

### Green Buildings Project

“Sustainable architecture demands that we rethink the extractive habits of our industry in this country, and reconnect with the natural world and ecosystems that support life. Most importantly, we must reinvent our mindset as designers, developers, and builders. We believe that this starts with looking for local abundance and challenging our buildings to be self-sufficient citizens of the urban community. Architecture is a lasting endeavor—we make choices not only in cooperation with our clients, but also on behalf of future generations. They will inherit what we create, and must live with the consequences of our decisions. Because of this, the architecture profession is inclined to reflect on its legacy, and is obligated to take the lead in the transition to sustainability.”  
(Cook)



A new standard called LEED (Leadership in Energy and Environmental Design) has been created by the U.S. Green Building Council to establish a means to measure how sustainable our built environment is. There are various classifications of LEED, but the classification specific to One Bryant Park is the LEED for New Construction and Major Renovations. LEED for New Construction and Major Renovations is a rating system for buildings that was designed to guide and distinguish high performance buildings that have less of an impact on the environment, are healthier for those who work and/or live in the building, and are more profitable than their conventional counterparts. The LEED for New Construction Rating System can be applied to commercial, institutional and high-rise residential projects, with a focus on office buildings. Practitioners have also applied the system to K-12 schools, multi-unit

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residential buildings, manufacturing plants, laboratories and many other building types.  
(USGBC)

LEED for New Construction is a performance-oriented rating system where building projects earn points for satisfying criterion designed to address specific environmental impacts inherent in the design, construction, operations and management of a building. The LEED certification system is organized into six environmental categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality and Innovation & Design. Innovation & Design, awards points to LEED projects that develop new solutions, employ new technologies, educate, or realize exemplary performance in another area. (USGBC)



The case study in this paper looks at One Bryant Park, also known as Bank of America Tower in New York City. This new corporate headquarters for the Bank of America located in Midtown Manhattan is nearing completion. Designed by New York architect Cook + Fox, the 52 story glass and steel tower will be the first high rise building in the city to be LEED Platinum certified and the greenest skyscraper in the country.

Located on the largest development site in Midtown Manhattan, the Bank of America Tower will house the 1.6 million sq ft headquarters for the New York operations of Bank of America and the 50,000 sq ft restored and reconstructed Henry Miller Theater,

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as well as 1 million sq ft of office space for other tenants. The \$1 billion project, co-developed by Bank of America and The Durst Organization, will rise adjacent to the Condé Nast Building at Four Times Square. (McHugh)



The first sustainable feature of this Green building is its use of sunlight. Based on studies of the site's different solar patterns in winter versus summer, the building's faces will be oriented to work optimally with the sun. It will have floor-to-ceiling exterior walls of high-performance, low-emissive glass—filtering out infrared rays but admitting abundant daylight—letting occupants access the views and connect to the elements outside. It will be able to further scale back the use of artificial light through daylight-dimming lighting fixtures. A custom silk-screened ceramic frit pattern will be graded to leave a clear field of vision from the inside, while partially blocking incoming rays. The building's low-iron glass will be exceptionally clear, enhancing the structure's faceted, crystalline nature. In an atmosphere of plentiful daylight and impressive views, we think workers in the building will enjoy significant advantages in terms of health and productivity. (Cook, pg 2)

The next sustainable feature of this green building is its innovative use of rainwater. Plumbing designers at the New York mechanical and plumbing engineering firm of Jaros, Baum & Bolles (JB&B) have taken their cues from the past and are

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devising a series of rainwater collection tanks and distribution piping. These will be positioned on the tower's roofs and at strategic points amid the 52 floors. Collectively, they form a unique plumbing matrix that will integrate freshwater loops with gray water collection for reuse in all of the building's water services.

Downspouts run to four stacked water tanks positioned about 10 feet apart and arranged so that water from the upper tower roof flows into the top tank and then cascades down to the successively lower tanks, filling each in turn, as rain volumes require. From these tanks, the water will flow directly to the building's 250- to 300-flush toilet fixtures. It is a complete gravity system requiring no pumps and thus saves a lot of electricity. Black water from toilets will of course plumb to the sewer—but that's about *all* the water that will, as most of the flow—including lavatory gray water, cooling tower condensate and blow down, steam water condensate, and assorted other service gray water—will travel to a large basement storage tank for filtering, disinfection, and reuse. (Engle)



Another innovative feature of this skyscraper is Low-Flow toilets, Automated Faucets, and Waterless Urinals. In the men's rooms, several hundred of Sloan's Water free vitreous china urinals will be installed. Urine is collected in a small sealed cartridge containing a biodegradable liquid that stores and degrades the waste in an odorless trap. The design eliminates the need for any water at all—as well as plumbing inflow or outflow pipes and associated costs. (Engle)

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As for the bathroom lavatory sinks (Kohler under-counter models), these will of course be plumbed with potable water. For water efficiency they'll be equipped with Sloan battery-powered electronically controlled low-flow faucets. The low-flow and electronics in tandem can reduce flow to just half a gallon per minute; by contrast, New York code allows conventional faucets a profligate 2.2 gallons per minute or more. (Engle)

Sloan Valve's Allen adds that the combination units "are tremendous water savers." A recent study at Texas A&M University found the relative conservation advantage came to "about 70% over standard high-flow manual taps," he reports. Any architect or plumbing designer can do a simple demonstration test to impress a client, by using a sensor-equipped faucet side-by-side with a manual one, and then measuring the result in a bucket. Allen sums up: "Sensors are very water efficient, and we always encourage their use in a high-performance LEED building." (Engle)

A final innovative aspect of One Bryant Park is its ventilation system. Just as the building's water system will rely on gravity to fill staged storage tanks and supply restrooms, the ventilation system will rely on the law of thermodynamics that warm air rises. Most large buildings in the United States provide ventilation through overhead ducts: high pressure fresh air is forced in, diffuses throughout the room, then a mix of stale and fresh air is vented out from the ceiling. In cooling a room, the warmest air near the ceiling is cooled first, meaning the system must introduce colder-than-desired air, and then pump it downwards. (Cook, pg 3)

Instead of this, One Bryant Park will have an under-floor displacement air ventilation system that supplies air at low pressure, through vents at the floor level. As warm air rises and is vented out from the ceiling, fresh, temperature-adjusted air is drawn up around each occupant. Each individual workstation will have its own manually-adjusted heating/cooling control, resolving the number one complaint in every office building in our country. The system will also filter out 95% of particulates, plus ozone and volatile organic compounds from the outside air, creating a much healthier indoor environment. Air exiting the structure will actually be cleaner than when it came in, as if the building were a giant air filter. (Cook, pg 3)

### Green Buildings: One Bryant Park

Our lifestyle reveals a mentality of extraction and waste, one that sees the earth and its ecosystems as resources to dominate, sell off, and degrade. One could argue that my home town of New York, with the excesses of Wall Street, is the epicenter of that problem. It makes me excited that One Bryant Park is also being built in New York and I hope that the immense scale of this platinum certified building will resonate with developers in emerging nations. Buildings that provide for themselves efficiently and locally will produce compounding economic, social, and environmental benefits.

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