

A BLUEPRINT FOR GREENING NEW YORK CITY'S BUILDINGS


1 Year: 1,000 Green Superintendents



Building Service 32BJ
Thomas Shortman Training Fund



Urban Green Council
(U.S. Green Building Council New York)



“Marketers, politicians and consumers like to imagine a world of solar panels, wind turbines and cars fueled by wood chips. But none of that gadgetry packs the here-and-now punch of a decades-old option: plugging leaky homes with a caulk gun.”

–Jeffrey Ball, *Wall Street Journal* Editor

EXECUTIVE SUMMARY

Buildings in the United States consume more energy than any other sector of the economy, including transportation or industry. In New York City this problem is especially pronounced, with buildings responsible for 66% of total energy use and 77% of city greenhouse gas emissions. Inefficient buildings are wasting our money and polluting our atmosphere.

One of the most cost effective ways to improve efficiency or “green a building” is to ensure that it is operated and maintained in the most efficient way possible. Energy efficient operations and maintenance (O&M) is the practice of ensuring that all systems within a building are running at peak performance. This includes the testing, cleaning, and intelligent use of a building’s heating, cooling, and ventilations systems. Additionally, energy efficient O&M includes the air sealing of a building’s envelope, the use of efficient lighting and lighting controls, and minimizing water use. Energy efficient O&M requires no major installations or large capital expenditures. The only thing it does require is a talented and well trained workforce.

The Building Service Local 32BJ Thomas Shortman Training Fund (Training Fund), the joint labor-management organization which provides training to members of SEIU Local 32BJ, has been greening the city’s buildings for the last four years by providing intensive training courses for building service professionals. The Training Fund, co-managed by 32BJ and the Realty Advisory Board on Labor Relations, is uniquely positioned to bring change to an entire industry and meet the needs of an energy efficient 21st century.

This year the Training Fund launches *1 Year: 1,000 Green Superintendents*, an innovative green building initiative that trains superintendents, resident managers and handypersons to become energy efficient Multifamily Building Operators certified by the Building Performance Institute and the Urban Green Council (U.S. Green Building Council New York).

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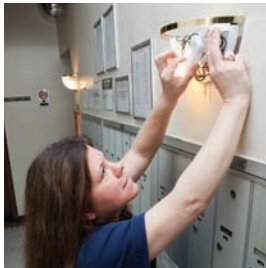
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 Thomas Shortman Training Fund, September, 2009
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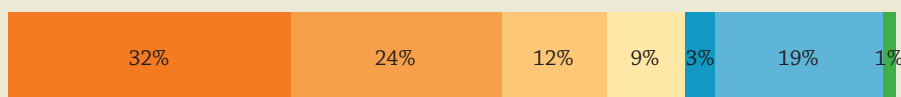
The Challenge: Inefficient Buildings, Wasted Money

Buildings in the United States consume more energy (39%) and generate more greenhouse gas pollution (38%) than any other sector of the economy, including transportation or industry.¹ Reducing this energy consumption should be a top priority for economic, environmental, and security reasons. The good news is that better technology and smarter management practices can reduce energy use in buildings by 20–40%, while saving money even after the costs of improvements are taken into account.²

Right now, the talent and technology exists to save large sums of money and help avert the climate crisis. The investment required to green our buildings is miniscule compared to the payoff. There are a variety of low cost and no cost techniques to make buildings run more efficiently. It is just a matter of providing our building professionals with cutting edge green training and technology. Often it is the smallest investments that produce the greatest returns.

🌱 **Green Buildings:**
This term refers to buildings which are designed, operated, and maintained in a manner which minimizes their consumption of energy, water, and materials while maintaining or improving occupant comfort.

2007 New York City CO₂ Emissions by Sector



Buildings = 77%

- Residential = 32%
- Commercial = 24%
- Industrial = 12%
- Institutional = 9%

Transportation = 22%

- Transit = 3%
- On-Road Vehicles = 19%

Other = 1%

- Methane = 1%

Source: PlaNYC: Inventory of Greenhouse Gas Emissions, Sept 17, 2008.
http://www.nyc.gov/html/planyc2030/downloads/pdf/emissions_inventory_2008.pdf

Table 1: Energy Usage by Building Type in New York City

BUILDING TYPE	HEAT	HOT WATER	LIGHTING	APPLIANCES	COOLING	OTHER	TOTAL
1-4 family residential	7.6%	2.6%	1.7%	2.2%	0.6%	0.0%	14.7%
Multi-family residential	7.4%	7.4%	3.0%	3.9%	1.2%	0.0%	22.9%
Commercial	8.5%	2.8%	10.2%	4.5%	4.5%	0.9%	31.4%
Industrial	2.6%	2.1%	4.0%	3.3%	1.1%	0.2%	13.0%
Institutional/Government	6.3%	4.0%	3.6%	1.7%	1.4%	0.9%	17.9%
ALL TYPES	32.4%	18.9%	22.5%	15.6%	8.8%	2.0%	100%

Source: Con Edison, Keyspan, U.S. Department of Energy, New York State Energy Research and Development Authority

Our Pocketbook

In these tough economic times the urgency to green our buildings could not be greater. Every inefficient building system that wastes energy may as well be burning money. Small green investments can payoff almost immediately. These savings are not just hypothetical. They have already been produced by building owners nationwide. A 2008 green buildings survey by Incisive Media found that “65% of building owners who have implemented green building measures say their investments have already resulted in a positive return.” Additionally, “84% of building owners said their green buildings have resulted in lower energy costs, with 68% reporting lower overall operating costs.”³ Green buildings are profitable buildings.



Our Environment

The expense of inefficient buildings cannot be measured solely in dollars. The cost to our atmosphere and environment is also significant. The scientific community now accepts that greenhouse gas emissions must be sharply reduced within the next few years to prevent the worst effects of global warming. Effects could include rising average temperatures, the spread of infectious diseases more typical of tropical regions, more severe storm surges, and rising waters in coastal zones.

The management consulting firm McKinsey & Company has identified energy savings from buildings as the single lowest-cost method of reducing greenhouse gas emissions. Actions like installing better insulation or replacing old lighting fixtures are not only much cheaper than building new solar or wind power plants, McKinsey analysts report that these off-the-shelf technologies actually pay for themselves through energy savings.⁴

Our Health

The environmental cost of wasteful buildings is not limited to our atmosphere. The impact starts at home. Americans spend almost 90% of their time inside and Environmental Protection Agency (EPA) studies have shown that indoor air quality is sometimes two to five times worse than the outside air. A green building improves human health at the same time it improves the health of the environment. Improving indoor air quality lessens asthma and allergy symptoms and reduces the frequency of headaches, fatigue, and irritation of the ear, nose, and throat. A green building also improves comfort. Green buildings with properly sealed windows keep conditioned air inside, street noise outside, and make for a more comfortable living environment.

Our Home

New York City is the ideal location for green buildings. Our buildings produce 77% of the city's greenhouse gases and consume 66% of its energy.⁵ In total, New York City residents spend \$13.4 billion per year on energy for buildings.⁶ Just the city government alone spends \$800 million annually on building energy.⁷

Our city's large residential buildings are perfect candidates for a green makeover. Big Apple residents have one of the highest electricity rates in the country. Con Ed charges 22 cents⁸ per Kilowatt Hour (kWh) while the average price of electricity in the United States is only 12 cents/kWh.⁹ Every kilowatt of electricity New York City residents save puts almost twice the money in our pockets compared to an average American building. This significantly increases the speed at which our green investments can produce a profit.

The cheapest, fastest way to save energy is to upgrade the energy performance of existing buildings with more efficient heating, cooling, lighting, and better operations and maintenance.¹⁰ We have known for more than 25 years that better operations and

John Sarich is a Resident Manager and long time 32BJ member.

John has used a variety of strategies to green his building. Lights are one of the areas where John has made the biggest difference. He installed dusk to dawn sensors in the common spaces of his building which turn lights off during the day if enough daylight is present. Additionally, for interior areas without natural light, John installed motion sensors and timers to shutoff lights automatically when the spaces were not in use.

Elevators were another area where John saves a lot of energy. He set up a schedule that turned off one of his elevators in the dead of the night when they were not being used. This action saved his building large amounts of energy with essentially zero cost.

Mr. Sarich's green efforts have reduced his building's annual energy costs by 20%.



Buildings Impacted by PlaNYC



*Lots with built area
of 50,000 square feet
or greater.*

*Source: PlaNYC's Greener,
Greater Buildings Plan*

*🌱 PlaNYC 2030:
Announced in 2007,
PlaNYC is Mayor
Bloomberg's vision for
a sustainable New York
City. This 127 point plan
aims to reduce city car-
bon emissions by 30%
by the year 2030.*

maintenance alone can reduce a building's energy use by as much as 10% per year.¹¹ This seemingly small percentage adds up quickly. A typical 100 unit high rise building may spend approximately \$300,000 per year on heating fuel, \$200,000 on electricity, and \$40,000 on water.¹² If a building such as this were to be optimally operated and maintained and did manage to achieve a 10% reduction in energy use then it would save more than \$50,000 per year. If all of our large apartment buildings achieved these savings, New Yorkers could save \$230 million every year¹³ and reduce carbon pollution by the equivalent of taking 150,000 cars off the road!¹⁴

Our Government

Increasingly government policy will either encourage or require effort to make buildings more energy efficient. For example, Mayor Bloomberg announced a sweeping green buildings plan as part of PlaNYC. This six part plan will update the city's energy code, require lighting upgrades, promote benchmarking, encourage green workforce development, provide green building financing, and mandate audits and retrofits for buildings larger than 50,000 square feet. The City estimates that this plan will create 19,000 green construction and auditing jobs, reduce carbon emissions in the city by 5%, and save New Yorkers \$750 million annually in energy costs.¹⁵

New environmental policy is also coming from Albany and Washington. The Regional Greenhouse Gas Initiative (RGGI) is a mandatory, market-based effort by ten Northeastern and Mid-Atlantic States (including New York) to cap and then reduce CO₂ emissions from the power sector by 10% within the next 10 years. At the national level there are a variety of environmental bills being debated that would impact our energy consumption.

Our Plan

Our inefficient buildings hurt our health, damage our environment, and empty our pocketbooks. It does not have to be this way. Green buildings offer one of those always elusive win-win opportunities where doing the right thing is also doing the profitable thing. The Training Fund, the joint labor-management organization which provides training to 32BJ members, has been providing green training for the last four years. It is now poised to significantly expand upon its existing green training experience to make a significant and lasting difference in the lives of New Yorkers. To make the biggest impact, the Training Fund will target the building service worker most responsible for building operations and maintenance — the superintendent. Once the new program is fully realized, the Training Fund will train 1,000 green superintendents in one year to help make the city greener.

2.

Green Buildings: Focusing on the Here and Now

It is estimated that 85% of city energy use in the year 2030 will come from buildings that exist today.¹⁶ We have invested countless billions to construct our majestic skyline so our focus must be on what we have right now, on our existing buildings and our existing building service workers.

Expanding the Scope of Green Buildings

Often when we hear about green buildings the main focus is on new construction and large capital improvements. We tend to focus on the comparatively few new buildings that get constructed each year and on expensive capital retrofits like photovoltaic (PV) solar panels, sophisticated HVAC controls, and other expensive technology. Missing from this picture is the human factor.

Chart 1 gives a complete picture of what it means to make a building green. Capital investments in advanced technology move a building along the horizontal axis. However, we also need investments in our workforce to move a building — whether conventional or high-tech — up the vertical axis. A broader, more powerful and more cost effective perspective of green buildings sees buildings as a combination of physical

Bill Aristovulos is the superintendent of The Saint Germain in Greenwich Village and a 32BJ member. He has been working in the building service industry for almost 30 years, 18 as a super.

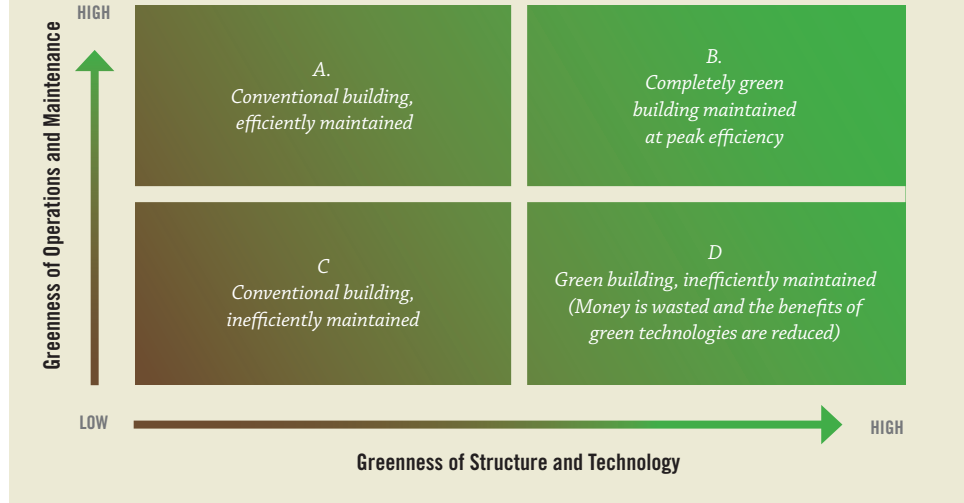
Bill has greened his building in a variety of ways. He has installed highly efficient lighting systems in the communal areas of his building and motion sensors on the lights in the garage.

Mr. Aristovulos also installed a new highly efficient air conditioning chiller in his building. Installing this system saves his building \$20,000 in energy costs per year and prevents 300 dangerous pounds of refrigerant from entering our atmosphere annually.

Water conservation is another goal Bill has pursued. He installed low-flow toilets in every apartment in his building. This action reduced the building's water consumption by 30%.



Chart 1: A Building's Green Capacity



structure and the human capital charged with operating and maintaining that structure. An expansive, holistic view of green buildings sees both axes. This view comes from a whole-building viewpoint and prioritizes both the physical and operational aspects of a building.

Retrofitting an existing building, i.e. moving along the horizontal axis from C to D, requires some form of capital investment. Moving an existing building along the vertical axis from C to A requires training. Specifically, it requires that the building service workers operating and maintaining that building are trained in the most advanced techniques and strategies available for efficient building operation. When you make a capital investment, and move a building from C to D, but neglect to train that building's workforce, you reduce the monetary and environmental benefits of that retrofit. Often a lack of training can eliminate the benefits of the capital investments all together. Several years ago the Community Environmental Center, a non-profit building energy conservation organization in Queens, returned to twenty large residential apartment buildings they had previously retrofitted and found that the economic and environmental benefits of their upgrades had been nullified in almost half of those buildings because of improper operations and maintenance practices.¹⁷

Spending Money to Waste Energy

There is nothing worse than paying tens or even hundreds of thousands of dollars to install solar panels on your roof to produce electricity that then just gets wasted in an inefficient system inside your building. When we make large capital investments in inefficient and improperly maintained buildings we are compounding our mistakes. The first and most cost effective step to a truly green building will require us to

maximize the resources we currently have. Even our most wasteful buildings can be run more efficiently. When we do choose to install advanced green technologies it is important to pair that installation with energy efficient O&M to maximize the return on our investment.

A Recipe for Waste: Green Capital Investment without Training

The importance of a trained green staff cannot be overstated. There are numerous scenarios where great intentions and large investments are squandered because of a lack of training. One all too familiar scenario starts something like this: A building installs an expensive, powerful, and extremely efficient boiler in its basement. The new high-tech boiler will consume less oil and therefore save the building large sums of money. The boiler uses computers to automate its operation and to ensure it is always running at maximum efficiency. The building's owners spend tens of thousands of dollars to install the boiler but neglect to invest any time in ensuring that the staff knows how to use it. After a few weeks of operation the staff becomes frustrated with the new boiler because they can not figure out how to operate it properly. To keep the building heated the staff opts to shut-off the computer controls of the boiler and simply run it manually, like the way they used their old inefficient boiler. By turning off the computer controls they effectively turn this new boiler into the old boiler.

Turning off the computer controls has negated the economic and environmental benefits of the new boiler and has wasted the money and good intentions of the building owners. Compounding this problem, the owners look at their fuel bills in the months after the boiler's installation and feel like they were ripped off. They conclude that the new boiler was not more efficient as had been promised. They then decide that it is not in their best interest to continue to invest in green technologies for their building. This entire scenario could have been avoided with a small investment to make sure that the building staff knew how to use the boiler properly. Thousands of dollars were wasted, the good intentions of owners were squandered, and we all pay for the mistake.

But it can get even worse. In one particularly bad case a 34 unit residential building in Brooklyn performed a series of retrofits, including the installation of an energy management system (EMS), a new burner for the boiler, insulation, EnergyStar refrigerators, and more. The entire project was projected to reduce fuel use by 58% but in reality total fuel use increased by 47%! Upon inspection it was found that no one had been trained to use the new EMS. Instead, the superintendent had chosen to disconnect it and operate the boiler manually. Additionally, CFL bulbs were replaced with incandescent bulbs, low-flow water fixtures were missing, and EnergyStar appliances were removed.¹⁸



3.

Foresight, Small Investments, and Huge Rewards

Proper training is the first step to making our buildings greener. All of the cutting edge technology in the world cannot solve our problems if those in charge of using the technology are not trained to use it effectively. Providing comprehensive green building training will cost very little but will provide workers with the skills to save tens of thousands of dollars over the course of their career.

The Green Building Lynch-Pin

One of the most cost effective ways to make our buildings greener is to train our superintendents. These professionals are the keystone of green buildings in New York City. The super is responsible for all aspects of a building's operations and maintenance. They manage the building's workforce, they interact with the building's tenants, and they communicate with the building's owners. Superintendents are the focal point through which all green elements must flow. Without a green super the efforts of owners, tenants, and the public to improve the efficiency of the building will be limited. No other individual is as important to the efficiency of a large residential building than the superintendent.



Supers manage the porters, handypersons, and lobby staff of our city's residential buildings. They have the power to ensure that all staffers are performing their jobs in the most efficient way possible. A green superintendent fosters a green staff, and a green staff fosters a green building. Additionally, a green super has the ability to educate tenants to take simple and convenient actions to green their apartments. The building owners and property managers of our city also rely on their superintendent to provide day to day information about their building. A green super can provide owners with the tools and knowledge needed to make the best decisions for their buildings.

Ultimately, no one knows a building like the super. Outside contractors might have to be brought in for major renovations but only a super who works in a building every day can make the myriad of adjustments and decisions necessary to guarantee a building operates at peak efficiency.

Table 2: Energy Usage in Multi-Family Residential Buildings in New York City

	HEAT	HOT WATER	LIGHTING	APPLIANCES	COOLING	TOTAL
Multi-family residential	32.3%	32.3%	13.1%	17.0%	5.2%	100.0%

Source: Con Edison, Keyspan, U.S. Department of Energy, New York State Energy Research and Development Authority

Technology Only Gets You So Far

Another essential element that a trained green superintendent provides is the ability to recognize problems and fix them. There is no technology in existence today that can fix a leaky sink, replace an inefficient light bulb, install a low-flow faucet aerator, or calibrate thermostats. These simple, cheap, and effective strategies to make a building more efficient rely on one thing: a knowledgeable building staff. Changes such as these have far and away the quickest payback in terms of investment. By training our supers we are maximizing the value of all of our green capital investments.

Green Supers Make the Difference

A trained green superintendent can have a significant and long lasting impact on the energy and water usage of a large multi-family building. There are a variety of low-cost and no-cost strategies and upgrades that a building's superintendent can initiate that can save money and improve the environment. The savings potential and environmental benefits of simple changes are significant. The following four core areas of building operation and maintenance presents a brief sampling of the types of changes a green superintendent can make in their building.

1. Heating, Ventilation, Air Conditioning and Other Mechanical Systems

The heating and cooling of our building's air and water are far and away the largest consumer of energy, representing 70% of the total energy consumed by our large multifamily buildings. There are a multitude of simple things that a green super can do to help reduce a building's energy use. For example, a super can initiate a preventive maintenance program for the building's heating and cooling systems. A superintendent will ensure that all systems are cleaned, calibrated, and properly maintained. By simply ensuring existing systems run properly, the efficiency of our buildings can be increased.



2. Lighting and Electricity

Our lights and appliances account for 30% of total energy consumption. Addressing these energy hogs is one of the easiest and most cost effective ways to green our city's buildings. Green superintendents have a lot of power to reduce this largely unnecessary energy expenditure by swapping out old fashioned incandescent light bulbs with modern Compact Fluorescent Lights (CFLs) and installing motion sensors in public areas that will automatically turn the lights off when there is nobody using the space.

3. Building Envelope

A poorly maintained building envelope wastes energy when it fails to separate the outside air from the inside. Small leaks, poorly sealed windows, and insufficient insulation allow the conditioned air on the inside to escape. A green super can make sure that a building's atmosphere is properly sealed from the outside environment, thus reducing heating and cooling costs, and improving the comfort of building tenants.

4. Water Conservation

The average New York City household consumes 100,000 gallons of water per year.¹⁹ A green super can help reduce this number through the installation of very simple systems such as low-flow showerheads, faucet aerators, and efficient toilets. Additionally, one trillion gallons of water are wasted each year in the United States from easy-to-fix leaks.²⁰ A green superintendent will have the skills to track down and fix these deceptively expensive leaks.



Table 3: Green Supers Perform Energy Upgrades that Pay for Themselves

RETROFIT	COST PER SQ FT	PAYBACK
1. Exhaust fan timers	\$0.03	0.8 years
2. Boiler cleaning and tuning	\$0.07	1.0 years
3. Lightbulb upgrades (e.g. CFLs)	\$0.04	1.0 years
4. Domestic hot water controls	\$0.01	1.1 years
5. Efficient faucets and showerheads	\$0.04	1.3 years
6. Pipe insulation	\$0.02	2.0 years
7. Energy management systems	\$0.23	2.0 years
8. Lighting controls	\$0.06	2.3 years
9. Lighting fixture upgrades	\$0.06	2.5 years
10. Exterior weather-stripping and sealing	\$0.07	2.5 years

Source: New York State Energy Research and Development Authority data on multi-family buildings

Table 4: The Costs and Benefits of Select Residential Building Retrofits²¹

RETROFIT	RESOURCES SAVED	\$ SAVED	COST	PAYBACK	
1. Repair Leak ²²	Slow Drip–36g/day	13,140g	\$118	\$11	1 month
	Steady Drip–180g/day	65,700g	\$591	\$11	7 days
	Quarter Open–684g/day	249,660g	\$2,247	\$11	2 days
2. Install Low-Flow Shower Head (2 gallons/min) ²³		1,095g–2,190g	\$10–\$20	\$15	9–18 mos.
3. Install Faucet Aerator ²⁴		182g–1,642g	\$2–\$15	\$6	5–44 mos.
4. Install Low-Flow Toilet (1.6 gallons/flush) ²⁵		6,935g–12,410g	\$62–\$112	\$130	14–25 mos.
5. Install Toilet Displacement Device ²⁶		365g–1,095g	\$3–\$10	\$4	5–15 mos.
6. Replace Leaky Toilet Flapper ²⁷		10,950g	\$99	\$20	2 mos.
7. Install One Compact Fluorescent Bulb ²⁸		213 kWh	\$40	\$4	1 month
8. Install T8 Fluorescent Lighting Fixture ²⁹		234 kWh	\$44	\$61	17 mos.
9. Install LED Exit Sign ³⁰		333 kWh	\$64	\$25	5 mos.
10. Install Photosensor on Exterior Light ³¹		274 kWh	\$52	\$50	12 mos.
11. Install Motion Sensor ³²		327 kWh	\$62	\$70	14 mos.
12. Clean Refrigerator Coils ³³		74 kWh	\$14	\$10	9 mos.
13. Fix Steam Trap ³⁴		33,560 lbs	\$835	\$130	2 mos.

Calculations Based On:

- Price of Water & Sewer: \$0.009 per gallon³⁵
- Four Year Average Price of Electricity (Variable Costs Only): \$0.19/kWh³⁶
- Four Year Average Price of Con-Ed Steam (Variable Costs Only): \$.0249/lbs³⁷
- Cost of Super’s Labor: \$30 per hour

Unit Abbreviations:

- g: gallon
- kWh: kilowatt hour
- lbs: pounds

4.

A Teacher: Building Service Local 32BJ Thomas Shortman Training Fund

Green Partner Organizations

- 🌱 *The Center for Sustainable Energy*
 - 🌱 *The City University of New York's High Performance Building Lab*
 - 🌱 *New York State Energy and Research Development Authority (NYSERDA)*
 - 🌱 *The Urban Green Council (U.S. Green Building Council New York)*
 - 🌱 *The Urban Agenda-Apollo Alliance*
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The Thomas Shortman Training Fund, a joint labor-management partnership, is at the vanguard of green training in the real estate industry. This year the Training Fund launches *1 Year: 1,000 Green Superintendents*, an innovative green building initiative that trains superintendents, resident managers and handypersons to become energy efficient Multifamily Building Operators certified by the Building Performance Institute and the Urban Green Council (U.S. Green Building Council New York). Students in the class learn how to reduce water usage, improve heating and air conditioning performance and reduce overall energy use within common areas of the building. With more than 110,000 members in nine states and the District of Columbia, 32BJ is the largest property services union in the country. More than 80% of the large multifamily residential buildings in New York City have 32BJ workers. In total, the union represents more than 30,000 residential workers in the City.

The Training Fund is in a unique position to make a significant and lasting difference in the lives of all New York City residents. Because labor, as represented by 32BJ, and management, as represented by the Realty Advisory Board on Labor Relations (RAB), work together to co-manage the Training Fund we can be confident that the skills that are learned in the classroom will be put to good use in our city's buildings.

A History of Green Building Training

Since 2005, the Training Fund has been educating 32BJ members on green building technologies and practices that make our buildings more efficient. The green training courses are the first of their kind in the New York area for a labor union. By harnessing the existing training infrastructure, The Training Fund has leveraged the existing connections between property managers, building owners, non-profits, and union members to create a comprehensive program to green our city's supers (See Appendix A for full curriculum).

The Training Fund will also train supers to understand government incentive programs. This will help streamline the communication between incentives and potential program participants. Once a building has a green super, a green staff, and a green owner it then has the ability to maximize the benefit of green capital investments. Incentives programs are an effective way to pursue these capital upgrades. The up front costs of installing new boilers, solar panels, green roofs, and other systems are often large enough that buildings need help to make them economically viable. The Training Fund, acting as an informational resource for green supers and building owners can help the right buildings find the right incentives.

Answering The Call

The Training Fund has experience delivering successful programs when the circumstances demand it. In the aftermath of September 11th the Training Fund partnered with the New York Police, Fire, and Emergency Management Departments to create New York Safe & Secure. This program trained 6,500 doormen, porters, and cleaners in a variety of security related measures. This program taught 32BJ members how to identify suspicious packages and behavior, sharpen observation skills, provide information to emergency responders, and protect residents in the event of an emergency.

While the Safe & Secure program addressed security and terrorism, the 1,000 Green Supers program will help address the global environmental and energy issues facing New York City. It is in this spirit of civic service that 32BJ, the Training Fund, and The Realty Advisory Board look to help the city address another global crisis.

Hector Norat is a 32BJ member and the Resident Manager of 1400 on 5th.

Hector is responsible for operating and maintaining one of the greenest buildings in New York City. His building was constructed using 60% renewable materials, utilizes green cleaning supplies, low-VOC paint, and EnergyStar appliances. Most impressively, Hector's building has the nation's largest residential geothermal pump which helps lower the building's heating and cooling costs by 70%.

Mr. Norat has taken multiple green building classes at the Thomas Shortman Training Fund. By continually improving his green building expertise, Hector is able to ensure that his building will always be optimally operated and maintained.



5.

1 Year: 1,000 Green Supers. Our Vision for a Greener Future

To date, the following partner property management firms have been extraordinarily valuable in ensuring this program's success:

- ✔ Akam Associates
 - ✔ Brown, Harris, Stevens
 - ✔ Charles H. Greenthal Management Corporation
 - ✔ Columbia University
 - ✔ Cooper Square Realty
 - ✔ Douglas Elliman Property Management
 - ✔ Durst Organization
 - ✔ Glenwood Management
 - ✔ Orsid Realty
 - ✔ Related Management
 - ✔ Rose Associates
 - ✔ Wallack Management
-

Our program to train superintendents is a cooperative effort between building owners, property managers, building service workers, and 32BJ. Participating firms will send their supers to a rigorous 40-hour core course that will cover all aspects of green building operations and maintenance. Our curriculum (see appendix A) draws from standards established by the Building Performance Institute (BPI) and the Urban Green Council (U.S. Green Building Council New York). It includes units on quantifying a building's energy usage, optimizing heating, cooling, lighting and water use, sealing the building envelope, and using green cleaning products to improve indoor air quality. The program also includes electives tailored to the specifics of particular building types. At the conclusion of the course, superintendents will take written and field tests. Upon satisfactorily completing both tests each super will be certified by the Building Performance Institute and the Urban Green Council (U.S. Green Building Council New York).

The Training Fund will provide a broad framework of support for participating supers to ensure that new skills are put to good use on the job. The program is targeted to reach committed workers with supportive management. Each super will be asked to develop a green building management plan with building owners. As a part of this plan we will encourage supers to post information in the public areas of buildings, circulate letters to tenants, and otherwise share information on their building's new green practices. The goal will be to create a climate of shared responsibility in the building to improve environmental performance.

Finally, an interactive online community through the Training Fund's website will enable supers to post success stories, view "how to" videos, and compare results with

classmates. Additionally, tours of stand out buildings will be organized that are open to all supers who have graduated from the program. The tours will enable superintendents to learn from and inspire each other with innovations adopted by their peers.

In addition to providing training to superintendents we also plan to track the progress our students make. To this end we plan to collect energy metrics for a selection of the buildings and supers that go through our program and assess the impact our initiative has on energy consumption in our city's buildings.

In the first full year of program execution, the Training Fund plans to teach 1,000 green building classes, provide 4,500 hours of instruction, and provide New York City with 1,000 green supers. In doing so, the Training Fund will help provide our city with a professional building service workforce capable of reducing energy use, conserving water, saving money, improving our health, and cleaning our environment.

If you are a building superintendent, a property manager, a building owner, or are interested in more information, please contact us at:

Thomas Shortman Training Fund
101 Avenue of the Americas
New York, NY 10013-1991

Phone: 212-388-3220
Email: 1000supers@32bjfunds.com
Web: www.1000supers.com

Please visit www.1000supers.com to learn more about the program, keep tabs on the progress, and see if your building has a green superintendent.

1,000 Supers Training Curriculum

- Day 1**
 - a. Building Science
 - b. Building Envelope
 - c. Lighting, Electricity, and Plug Loads
- Day 2**
 - a. HVAC (Heating, Ventilation, and Air Conditioning)
 - b. Field Exercise: HVAC Operations and Maintenance
- Day 3**
 - a. Indoor Environmental Quality
 - b. Water Conservation
 - c. Field Exercise: Hallway, Lobby, Apartment
- Day 4**
 - a. Quantifying Energy Usage
 - b. Green Building Work Plan and Communications
- Day 5**
 - a. BPI Written Test
 - b. Urban Green Council (USG-BCNY) Written Test
 - c. BPI Field Test
- Electives**
 - a. 1 Pipe Steam
 - b. 2 Pipe Steam
 - c. Hydronics
 - d. Forced Hot Air
 - e. District Steam
 - f. Co generation
 - g. Renewables
 - h. Green Roofs
 - i. Retro commissioning
 - j. Grey/Black Water Reuse

See Appendix A to learn more about the curriculum of our program

Appendix A: Program Curriculum



Green training at the Training Fund will include 40 hours of core work which covers all aspects of green building operations and maintenance, four hours of elective work customized to each super's building, and four hours of written and field testing aimed at earning Building Performance Institute and Urban Green Council (USGB-CNY) certifications. The 40 hour core course is comprised of the following 10 units plus certification tests.

Building Science — Unit 1 will cover the fundamentals of building science and examine a whole building approach to operations and maintenance. Topics of this class will include the Laws of Thermodynamics, air movement, sensible and latent heat, heating degree days, energy measurement, heat transfer, and relative humidity.

Building Envelope — Unit 2 will cover the core area of the building's envelope and explore ways to keep conditioned air from escaping to the outside environment. Topics in this class include air barriers, vapor barriers, thermal barriers, air sealing, insulation, pressure boundaries, and compartmentalization.

Lighting, Electricity, and Plug Loads — Unit 3 will cover all aspects of electricity, lighting, and appliances. Topics of this class will include electrical science, lighting types, lighting retrofits, lighting audits, motion sensors, and appliance maintenance and purchasing.

HVAC — Unit 4 will cover the essentials of running a building's heating, ventilation, and air conditioning system. Topics in this class include combustion science, combustion efficiency, controls, distribution, and steam.

Field Exercise (HVAC): Mechanical Room and Roof — Unit 5 will be an onsite visit to a building's machine room and roof where instructors will teach supers how to perform solid state efficiency tests, maintain rooftop ventilation equipment, and properly log the daily use of the building's mechanical systems.

Indoor Environmental Quality — Unit 6 will address the indoor atmosphere of a building. Topics will include green cleaning, volatile organic compounds, moisture, mold, asbestos, and pest control.

Water Conservation — Unit 7 will cover the essentials of water use and water conservation strategies. Topics include water metrics analysis, domestic hot water optimization, low flow appliances, and leak detection and repair.

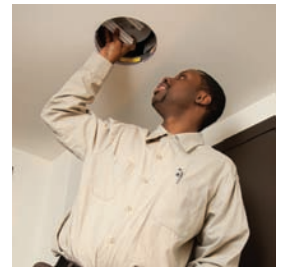
Field Exercise: Hallway, Lobby, Apartment — Unit 8 will be an onsite exercise where supers learn how to evaluate the building's envelope, audit a building's lighting, and address wasted energy in a variety of locations throughout the building.

Quantifying Energy Usage — Unit 9 will cover energy usage and benchmarking. Topics in this class will be analyzing energy bills, determining base usage, and building metrics. The culmination of this class will be for each student to perform a basic benchmark of their building.

Green Building Work Plan and Communications — Unit 10 will provide strategies and techniques for supers to develop a green building work plan and communicate effectively with building owners, tenants, and staff on the green measures that they are taking. Topics of this course will be on generating tenant buy-in, presenting a green business plan to management, and performing cost benefit analysis for owners.

Electives — The technologies inside buildings vary widely. So rather than ask all supers to learn about all systems, our program offers elective courses on the different technologies specific to their own buildings. An abbreviated list of available electives include:

- ✔ 1-Pipe Steam
- ✔ 2-Pipe Steam
- ✔ Hydronics
- ✔ Forced Hot Air
- ✔ District Steam
- ✔ Co-generation
- ✔ Renewables
- ✔ Green Roofs
- ✔ Retro-commissioning
- ✔ Water Reuse



Footnotes

- ¹ United States Green Building Council. "Green Building Research", 2008
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1718>
- ² Calculation based on data generated by the National Action Plan for Energy Efficiency (NAPEE). "Vision for 2025: Developing a Framework for Change", 2007, p. 2-1
- ³ Building Design and Construction. "National Studies Show Green Building Creates Green Jobs that Save Energy and Money", 2009
<http://www.bdcnetwork.com/article/CA6629766.html>
- ⁴ McKinsey & Co. "Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Curve", 2009, p. 7
- ⁵ The City of New York. "PlaNYC: Inventory of New York City Greenhouse Gas Emissions", 2008
http://www.nyc.gov/html/planyc2030/downloads/pdf/emissions_inventory_2008.pdf
- ⁶ The City of New York. "PlaNYC: A Greener, Greater New York", 2007
http://www.nyc.gov/html/planyc2030/downloads/pdf/report_energy.pdf
- ⁷ The City of New York. "PlaNYC: A Greener, Greater New York", 2007
http://www.nyc.gov/html/planyc2030/downloads/pdf/report_energy.pdf
- ⁸ Con Edison, "Annual Report", 2005–2008
http://www.coned.com/documents/Con_Edison_2008_Annual_Report.pdf
Consolidated Edison, "P.S.C. No. 9–Electric Tariff; Historical Electric Rates"
<http://www.coned.com/rates/elec-historical.asp>
- ⁹ United States Department of Energy. "Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State", 2009
http://www.eia.doe.gov/cneaf/electricity/epm/table5_6_a.html
- ¹⁰ McKinsey & Co. "Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Curve", 2009, p. 7
- ¹¹ Synectics Group for U.S. Department of Energy, "An Evaluation of the Institutional Conservation Program", 1983
- ¹² Correspondence with superintendent John Sarich. Values reflect a 100 unit, natural gas powered, condominium high-rise.
- ¹³ New Yorkers spend \$13.4 billion each year on energy for buildings (PlaNYC). Apartment buildings with 5 or more units account for 23% of this demand (NYSERDA), or \$3.1 billion annually. Of this energy demand, large buildings with more than 30 units account for 75% or \$2.3 billion annually. If better O&M reduced energy use 10% in these large apartment buildings, New Yorkers would save more than \$230 million every year.
- ¹⁴ According to PlaNYC, New York emitted 61 MMT of carbon dioxide equivalent in 2007. We multiplied by .77 for the share of emissions attributed to buildings, and then by .23 for the share of total building energy use by apartment buildings, then by .75 for the share of energy used by apartment buildings larger than 30 units to conclude that New York's apartment buildings generate 8.1 MMT of carbon emissions each year. If each apartment building achieved 10% energy savings, carbon emission would be reduced by 0.8 MMT per year city-wide. Since a single automobile generates about 5.4 metric tons of carbon per year, reducing emissions by 0.8 MMT is equivalent to taking 150,000 cars off the road.
- ¹⁵ The City of New York. "PlaNYC: Green, Greater Buildings Plan", 2009
http://www.nyc.gov/html/planyc2030/html/plan/buildings_plan.shtml
- ¹⁶ The City of New York. "PlaNYC: A Greener, Greater New York", 2007
http://www.nyc.gov/html/planyc2030/downloads/pdf/report_energy.pdf
- ¹⁷ Conversation with Richard Cherry, President and CEO of the Community Environmental Center, 2009
- ¹⁸ Richard Leigh and Eduardo Guerra. "Saving Energy in Existing Residential Buildings", 2007
<http://www.sallan.org/newviews/archives/2007/01/000260.php>
- ¹⁹ New York City Water Board. "Drinking Water Supply and Quality Report", 2008
<http://www.nyc.gov/html/dep/pdf/wsstate08.pdf>
- ²⁰ New York City Department of Environmental Preservation. "Fix a Leak Week is March 16 to 20", 2009
http://www.nyc.gov/html/dep/html/news/fix_a_leak_week.shtml
- ²¹ This chart is not based on the lifecycle cost of a particular action or retrofit. It is based simply on the amount of upfront money required to make the particular change and the dollar savings that change will generate over the course of a year. Therefore, these dollar savings calculations are most likely undervaluing the long term value of certain actions. For example, a CFL light bulb lasts 10 to 15 times longer than a standard incandescent (American Lighting Association) but this benefit is not reflected in this chart.
- ²² Cost: \$1 for equipment, \$10 for labor
New York City Department of Environmental Protection, "Leaks and their Costs", 2009
http://www.nyc.gov/html/dep/html/ways_to_save_water/waterleak_wide.shtml
- ²³ Resources Saved: 3 to 6 gallons of water saved per day per apartment * 365 days per year
Cost: \$5 for equipment, \$10 for labor
Water Resources Engineering Inc., "Overview of Retrofit Strategies: A Guide for Apartment Owners and Managers", U.S. Department of Housing and Urban Development, 2002, p. 6
<http://www.huduser.org/publications/pdf/Book1.pdf>



- 24 Resources Saved: 0.5 to 4.5 gallons of water saved per day per faucet * 365 days per year
 Cost: \$4 for equipment, \$2 for labor
 Water Resources Engineering Inc., "Overview of Retrofit Strategies: A Guide for Apartment Owners and Managers", U.S. Department of Housing and Urban Development, 2002, p. 6
<http://www.huduser.org/publications/pdf/Book1.pdf>
- 25 Resources Saved: 1.9 to 3.4 gallons of water saved per flush * 2 people per apartment * 5 flushes per person per day * 365 days
 Cost: \$100 for equipment, \$30 for labor
 Water Resources Engineering Inc., "Overview of Retrofit Strategies: A Guide for Apartment Owners and Managers", U.S. Department of Housing and Urban Development, 2002, p. 16
<http://www.huduser.org/publications/pdf/Book1.pdf>
 American Water Works Association, "Residential End Uses of Water", 1999
- 26 Resources Saved: 1 to 3 gallons of water saved per toilet per day * 365 days per year
 Cost: \$0 for equipment, \$4 for labor
 Water Resources Engineering Inc., "Overview of Retrofit Strategies: A Guide for Apartment Owners and Managers", U.S. Department of Housing and Urban Development, 2002, p. 6
<http://www.huduser.org/publications/pdf/Book1.pdf>
- 27 Resources Saved: 30 gallons of water saved per day * 365 days per year
 Cost: \$10 for equipment, \$10 for labor
 New York City Department of Environmental Protection, "Leaks and their Costs", 2009
http://www.nyc.gov/html/dep/html/ways_to_save_water/waterleak_wide.shtml
- 28 Resources Saved: A 100 Watt incandescent is replaced with the equivalent 27 Watt CFL and used for 8 hours a day * 365 days per year
 Cost: \$3 for equipment, \$1 for labor
 New York City Department of Environmental Protection, "Leaks and their Costs", 2009
http://www.nyc.gov/html/dep/html/ways_to_save_water/waterleak_wide.shtml
- 29 Resources Saved: Replacing a 192 Watt F40-T12 (4 lamps, 2 ballasts) system with a 112 Watt F32-T8 (4 lamps, 1 ballast) system that is on 8 hours per day
 Cost: \$16 for bulbs, \$15 for ballast, \$30 for labor
 Madison Gas and Electric, "T8 Fluorescent Lamps and Electronic Ballasts", 2009
<http://www.mge.com/business/saving/detail/t8.htm>
- 30 Resources Saved: A 40 Watt incandescent exit sign is replaced with the equivalent 2 watt LED exit sign
 Cost: \$15 for equipment, \$10 for labor
- 31 Resources Saved: Turns off standard 75 watt exterior light for 10 hrs per day (daytime)
 Cost: \$20 for equipment, \$30 for labor
- 32 Resources Saved: Turns off standard 112 watt fluorescent fixture for 8 hrs per day
 Cost: \$40 for equipment, \$30 for labor
- 33 Resources Saved: 6% energy savings per year on 1,239 kWh/year refrigerator (U.S. average)
 Cost: \$0 for equipment, \$10 for labor
 U.S. Department of Energy, "U.S. Household Electricity Report", 2005
http://www.eia.doe.gov/emeu/repse/enduse/er01_us.html
 Home Energy Magazine Online, "Sacramento Municipal Utility District Study", 1993
<http://www.homeenergy.org/archive/hem.dis.anl.gov/eehem/93/930109.html>
- 34 Assumptions: Steam trap has a 0.187" orifice, the boiler is running at 5 psig, and the building uses Con Ed Steam
 Resources Saved: 2,000 hours of boiler on time * 16.78 lbs/hr
 Cost: \$100 for equipment, \$30 for labor
 Manczyk, Henry, "Estimating the cost of steam loss through the orifice of a steam trap"
<http://www.energy.rochester.edu/efficiency/steam.pdf>
- 35 New York City Water Board. "Rate Schedule", 2009
http://www.nyc.gov/html/nycwaterboard/html/rate_schedule/index.shtml
- 36 Con Edison, "Annual Report", 2005–2008
http://www.coned.com/documents/Con_Edison_2008_Annual_Report.pdf
 Consolidated Edison, "P.S.C. No. 9–Electric Tariff; Historical Electric Rates"
<http://www.coned.com/rates/elec-historical.asp>
- 37 Consolidated Edison, "Annual Report", 2008
http://www.coned.com/documents/Con_Edison_2008_Annual_Report.pdf
 Consolidated Edison, "P.S.C. No. 4–Steam", 2009
http://www.coned.com/documents/steam/Tariff_LeavesSCs.pdf
 The City of New York, "PlaNYC: Inventory of New York City, Greenhouse Gas Emissions", Appendix A, 2007
http://www.nyc.gov/html/planyc2030/downloads/pdf/emissions_inventory.pdf
 *NOTE: 2005–2007 Fixed costs were not available. This figure based on an extrapolation of fixed cost increases for electricity





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The 32BJ Thomas Shortman Training fund offers training to 80,000 members of SEIU Local 32BJ working in the property services industry. The Training Fund is a joint labor-management organization, cosponsored by Local 32BJ and the Realty Advisory Board on Labor Relations.

Every year the Training Fund provides industry, academic, and computer courses to thousands of Local 32BJ building service workers at over 20 locations in New York, New Jersey, Connecticut, Pennsylvania, Maryland, Virginia, and The District of Columbia.

