



D U R A

NEW YORK CITY COLLEGE OF TECHNOLOGY
SOLAR DECATHLON 2015



**CU
NY** The City
University
of
New York

 NEW YORK CITY COLLEGE OF TECHNOLOGY
CITY TECH

 U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON

DURA CITY TECH



DURA : An urban approach to resilient, energy-efficient housing that adapts to the needs of a diverse city and its people.



durahome.org
@teamdura
[facebook.com/nycctSD2015](https://www.facebook.com/nycctSD2015)

Dear friend,

Thank you for your interest in the New York City College of Technology (also known as City Tech) Solar Decathlon team. The City Tech team is one of twenty selected from a nation-wide, rigorous selection process. The Solar Decathlon provides student teams an invaluable experience in the innovation-driven, interdisciplinary collaboration that defines the 21st century global economy. The City Tech team has recently passed the first hurdle, submitting plans for our cutting-edge design, and are currently hard at work on design development.

The City Tech entry into the Solar Decathlon adopts the acronym DURA (Diverse, Urban, Resilient and Adaptable). DURA is a prototype for state-of-the-art urban housing that is affordable, comfortable and energy efficient. This interdisciplinary collaborative project is fostering research-based scholarship that benefits both faculty and students at the College. Most importantly, we expect to contribute to building industry practices and to public discussion, with innovations that will emerge from the process.

DURA is product of the vibrant ethnic diversity present within New York City, and within City Tech, where a diverse team is working on design solutions to meet its needs. In each of the last ten years, US News and World Report has listed City Tech as among the most ethnically diverse colleges of its type in the US; over 60% of City Tech students speak a language other than English at home. The City Tech team reflects that diversity.

The City Tech Solar Decathlon team is composed entirely of undergraduate students, from a wide range of departments at City Tech including Construction Management & Civil Engineering Technology, Mechanical Engineering Technology, Electrical Engineering Technology, Chemical Technology, Biological Sciences, Architectural Technology, Hospitality Management, Entertainment Technology and Advertising Design & Graphic Arts.

Throughout the course of the competition, the Solar Decathlon receives far-reaching media attention, with more than 2 billion total media impressions. Highlights include:

- Online — more than 1,750 online articles
- Print — 350 articles in nearly 150 print publications around the world
- Broadcast — 200 television interviews worldwide and 150 radio interviews
- Onsite — hundreds of media checked in onsite to cover the event; over 67,000 people visited the homes

There are numerous ways to support the team: monetary support, material donation and professional mentoring. Your support of DURA is a contribution to clean-energy, sustainable building and classroom innovation focused on science, technology, engineering, mathematics and architecture.

We hope to welcome you as a supporter of the City Tech Solar Decathlon team!

Thank you,
TeamDURA

CITY TECH SOLAR DECATHLON 2015



SOLAR DECATHLON



The Solar Decathlon takes place in the Great Park in Irvine, CA (shown at right and below). Teams from around the globe compete in the biannual competition in ten contests:

ARCHITECTURE
ENGINEERING
MARKET APPEAL
AFFORDABILITY
ENERGY BALANCE
COMMUNICATION
COMFORT ZONE
APPLIANCES
HOME LIFE
COMMUTING

Images courtesy of www.solardecathlon.gov



DEPARTMENT OF ENERGY SOLAR DECATHLON

The U.S. Department of Energy Solar Decathlon challenges collegiate teams to design, build, and operate solar-powered houses that are cost-effective, energy-efficient and attractive. According to Richard King, the director of the Solar Decathlon, "The Solar Decathlon can be a positive, life-changing experience for participating students. In addition to developing leadership, team spirit and problem-solving skills, this competition bridges formal education with hands-on experience that helps decathletes excel once they enter the workforce." The winner of the competition is the team that best blends affordability, consumer appeal and design excellence with optimal energy production and maximum efficiency. The Solar Decathlon competition houses will be open to visitors October 8–18, 2015, at the Orange County Great Park in Irvine, CA.

The goals of the Solar Decathlon are:

- Educate students and the public about the money-saving opportunities and environmental benefits presented by clean-energy products and design solutions;
- Demonstrate to the public the comfort and affordability of homes that combine energy-efficient construction and appliances with renewable energy systems available today;
- Provide participating students with unique training that prepares them to enter our nation's clean-energy workforce.

The City Tech team's approach to the Solar Decathlon is an urban response to the design of energy-efficient homes in order to meet challenges posed by global climate change. Estimates attribute more than one-third of global carbon emissions to buildings, ahead of vehicles and manufacturing. Further, the estimated percentage of the population living in cities surpassed 50% in 2012 and will continue its growth through this century, reaching 6.3 billion in 2050. Considering these trends, urban design which considers environmental impact, and sustainability, is critical.



durahome.org
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CITY TECH TECH + DESIGN



CITY TECH SCHOOL OF TECHNOLOGY & DESIGN

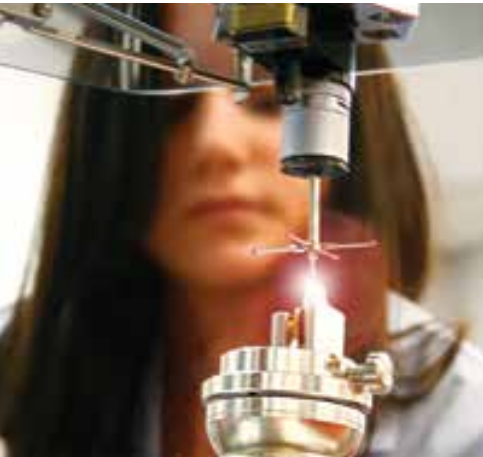
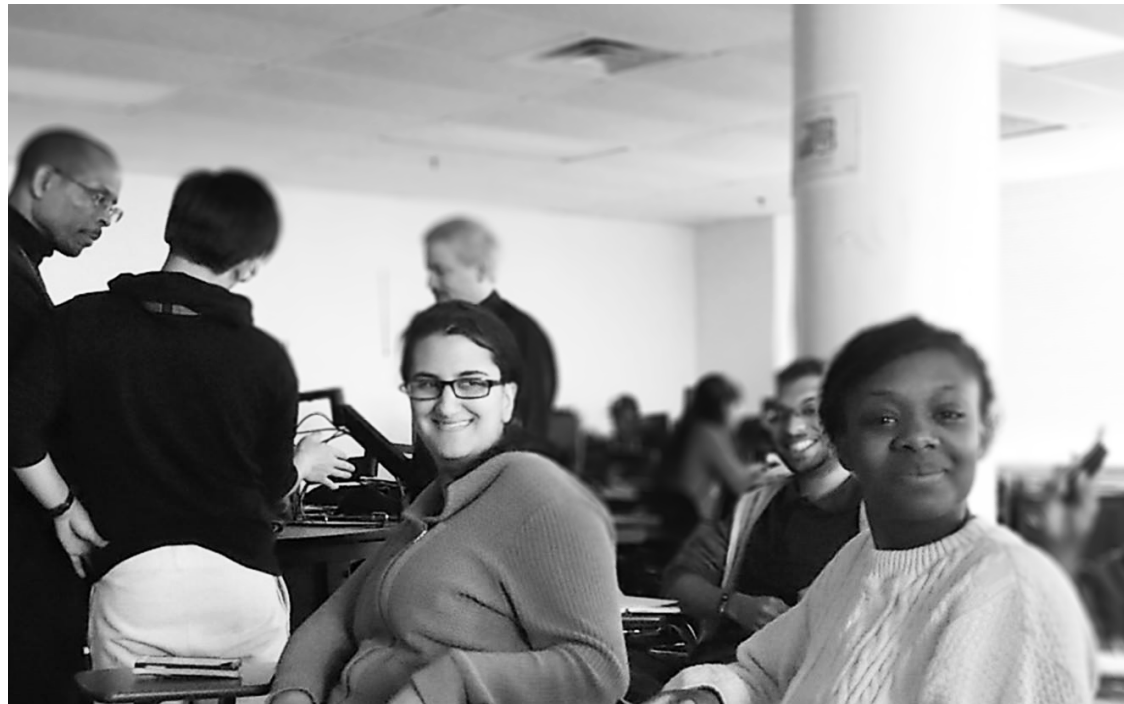
City Tech, in downtown Brooklyn, is the college of technology of The City University of New York (CUNY), and is the largest and most culturally diverse public college of technology in the Northeast. Founded in 1946 with 247 students, largely returning GIs, the College today enrolls 17,000 degree-seeking students in its baccalaureate and associate degree programs. In its role as the senior college of technology of The City University of New York (CUNY), the school offers the most accessible technological design education in the metro area.

Located at the foot of John Roebling's world famous Brooklyn Bridge, City Tech's School of Technology & Design offers programs in engineering, design and media technologies. These programs are application-driven, preparing students for communication, production and management positions in corporate, industrial and creative professions. Digital processing, modeling, planning and control are emphasized throughout the School. Fields of study include graphic communications, architecture, computer-aided design, live entertainment and interactive technology, information security and data management, optical and wireless telecommunications, robotics and automation, civil engineering and construction technologies, and environmental control systems.

What is most marked about the approach of the College is its blend of the theoretical and the hands-on; more space is dedicated to specialized laboratories than to general purpose classrooms. At City Tech students learn technology through design, and design through technology. From computer hardware and software to telecommunications networks and embedded information processors; from architectural and industrial design to construction and management of buildings, bridges and environmental systems; from graphic communications to entertainment and live performance: City Tech students develop technical mastery with design sensibility.



CITY TECH STUDENTS



CITY TECH STUDENT TEAM

CMCE | MECH ENG | ARCH TECH | COMP ENG | CHEM TECH | BIO SCIENCES
HOSPITALITY MGMT | ENTERTAINMENT TECH | GRAPHIC DESIGN | ENV SCIENCE

City Tech is known for its workplace oriented curriculum, leading edge technologies, student-focused environment, and for providing opportunities for students to engage in real-world community service projects, the DURA Solar Decathlon serves as a shining example of a hands-on, technology driven, real-world project.

In each of the last ten years, US News and World Report has listed City Tech as among the most ethnically diverse colleges of its type in the U.S. City Tech is one of the nation's top producers of underrepresented minority STEM (science, technology, engineering, mathematics) graduates at the associate degree level. Over 40% of the student population was born outside of the United States (138 countries represented) and over 60% report a language other than English spoken at home. City Tech ranks 6th nationally in the number of associate-level science and engineering degrees awarded to black students, 10th in degrees awarded to Asian/Pacific Island students, 17th in degrees offered to male students and 38th in degrees awarded to women.

The City Tech Solar Decathlon team reflects the vibrant ethnic diversity present within New York City and City Tech. The team of undergraduate students brings an international perspective to their work; the design team includes students from over 20 countries, including Nigeria, Ukraine, Dominican Republic, Mexico, China, Russia, India, Bangladesh, Cameroon, Puerto Rico, Poland, Jamaica, Antigua and Guyana. Students involved in the Solar Decathlon also come from a wide range of departments at City Tech including Construction Management & Civil Engineering Technology, Mechanical Engineering Technology, Electrical Engineering Technology, Chemical Technology, Biological Sciences, Architectural Technology, Hospitality Management, Entertainment Technology and Advertising Design & Graphic Arts.



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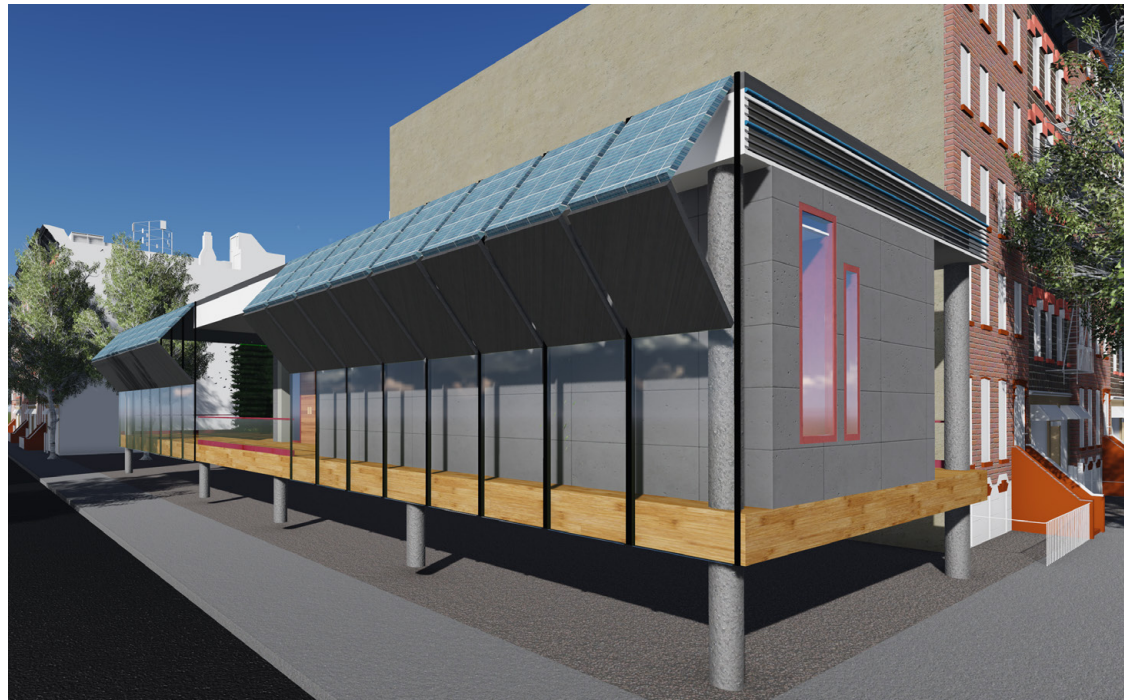


DURA HOME



DURAhome is a prototype for state-of-the-art urban housing that is affordable, comfortable, and energy efficient. This collaborative project is interdisciplinary, fostering research-based scholarship that benefits both faculty and students at the College.

Most importantly, the project aims to contribute to building industry practices and to public discussion, with innovations that will emerge from the process. It will provide a replicable national model for energy-efficient construction in urban settings.



DURA

An **urban** approach to **resilient**, energy-efficient housing that **adapts** to the needs of a **diverse** city and its people.

DIVERSE

DURA is a product of the vibrant ethnic diversity of New York City, and City Tech, where a diverse team is working on design solutions to meet its needs. In each of the last ten years, US News and World Report has listed City Tech as among the most ethnically diverse colleges of its type in the U.S. The City Tech team reflects that diversity.

URBAN

DURA is suitable for construction at the heart of the URBAN environment. Heightened living densities and high consumption rates are often seen as factors inhibiting sustainable practices. DURA challenges conventional methods of a post industrial society to meet the evolving path of urban living, developing sustainable approaches for the future.

RESILIENT

Sandy devastated many communities throughout New York City; DURA is designed to respond to an environment rife with climactic change and aims to mitigate disaster damage. Proximity to the flood plain and the rising sea levels of the Atlantic Ocean increases the need for proactive resilient design in response to the threats of flood water, gale force winds, and seismic activity

ADAPTABLE

DURA is adaptable in usage and location. Its modularity is designed for aggregation, stackability and an ability to transform for various lots throughout the urban environment. Floor plans are open with design flexibility, so as to appeal to diverse populations and adapt to a wide range of needs.

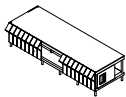


DURA HOME

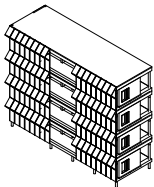


MODULAR WOOD HOUSING

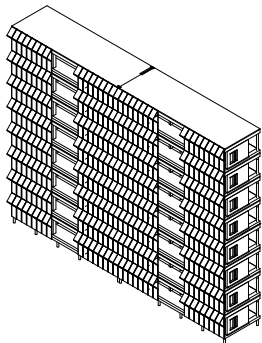
DURA's modularity is designed for aggregation, stackability and an ability to transform for various lots throughout the urban environment. Drawing from new developments in wood technology, the team is creating a system for modular housing that transform the face of urban multi-family building strategies.



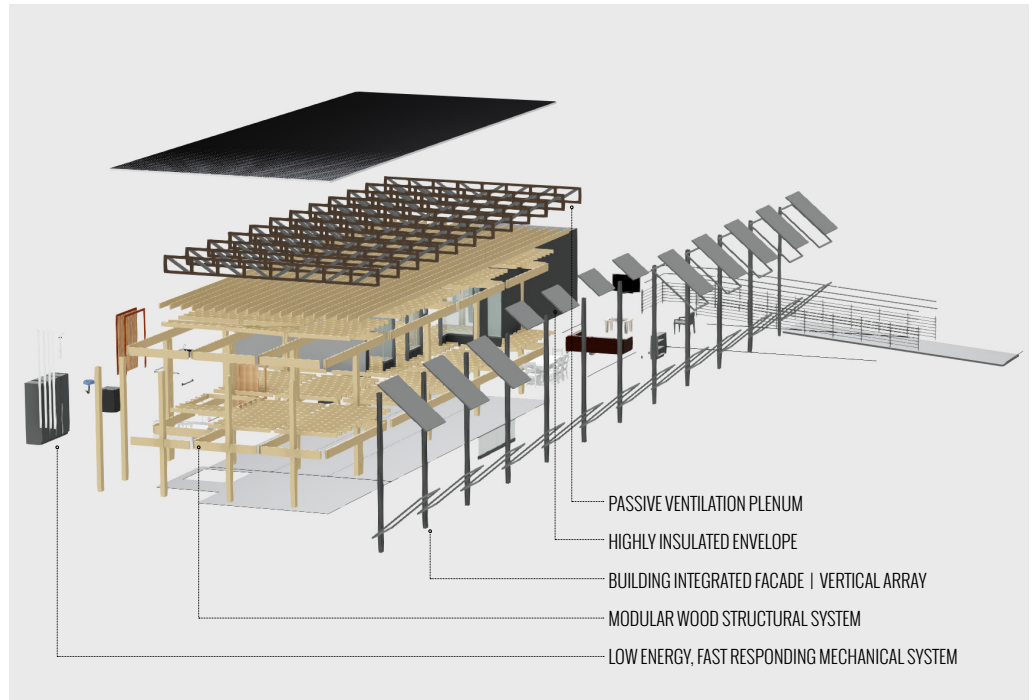
SINGLE FAMILY



4-PLEX



TOWER



DURA

An urban solution to energy-efficient housing developed through a multi-pronged approach: a hybrid of passive and active systems that can adapt to various urban configurations.

Combining elements of passive ventilation with Passive House building principles results in highly-efficient house with reduced cooling loads in the summer and reduced heating loads in the winter.

24 X 50 : A slender plan allows the plan to fit within most New York City lots.

R50 + ERV = 6.5 : An optimized envelope and form and an efficient mechanical system allows the building integrated 6.5kW PV array to provide all power.

PLENUM : A plenum between the exterior envelope and the roof, detailed with louvers aligned with prevailing winds, optimizes passive ventilation, thereby reducing cooling loads. In the winter, this air barrier functions as an additional layer of insulation.

SEASONAL TRACKING SOLAR SHUTTERS : Panel orientation that is seasonally optimized allows for higher efficiency than traditional single-angle installations.

BUILDING INTEGRATED FACADE : An urban appropriate construction system includes prefabricated and off-site strategies.

DWELLER RESPONSIVE : Manual individualized operation responds to the urban dweller and can adjust according to a wide variety of lifestyles.

ADAPTABLE TO VARIOUS FACADES : A section in the air grille allows for customization, expression and variability in the size and geometry for the installed building. The system also includes the ability to retrofit to existing building stock, incorporate unit planters into the supports and optimize the facade for specific sites.



HOW TO SUPPORT



Event Highlights:

More than 2 billion total media impressions

Media Highlights:

Online – more than 1,750 online articles

Print – 350 articles in nearly 150 print publications around the world

Broadcast – 200 television interviews worldwide and 150 radio interviews

Onsite – hundreds of media checked in onsite to cover the event: 67,000 visitors

Digital Highlights:

Website – More than 3 million page views

Facebook – More than 13,500 fans

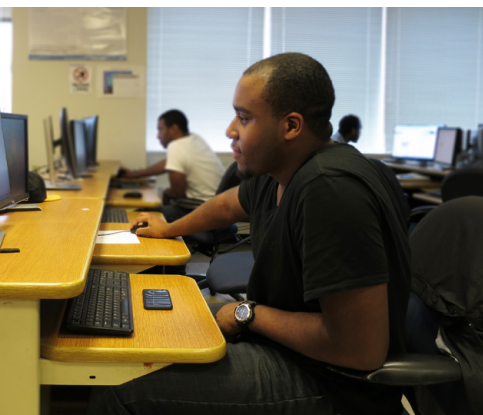
Twitter – More than 11,600 followers and

1,600 uses of the #SD2013 hashtag during the competition

YouTube – 319,000 video views

Flickr – 2.4 million overall image views, with 760 photos uploaded from Solar Decathlon '13

Other – Instagram, Google+, Foursquare, QR codes, and mobile site



BROOKLYN BRIDGE

\$100,000+

Naming rights to a room in the final DURAhome Opportunities for product giveaway at the competition
Leader logo on website, t-shirt and event materials
Title sponsor

MANHATTAN BRIDGE

\$75,000 - \$99,000

Personal recognition plaque
Physical model of DURAhome
Large logo on website, t-shirt and event materials

WILLIAMSBURG BRIDGE

\$50,000 - \$74,000

Name engraved on a panel in our house
Framed floor plans of DURAhome
Use of DURAhome for one additional event

VERRAZANO-NARROWS BRIDGE

\$25,000 - \$49,000

Walk through/tour/quick pass at the competition
Updates on our progress and walk-through access to our working site at the Brooklyn Navy Yard
Company logo on transport trucks

QUEENSBOROUGH BRIDGE

\$10,000 - \$24,000

DURAhome poster
Invitation to our kickoff party

BRONX-WHITESTONE BRIDGE

\$5,000 - \$9,000

Storyboard booklet describing DURAhome
Company logo on DURA t-shirt worn at competition

GEORGE WASHINGTON BRIDGE

\$1,000 - \$4,900

Company name, logo and link to company website on durahome.org
DURA t-shirt

THROGS NECK BRIDGE

\$500 - \$999

Company logo on durahome.org and at competition

KOSCIUZO BRIDGE

\$5 - \$499

Listing on our DURA website and at competition

All donations will be received by the New York City College of Technology Foundation, an IRS-designated 501 (c)(3) entity.
All levels include benefits of tiers below.





Thank you for your
consideration of support.

Team**DURA**



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