

# City program coats roofs white, cuts electricity bills

## Use volunteers to coat your roof, and keep you cooler in summer

Traditional black asphalt roofs hold the sun's rays as heat, getting as hot as 190° F on summer days. Applying highly reflective white coatings make roofs much cooler, lowering internal building temperatures by up to 30% in summer. Since cooler roofs expand and contract less, they last 5 to 10 years longer than typical roofs, and have lower maintenance costs. To make this standard practice, NYC Service and the NYC Department of Buildings launched NYC °CoolRoofs. Piloted in Long Island City, Queens in 2009, the program coated over 1 million square feet citywide in 2010.

<http://www.nyc.gov/html/coolroofs/html/home/home.shtml>

For building owners who agree to share before and after energy bills with the City, NYC °CoolRoofs will provide a free roof inspection, assist the owner in purchasing roof coating at a discounted rate from NYC °CoolRoofs vendors, and volunteer labor to apply it. They will coordinate with the client to set up a series of coating days, depending on weather and availability of volunteers. NYC °CoolRoofs will arrange for a coating delivery, supply rollers and other equipment, and coordinate volunteers to carry out the coating project. Nonprofits are encouraged to recruit volunteers from amongst their constituents, and the surrounding community. Community partners such as Long Island City Business Development Corporation will assist building owners in accessing NYC °CoolRoofs benefits.

## Where coating your roof white is the best investment for building owners

Applying a white roof coating to older buildings can save up to 8 or 9 cents in electricity per square foot per year, updating the estimated savings of about \$0.067 psf of roof per year from a 2005 NYC DDC report for higher electric costs. Both costs and savings are likely to rise in the future. With labor costs as much as 50 cents psf, the City's offer of free roof coating drastically reduces project costs.

- Conservative estimates show cool roofs reducing air conditioning costs by 10% to 30% on hot summer days in which air conditioning accounts for up to 40% of daily electricity use. Actual savings may be higher.
- Cool roofs can reduce internal building temperatures up to 30%, reducing cooling loads and extending the life of cooling equipment.

Focused only on financial return? Savings will pay for the cost of a white roof project within about three years, under these circumstances:

- The building is owner occupied
- It was built before 1980, and is not energy-efficient or well-insulated
- The existing roof surface is standard black asphalt/granulated/bituminous
- It is only one or two stories tall, with much more surface area compared to mass

NYC DDC's *Cool and Green Roofing Manual*, (2005), Table 5.  
[http://www.nyc.gov/html/ddc/downloads/pdf/cool\\_green\\_roof\\_man.pdf](http://www.nyc.gov/html/ddc/downloads/pdf/cool_green_roof_man.pdf)

Building owners can calculate their individual savings with the US Department of Energy cool roof calculator at <http://www.ornl.gov/sci/roofs+walls/facts/CoolCalcEnergy.htm>

## **Cooling your roof is good for the City**

Cities are 5°F – 7°F hotter than the surrounding countryside because of a phenomenon called the Urban Heat Island Effect. Dark surfaces, like asphalt roofs and roads, and the vast heat-absorbing bulk of buildings, capture sunlight to heat cities and warm the surrounding buildings and air.

The massive amounts of energy needed to keep NYC cool each summer can be substantially reduced by increasing the reflectivity of its roofs and roads, and planting green roofs and trees, which counter the Heat Island Effect. If widely implemented, NYC °CoolRoofs says cool roofs could lower the temperature in NYC by up to 1°F.

Reducing urban heat will decrease summertime peak energy demand - reducing utility grid stress and the likelihood of outages. It will also reduce air pollution, heat-related illnesses and water quality impacts. By reducing carbon emissions, cool roofs are an important response to climate change.

- Cool roofs in NYC are estimated to reduce CO2 emissions at a rate of 0.5 lbs per square foot of cool roof area.
- 1 million square feet of cool roofs should reduce NYC's CO2 emissions by 500,000 lbs. or 227 metric tons. In car equivalents, this equals removing 50 cars from the road or having 300 New Yorkers not drive for an entire year.

White coatings reduce roof surface temperatures about 20%, which outperforms commonly used aluminum paint. Green roofs of short, hardy perennial plants in shallow layers of soil attain 38% reductions, but their upfront installation costs are much higher.

## **NYC °CoolRoofs Program**

All buildings can access a discount on the purchase price of white roof coating through the NYC °CoolRoofs coating vendors offering a discount (not all do). Buildings willing to use volunteers to coat the roof may request a free roof inspection from NYC °CoolRoofs. If the roof passes inspection, the building owner will receive free supervision, coordination & support of volunteer crews

### **Free roof inspection from NYC °CoolRoofs**

NYC °CoolRoofs will arrange inspection of the roof at no charge, whether the building is commercial or residential, or whether it is owned by a nonprofit organization or a government agency as long as the building owner agrees to use volunteer labor to coat

the roof. If the building is owned by a private company, the building owner must also agree to share energy bills with NYC °CoolRoofs in order to utilize the free volunteer labor. By sharing before and after energy bills with NYC °CoolRoofs, the effectiveness of the roof cooling program can be measured. Contact [nyc.gov/coolroofs](http://nyc.gov/coolroofs) and fill in the online form to request an inspection.

The inspection will determine the type of roof material, the condition of the roof, and whether or not it can be coated. Because of the varying chemical properties and porosity of different types of roofs, some types of coatings will be more suitable than others. NYC °CoolRoofs will present the building owner with an estimate of the number of square feet to be coated, the recommended coating types, the amount of coating that will be needed, and the expected cost of coating materials. The inspection will not review any other aspect of the building besides its suitability for white roof coating. If the building passes roof inspection for coating activities, NYC °CoolRoofs will coordinate directly with the owner to sign a building waiver and schedule coating activities.

Building owners that are not willing to share their energy bills with NYC °CoolRoofs will not be eligible for the free roof assessment, or the volunteer crews to coat their roof at no charge. They can use coating vendors or qualified roofing contractors to inspect their roof. The coating can easily be applied by building staff or a contractor. If they wish to coat the roof themselves or use building staff, they can still purchase coating at a discounted rate from NYC °CoolRoofs vendors if they report completed square footage to the program.

## **Discount on cost of white roof coating**

Any building owner going through NYC °CoolRoofs for inspection, coating purchase and coating application will qualify for any discounts coating vendors might offer. The discount will vary by vendor and by product.

“Cool it yourself” building owners can still take advantage of the City’s discounted coating price by selecting one of the coatings on the NYC CoolRoofs web site, purchasing it from one of the approved vendors at the reduced rate, and then reporting the square footage painted to NYC °CoolRoofs when the job is completed.

<http://www.nyc.gov/html/coolroofs/html/partners/vendors.shtml>

## **Get your roof coated for free by volunteers**

With labor costs as high as 50 cents psf, the cost to apply the coating can be higher than that for materials. The best part of the NYC °CoolRoofs package is that *all building owners, both private and non-profit, can obtain volunteer coating crews from NYC °CoolRoofs*. Volunteers come through NYC Service, green job training programs, and volunteer groups supporting NYC °CoolRoofs.

The roof coating will be scheduled, organized and supervised by NYC °CoolRoofs, their contractors, and their volunteer partners. °CoolRoofs will coordinate delivery of the

coating, and will supply rollers and brushes. Roofs can be coated in spring, summer or fall, as long as there is no rain, and the temperature is above 50F. Several days are required to prepare the roof, and lay down two applications of coating.

## Options for different types of buildings and owners

- *Privately owned residential or commercial buildings*
- *Non-profits that rent space in a privately owned building*
- *Non-profits that own the building in which they are located*
- *Any building doing both the roof inspection and the painting itself*

Type of Building/Owner	Discounted coating	Volunteer Labor	Inspection Services
Non-profit owner	✓	✓	✓
Non-profit renter	✓	✓	✓
Government	✓	✓	✓
Hospital/School/Low Income Housing	✓	✓	✓
Private Owner using volunteer labor and sharing energy bills	✓	✓	✓
Private owner "Cool It Yourself"	✓		

### *Privately owned commercial or residential buildings*

NYC °CoolRoofs will provide volunteer crews to coat the roof of private buildings, as long as the owner will sign up with NYC °CoolRoofs as a research partner, and share its before and after energy billing information. Volunteer crews for private buildings will come through NYC Service, and green jobs training programs.

### *Non-profit tenants and building owners both covered*

Non-profits, government agencies, hospitals, schools, low-income housing facilities all qualify for free inspection and the coating services package. It doesn't matter if the non-profit requesting white roof painting is a tenant in a privately owned building, or owns the building itself.

### *Non-profits can access additional sources of volunteers*

NYC °CoolRoofs will provide volunteer crews to paint the roofs of non-profits, schools, hospitals, and low-income housing facilities. These buildings can access additional sources of volunteers. Many volunteer groups want to paint the roofs of non-profit buildings white, to reduce NYC's greenhouse gas emissions and respond to climate change, in partnership with NYC °CoolRoofs. Volunteer groups are also reaching out to elected officials and community leaders, recruiting non-profit organizations willing to join the NYC °CoolRoofs program, and organizing locally to make neighborhoods more sustainable. Such non-profits should follow up with both NYC °CoolRoofs and the

volunteer group that referred them to the program, after passing their roof inspection, to schedule the coating of their roof. Contact White Roof Campaign for additional volunteer resources, and assistance with local organizing. [www.whiteroofcampaign.org](http://www.whiteroofcampaign.org)

*In some cases, qualified non-profits can get their roofs painted completely for free.*

Through NYC °CoolRoofs' Totally Cool Corporate Days, some corporations will pay for all the coating, and volunteer their own staff to apply the coating. Non-profits located in easily accessible neighborhoods, such as Long Island City, downtown Brooklyn, the south Bronx, and Manhattan, are most likely to obtain this limited corporate support. If your building is approved for coating after inspection, NYC °CoolRoofs will contact you during the season if there is corporate interest in sponsoring your building. Corporate support is not guaranteed.

*Cool It Yourself Buildings: owner both inspects roof and applies coating themselves*

Some building owners may want to have their contractor / a white roof coating vendor inspect the roof, recommend a suitable coating, and use their own staff or a contractor to apply the coating. The owner can still get the discount, if they mention the NYC °CoolRoofs program when ordering the coating from one of the approved vendors, and report their completed square footage painted on the °CoolRoofs website.

## Getting the right coating for your roof

It's necessary to elect the right type of coating for the surface material of your roof. For NYC's most common roof surfaces, generic aluminum paint or black asphalt, pick from among the following standard short list of coatings. If you have a roof warranty, check if it allows the use of the products on the list. Prices for a five gallon container range widely, from approximately \$70 - \$140. The amount of the NYC °CoolRoofs discount will vary with each vendor and coating type (some vendors do not offer discounts). ***The most savings will come to roofs on which the least expensive coating is applied.***

### Proprietary Roof brands

Firestone and GAF brand roofs typically require the use of one of their coating products to prevent the voiding of the roof warranty. There may be other proprietary brands that NYC °CoolRoofs has not encountered yet, so a building owner should always check with the manufacturer before applying anything.

### Best Products by Roof Surface

- Aluminum paint: GAF Top Coat MB adheres best, so is the most effective
- EPDM: GAF and APOC, which need special primer first, raising the cost
- Granulated/Asphalt/Bituminous: Any coating will work

### Roll Application vs. Spray Application

*Best coatings for roller application:*

- APOC 247 and 248
- Roof Xtender 500

- Roof Xtender 700
- GAF Top Coat MB
- ThermoCote
- Uniflex
- Energy Seal

*Best coatings for spray application:*

- ThermoCote has been tested on sprayers by NYC CoolRoofs
- Others probably spray well, but have not been tested by NYC CoolRoofs

**Coatings with UL Fire Rating**

- APOC 248
- Roof Xtender 700
- GAF Top Coat MB Fire
- ThermoCote

**Coating Cost per 5 Gallon Bucket (costs from 2010 program)**

- APOC 247: \$74.40
- APOC 248: \$84.80
- Roof Xtender 500: \$69.08
- Roof Xtender 700: \$95.64
- GAF TopCoat MB: \$137.75
- ThermoCote: \$150
- Uniflex
  1. Kool Seal 63-300 (7 year white): \$76.00
  2. Kool Seal 63-600 (10 year white): \$96.25
  3. Kool Seal Koolastic Primer: \$103.75
  4. Snow Roof Premium White: \$112.75
  5. Snow Roof Elastoseal Primer: \$132.50
- Energy Seal Acu-Shield: \$91.90

The term vendor encompasses products, manufacturers and distributors.

Vendors that meet NYC °CoolRoofs requirements are listed here:

<http://www.nyc.gov/html/coolroofs/html/partners/vendors.shtml>

***For more information:***

“DDC Cool and Green Roof Manual,” NYC Dept. of Design & Construction, 2005

[http://www.nyc.gov/html/ddc/downloads/pdf/cool\\_green\\_roof\\_man.pdf](http://www.nyc.gov/html/ddc/downloads/pdf/cool_green_roof_man.pdf)

Cool Roofs / Heat Island Effect, US Environmental Protection Agency

<http://www.epa.gov/heatisd/mitigation/coolroofs.htm>

“Reducing Urban Heat Islands: Compendium of Strategies,” cool roofs chapter

<http://www.epa.gov/heatisd/resources/pdf/CoolRoofsCompendium.pdf>

“Guidelines for Selecting Cool Roofs,” US Department of Energy, 2010  
<http://www1.eere.energy.gov/femp/pdfs/coolroofguide.pdf>

“A Temperature and Seasonal Energy Analysis of Green, White and Black Roofs,”  
Center for Climate Systems Research, Columbia University, 2010  
<http://www.coned.com/newsroom/pdf/Columbia%20study%20on%20Con%20Edisons%20roofs.pdf>

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<http://www.sciencedirect.com/science/article/B6V2W-4B2CCTF-1/2/6d6bb711e68e49cf7899a0e098af0e21>