

Monday, October 15, 2012

ASHRAE Manager of Standards  
 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.  
 1791 Tullie Circle, NE  
 Atlanta, GA 30329-2305



**RE: Proposed Addendum i to Standard 189.1 1-2011 Standard for the Design of High-Performance Green Buildings**

The Global Cool Cities Alliance supports Addendum i to Standard 189.1-2011 which proposes to expand the solar reflectance requirements for roofs to climate zone 4. We agree with the analysis presented in the proposed addendum that cool roofs are beneficial across a range of building types in climate zone 4. The Levinson and Akbari paper from 2009 that is cited in the proposed addendum gives a comprehensive review of the energy and cost savings of installing cool roofs across the country and show clear benefits in climate zone 4.

GCCA recently updated the findings from this paper, using energy savings findings from Levinson and Akbari, 2009, along with electricity and natural gas prices from the U.S. Energy Information Administration (EIA) from 2010. Our findings are shown in the table below. Because electricity prices have generally risen over the last few years, while natural gas prices have generally declined, the energy-cost savings of cool roofs has generally increased since the Levinson and Akbari paper was published in 2009 (using 2005 electricity and natural gas prices).

**Table 1: Energy-cost savings of cool roofs**

Benchmark cities	State	Climate Zone	new office annual energy-cost saving (\$/m2)	old office annual energy-cost saving (\$/m2)	new retail annual energy-cost saving (\$/m2)	old retail annual energy-cost saving (\$/m2)
Miami	FL	1A	\$ 0.31	\$ 1.02	\$ 0.41	\$ 1.17
Houston	TX	2A	\$ 0.26	\$ 0.79	\$ 0.33	\$ 1.16
Phoenix	AZ	2B	\$ 0.37	\$ 1.08	\$ 0.46	\$ 1.33
Atlanta	GA	3A	\$ 0.23	\$ 0.80	\$ 0.32	\$ 1.07
Los Angeles	CA	3B	\$ 0.27	\$ 0.85	\$ 0.32	\$ 1.09
Las Vegas	NV	3B	\$ 0.29	\$ 0.90	\$ 0.36	\$ 1.14
San Francisco	CA	3C	\$ 0.16	\$ 0.74	\$ 0.24	\$ 1.05
Baltimore	MD	4A	\$ 0.15	\$ 0.65	\$ 0.24	\$ 0.85
Albuquerque	NM	4B	\$ 0.24	\$ 0.83	\$ 0.33	\$ 1.07
Seattle	WA	4C	\$ 0.12	\$ 0.58	\$ 0.20	\$ 0.73
Chicago	IL	5A	\$ 0.11	\$ 0.46	\$ 0.13	\$ 0.64
Denver	CO	5B	\$ 0.15	\$ 0.61	\$ 0.25	\$ 0.92
Minneapolis	MN	6A	\$ 0.10	\$ 0.32	\$ 0.12	\$ 0.61
Helena	MT	6B	\$ 0.12	\$ 0.59	\$ 0.19	\$ 0.79
Duluth	MN	7	\$ 0.04	\$ 0.27	\$ 0.09	\$ 0.56
Fairbanks	AK	8	\$ 0.04	\$ 0.32	\$ 0.09	\$ 0.56

As the proposed addendum states, there are important benefits of cool roofs beyond building energy cost savings. Extensive scientific literature has demonstrated that increasing the reflectivity of roofs in urban areas reduces the ambient air temperature, thus reducing the urban heat island effect. Reduced air temperatures improves air quality, further reduces the need for air conditioning, makes un-conditioned spaces more comfortable and productive, and increases the resilience of human populations to heat events. Reduced heat sharply slows the rate

at which air pollutants – VOCs and NOx - cook into smog. Thus cooler urban temperatures can reduce smog formation in population centers.

We applaud efforts to further the utilization of cool roofs through ASHRAE Standard 189.1 and fully support the adoption of Addendum i.

Best regards,



Kurt Shickman  
Executive Director  
Global Cool Cities Alliance