

WINNER

Cricket Shelter and Farm







For the exhibition “Survival Architecture and the Art of Resilience,” organized by the Oakland, Calif., nonprofit Art Works for Change, Mitchell Joachim, ASSOC. AIA, envisioned a structure that would provide not only shelter, but also a source of sustenance that could endure climate change and natural disasters. The food source? Crickets, whose protein-rich bodies require little water and energy to grow. “They’re good for you and good for the planet,” says Joachim, the co-founder of Brooklyn, N.Y.-based **Terreform ONE** and an associate professor of practice at New York University.

Ultimately, **Terreform ONE**’s prototype cricket shelter and farm is less about providing emergency relief, and more about experimenting with food culture and ecology through architecture. Currently cricket protein is ground up in energy bars that “taste like wood,” Joachim says. He suggests that the insect could be integrated into refined dining culture and cuisine, similar to how sushi took off in the U.S. in the 1980s. And crickets can—and should—be grown and harvested locally, he says, to match the farm-to-table

values of today’s eco-conscious gourmands.

Crickets have long been farmed in several countries, Joachim says, but the standard practices are unsanitary because they do not effectively screen out carcasses, baby crickets, feces, and dirt. In contrast, **Terreform ONE**’s carefully considered design allows handlers to maintain hygienic conditions and to harvest living adult specimens only.

The 144-square-foot structure comprises 224 interconnected modules set within a vault of 16 CNC-milled wood ribs. Each module consists of a 5-gallon plastic container lined with a nylon mesh sac and equipped with a ventilated door, a shading louver, and “mobility tubes” that lead to other modules. These 0.5-inch-diameter PVC tubes are lined with soft nylon mesh. Cocoon-like “sex pods” affixed to the outside of the shelter make mating a potential spectacle. Once the baby crickets, or nymphs, are strong enough, they can hop freely into the main farm via the tubes.

“This is a brilliant architectural proposition combining science, cuisine, and construction—all



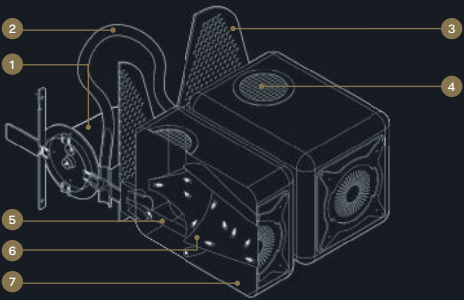
executed with a sense of humor,” said juror Elizabeth Whittaker.

Crowning the shelter are 25 spiky quills, made of pipe cowls attached to 4-foot-long fins of plastic and coated masonite, that draw air and heat out via the stack effect, and amplify the sound of the crickets’ chirping. Sculpturally, the quills nod to Constantin Brâncuși’s *Bird in Space* and John Hejduk’s *The House of the Suicide*, and reflect the designer’s desire to “do something fabulous,” Joachim says.

Details like these led Whittaker to call the project “a combination of the elegant and the grotesque.” Juror Doug Stockman added, “It sort of reminds me of the scene in *The Martian* (2015) when he’s trying to grow the potatoes.”

The shelter and farm will be exhibited at the Appleton Museum of Art in Ocala, Fla., from Sept. 10 to Nov. 13. The first harvest, overseen by Robyn Shapiro of Seek Food, was used to make an infused vodka. Next on the menu? Cricket-flour bonbons with fruit and nuts. —G.s.

Module Diagram



- | | |
|---------------------|--------------------------|
| 1. Sex pod | 5. Nylon mesh tube |
| 2. Mobility tube | 6. Semi-rigid weave sack |
| 3. Shading louver | 7. 5-gallon module |
| 4. Ventilation mesh | |

Jury

Mic Patterson is founding principal of Los Angeles–based Design Tectonics, a consultancy that focuses on innovative façade technology applications and research. He was formerly the vice president of strategic development at Enclos. Patterson is a Ph.D. candidate in the University of Southern California School of Architecture with a focus on sustainable façade renovation practices.

Douglas Stockman, AIA, is a founding principal at El Dorado in Kansas City, Mo. He also serves on the Kansas State University College of Architecture, Planning, and Design Dean's Advisory Council, and is chair of the Downtown Council of Kansas City. Stockman received a B.Arch. from Kansas State University.

Elizabeth Whittaker, AIA, is founder and principal of Merge Architects in Boston. In 2015, she was a recipient of the AIA Young Architects Award and the Emerging Voices award from the Architectural League of New York. Whittaker received an M.Arch. from the Harvard Graduate School of Design, where she is an assistant professor in the practice of architecture.

Credits

Cricket Shelter: Modular Edible Insect Farm, page 112

Client: Randy Jayne Rosenberg
Design Firm: Terreform ONE, Brooklyn, N.Y. · Mitchell Joachim, ASSOC. AIA, (co-founder and primary investigator); Jiachen Xu, Lissette Olivares, Cheto Castellano, Ivan Fuentealba, Sung Moon, Kamila Varela, Yucel Guven, Chloe Byrne, Miguel Lantigua-Inoa, AIA, Alex Colard, Melanie Fessel, Maria Aiolova, ASSOC. AIA, Vivian Kuan (project management); Felipe Molina, Matthew Tarpley (research assistants)
Consultant: Seek Food · Robyn Shapiro
Fabricators: Shandor Hassan, Christian Hamrick
Funding: Art Works for Change; Terreform ONE
Photography: Mitchell Joachim, Matthew Tarpley
Special Thanks: David Stewart, Christian Hubert, Heather Lord, Scott Pobiner, New Lab, Brooklyn Navy Yard, GMD Shipyard, New York University Gallatin School of Individualized Study

BayArc: A Tidal Responsive Barrier, page 116

Design Firm: Skidmore, Owings & Merrill, San Francisco · Craig Hartman, FAIA (concept and interdisciplinary leader); Mark Schwetmann, AIA, Alex Cruz, Ross Findly, David Kwon (project team)
Project Adviser: Moffatt & Nichol
Drawings: Skidmore, Owings & Merrill
Structural Engineer: Mark Sarkisian, Eric Long, David Shook, Geoffrey Brunn
Marine Engineering Concept: Moffatt & Nichol · Dilip Trivedi, Richard Dornhelm

The Tower at PNC Plaza, page 118

Client: PNC Financial Services Group
Design Firm: Gensler, San Francisco · Doug Gensler, AIA (principal-in-charge); Hao Ko, AIA (principal and architectural design director); Benedict Tranel, AIA (principal and technical director); Lisa Adkins, AIA (project manager); Anastasia Huggins, AIA, David Hall, Gunwook Nam, Alison Wilkinson, AIA, Daniel Nauman, AIA, Jorge Barrero, AIA, Ethel Macleod, Eugene Lee, Joe Chisholm,

Brent Van Gunten, AIA, Len Sciarra, Philip Kaefer, AIA, Joel McCullough, AIA, Rich Peake, Mariana Vaida, Jessica Yin, Yooju No (project team)
Rendering: Space Matrix; Tangram 3DS
Construction Manager: PJ Dick
Lighting Designer: Fisher Marantz Stone
Structural and M/E/P Engineer: BuroHappold
Sustainability Consultant: Paladino & Co.
Photography: Connie Zhou Photography

LELU Exit Sign, page 122

Client: Architectural Safety Components
Design Firm: Interloop—Architecture, Houston · Mark Wamble, Dawn Finley, AIA (design principals); Eric Hughes, Peter Muessig, Jack Mussett (project team)
Project Adviser: Architectural Safety Components · Sam Youdal
Consultant: Martin Co. · John Martin
Fabricators: Moore Fabrication · Kerry Krumbeck; Professionalized Products and Services · Jerry Huang; Southwest Electronic Energy Group · Alex Marin; Anodizing Graphics of Houston · Linda Sayers
Special Thanks: Underwriters Laboratories · Abdul Ahad (investigating engineer)

Tally, page 124

Design Firm: KieranTimberlake, Philadelphia · Roderick Bates, Stephanie Carlisle, Billie Faircloth, AIA, Elizabeth Friedlander, AIA, Ryan Welch (project team)
Development Partners: Autodesk; Thinkstep (previously PE International)
Project Team: Autodesk · Jonathan Rowe; Thinkstep · Heather Gaddoniex, Nick Santero, Maggie Wildnauer
Special Thanks: Emma Stewart, Jacky Liang

Pulled Plaster Panels, page 128

Design Firm: Young Projects, New York · Bryan Young, AIA (principal); Jon Cielo, AIA (project architect); Noah Marciniak, Samantha Eby, Nayoung Kim (project team)
Lighting Designer: Architectural Lighting · Rick Shaver
Structural Engineer: Silman · Nat Oppenheimer

Electrical Engineer: Engineering Solutions · John Ryan
Consultants: Butter and Eggs · Judy Dunne (interiors); Taocon (general contractor); Engineering Solutions · John Ryan (M/E/P engineering)
Drawings: Young Projects
Fabricators: Kammetal (stainless steel screen); Balmer Architectural Mouldings
Photography: Young Projects and Jon Cielo

Chicago Horizon, page 130

Client: Chicago Architecture Biennial, Chicago Park District
Design Firm: Ultramoderne, Providence, R.I. · Yasmin Vobis, Aaron Forrest, AIA, Emily Yen, ASSOC. AIA, Tida Osotsapa, Will Gant, Hua Gao, Ronak Hingarh (project team)
Design Structural Engineer: Guy Nordenson and Associates · Brett Schneider
Structural Engineer of Record: Thornton Tomasetti
Architect of Record: Animate Architecture · Joe Lambke
Fabricator: Nordic Structures
Funding: BP; Chicago Park District; Chicago Architecture Biennial; Rhode Island School of Design; ReThink Wood; Nordic Structures
Photography: Naho Kubota
Special Thanks: Laura Briggs

Spray-On House, page 132

Design Firm: Patrick Tighe Architecture, Los Angeles · Patrick Tighe, FAIA, Zachary Teixeira, Evelina Sausina, ASSOC. AIA, Risa Tsutsumi, Bran Arifin (project team)
Structural Engineer: Nous Engineering · Matt Melnyk
Consultant: Demilec
Fabricator: Machineous
Life-Cycle Assessment: Department of Civil and Environmental Engineering, School of Engineering, Stanford University
Prototype: Built at Southern California Institute of Architecture (SCI-Arc), as part of the SCI-Arc Gallery Series
Drawings, Renderings, and Photography: Courtesy Patrick Tighe Architecture
Special Thanks: SCI-Arc team

Vegas Altas Congress Center and Auditorium, page 134

Client: Junta de Extremadura
Design Firm: Pancorbo + de Villar + Chacón + Martín Robles, Madrid · Luis Pancorbo, José de Villar, Carlos Chacón, Inés Martín Robles (project team)
Drawings and Lighting Designer: Luis Pancorbo, José de Villar, Carlos Chacón, Inés Martín Robles
Structural Engineer: Mecanismo · Juan Rey, Pablo Vegas, Jacinto Ruiz Carmona
Electrical and Facilities Engineering: Úrculo Ingenieros · Rafael Úrculo, Sergio Rodríguez
Acoustics: Arau Acústica · Higini Arau
Models: Gilberto Ruiz
Construction: Placonsa · Eloy Montero; Julio Oreja (site manager)
Ropes Installation: Cotesi; Lastra & Zorrilla
Funding: Junta de Extremadura
Cost: €10,505,187 (\$11.7 million, approx.)
Photography: Jesús Granada (building); Ignacio Bisbal Grandal (model)

Nanobiome Building Skin, page 136

Design Firm: Michael K Chen Architecture (MKCA), New York · Michael Chen, Justin Snider, AIA, Alan Tansey, Natasha Harper, Elena Hasbun, Braden Caldwell, AIA, Julian Anderson, AIA (project team)
Drawings: MKCA
Landscape Architect: Local Office
Landscape Architecture: Walter Meyer, Jennifer Bolstad, AIA, Jenny Hindelang
Conservation Consultant: State University of New York College of Environmental Science and Forestry, Department of Environmental and Forest Biology · Danilo Fernando (associate professor and graduate program director)
Façade and Structural Engineer: Buro Happold
General Contractor: IA Construction Management
Manufacturer: Boston Valley Terra Cotta
Photography: MKCA

Infundibuliforms: Kinetic Tensile Surface Environments, page 138

Design Firms: Matter Design, Boston · RVTR, Ann Arbor, Mich., and Toronto · University of Michigan
Primary Investigators: Wes McGee, Geoffrey Thün, Kathy Velikov
Design Research Associate: Daniel Tish
Fabrication Assistants: Asa Peller, Dustin Brugman, Andrew Kremers, Andrew Wald, Iram Moreno Pinon
Wireless Sensing Adviser: Jerome Lynch
Technical Partners: Buckeye Polymers; Industrial Fabricating Systems; Beckhoff
Funding: Taubman College of Architecture and Urban Planning: 2016 Research Through Making Program; University of Michigan Office of Research: Small Projects Grant
Photography: Peter Smith

Timber Waste Modular Unit ("TwMU"), page 140

Design Firm and Fabricator: IKD, Boston · Yugon Kim, Tomomi Itakura (leaders); Yuki Kawae, Steven Hien, Brendan Casimir, David Morgan, Erin Kim, James Fan, Miguel Lorenzo Gumila (student research assistants)
Drawings: IKD
Funding: Heritage Museums & Gardens; Rhode Island School of Design
Photography: IKD
Special Thanks: Windy Hill Farm Sawmill

Grove, page 141

Client: Design Biennial Boston, Boston Society of Architects (BSA)
Design Firm and Fabricator: GLD Architecture, Brookline, Mass. · Joel Lamere, Cynthia Gunadi, Sophia Chesrow, Grigori Enikolopov, Zain Karsan, Dohyun Lee, Elizabeth Galvez (project team)
Drawings: GLD
Funding: Design Biennial Boston; GLD
Photography: Jane Messinger
Special Thanks: Rose F. Kennedy Greenway Conservancy, Boston Art Commission, Pinkcomma Gallery, BSA Space, Boston Mayor's Office of New Urban Mechanics, David Costanza, Sixto Cordero, Caitlin Mueller, Steven O. Anderson, John Skibo, Matt Wagers, Chris Dewart, Christopher Gunadi

Blooming Bamboo Home, page 142

Design Firm: H&P Architects, Hanoi, Vietnam · Doan Thanh Ha, Tran Ngoc Phuong, Chu Kim Thinh, Erimescu Patricia, Nguyen Van Manh, Nguyen Khanh Hoa, Nguyen Quynh Trang, Tran Quoc Thang, Pham Hong Son, Hoang Dinh Toan, Pham Quang Thang, Nguyen Hai Hue, Nguyen Khac Phuoc (project team)
Fabricator: H&P Architects
Photography: Doan Thanh Ha
Cost: \$2,500
Special Thanks: Nguyen Tri Thanh