical to achieve transparency from the street within their new facility to express and celebrate the meaningful programs happening within. Another key design intent was to offer a variety of spaces with design flexibility, including full-height glass movable partitions to vary the size of rooms depending on programming and events. All program activities occur at the building's perimeter to allow for direct views to the exterior and surrounding neighborhood. Upon entering the space, one experiences a skylit, double-height volume featuring a unique, open, monumental, self-supporting cantilevered staircase. As the focus of the lobby, the stairs promote physical activity/wellness. The interior finishes (low-emitting materials) include exposed steel structural elements, polished concrete floors, and vibrant pops of color. Natural light fills the spaces during the daytime, and at night, the illumination allows the dynamic pops of color and 10' high "LGBTQ+" window graphics to activate the street. The interior finishes and furnishings focused on easily cleanable surfaces. Off of the lobby, a kitchen was a key programmed space, designed to promote/teach the benefits of healthy eating. A "Green/Sustainable" education binder is available as a resource at front lobby welcome/greeter desk to share sustainable features. The project attained LEED Silver certification, Version 4. BD+C: NC.

Project Impact:

- Achieved 7/16 points under LEED V4 Indoor Environmental Quality
- Indoor air quality / Low emitting materials (Awarded 3/3 points under Low-Emitting Materials credit)
- Construction indoor air quality management plan followed
- Thermal comfort (system plus controls)
- Visual comfort – daylighting/views/lighting (including controls)
- Acoustic comfort
- Walkable/bikeable location – encourage physical activity / enhance health
- Cleaning/maintenance policies
- Healthy snacks/beverages provided
- Ergonomic workstations /Design for active occupants

Healthy Buildings - Honorable Mention



The Lincoln

Owner: Sustainable Community Associates

Architect: Bialosky

Landscaping Services: Neff

Green Building Consultant: Emerald Built Environments (Cleveland 2030 District partner)



Project Rationale:

The Lincoln is the culmination of Sustainable Community Associate's decade-long commitment to revitalizing Tremont's Scranton Corridor and offers new residents an opportunity to make a home in one of Cleveland's most vibrant communities. Inspired by the push and pull between nature and industry, The Lincoln carves out a new space in the steep slope of Tremont's Willey Avenue. Their hope is that The Lincoln cultivates a living experience more connected to the outdoors. It is an intentional, sustainable space where you never feel far from Lincoln Park or the dynamic community that surrounds it. They believe The Lincoln can serve as a symbol for what meaningful development can be: sustainable design, focused on strengthening the fabric of existing neighborhoods, dreamt of and realized by a team committed to community-building.

Project Highlights:

A steel framework surrounds part of the exterior and stretches up all four stories. On that framework, Virginia and trumpet creepers, climbing roses, and honeysuckle are scaffolded to create a living wall. The brickwork extends around each window, providing space for native plants like bee balm, butterfly weed, foxglove, and big bluestem grasses to take hold. Over time, these plants will establish themselves across the building's exterior. The building features a green roof over the commercial entrance, a sky deck providing a connection to the outdoors, and plantings and irrigation on each face of the building tailored for the environmental conditions. The project achieved Energy Star certification and was designed and built in accordance with the City of Cleveland Green Building Standard.

Project Impact:

- Project earned additional points for achieving greater than required energy savings
- Low Flow Water Fixtures
- Compact Development increasing population density
- Transit-rich location near rapid and bus stops
- Construction Waste Diversion rate of 78%

Small Projects - Honorable Mention

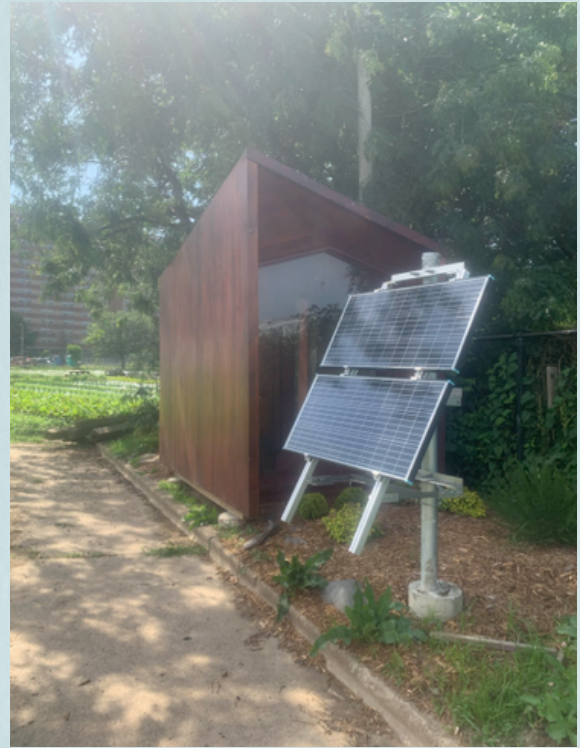


Ohio City Farm Bee Barn

Architect: redhouse Studio

Collaborator: Youth Bee Works

Collaborator: How Do We Sustain



Project Rationale:

The connection among nature, architectural design, and technology made this project exciting. Colony collapse in raising bees is a critical issue in bee farming and the extreme weather conditions in Cleveland make it difficult to house bee hives outdoors. This is a research and development project that hopefully can be replicated so that Bee keepers can help bees thrive in Northeast Ohio and elsewhere.

Project Highlights:

The Ohio City Farm Bee Barn is bedroom sized structure with passive solar, solar electric, and automation to house bees year around. The building can naturally collect solar thermal heat. It also has heating coils for extremely cold temperatures and has an exhaust fan to circulate cooler air in hotter seasons. The automation system collects and reports temperature data and operates the temperature controls so that the bees can stay happy and healthy all four seasons.

Ohio City Farm and Refugee Response wanted to increase their bee population to improve the pollination that supports the 3 acres of farmland. This project allows the bees to survive the cold winter and hot summer inside a structure so that the can thrive and pollinate during the growing season.

Project Impact:

- 3,404 kWh of solar energy produced and used annually
- A reduction of 2,784 pounds of CO₂

Small Projects - Honorable Mention



Fairmount Presbyterian Church Electricity Use Reduction

Building Owner: Fairmount Presbyterian Church

Project Rationale:

To reduce energy use, to reduce the church's spending on energy, and to reduce the church's pollution emissions. This project supported Fairmount as an Earth Care Congregation, a certification of the Presbyterian Church (U.S.A.).

Project Highlights:

The results included electricity use reduction of over 50% during the project, a more energy efficient commercial kitchen by installing Energy Star appliances, and improved energy efficiency by replacing almost all building lighting with LED. By cutting out a lot of energy use waste, they were able to redirect spending from energy use to programs and missions, and reduce the church's pollution emissions.

Accomplishments:

Culture and behavior change: staff and members agreed to more faithfully turn off lighting and equipment after use, and agreed to energy efficiency as a goal.

Replaced 30-watt incandescent bulb EXIT signs with 2-watt LED bulb EXIT signs

LED light bulb replacements in the Chapel, chandeliers and in some hallways

Upgraded old computer network and computing devices that use much less energy

Automatically control the lighting in meeting rooms with occupancy sensors

Selectively air condition meeting rooms using mini-split units

Replaced old kitchen appliances with new Energy Star models: refrigerator, freezer, ice maker and dish washer designed to use less water

Wholesale replacement of fluorescent lighting with LED bulbs in Andersen Hall, in the dining room, in the sanctuary, in the choir loft, meeting rooms and church office

Replaced hallway fixture compact fluorescent bulbs with enclosed rated LED bulbs

Replaced broken solar cells controlling exterior lighting

Project Impact:

-Approximately a 56% reduction in electricity use

-Approximately \$15,000 annually in avoided cost