DESIGN + CONSTRUCTION EXCELLENCE

Sustainable New York

IMPLEMENTING SUSTAINABLE DESIGN IN THE CITY'S PUBLIC WORKS

2007
Queens Botanical Garden
BKSK Architects
The 15,000-square-foot Visitor and Administration Center at the Queens Botanical Garden embraces sustainability by combining numerous significant green elements into the building's design. These traits include a graywater system, a geothermal heating and cooling system, photovoltaic panels, a cleansing biotope for stormwater, and a publicly accessible green roof. The building is certified LEED Platinum, the highest rating from the U.S. Green Building Council.

Sustainable New York

Dear Friends:

Since its creation in 1996, the New York City Department of Design and Construction (DDC) has been a leader in designing and constructing environmentally responsible public works, creating a capital construction program that is at the forefront of sustainable design.

In 2004, DDC launched the Design + Construction Excellence (D+CE) initiative, a multi-agency effort to improve design by adopting new procurement methods to emphasize quality in the selection process. Sustainable design is an integral part of the program, which encourages City agencies to pursue green practices in all their public works projects. The results of D+CE and the Department's efforts to promote greater environmental responsibility in building design are highlighted on the following pages of this report.

Three years later, our Administration created PlaNYC, a comprehensive plan to create a sustainable future for our City. As we continue to work toward our vision of a greener, greater New York, public projects play an important role in helping the City reduce its carbon footprint. Given that buildings account for more than 80 percent of all municipal greenhouse gas emissions, constructing buildings with energy-efficient features is essential to reducing those emissions, and DDC plays a critically important role in that work.

Every day, DDC demonstrates that sustainable building practices are not only environmentally responsible but also make for excellence in design. If you would like more information on our public works projects, please call 311 or visit www.nyc.gov.

Sincerely,

Michael R. Bloomberg
Mayor

David J. Burney, FAIA
Commissioner

Contents

Sustainable Strategies Symbol Guide

The projects shown on the following pages detail many of the sustainable strategies promoted through PlaNYC as well as through the Department of Design and Construction's own green initiatives. Each project page contains icons—defined below—that note which sustainable categories DDC feels are most strongly represented by the project. Additional icons are placed on the appropriate project pages to signify the sustainable law or policy for which the program qualifies.

Sustainable Site
Many DDC project sites are designed to maximize trees, vegetation, and landscape features that cool the City, control stormwater, cleanse the air, and give people a sense of well-being. Water-efficient landscaping is incorporated to conserve potable water, and native species are planted to promote biological diversity. In addition, paved areas and roofs are constructed of light-colored and reflective materials to minimize heat gain in summer, and environmentally preferable landscaping materials are specified. During construction, site disturbance is minimized in order to protect existing trees and vegetation and to prevent erosion.

Water Efficiency
DDC projects reduce water consumption through the careful selection of low-flow fixtures and by planting native or adaptive plant species requiring minimal irrigation. Projects are also able to conserve water by installing water-recycling systems that enable water draining from sinks, showers, and dishwashers to be treated and reused to flush toilets. In addition, stormwater is used for irrigation andother facility needs, simultaneously conserving water and diverting stormwater from flowing directly into the City's overburdened combined sewers. Maximizing permeable surfaces on-site can also help the combined sewer overload.

Energy Efficiency
The DDC's sustainable projects implement strategies that decrease energy consumption through improved efficiencies, support on-site generation of energy from renewable resources, and promote the use of carbon-free electricity from the grid. On most projects, lower lighting power densities decrease electricity use, especially when paired with occupancy and daylight sensors that automatically turn off unnecessary lights. Features such as well-insulated building exteriors, high-efficiency heating and cooling equipment, and ground-source geothermal heat pumps all reduce the energy required to condition a building's air. Many projects also benefit from a citywide renewable energy credit purchase, and some incorporate photovoltaics for on-site generation of electricity.

Materials and Resources
To minimize the environmental impact of materials demands, DDC adapts existing structures and requires more sustainable construction materials on all of our projects. We promote the use of recycled and rapidly renewable content in concrete, insulation, carpet and other materials, and enforce low-toxicity standards. When disposing of materials, a construction and demolition (C&D) waste management plan is required—typically diverting anywhere from 50 to 80% of waste from entering landfills. This is especially significant in New York City, where waste from C&D sites comprises more than 60% of the municipal solid waste stream.

Healthy Interiors
Since most people spend the majority of their time indoors, DDC strives to create healthy interiors. Protecting ventilation systems during construction and flushing out the building before occupancy ensure fresh and clean air for occupants to breathe. Placing walk-off mats at entrances prevents particles and allergens from entering the building from the street. Safer paints, coatings, adhesives, sealants, carpeting, and agrifiber products are required on all projects. Daylighting, views to outdoors, and air-quality controls are other strategies that increase comfort and encourage productivity.

SYMBOL GUIDE

- SUSTAINABLE SITE
- WATER EFFICIENCY
- ENERGY EFFICIENCY
- MATERIALS & RESOURCES
- HEALTHY INTERIORS

- PLANYC INITIATIVES
- LOCAL LAW 86
- LEED PLATINUM
- LEED GOLD
- LEED SILVER

Sustainable Highlights

The measurement of costs and benefits is crucial to the success of DDC's sustainable design and construction program. Though qualitative benefits, such as occupant health, happiness and well-being, cannot be easily assigned a value, many other important benefits can be clearly and accurately expressed numerically, such as energy cost savings, water-use reduction and waste diversion. Metrics are used at all stages of our projects to determine which proposed sustainable features generate the most environmental rewards and whether they are cost-effective to implement. Over the last decade, our project metrics have demonstrated that a sustainable design philosophy yields tangible results, which have given it legitimacy and helped establish the basis for a broader initiative within the City.

The percentages below highlight the sustainable achievements of DDC projects. In the case of energy and water, calculations were made by comparing the proposed building design with that of a baseline building designed to meet the minimum code requirements in effect at the time of design. Energy- and water-consumption reductions vary due to weather conditions, final construction details and building use and occupancy.

95%

Bronx County Hall of Justice
Reaches 95% of the occupied interior spaces.

100%

DHS Family Center
100% of employees have access to lighting controls for individual and shared spaces.

41%

New York Hall of Science
The new exhibition wing uses 41% less energy than the New York State Energy Conservation Construction Code minimum.

30%

Staten Island Animal Care Center
The building is expected to save 30% in energy costs compared with the ASHRAE 90.1 standard building design.

28%

121 Police Precinct Station House
The building is expected to save 28% in energy costs compared with the standard industry measurements.

70%

Bronx Zoo Lion House
The building is expected to save 70% in energy costs with mechanical features such as a geothermal system, fuel cells, and high-tech, adjustable skylights.

50%

Glen Oaks Library
The project expects to achieve a 50% reduction in energy costs through radiant heating and cooling measures and bringing daylight into every room, including below-grade interior space.

33%

Office of Emergency Management
The building uses 33% less potable water than industry standard, saving 137,800 gallons of water per year.

50%

Staten Island Zoo Reptile House
The Reptile House recycled 50% of its construction and demolition waste.

90%

Weeksville Heritage Center
90% of the occupied interior spaces have views to the outside.

99%

Brooklyn Children's Museum
The project incorporated 99% of the existing building's structure into the new building design.

78%

Kensington Branch Library
Daylight is designed to reach 78% of the occupied interior spaces through skylights in a central atrium and the north-facing curtain wall.

100%

Queens Botanical Garden
All storm water runoff is cleansed and retained, reducing overload on the city's combined sewer system.

65%

Sunrise Yard
The building is expected to save 65% in energy costs compared with the ASHRAE 90.1 standard building design as a result of high-efficiency lighting and HVAC systems.

48%

Remsen Yard
The building is projected to reduce potable water use for vehicle yard operations by 48%, approximately 1 million gallons per year, through on-site rainwater harvesting.

Sustainable Strategies

Sustainable Sites

Madison Avenue, Manhattan
The trenchless water main relining on Madison Avenue avoided large, open trench cuts and helped ease traffic through the site.

Minimizing Site Disturbances
Minimizing site disturbances during construction to protect valuable trees, vegetation, and soil is a critical aspect of sustainable site design. Soils and plants are valuable resources that can be destroyed if root, limb, and trunk systems are disrupted. Unnecessary destruction is costly in many ways: It eliminates valuable soils, increases erosion, harms the surrounding vegetation, and can ultimately increase project costs due to the high cost of tree and plant replacement and the importation of new soil. These negative effects can be avoided by ensuring the clear delineation of the construction site and staging areas, providing compensatory watering and fertilization, utilizing proper felling techniques, installing erosion-control fabric, and procuring the services of a professional arborist.

Site Materials
Plants and natural materials are standard sustainable-site and landscape-design elements. But a wide range of products can be used to establish and maintain natural site features and increase the site's sustainability. Light-colored materials for parking, walkways, plazas, and other hardscape surfaces reflect heat, helping mitigate the Urban Heat Island (UHI) effect and make outdoor areas more pleasant. This is an important consideration for the DDC, especially for properties with outdoor public areas or on-site parking. Additionally, permeable pavements, such as those at Sunrise Yard, in Queens, not only contribute a cooling effect by releasing trapped moisture but also reduce stormwater runoff.

Strategies that incorporate sustainable-site and landscape materials are used by the DDC whenever possible. For example, walkways and plazas can salvage suitable materials from site demolition, as well as incorporate glass and other recycled materials in pavers. The selection of these resources is driven by aesthetics, intensity and frequency of use, site gradation, cost and maintenance. In addition, planting beds in traffic medians, such as the new traffic medians on Houston Street in Manhattan, and other green areas can use recycled compost, native vegetation, and mulch as well as recycled plastics in irrigation systems. PlaNYC, with a focus on creating more open green space for all New Yorkers, presents a prime opportunity to source eco-friendly materials in New York City's public spaces.

Bluebelt Wetlands, Staten Island
Stormwater management strategies, such as the City's Best Management Practices program on Staten Island, use natural resources to cleanse, store, and channel stormwater without negatively impacting the surrounding environment.

On-Site Water Management
Plazas, parking lots, roadways, parkland and building sites must use techniques to manage variable rainfall amounts so that stormwater does not damage the vegetation, soils, streets and adjacent properties or overload the City's combined sewer system. Different strategies can be employed to mitigate the negative effects of excess stormwater, including the use of porous concrete, asphalt and pavers. These materials allow stormwater to be absorbed by the site, thereby limiting potentially damaging runoff to surrounding areas. Other effective techniques include the use of planters, sound irrigation practices, underground detention tanks, bioswales, water-efficient landscaping and planting native vegetation. Green roofs—which use soil, plant roots, and foliage to retain water—can hold up to 1.5 inches of stormwater—which additionally limiting runoff entering the storm sewer system.

Stormwater Management
PlaNYC strives to preserve the City's natural wetland areas, such as Staten Island's Bluebelt area. To support this, the DDC is actively engaged in the Best Management Practices (BMPs) program. BMPs preserve the City's wetlands by alleviating the negative effects of stormwater. They take advantage of natural drainage systems to direct stormwater into controlled collection pools and streams using structures designed to preserve wildlife and moderate flooding. The extensive environmental work involved in BMPs includes construction of stilling basins to slow stormwater flow, micro-pools for the collection of solids, holding ponds to aid in the settlement of suspended particles, culvert replacements, and the reconstruction and stabilization of streams and environmental landscaping.

Urban Heat Island Effect
Many of the same strategies the City employs to manage stormwater, such as maximizing vegetation and using porous surfaces, can also be applied to reduce the Urban Heat Island (UHI) effect. UHI is the term used to describe the increased air temperatures in urban areas compared to those in surrounding rural areas. This temperature increase can be attributed to dark roofs and paved surfaces, as well as to a dearth of vegetation. Planting vegetation, especially trees, is a key remedial approach for site and landscape architects seeking to minimize the UHI effect. Other include utilizing light-colored surfaces, such as cool roofs, and light-colored pavement.

Fort Hamilton Parkway, Brooklyn
Trenchless technologies, such as this micro-tunneling project in Brooklyn, minimize site disturbances and reduce the amount of construction waste on-site.

Trenchless Technology
Many of the roadway, water, and sewer projects the City undertakes involve complicated excavation and the storage of heavy equipment on-site. This can impede normal traffic flow, contribute to an increase in noise levels, disrupt business and produce large amounts of materials and waste that must be removed from the site. One way to ease these effects is to use trenchless technologies, which encompass a system of procedures, devices and equipment dedicated to providing an alternative to open-cut trench excavation. These technologies can produce less debris, resulting in less waste and fewer removal vehicles—an outcome that assists PlaNYC's goal of reducing emissions. Noise levels are reduced due to less need for machinery. Traffic, usually slowed or detoured because of the size of the trench and the need to store excavated materials, maintains a steady flow. One such technology, micro-tunneling, involves creating small pits at the pipe insertion and receiving points and using a drill to simultaneously remove earth beneath the roadway and push the pipe through the void created by the drill.

Existing pipes can also be relined using the trenchless technologies. For a pipe relining project along Madison Avenue in Manhattan, more than 10,000 feet of cast-iron water main was recently rehabilitated by pulling a new high-density plastic lining through the existing pipes from a small pit on one end to a pit at the end of the work site, thereby avoiding open-cut excavation. This 10,000-foot-long water main relining project is the largest of its kind in the nation.

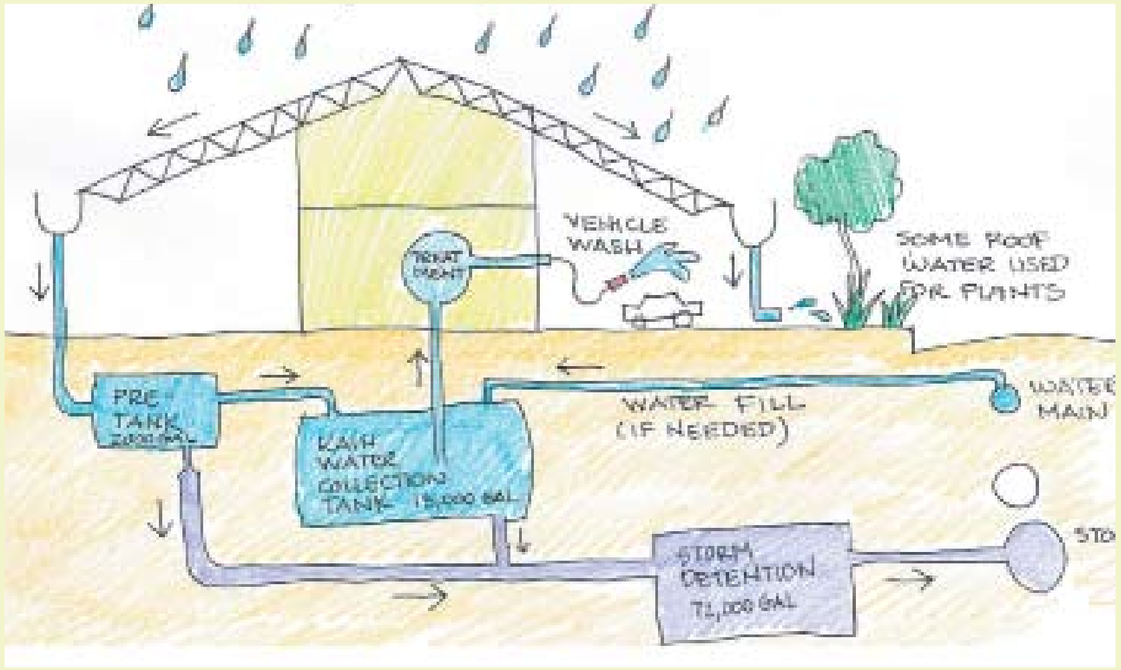
Energy Efficiency

Reducing energy consumption is the first step toward mitigating the negative impact of burning fossil fuels. Better equipment isvital to this process, and DDC's projects implement equipment technologies that range from high-efficiency boilers and ground-source geothermal heat pumps to well-designed lighting and ventilation systems capable of delivering the precise amount of necessary light and air. Careful orientation of a long, narrow building and well-considered positioning and shading of windows and clerestories allow buildings to use natural light and reduce their energy load, as demonstrated by the 121 Police Precinct station house, currently in construction on Staten Island, and the recently completed Sunrise Yard, in Queens. In addition, green and cool roofs contribute to a reduction in energy costs and reduce the temperature of the site.

Another solution is to generate energy domestically without burning fossil fuels. Nearly half of all energy consumed by New York City's buildings is electricity, and renewable technologies can help make a percentage of that demand carbon-free. In 2010, the Department of Environmental Protection's Remsen Yard, in Brooklyn, will be completed. There, photovoltaic panels, which double as skylights, generate electrical energy on-site during peak demand hours, offsetting energy drawn from the grid at the time New York City's power plants are the most strained, an energy-saving strategy outlined by PlaNYC. DDC projects also benefit from a city wind-power purchase, offsetting anywhere from 35% to all of their electrical demand for at least two years. Not only do these initiatives help to support and implement PlaNYC they are also crucial in developing renewable technologies with lower carbon emissions and strengthening the City's energy infrastructure.

On most projects, DDC engages a commissioning professional to review the design for energy efficiency, assess the construction for compliance with design intent and instruct building operators to understand and use systems and controls. Sustainable benefits yielded by the commissioning process include reductions in errors, omissions and change orders during the design and installation process. It also ensures that building systems are operating at their maximum efficiency levels, reducing energy consumption and costs. The expenses incurred by commissioning are typically recouped in operational savings within two years.

Solar II Green Energy Arts and Education Center, Manhattan
The Center will use vine screens to shield the building from solar heat. Photovoltaic cells on the roof will provide a portion of the building's electrical power.



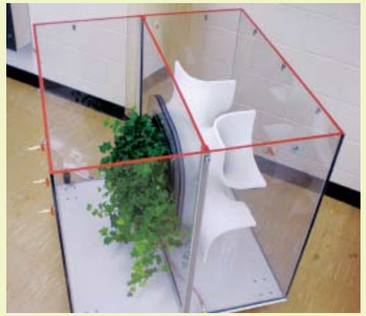
Water Efficiency

Remsen Yard, Brooklyn
The Remsen Yard maintenance facility, above, collects and stores stormwater on-site, thereby greatly reducing the amount of potable water used for vehicle maintenance and site irrigation.

Maintaining the functionality of our water infrastructure and mitigating its adverse environmental impact is a PlaNYC priority. Working with other agencies, DDC has piloted and implemented a number of aggressive water-conservation and stormwater management strategies toward this end. Most DDC building projects implement low-flow, high-efficiency fixtures and building systems, typically achieving potable-water reduction rates of 25–35%. We also examine rainwater management on our projects and when possible develop innovative recycling schemes that, in combination with traditional conservation methods, can reduce both potable-water consumption and wastewater flow by nearly 65%.

In addition to the continual upgrades it performs on the City's network of water distribution mains and sewers, DDC works with the Department of Parks and Recreation and the Department of Transportation to install landscape-based water-management features, such as swales, which capture and filter stormwater, and permeable paving, which allows stormwater to be absorbed. As an example, upon completion, the East Houston Street project will feature a widened, planted median and two large blocks where surface water is directed into rain gardens, slowing flow into combined sewers, promoting infiltration, and supporting beds of native, drought-tolerant plants. Similarly, Bryan Park, in the Bronx, will include rain gardens and permeable pavers to allow water to be absorbed on-site. Whenever possible, DDC maximizes tree planting and vegetation, deploying enhanced and continuous tree pits for tree health and storm water absorption.

By 2030, the City's population is projected to grow by 14% over the 2000 population, increasing demand and straining current system capacity. Along with the large-scale process of expanding the water system, simpler, more sustainable measures must also be taken in order to conserve water. DDC's projects typically conserve water through the careful selection of low-flow fixtures and by planting native or adaptive plant species that require minimal irrigation—at little to no cost impact. The Queens Botanical Garden Visitor & Administration Center, in Flushing, installed innovative water-recycling systems that help reduce consumption at the facility by approximately 110,000 gallons per year and prevent nearly 70,000 gallons of wastewater from entering the sewer system annually.



Materials and Resources

The use of raw materials and other resources in our built environment has a lasting impact that extends far beyond the walls of buildings and the curbs of the City's streets. Climate-disrupting greenhouse gases and other harmful emissions are directly and indirectly generated by raw extraction, production, transport, and disposal of materials across the globe. Impacts felt at the local level includes deforestation, water contamination, and soil degradation.

DDC's careful selection and use of materials—such as concrete, fireproofing, insulation, gypsum board, carpets, and a variety of interior finishes and furnishings—can mitigate many adverse environmental effects. Using locally extracted and manufactured products and materials; incorporating materials generated by local salvage operations and recyclers; and creative reusing materials existing on-site can also greatly reduce energy use and harmful emissions associated with transporting construction materials while saving money. Responsible material and waste management also lessens burden on landfills, and DDC projects are required to implement a construction and demolition (C&D) waste-recycling plan as detailed in the specifications and the DDC C&D Waste Manual.

DDC is also using more sustainable materials on our roadway reconstruction projects. The materials specified in DDC infrastructure projects are used across 20,000 paved lane miles, or approximately 1.2 billion square feet, guaranteeing that improvements to our specifications yield immediate and far-reaching benefits citywide.

Recycled Roadway Materials
The use of recycled or reclaimed materials on roadway reconstruction reduces pressure on landfills and in many cases can offer significant cost savings when the materials are sourced locally.

Healthy Interiors

Healthy interior spaces can improve worker productivity, increase children's learning ability, and contribute to occupant health and well-being. Developing healthy interiors can be challenging for the City and its wide variety of building types. For example, correctional facilities, firehouses and police precincts are in operation around the clock, heightening the need for a healthy workplace. Children, in particular, are sensitive to environmental factors. Two of the DDC's earliest projects—the Administration for Children's Services Bellevue Center and the Williamsburg Day Care Center—feature materials carefully chosen for their extremely low potential to expose occupants to harmful toxins. At ACS, located in a congested Manhattan neighborhood, DDC took the simple measure of locating the air-intake units on the roof rather than at street level, minimizing the possibility of automobile exhaust and other pollutants entering the building.

These pilot projects led to the development of a complete set of standard specifications for low-toxicity building materials covering a range of products from adhesives to polyurethanes and varnishes. Most projects are also required to ensure that composite woods contain no urea-formaldehyde, and to certify that building air-delivery systems have been protected from dust during construction. In addition, upgraded ventilation, filtration, and carefully controlled building systems are common in DDC projects. Daylighting, a simple and efficient strategy for creating healthy interiors, has also continued to be an important design element for energy conservation.

Public Safety Answering Center II, the Bronx
The CASE Active Phytoremediation Wall will cleanse the interior air through evapotranspiration, a natural plant process that also helps lower interior temperatures.

Sustainable Policies

PlaNYC

PlaNYC 2030
PlaNYC implements environmental changes that have long-term benefits for our economy, our environment, and our quality of life.

In December 2006, Mayor Bloomberg presented New Yorkers with a plan to create a more sustainable future for the City. Focusing on the five dimensions of the City's environment—land, air, water, energy, and transportation—this set of initiatives, called PlaNYC 2030, will contribute to a targeted 30% reduction in global warming emissions over the next two decades and help to ensure a higher quality of life for generations of New Yorkers.

Land
Creating natural, open spaces is a priority of PlaNYC, and the program outlines ways to ensure that all New Yorkers live within a ten-minute walk of a park. DDC and the Department of Transportation are currently working on a public plaza program that will create new sustainable plazas and more open, green space in all five boroughs.

Water
PlaNYC seeks to preserve and protect our water infrastructure and the City's natural water resources. DDC and the Department of Environmental Protection have developed the Best Management Practices program, which uses sustainable environmental elements, including stilling pools and bioswales, to manage stormwater. BMPs keep wetlands healthy by preventing unwanted erosion and by diverting stormwater back into the environment, thereby reducing the amount of stormwater entering the City's sewer system.

Transportation
PlaNYC seeks to shorten travel times by improving our transit network and reducing gridlock through better road management. DDC seeks to improve the sustainable aspects of roadway reconstruction by implementing strategies that create less construction waste, mitigate noise and air pollution due to debris removal and vehicle exhaust, and improve traffic flow by reducing the need for large-scale open trench cuts.

Energy
New Yorkers face escalating energy costs coupled with an aging energy infrastructure straining to meet the demands of a growing population. Energy-efficiency measures—such as geothermal heating and cooling at the Brooklyn Children's Museum, carbon-dioxide sensors at the Office of Emergency Management headquarters in Brooklyn, and the use of photovoltaic cells in repairing of Manhattan's City Hall are all strategies that have been proven to cut energy costs, a prime PlaNYC goal.

Air
PlaNYC targets air-pollution sources that can be controlled, such as reducing transportation emissions and eradicating emissions from buildings and power plants. Natural solutions, such as planting one million trees, will also help bridge the gap between the reality of the current situation and the goal of becoming the city with the cleanest air. Strategies that minimize the need for construction waste removal from DDC sites mean fewer trucks are needed, resulting in a reduction in exhaust emissions. Indoor air quality is equally important, and cutting-edge strategies such as the CASE Active Phytoremediation wall planned for the Public Safety Answering Center in Queens are natural ways to ensure that building occupants receive fresh air.

Climate Change
The need to address climate change underlies every PlaNYC initiative. Each strategy—from reducing the number of cars to building cleaner, more efficient power plants—will contribute to achieving the 30% emissions reduction target. DDC's experience with sustainable design and construction positions us to be leaders in this initiative, developing and implementing relevant, cost-efficient, and technologically advanced strategies that help to guarantee the overall success of PlaNYC.

Kew Gardens Hills Library, Queens
The library will include a green roof, which can contribute to a reduction in surface temperatures, thereby keeping the City cooler and reducing greenhouse gas emissions.

LEED
LEED Green Building Certification System

LOCAL LAW 86
Local Law 86

Staten Island Animal Care Center
The building's exterior is almost 100% recyclable and allows light to penetrate nearly all occupied areas of the Center. These sustainable features will help the building achieve its targeted LEED Silver rating.

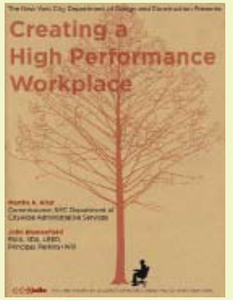
LEED Green Building Certification System
LEED (Leadership in Energy and Environmental Design) is an internationally recognized green building certification system providing third-party verification that a building or community was designed and built using strategies aimed at improving environmental performance.

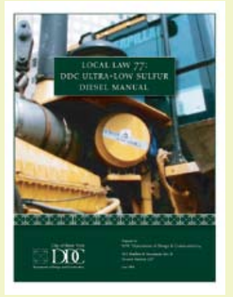
Developed by the U.S. Green Building Council (USGBC), LEED provides a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. Buildings receive a LEED rating by the USGBC if their designs score sufficient points in five performance categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. The number of points the project earns determines the LEED rating level, with LEED Platinum being the highest level, followed by LEED Gold, LEED Silver, and LEED Certified. Currently, DDC has four LEED-rated projects, with 50 additional projects seeking a LEED rating.

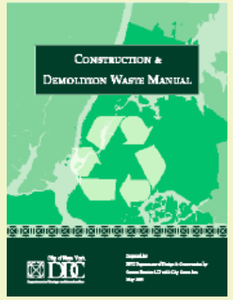
Many of the sustainable design and construction strategies implemented by DDC's Office of Sustainable Design are comparable to LEED benefits and focus on site sustainability, healthy interiors, energy and water efficiency, and materials and resources. Currently, New York City municipal buildings have over five million square feet of space that implement many of the LEED guidelines.

Local Law 86
In accordance with New York City Local Law 86, which took effect in January 2007, most New York City capital construction projects must meet LEED green building guidelines for a Silver rating. Similarly, new buildings and additions constructed by the City that cost more than $2 million must also be energy efficient according to the LEED green building guidelines. Since New York City owns approximately 1,300 buildings and leases more than 12.8 million square feet of office space, the law will help reduce the City's electricity consumption, air pollution, and water usage, while also promoting healthy interior spaces and worker productivity. Due to the size of New York City's capital construction plan, this legislation will likely affect more than $12 billion in construction costs over the next ten years.

Sustainable Education







Continuing Education
DDC publishes materials annually to educate consultants, contractors, other city agencies, and the public about sustainable design and construction strategies. In addition, DDC presents a monthly education series focusing on architecture, design, engineering and sustainable best practices.

DDC Talks
DDC Talks is a popular monthly educational lecture series that highlights projects, issues, challenges and emerging technologies facing architects, engineers and other design and construction professionals. By presenting current and recently completed capital construction projects and providing a forum for forward-thinking ideas and practices, this program elevates the level of discourse on issues affecting the design and construction industries. Recent topics have included: construction technology, sustainable design, site safety, research, materials, client management, design process, adaptive reuse of buildings, open space, and forensic structural engineering.

DDC encourages its architectural, engineering and project-management staff to attend these lectures. This program is also open to the public on a limited basis and is promoted on the American Institute of Architects' Web site each month. Participants can earn continuing education unit hours for attending the lecture.

Sustainable Design Manuals
As a leader in design and construction practices, DDC believes the hallmarks of a successful sustainable public works program are research, implementation and evaluation. As such, we regularly issue guidelines that detail efficient sustainable solutions in order to assist the designers and project managers working on City projects. The following manuals can be downloaded at www.nyc.gov/ddc.

Sustainable Urban Site Design Manual
Cool and Green Roofing Manual
Geothermal Heat Pump Manual
Construction and Demolition Waste Manual
Quality, Energy Efficient Lighting Manual
Local Law 77 Ultra-Low Sulfur Diesel Manual
High Performance Building Guidelines
High Performance Infrastructure Guidelines

Sustainable Projects: 2001–2013

The air-intake units are located on the roof of the ACS Children's Center to reduce the amount of car exhaust drawn into the building.

Light shelves and windows in interior doors spread daylight deep into interior spaces and decrease the need for electrical lighting.

From reusing an existing building to carefully selecting recycled and rapidly renewable plant-based interior finishes, the design of the ACS Children's Center focused on efficient material use.

2001
ACS Children's Center, Manhattan
Dattner Architects

The Administration for Children's Services (ACS) Children's Center is located in a landmarked 1912 building in the Bellevue Hospital complex. For ACS, the City created a safe and sustainable space for children entering the foster care system or temporarily without a home. The design incorporates features of the historic building, such as high ceilings, expansive windows and shallow floor plates, allowing an abundance of natural light to enter for a welcoming and energy-saving environment. Natural materials used throughout the project change the institutional feel of the atmosphere and emphasize healthy indoor air quality.

PlaNYC ENERGY: *The Center's glycol heat-recovery system, variable-air-volume ventilation system and carbon-dioxide sensors in irregularly occupied spaces ensure that the HVAC system uses only the energy necessary to keep the building comfortable.*

2004
Williamsburg Child Care Center, Brooklyn
Herbert Beckhard Frank Richlan & Associates

s m i

This 19,200-square-foot public child care facility accommodates children of a variety of ages. The three-story Center is largely devoted to classrooms but also includes administrative offices, facility support rooms, ground-level and rooftop play areas and a kitchen.

With children's well-being foremost, the design prioritizes a healthy indoor environment. Green materials were selected after a rigorous review of their potential to minimize the emission of toxins or volatile organic compounds. Natural light, introduced in several ways, conserves energy by reducing the use of electric lighting and enhances the quality of the learning environment. A glazed interior light well, toward the rear of the site, extends from the roof to the ground level. It introduces daylight to the inner core of the facility, which is walled-in at the rear and on both sides by neighboring buildings contructed to the lot lines.

PlaNYC CLIMATE CHANGE: *From the light-colored, highly reflective roofing to the perimeter planting with its structural soil, the Williamsburg Child Care Center is designed to mitigate the Urban Heat Island effect by reducing atmospheric temperature.*

The compact shape, light shelves, and a light well allow the center to make the most of natural light and reduce energy consumption.

At the Williamsburg Child Care Center, recycled materials can be found in the carpet, rubber flooring, ceiling panels, concrete, steel, walls, bathroom tiles and partitions, and furniture.

The bamboo millwork and linoleum flooring in the center are made of materials that grow back quickly, reducing the use of non-renewing resources.

Indoor air quality is improved by the walk-off mats at the entrances, low-emitting materials and finishes and separate ventilation for service areas.

2004
New York Hall of Science, Queens
Polshek Partnership Architects

s m e

The expansion and renovation of the New York Hall of Science increased and modernized exhibition, education and administrative spaces. Natural light is an important element of the new design, with a translucent fiberglass insulating-panel system used as an envelope for the walls and roof. This feature allows sunlight to enter the exhibition space and greatly decreases electrical energy requirements. Low-emissivity glass, additional insulation, temperature stratification in the exhibit hall and zone controls for the variable air volume system also limit energy use. These high-performance features were all incorporated at no additional cost.

PlaNYC ENERGY: *The use of daylighting, a translucent fiberglass building envelope and efficient HVAC equipment resulted in a 40% reduction in energy use for the project compared to industry standards.*

Occupant-controlled heating, lighting and cooling has resulted in a reduction in energy use and costs.

During the renovation, existing site paving was replaced with additional green space, helping to alleviate the negative impact of stormwater.

Extensive daylighting throughout the Hall of Science saves energy and promotes occupant health and well-being.

Low-emitting composite woods, paints, carpets and other materials limit exposure to indoor air contaminants.

The building's air-intake units are located near the roof, away from street-level pollutants. This contributes to a healthier interior environment for the occupants.

Daylight is maximized to 95% of the rooms throughout the Hall of Justice, including courtrooms.

2006
Bronx County Hall of Justice
Rafael Viñoly Architects

The Bronx County Hall of Justice houses 47 courtrooms, seven grand jury rooms as well as office and administration spaces, and provides underground parking for more than 200 vehicles. Energy conservation was accomplished throughout this 770,000-square-foot complex with the extensive use of daylighting; high-performance, low-emissivity glass; energy-efficient supplemental lighting; and heating and air-conditioning systems that incorporate displacement ventilation.

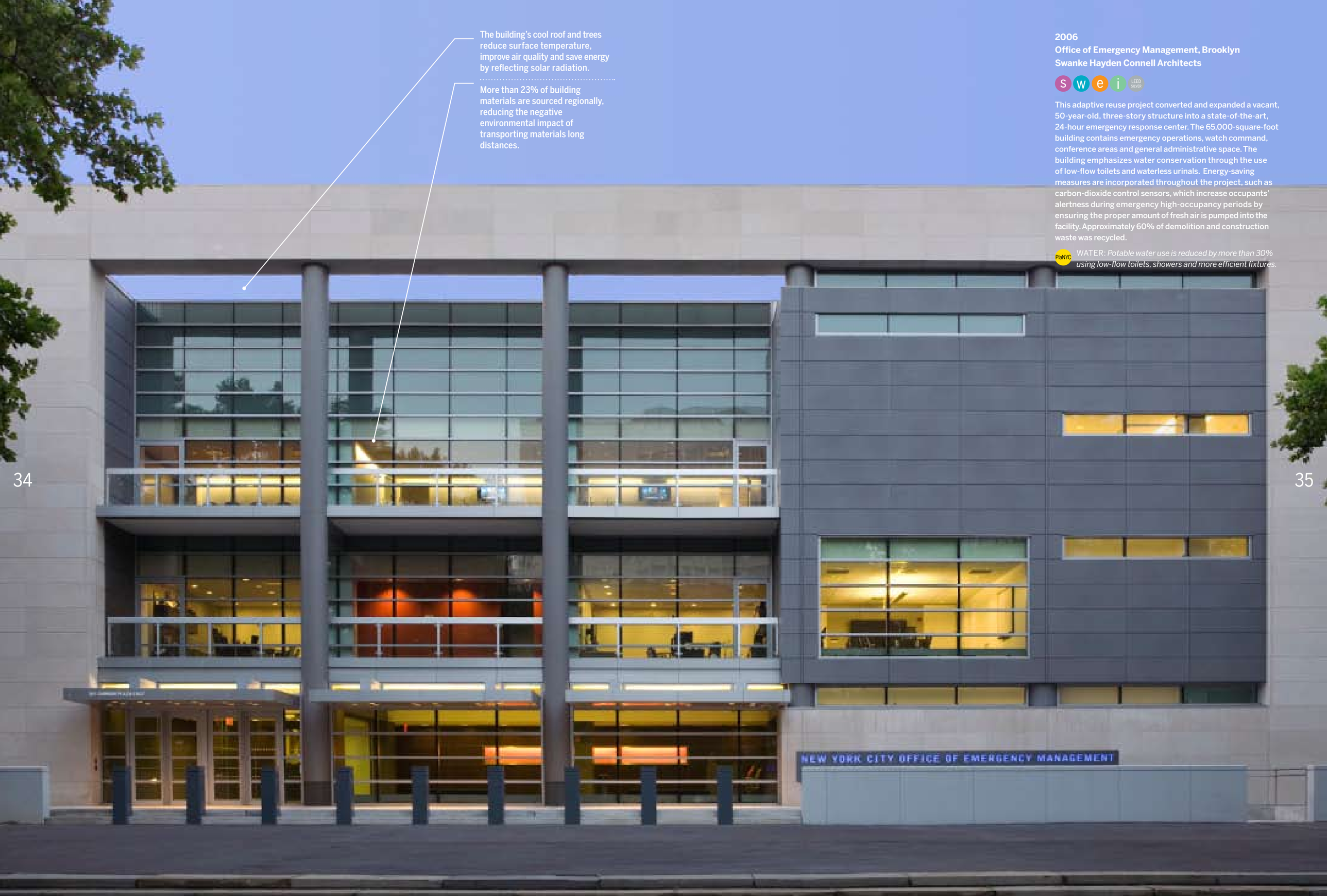
PlaNYC ENERGY, WATER, AIR: *The building's cool roof and on-site vegetation keep surface-temperature increases to a minimum, resulting in a reduction in energy costs as well as an improvement in on-site air quality.*

Carbon-dioxide control sensors optimize fresh air throughout the project.

Low-emitting composite woods, paint, carpet and other materials provide a healthy interior environment for occupants.

Non-tropical hardwoods are used in the building's courtroom woodwork and furniture.

BRONX COUNTY HALL OF JUSTICE



The building's cool roof and trees reduce surface temperature, improve air quality and save energy by reflecting solar radiation.

More than 23% of building materials are sourced regionally, reducing the negative environmental impact of transporting materials long distances.

2006

Office of Emergency Management, Brooklyn

Swanke Hayden Connell Architects

SWEI LEED SILVER

This adaptive reuse project converted and expanded a vacant, 50-year-old, three-story structure into a state-of-the-art, 24-hour emergency response center. The 65,000-square-foot building contains emergency operations, watch command, conference areas and general administrative space. The building emphasizes water conservation through the use of low-flow toilets and waterless urinals. Energy-saving measures are incorporated throughout the project, such as carbon-dioxide control sensors, which increase occupants' alertness during emergency high-occupancy periods by ensuring the proper amount of fresh air is pumped into the facility. Approximately 60% of demolition and construction waste was recycled.

PlaNYC WATER: *Potable water use is reduced by more than 30% using low-flow toilets, showers and more efficient fixtures.*

The use of Forest Stewardship Council (FSC)–certified wood products was required. The FSC encourages practices that lead to the responsible management of the world's forests.

Low-emitting composite woods, paints, carpets and other materials are used throughout the building to reduce indoor air contaminants.

Damage-protection zones prevented harm to trees and plantings during construction of the Reptile House. A professional arborist was consulted throughout construction.

The existing building is rehabilitated and adapted, conserving materials and reducing the project's demolition waste. Approximately 50% of the project's construction and demolition waste was recycled.

2007
Staten Island Zoo Reptile House
Gruzen Samton Architects
Curtis + Ginsberg Architects (exhibits)

The 16,000-square-foot Carl F. Kauffeld House of Reptiles, located in an expanded and renovated wing of the Staten Island Zoo, houses the zoo's renowned reptile collection.

The building is expected to save 20% beyond its energy baseline while meeting the heavy heat demand of its occupants. Measures such as zoned controls, envelope improvement, heat recovery, new burners for the existing boilers and premium-efficiency motors limit heating-related energy consumption, while radiant-heated artificial rocks, an energy-efficient alternative to previously installed heat lamps, are used extensively in the exhibit cages. New skylights and clerestories bring in daylight for the anaconda, aquatic and desert exhibits where the light and temperature variations are acceptable.

The building also supports public visitors and zoo keepers. Separate HVAC systems and controls serve the visitor areas. Electric lighting for viewers is subdued, utilizing light from the exhibits, skylights and clerestory. The zookeeper work areas are located along the exterior walls, taking advantage of the natural light and operable windows of the existing building. The predominant interior materials have recycled content, and the display casework is made of bamboo.

PlaNYC LAND: *The conservation of existing trees and vegetation and the rehabilitation of the site increased the amount of green space available to the public.*

Radiant-heated rocks conserve energy and provide a state-of-the-art animal habitat.

Interior finishes and display casework incorporate recycled and rapidly renewable materials.

Trees located around the Lion House site provide shade to more than 60% of the paved surfaces.

2008
Bronx Zoo Lion House
FXFOWLE Architects

The conversion of the 1903 Lion House at the Bronx Zoo into the spectacular 42,300-square-foot Madagascar exhibit entailed delicate preservation, contemporary exhibit design and viable habitat creation. The exhibit design transforms former open-air cages into new natural environments, while the former public viewing hall has been adapted into a multipurpose space that opens to a garden and terrace.

The project's systems are nearly invisible—no dropped ceilings hide ductwork, roof vents are eliminated and a geothermal system negates the need for cooling towers. The building also features intricately designed skylights that adjust with changing light levels. The skylights are inflatable plastic, capable of adjusting shading, thermal and aesthetic characteristics as the day progresses. They provide the sunlight that the plants and animals need but block excessive heat.

The building also includes an under-floor air system, operable windows, carbon-dioxide monitoring in the multipurpose space and environmentally-friendly materials throughout.

PlaNYC CLIMATE CHANGE: *The project's use of Forest Stewardship Council–certified wood promotes healthier forest management practices and helps prevent climate change.*

The adaptive reuse of the historic, landmarked structure conserved building material and reduced demolition waste by approximately 77%.

BRONX ZOO LION HOUSE

BRONX

Adjustable skylights block the sun's heat but transmit light, saving energy and creating a better habitat for animals and vegetation within the exhibits.z

Low-flow fixtures and water recycling reduce the building's potable water use by more than 40%.

50% of the building's annual energy consumption is offset by the purchase of renewable energy credits.

An extensive water-recycling system cleanses sink, shower and dishwashing water for landscape irrigation, reducing the use of potable water.

2008
Brooklyn Children's Museum
Rafael Viñoly Architects

The renovation and expansion of the Brooklyn Children's Museum uses bold design and state-of-the-art sustainable features to double the museum's space (to over 100,000 square feet). The bright, L-shaped addition creates a modern street presence and connects to the museum's existing structure through a series of open staircases and circulation cores, all of which provide the museum's 400,000 annual visitors with more ways to enjoy exhibits. In addition, the original rooftop garden was restored, adding a paved outdoor seating area for the museum's Kid's Café. Other new features include a spacious lobby, exhibition galleries, classrooms, a library, gift shop and administrative space.

The museum is the first New York City cultural institution to tap into geothermal wells for its heating and cooling needs. The use of water from a temperature-consistent site aquifer diminishes energy requirements, making the building a more efficient heat source and cooling medium. Similarly, photovoltaic systems convert solar energy directly into electrical power — establishing the museum as a forerunner of this technology among the City's cultural institutions. Furthermore, the museum's ventilation and lighting systems are controlled through motion, photoelectric and carbon-monoxide sensors, thus ensuring the comfort of visitors while simultaneously reducing energy requirements.

PlaNYC TRANSPORTATION: *Bicycle racks and shower facilities for employees promote cycling, an emission-free, low-cost travel alternative.*

Low-emitting paints, carpets, adhesives and sealants help maintain healthy indoor air quality throughout the museum.

The museum's carbon-dioxide emission is reduced by more than one million pounds per year as a result of its energy-efficient measures.

The museum's geothermal heat pump and photovoltaic panels generate renewable energy on-site, complimenting the building's efficient lighting system and helping reduce energy use by 20%.

2008
Engine Company 277, Brooklyn
STV, Inc.

The 16,000-square-foot, three-story firehouse for Engine Company 277 and Ladder Company 12 represents a new generation of design that respects the history of the Fire Department while maximizing cost-efficiency and productivity. Important features include full-height glazing on the street façade, easy-to-maintain exterior materials, traditional red doors and trim and prominent signage. Residential spaces, including a kitchen, a lounge and a courtyard, are adjacent to the apparatus floor, providing a direct route to gear and equipment.

PlaNYC CLIMATE CHANGE: *Engine Company 277 uses precast concrete panels manufactured with recycled content, thereby reducing embodied greenhouse gas emissions.*

The project's perforated metal screen allows daylight to enter the interior of the building while reducing heating and cooling costs.

The apparatus floor exhaust system diverts fumes from the building's residential and dining areas, improving indoor air quality throughout.

2009
Rescue Company 3, Bronx
Polshek Partnership Architects

The 22,000-square-foot facility for FDNY's Rescue Company 3 provides a modern training facility for one of the most advanced rescue companies in New York City. Serving as the citywide response team for collapse emergencies, members of Resuce Company 3 must undergo specialized training. The building is operational 24 hours a day and meets these specialized needs in many ways, including by building a vertical training tower and a multi-terraced training area. To keep response time to a minimum, the interior spaces, including work areas, storage rooms and other support spaces, are located near the vehicles. In addition, daylight is maximized through large strips of windows on the façade and through interior skylights.

PlaNYC ENERGY: *Limited openings on the building's south façade reduce the interior temperature, leading to a reduction in energy costs during the summer months.*

Daylight reaches most of the interior occupied spaces of Rescue Company 3, increasing the well-being of occupants and reducing energy expenditures.

The exterior wall of the Center, comprised of high-performance glass, steel, terra cotta tiles and zinc panels, is thermally efficient and promotes a healthy interior space.

The project's perimeter daylighting system features photo sensors that dim interior lighting as necessary and adjust shades automatically, which will contribute to a 20% energy-use reduction.

More than 30% of the Center's site will be open and green, contributing to the project's goal of achieving LEED Silver certification.

The building's retention tank will store and recycle rainwater for cooling tower use. It is estimated that the building will consume 36% less potable water than required by the Energy Policy Act.

2010
DHS Family Center, Bronx
Polshek Partnership Architects

s w m e i LEED SILVER LOCAL LAW 86

Once completed, this 77,000-square-foot facility will provide a dignified and welcoming space to assess eligibility for New York City families seeking shelter. The new, light-filled Center will include comfortable and efficient administrative spaces, waiting areas, private interview rooms and storage space.

Sustainable features include a green roof, stormwater collection, a rain-screen façade system, construction and demolition waste management, high-efficiency boilers, occupancy sensors, outside air modulation, daylight dimming controls and the use of recycled materials.

PlaNYC OPEN SPACE, WATER: *The green roof area, visible from the family waiting room inside the building, provide a more calming environment for occupants as well as capture stormwater, which helps prevent the City's combined sewer system from becoming overloaded.*

Carefully controlled daylighting is the primary light source throughout the project, resulting in a 90% savings over the minimum energy standard.

The windows incorporate high-performance glazing, which conserves energy by allowing daylight to enter the building while preventing interior heat gain.

98% of the interior spaces have views to the outdoors.

The project recycled 75% of its construction and demolition waste.

2010
Sunrise Yard, Queens
Gruzen Samton

swmei LEED GOLD

Sunrise Yard, a new 27,000-square-foot maintenance facility, is the headquarters for the engineers, carpenters, electricians and plumbers who maintain and support the structure occupied by the New York City Department of Transportation.

The facility contains space for a fabrication shop, administrative offices and materials storage. It is projected to achieve an energy savings of roughly 65% when compared to the minimum energy standards for buildings. The building achieves this economy through such low-tech strategies such as proper site orientation, north-facing skylights, and natural ventilation combined with more sophisticated technologies such as high-performance glazing, lighting-control systems, radiant floor heating and efficient fans and pumps. A three-part building organization based on function allows the HVAC systems, lighting needs and materials storage to be defined separately so that each area can be tailored according to its individual usage patterns. Since the building is located in a low-rise residential community, sustainable landscape practices are a priority. Green fences, native plantings, trees, increased site permeability, residential setbacks and shielded vehicular access help make this industrial building a good neighbor.

PlaNYC ENERGY: *Sunrise Yard is expected to achieve a 65% energy use reduction by using high performance features such as glazing, lighting control systems, and by bringing natural light into most areas of the building.*

A screen wall, commissioned through the City's Percent for Art program and designed by the artist Samm Kunce, runs the northern length of Sunrise Yard. It shields the neighborhood from yard equipment and is made of recycled and reclaimed soil and rock—materials that representing Queens.

2010
Children's Library Discovery Center
Queens Central Library
1100: Architect PC
Lee Skolnick Architecture + Design Partnership

S W LOCAL LAW 86 LEED PLATINUM

The Children's Library Discovery Center (CLDC) at the Queens Central Library, in Jamaica, will be a new two-story, 22,000-square-foot science museum and children's library. It will use interactive discovery exhibits and learning labs to teach children aged 3–12 how to research information and expand their interest in books and reading. The building will have an abundance of natural light through cutout niches and window seats that invite users to look outside and allow passersby to see the activities inside. On display and integrated into the library book stacks will be exhibits developed to provide children with a stimulating and experiential learning environment.

The sustainable design strategy includes elements such as a high-performance façade, maximum use of daylight, energy-efficient artificial lighting, 100% fresh air, a new central gas-fired heating and cooling plant and recycled and low-VOC-emitting materials.

PlaNYC WATER: *This project is expected to use 37% less potable water than the standard set by the Energy Policy Act, saving approximately 67,000 gallons of water per year.*

The building materials for this project contain 26% recycled content.

More than 80% of the construction and demolition waste for this project will be diverted from landfills.

Recycled and low-VOC-emitting materials and finishes will be used throughout the project to preserve healthy indoor air quality.

2011
Kensington Branch Library, Brooklyn
Sen Architects

The new 20,000-square-foot Kensington Branch Library will include a main reading room, a children's reading area, a computer lab, circulation and staff support spaces and a multipurpose community room. Located in a residential neighborhood, the building will maximize daylight with a central top-lit atrium; north-facing, high-performance curtain wall; south-facing garden wall and sidewall setback for east exposure. The skylight and main north-side glazing will bathe the entire library in natural daylight. A computer-controlled louver system, installed below the skylights, will adjust throughout the day to eliminate glare. In addition, the high-performance lighting system will include dimming and occupancy controls. This integrated daylight and electric-light strategy will significantly reduce the building's use of electricity. In addition, ground-source heat pumps will decrease the use of fossil fuels. This system will eliminate noisy cooling equipment from the roof as well as the emissions associated with conventional mechanical systems, making this green building an exemplary addition to the community.

PlaNYC ENERGY: *The library is expected to achieve a 33% reduction in energy, contributing to less strain on the City's power grid.*

Daylight is expected to reach 78% of the occupied spaces in the library through skylights in the central atrium and a north-facing curtain wall.

The Kensington Branch Library will feature a ventilated terra-cotta rain-screen panel system.

The project is also expected to achieve a 38% reduction in potable water use.

2011
Remsen Yard, Brooklyn
Kiss + Cathcart Architects

Remsen Yard is a 60,000-square-foot maintenance facility for the New York City Department of Environmental Protection (DEP) that supports the City's water and sewer operations. The 2.5-acre property accommodates DEP vehicles, equipment and materials storage, and personnel support facilities, including locker rooms, restrooms and administrative offices. The two-story building is housed under a large skylit roof covering the vehicle parking area, fueling operations and material piles. This roof shelters and shades the yard operations, provides natural light through its skylights and harvests rainwater for site-related uses.

The yard consumes a considerable amount of water, averaging 6,600 gallons per day for washing trucks and misting piles for dust control. Rainwater from the roof will be collected in a tank, treated according to New York City health guidelines and reused for site-related water needs, providing 51% of the water required for these site activities and saving 1.4 million gallons of potable water annually. More than an acre of the open yard is shaded by the roof, which shelters the outside activities. In addition to collecting rainwater, the roof has thin-film photovoltaic panels integrated into skylights. These panels are designed to produce up to 50 kilowatts of electricity and contribute approximately 26% of the annual electrical load.

PlaNYC CLIMATE: *Light-colored, highly reflective roofing contribute to a reduction in the Urban Heat Island effect, thereby lowering the climate temperature surrounding the site.*

Remsen Yard will reduce potable-water use for vehicle yard operations by 48%, or approximately one million gallons per year, by harvesting and storing rainwater.

The site is highly sustainable and will cut the amount of stormwater that enters the City's sewer system by more than 30%.

2011
Weeksville Heritage Center, Brooklyn
Caples Jefferson Architects

The Weeksville Heritage Center will be a new 19,000-square-foot exhibition and research building supporting the Weeksville Society and Hunterfly Road House complex which educates visitors about African-American heritage. The new Center will include educational and preservation spaces, offices, galleries, performance and lecture venues, a courtyard and a library.

The project will maximize natural light, bringing daylight into all visitor and staff spaces. This extensive use of daylighting as well as natural cross ventilation, will contribute to the overall comfort and health of the occupants. Natural light not only illuminates the interior but also creates geometric patterns that reference African weaving patterns and are thematically used in motifs and materials, including sustainably harvested Brazilian hardwood, locally quarried slate and zinc roofing. The landscape is an important design element, not only as an exhibit but for stormwater management. Water flow is slowed and channeled to filter storm runoff. The water will then continually drain through a spillway into a constructed wetland, with surplus water being drained to an existing drywell. Amended top soils for the pond and lower wetland will be placed over a synthetic clay liner according to industry standards for natural habitats and constructed wetlands. In addition, significant energy savings will be achieved through a geothermal heating and cooling system.

PlaNYC TRANSPORTATION: *Alternate transportation is encouraged, with designated open-grid carpool parking, on-site bicycle racks and shower facilities available.*

Carbon-dioxide sensors will prevent unoccupied areas from being ait-conditioned, contributing to an annual energy savings of approximately $20,000.

The project places a premium on healthy interiors and will use low-emitting paints, carpets, adhesives and sealants that will reduce toxins and volatile organic compounds.

75% of the Center's construction and demolition waste will be recycled, reducing the project's impact on landfills.

The site will provide the community with protected open space that includes an interpretive landscape exhibit, maintaining an important outdoor environment in a dense urban area.

The Weeksville Heritage Center site is will be highly sustainable, with 100% of stormwater being filtered and channeled into a constructed wetland.

Daylight will be brought into more than 75% of the library's spaces by a variety of devices, including windows, glass curtain walls and skylights.

Radiant heating and cooling located in the library's floor will contribute to a 30% energy-use reduction beyond the industry baseline standard.

Low-flow fixtures and metered faucets will reduce potable water use in the library by approximately 20% over the Energy Policy Act guideline, equaling more than 50,000 gallons in savings annually.

The project's construction and demolition waste will be sorted and recycled, resulting in a 75% diversion from landfills.

The library will have a landscaped public plaza, providing the neighborhood with outdoor community space.

2011
Glen Oaks Library, Queens
Marble Fairbanks Architects

Located at the juncture of a residential and commercial neighborhood in Queens, this new 18,000-square-foot branch library is designed to respect the scale of the surrounding buildings while providing a transparent and welcoming façade for the community. The public areas of the library are organized on three levels and include: circulation and information service, general adult collection and seating, young adult collection and seating, a children's area and meeting rooms. Private spaces will include a workroom, offices, a staff lounge and support spaces.

To meet the local zoning code, much of the building will be located below a ground-level plaza, which will provide green, open space for the neighborhood. Daylight, which decreases energy consumption while enhancing productivity and the well-being of the library's users, will enter the library in a variety of creative ways. The underground portions of the library will receive light through glass pavers in the plaza and a large double-height opening in the western portion of the ground floor, with spaces needing less light located toward the rear. The northern face of the building will have clear glazing, because of the softness and evenness of north light, while the western glazing will be translucent and insulated to protect against the heat and harshness of light from the west. Channel glass with embedded fiberglass insulation will form the upper translucent, insulated west wall, and the lower glass wall will be screened by a film printed with narrative text. Sunlight will project the word "search" in relief onto the north curtain wall, varying in scale and legibility as a result of the time of day, the weather and the season. New and inventive environmentally effective materials have been investigated and will be selected for use.

PlaNYC LAND: *The library is a successfully redeveloped brownfield site now capable of collecting stormwater for cleansing and storing, thereby eliminating the use of potable water for irrigation.*

2011

Mariners Harbor Branch Library, Staten Island

Atelier Pagnamenta Torriani Architects Planners LLP

The design of the new one-story, 16,000-square-foot Mariners Harbor Branch Library, on Staten Island, resembles an open oyster shell and pays homage to the neighborhood's oystering history. The new building will feature self-checkout and free wireless Internet service, along with areas for reading and meeting. The main environmental objectives focus on natural light and views of the outdoors, with transparent glass walls and skylights to draw in an abundance of daylight and minimize the need for overhead lighting during operating hours. The library will also have a ground-level outdoor terrace and will preserve the existing mature trees in the back garden.

PlaNYC ENERGY: *The project is seeking to achieve a 40% reduction in energy consumption through the use of such strategies as daylighting and environmental occupancy controls.*

Views of the outdoors will be available to more than 91% of the occupied interior spaces.

The library's interior spaces will be flooded with sunlight, providing an ideal reading environment and decreasing reliance on electrical power.

Low-emitting interior finishes and materials are chosen in order to maintain a healthy interior air environment.

2012
121 Police Precinct Station House, Staten Island
Rafael Viñoly Architects

m e i LEED SILVER LOCAL LAW 86

The 121 Police Precinct is Staten Island's first precinct to seek a LEED Silver rating under Local Law 86. The 53,000-square-foot building will include reception areas, administrative space, a detective bureau, personnel areas, equipment storage, a muster room and prisoner holding.

PlaNYC ENERGY: *The manner in which the building is situated on the site is expected to contribute to a 28% decrease in energy costs compared with the industry standard.*

The building's north-south site orientation will maximize daylight while minimizing heat gain, thereby reducing energy consumption

The precinct's landscaping will include native plants that rely solely on stormwater, eliminating the need for potable water for irrigation.

Stormwater will be collected for irrigation, reducing the amount of water entering the City's combined sewer system.

2012
Staten Island Animal Care Center
Garrison Architects

The new 5,300-square-foot Staten Island Animal Care Center is designed to prepare healthy animals for adoption. It will contain exam rooms, a surgery room and offices—all housed in the interior of the building, so the animals can be housed along the perimeter and exposed to natural light. The building will be sheathed in translucent polycarbonate made from recycled content and will allow the animals to be visible through the façade. In addition, the interior lighting will be controlled by photo cells, allowing lighting levels to vary in tandem with changes in the amount of available daylight. By day, traces of the interior activities of the animals will be visible through the façade; by night, the slight glow of the building will give it a subtle presence in the neighborhood.

PlaNYC ENERGY: *The building's exterior has been designed to be highly insulating, reducing its energy impact and minimizing temperature variability for the animals.*

It is estimated that 75% of the project's construction waste will be diverted from landfills.

Lighting, cooling and heating systems in the building will be occupant and sensor-controlled, resulting in a decrease in energy use when spaces are unoccupied.

The roof of the building will be made of highly reflective, light-colored material. These elements reflect solar heat and help decrease the overall temperature of the site, potentially leading to a reduction in the Urban Heat Island effect.

2013

Public Safety Answering Center II, Bronx

Skidmore, Owings & Merrill, LLP

The Public Safety Answering Center II (PSAC II) will be a second emergency communications 911 call intake and dispatch center for the City. The new building will act as a parallel operation to the existing PSAC I in downtown Brooklyn and will augment and provide redundancy to the current emergency 911 response service. It will serve as a streamlined emergency call and dispatch center for all of the City's first responders, including the NYPD, FDNY and Emergency Medical Services, and will house command control centers for the FDNY and the NYPD in order to coordinate emergency response throughout the entire City from a centralized location.

Sustainable features will include drought-resistant landscaping, which leads to less potable water use for site irrigation; low-flow fixtures and stormwater collection for toilet use, which will conserve potable water throughout the building; and low-emitting materials which help maintain healthy interior air quality. In addition, the project will undergo an enhanced commissioning process in order to ensure that all mechanical systems are functioning efficiently.

PlaNYC CLIMATE CHANGE: *The project plans to source at least 10% of its materials within 500 miles of the site. Limiting the distance vehicles travel for materials transport leads to a decrease in vehicular emissions.*


The project will use a CASE Active Phytoremediation wall on the ground floor to cleanse and cool interior air. In addition, plants are natural materials that contribute to the well-being of the occupants.

The New York Police Department's new training academy's high-performance building exterior is designed to shield the interior spaces from solar heat while allowing daylight to enter the space, resulting in a decrease in the use of electrical lighting.

2013
New York Police Academy, Queens
Perkins + Will with Michael Fieldman Architect

The new Police Academy will provide training space for up to 4,000 recruits per year while satisfying the ongoing requirements of the NYPD's uniformed officers and civilian corps. The campus will consolidate the Department's academic and training facilities currently scattered across the City. The overall complex will include instructional spaces for providing immersive, scenario-based training for police personnel, indoor firing ranges, a sophisticated tactical training building, classroom and administrative space and a driver training course. The new Academy will be one of the largest environmentally sustainable complexes in New York City.

PlaNYC WATER: *The new academy site will collect and cleanse stormwater for reuse. This feature also will reduce stormwater runoff to adjacent properties.*

Sustainable Growth Timeline

1996
- DDC begins operations

1999
- DDC's High Performance Building Guidelines are published, providing information that informs the development of the United States Green Building Council's LEED certification program
- First Best Management Practices (BMP) project completed — St. George Road, on Staten Island

2000
- LEED certification guidelines are instituted by the USGBC

2001
- ACS Children's Center completed

2002
- For the first time, DDC awards more than $1 billion in construction contracts for the fiscal year
- DDC Geothermal Heat Pump Manual published

2003
- DDC issues specifications for materials with recycled content, low-toxicity materials and construction and demolition waste reduction
- Construction and Demolition Waste Manual published by DDC

2004
- Bloomingdale Park BMP completed on Staten Island
- Design and Construction Excellence initiative launched
- DDC Ultra-Low Sulfur Diesel Manual published
- Williamsburg Child Care Center completed
- New York Hall of Science completed

2005
- High Performance Infrastructure Guidelines published
- Construction completed on the Office of Emergency Management, awarded LEED Silver
- Local Law 86 signed by Mayor Bloomberg requiring most capital construction projects valued at $2 million and above to seek a LEED Silver rating
- DDC Cool & Green Roofing Manual published
- DDC Manual for Quality, Energy Efficient Lighting published
- The Mayor's Office of Long Term Planning and Sustainability is instituted

2006
- Quality-based selection officially adopted by DDC for structures projects
- DDC begins implementing Local Law 86, one year ahead of schedule
- Bronx County Hall of Justice completed

2007
- DDC issues comprehensive LEED performance specifications for projects
- Local Law 86 officially takes effect
- Staten Island Zoo Reptile House completed
- Queens Botanical Garden Visitor and Administration building completed and awarded a LEED Platinum rating

2008
- Bronx Zoo Lion House awarded LEED Silver rating
- Brooklyn Children's Museum completes construction, becoming the first children's museum in New York to receive a LEED Silver rating
- DDC Sustainable Urban Site Design published

2009
- Weeksville Heritage Center begins construction in Brooklyn, seeking LEED Gold rating
- Construction begins on the Mariners Harbor Branch Library, on Staten Island, seeking LEED Silver certification
- Construction begins on the NYPD Academy in the Bronx, seeking a LEED Silver rating
- Construction begins on the 121 Police Precinct Station House, the first police facility to seek LEED Silver certification
- Rescue Company 3 completed

2010
- DHS Family Center, in the Bronx, completes construction, seeking LEED Silver rating
- Sunrise Yard project in Queens scheduled for completion with a LEED Gold rating
- PSACII begins construction in the Bronx, seeking LEED Silver certification
- DDC's portfolio of sustainable projects surpasses 5 million square feet
- DDC's project portfolio valued at over $6 billion

2011
- Children's Library Discovery Center, Queens Central Library in Queens scheduled for completion with LEED Silver rating
- Kensington Branch Library, in Brooklyn, scheduled for completion with LEED Silver rating
- Remsen Yard, in Manhattan, scheduled for completion with LEED Silver certification
- Glen Oaks Library, in Queens, scheduled for completion with LEED silver certification

2013
- Public Safety Answering Center II scheduled for completion
- NYPD Academy scheduled for completion

Credits

The City of New York
Michael R. Bloomberg, Mayor

PREPARED BY:
The Department of Design and Construction
David J. Burney, FAIA, Commissioner

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Cover	ESTO/Jeff Goldberg
Inside cover	ESTO/Jeff Goldberg
Inside foldout	ESTO/Jeff Goldberg
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Page 13	SOM and Rensselaer Polytechnic Institute
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