



CITY OF GLENDALE, CALIFORNIA
Community Development Department
BUILDING & SAFETY DIVISION

633 East Broadway
Glendale, California 91206-4390
Inspections (818) 548-4836
Plan Check & Permits (818) 548-3200
www.ci.glendale.ca.us

November 26, 2013

Mr. Joseph M. Loyer, Mechanical Engineer
High Performance Buildings and Standards Development Office
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Energy cost effectiveness analysis for radiant roof barriers in the City of Glendale, CA

Dear Mr. Loyer,

As a prerequisite for certification of Glendale's local amendment requiring the installation of a radiant roof barrier in the concealed attic space of all new residential construction, analysis is required to demonstrate cost effectiveness. Presented herewith is a conservative analysis which demonstrates that such a requirement is, indeed, cost effective. Simple payback within climate zone 9 can be expected within a reasonable period of time, which is far shorter than the life expectancy of the building or roof.

Background

On May 18, 2012, a report was prepared by Gabel Associates, LLC, which demonstrated that the inclusion of a radiant roof barrier was a cost-effective method of construction which could save energy in a manner which exceeded 2008 Title 24 Part 6 energy standards. A copy of said report is attached hereto as Attachment-1. The report's conclusion indicated that within energy zone 9, the energy savings from installation of a radiant roof barrier, compared to identical construction without such radiant roof barrier, was sufficient to recover the added cost of construction within a simple payback period ranging from 7 to 16 years. The average payback period within the Glendale climate was determined to be in the 11 to 12 year range.

This report serves as the basis of the current energy cost effectiveness analysis, by conservatively scaling the previous payback period to account for improvements in the 2013 Title 24 Part 6 standards which will take effect on January 1, 2014.

Analysis

During the development of the 2013 Title 24 Part 6 energy standards, energy experts have estimated that energy efficiency within climate zone 9 will be improved between 15% to 18% beyond the previous standards. To be conservative with our cost effectiveness approach, the City of Glendale will assume the highest end of the range, and demonstrate cost effectiveness based on a full 18%

improvement above and beyond the 2008 Title 24 Part 6 standards.

Furthermore, while the new Title 24 Part 6 standards may improve overall building performance in all areas of the building envelope, the City of Glendale will conservatively scale investment payback periods by assuming that the radiant roof barrier alone must account for the incremental energy efficiency savings, thereby stretching out the simple payback period for the full 18%. Of course, this is highly conservative, and other features in the design of a modern building will result in energy savings as well. Nonetheless, the City of Glendale's analysis will assume that the radiant roof barrier's contribution to energy savings must be reduced by a full 18% below the previous analysis by Gabel Associates, LLC, to determine a longer simple payback period to recover the investment cost.

According to the May 18, 2012 report:

3.0 Conclusions

Simple paybacks for radiant barrier in the three prototype single family homes range from 7 to 16 years in the Glendale climate, with an average payback in the 11 to 12 year range. Assuming that the useful life of roof sheathing is 30 years, and based on this analysis, radiant barriers are cost-effective as a mandatory requirement for roofing above attic spaces in Climate Zone 9.

Thus, by adjusting the simple payback period by a full 18%, a conservative estimate yields a new simple payback range of:

(7 to 16 years) X 1.18 = 8.26 to **18.9 years**

And the corresponding average payback period is similarly determined to be:

(11 to 12 years) X 1.18 = 12.98 to **14.14 years**

Therefore, even though 2013 Title 24 Part 6 energy standards have improved the required energy performance of all new buildings, radiant roof barriers are still a cost-effective mandatory feature. They will simply take slightly more than 2 additional years to payback their investment cost, compared to the 2008 energy code. Since the conservative payback periods are still well within the 30-year life expectancy of conventional roof sheathing materials, radiant roof barriers are a very cost-effective method of reducing energy consumption within buildings located in Climate Zone 9.

Respectfully,



Stuart Tom, P.E., CBO
Building Official