



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 95814-5514

Re: Cover Letter

Dear Mr. Loyer,

Thank you for working with Michael Gabel, Javier Mariscal and me to secure certification of the City of Glendale's radiant roof barrier requirement for new residential buildings. The radiant roof barrier requirement is identical to Glendale's provision last code-cycle, for which certification by the Commission was secured on November 14, 2012 by Resolution No. 12-1114-1e.

I am enclosing the following documents:

- 1) Letter to Mr. Robert Oglesby, dated November 26, 2013.
- 2) Copy of Glendale Ordinance No. 5813
- 3) Letter to Mr. Joseph Loyer, dated November 26, 2013, justifying cost-effectiveness
- 4) Copy of original Energy Cost-Effectiveness analysis by Gabel Associates, Dated May 18, 2012
- 5) Letter from Michael Gabel, dated December 3, 2012, concurring with cost-effectiveness determination

With this transmittal, I am formally requesting that the Commission consider the City of Glendale's request for certification of the local radiant roof barrier provision. If any further information is required, please do not hesitate to contact me at (818) 548-3214.

Respectfully,

A handwritten signature in black ink, appearing to read "Stuart Tom".

Stuart Tom, P.E., CBO
Building Official



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November 26, 2013

Mr. Robert Oglesby
Executive Director
California Energy Commission
1516 Ninth Street
Sacramento, Ca 95814-5514

Re: Certification of Local Building Energy Efficiency Standards

Dear Mr. Oglesby,

Per the request of Commission Staff, we would like to express to you our firm commitment to have the City of Glendale, California enforce the current Title 24 Building Energy Efficiency Standards as part of the implementation of our local energy ordinance. As the Chief Building Official, I will work with my staff involved in energy plan review and field inspection to improve their working knowledge of the energy standards. This includes special training as needed which focuses on enforcement of the energy standards and the special requirements of the Ordinance.

On November 19, 2013, I presented to the Glendale City Council, the *2014 Glendale Building and Safety Code* which was approved as Ordinance No. 5813. Within said ordinance, is an additional provision which requires a radiant roof barrier to be installed within concealed attic spaces of new residential buildings. This local Glendale requirement augments the basic energy standards required under Title-24, part 6, to improve the energy performance of new residential buildings. As an additional energy requirement, it requires certification by the Commission. An identical local amendment was included within Glendale's local code adoption during the previous code cycle, and was certified by the Commission on November 14, 2012 by Resolution No. 12-1114-1e.

To ensure that the local requirement for a radiant roof barrier is still cost effective, I have provided CEC staff with my analysis based on the earlier study performed by Gabel Associates, LLC. My analysis confirms that the cost to install a radiant roof barrier is recovered within a relatively short period of time, and is therefore cost effective.

The 2014 Glendale Building and Safety Code will ensure that residential and non-residential buildings in the City of Glendale will consume no more energy than permitted by Title 24, Part 6. A copy of Ordinance No. 5813 is available for public review in the Office of the Glendale City Clerk. A copy of said ordinance and a copy of the Energy Cost Effectiveness Study has been submitted to the Energy Commission staff. If additional information is desired, please feel free to contact me at (818) 548-3200.

Respectfully,

A handwritten signature in black ink, appearing to read "Stuart Tom".

Stuart Tom, P.E., CBO
Building Official

AN ORDINANCE ADOPTING THE 2013 CALIFORNIA BUILDING CODE AS VOLUME IA, THE 2013 CALIFORNIA RESIDENTIAL CODE AS VOLUME IB, THE 2013 CALIFORNIA PLUMBING CODE AS VOLUME II, THE 2013 CALIFORNIA MECHANICAL CODE AS VOLUME III, THE 2013 CALIFORNIA ELECTRICAL CODE AS VOLUME IV, THE 1997 UNIFORM HOUSING CODE AS VOLUME V, THE 2013 CALIFORNIA FIRE CODE AS VOLUME VI, THE GLENDALE SECURITY CODE AS VOLUME VII AND THE GLENDALE COMMERCIAL, INDUSTRIAL PROPERTY MAINTENANCE CODE AS VOLUME VIII AND THE 2013 CALIFORNIA GREEN BUILDING STANDARDS CODE AS VOLUME IX ALL OF WHICH COMPRISE THE BUILDING AND SAFETY CODE OF THE CITY OF GLENDALE, 2014.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF GLENDALE:

SECTION INT-1. The City of Glendale hereby adopts a Building and Safety Code of the City of Glendale, 2014, hereinafter designated as the “Glendale Building and Safety Code, 2014.”

SECTION INT-2. Volume IA. Building Standards.

The City of Glendale hereby adopts the 2013 California Building Code as Volume IA of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume IA of the Glendale Building and Safety Code, 2014, shall be as published in the California Building Code Volumes 1 and 2, 2013 edition, and as copyrighted in 2012 by the International Code Council, Inc. and the California Building Standards Commission, California Code of Regulations, Title 24, Part 2, Volumes 1 and 2, including all of its tables, indices, appendices, addenda and footnotes. Volume IA of the Glendale Building and Safety Code, 2014, shall include Appendix Chapter A1 of the California Existing Building Code, 2013 edition, published and copyrighted in 2012 by the International Code Council, Inc. and the California Building Standards Commission, California Code of Regulations, Title 24, Part 10, regarding seismic strengthening

provisions for unreinforced masonry bearing wall buildings and the Historic Building Code, 2013 edition, published and copyrighted in 2012 by the California Building Standards Commission, California Code of Regulations, Title 24 Part 8. Said California Building Code, California Existing Building Code and California Historic Building Code are hereby referred to and by such references are incorporated herein as if fully set forth.

SECTION INT-3. Volume IB. Residential Standards.

The City of Glendale hereby adopts the 2013 California Residential Code as Volume IB of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume IB of the Glendale Building and Safety Code, 2014, shall be as published in the California Residential Code, 2013 edition, and as copyrighted in 2012 by the International Code Council, Inc. and the California Building Standards Commission, California Code of Regulations, Title 24, Part 2.5, including all of its tables, indices, appendices, addenda and footnotes. Said California Residential Code is hereby referred to and by such reference is incorporated herein as if fully set forth.

SECTION INT-4. Volume II. Plumbing Standards.

The City of Glendale hereby adopts the 2013 California Plumbing Code as Volume II of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume II of the Glendale Building and Safety Code, 2014, shall be as published in the California Plumbing Code 2013 edition, and as copyrighted in 2012 by the International Association of Plumbing and Mechanical Officials and the California Building Standards Commission, California Code of Regulations, Title 24, Part 5, including all of its tables, indices, appendices, addenda and footnotes Said California

Plumbing Code is hereby referred to and by such reference is incorporated herein as if fully set forth.

SECTION INT-5. Volume III. Mechanical Standards.

The City of Glendale hereby adopts the 2013 California Mechanical Code as Volume III of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume III of the Glendale Building and Safety Code, 2014, shall be as published in the California Mechanical Code, 2013 edition, and as copyrighted in 2012 by the International Association of Plumbing and Mechanical Officials and the California Building Standards Commission, California Code of Regulations, Title 24, Part 4, including all of its tables, indices, appendices, addenda and footnotes. Said California Mechanical Code is hereby referred to and by such reference is incorporated herein as if fully set forth.

SECTION INT-6. Volume IV. Electrical Standards.

The City of Glendale hereby adopts the 2013 California Electrical Code as Volume IV of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume IV of the Glendale Building and Safety Code, 2014, shall be as published in the California Electrical Code, 2013 edition, and as copyrighted in 2011 to the National Fire Protection Association, Inc. and the California Building Standards Commission, California Code of Regulations, Title 24, Part 3, including all of its tables, indices, appendices, addenda, annexes and footnotes. Said California Electrical Code is hereby referred to and by such reference is incorporated herein as if fully set forth.

SECTION INT-7. Volume V. Housing Standards.

The City of Glendale hereby re-adopts the 1997 Uniform Housing Code as Volume V of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume V of the Glendale Building and Safety Code, 2014, shall be as published in the Uniform Housing Code, 1997 edition, and as copyrighted in 1997 by the International Conference of Building Officials, including all of its tables, indices, appendices, addenda and footnotes. Said Uniform Housing Code is hereby referred to and by such reference is incorporated herein as if fully set forth.

SECTION INT-8. Volume VI. Fire Safety Standards.

The City of Glendale hereby adopts the 2013 California Fire Code as Volume VI of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume VI of the Glendale Building and Safety Code, 2014, shall be as published in the California Fire Code, 2013 edition, and as copyrighted in 2012 by the International Code Council, Inc. and the California Building Standards Commission, California Code of Regulations, Title 24, Part 9, including all of its tables, indices, appendices, addenda and footnotes. Said California Fire Code is hereby referred to and by such reference is incorporated herein as if fully set forth.

SECTION INT-9. Volume VII. Security Standards.

Except as otherwise provided herein or as later amended, Volume VII of the Glendale Building and Safety Code, 2014 is hereby re-adopted as the Glendale Security Code, as previously adopted by Ordinance 5581

SECTION INT-10. Volume VIII. Commercial and Industrial Property Maintenance Standards.

Except as otherwise provided herein or as later amended, Volume VIII of the Glendale Building and Safety Code, 2014 is hereby re-adopted as the Commercial and Industrial Property Maintenance Code, as previously adopted by Ordinance 5581.

SECTION INT-11. Volume IX. Green Building Standards.

The City of Glendale hereby adopts the 2010 California Green Building Standards Code as Volume IX of the Glendale Building and Safety Code, 2014. Except as otherwise provided herein, or as later amended, Volume IX of the Glendale Building and Safety Code, 2014, shall be as published in the California Green Building Standards Code, 2013 edition, and as copyrighted in 2012 by the California Building Standards Commission, California Code of Regulations, Title 24, Part 11, including all of its tables, indices, appendices, addenda and footnotes. Said California Green Building Standards Code is hereby referred to and by such reference is incorporated herein as if fully set forth. The voluntary provisions in Appendix Chapter A-4 and Chapter A-5 are not adopted as mandatory compliance features at this time.

SECTION INT-12. Effect of Code on Past Actions and Obligations. The adoption of the Glendale Building and Safety Code, 2014, does not affect any civil lawsuit instituted or filed or prosecutions for ordinance violations committed on or prior to the effective date of said Code, does not waive any fee or penalty due and unpaid prior to the effective date of said Code, and does not affect the validity of any bond or cash deposit posted, filed or deposited pursuant to the requirements of any ordinance.

SECTION INT-13. References to Prior Code. Unless superseded and expressly repealed, references in City forms, documents and regulations to the chapters and sections of the former Glendale Building and Safety Code, 2011, shall be construed to apply to the corresponding provisions contained within the Glendale Building and Safety Code, 2014. Ordinance No. 5714 of the City of Glendale and all other ordinances or parts of ordinances in conflict herewith are hereby superseded and expressly repealed.

SECTION INT-14. Penalty. Unless otherwise provided in said Code, any person violating any provision of the Glendale Building and Safety Code, 2014, shall be guilty of a misdemeanor and upon conviction thereof, shall be punished by a fine not exceeding one thousand dollars, or by imprisonment in the City jail or the County jail of the County of Los Angeles for a term not exceeding six months, or both such fine and imprisonment.

SECTION INT-15. Severability. If any provision of this Ordinance or the application thereof to any person or circumstance is held invalid by a court of competent jurisdiction, that invalidity shall not affect other provisions or applications of this Ordinance that can be given effect without the invalid provision of application, and to this end the provisions of this Ordinance are severable.

SECTION INT-16. Effective Date, Exceptions. This ordinance becomes effective and shall be in full force on January 1, 2014; provided, however that where complete plans for buildings have been filed and are pending for building permits prior to the effective date of this Ordinance, permits may be issued, and the applicant may proceed with the construction in strict compliance with former Building and Safety Code, 2011, provided however physical construction is started within one hundred eighty (180)

VOLUME IA. BUILDING STANDARDS

SECTION IA-1. Volume IA of the Glendale Building and Safety Code, 2014, is amended as hereinafter provided.

SECTION IA-2. Chapter 1 Division II Section [A] 101.2 of Volume IA of the Glendale Building and Safety Code, 2014, is hereby amended to read as follows:

[A] 101.2 Scope. The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

Exception: Detached one-and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the California Residential Code as adopted and amended as Volume IB of the Glendale Building and Safety Code.

[A] 101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

SECTION IA-3. Chapter 1 Division II Section [A] 104.10.2 of Volume IA of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

[A] 104.10.2 Fire code official concurrence. For those cases which may affect fire or life safety, the building official shall obtain the concurrence of the fire code official.

SECTION IA-4. Chapter 1 Division II Section [A] 104.11.5 of Volume IA of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

[A] 104.11.5 Fire code official concurrence. For those cases which may affect fire or life safety, the building official shall obtain the concurrence of the fire code official.

SECTION IA-5. Chapter 1 Division II Section [A] 105.1 of Volume IA of the Glendale Building and Safety Code, 2014, is hereby amended to read as follows:

[A] 105.1 Permit Required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the building official and obtain the required permit. Parking lots shall not be paved, improved, striped, or restriped unless a separate permit for each parking lot has first been obtained from the building official.

Exception: A separate permit shall not be required to pave, improve, stripe, or restripe a parking lot when such work is included in the scope of another project for which a building permit has been issued and when the design of such parking lot was included in the plan check review of such project.

SECTION IA-6. Chapter 1 Division II Section [A] 105.2 of Volume IA of the Glendale Building and Safety Code, 2014, is hereby amended to read as follows:

[A] 105.2 Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in

violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m²).
2. Fences, pilasters, free-standing and retaining walls not over 18 inches (457 mm) high measured from the lowest adjacent grade to the top of fence, wall or pilaster, unless supporting a surcharge or impounding Class I, II, or IIIA liquids.
3. Oil derricks.
4. Water tanks supported directly on grade if the capacity does not exceed 5,000 gallons (18925 L) and the ratio of height to diameter or width does not exceed 2:1.
5. Platforms, sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or story below and are not part of an accessible route.
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Temporary motion picture, television and theater stage sets and scenery.
8. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, do not exceed 5,000 gallons (18925 L) and are installed entirely above ground.

15.11. Address Numbers, Identifying Data, and Illumination. The following standards shall apply to lighting, address identification and parking areas:

1. The address number of every commercial building shall be illuminated during the hours of darkness so that it shall be easily visible from the street. The numerals in these numbers shall be no less than six (6) inches (153mm) in height and be of a color contrasting to the background. In addition, any business which affords vehicular access to the rear through any driveway, alleyway or parking lot shall also display the same numbers on the rear of the building. (See also Volume VI Section 505.1)
2. All exterior commercial doors, during the hours of darkness, shall be illuminated with a minimum of one (1) footcandle (10.796 lux) of light. All exterior bulbs shall be protected by weather and vandalism-resistant covers.
3. Parking structures, open parking lots and access thereto, providing more than ten parking spaces and for use by the general public, shall be provided with a maintained minimum of one (1) footcandle (10.769 lux) of light on the parking surface from dusk until the termination of business every operating day.

16. Performance Testing.

16.1. Responsibility of Owner. It shall be the responsibility of the owner or his or designated agent, of a building or structure falling within the provisions of this Volume, to provide the enforcing authority with a written specification performance test report indicating that the materials utilized meet the minimum requirements.

16.2. Proof of Compliance. Whenever there is sufficient evidence of compliance with the provisions of this Volume or evidence that any material or any construction does not conform to the requirements of this Volume, or in order to substantiate claims for alternate materials or methods of construction, the enforcing authority may require tests as proof of compliance to be made at the expense of the owner or his agent by any agency which is approved by the enforcing authority.

16.3. Verification. Specimens shall be representative, and the construction shall be verified by assembly drawings and bill of materials. Two complete sets of manufacturer or fabricator installation instructions and full-size or accurate scale templates for all items and hardware shall be included.

16.4. Testing Methods. The enforcing authority shall establish and adopt testing methods which shall substantially meet the minimum standards in the most recent edition of the California Building Code.

VOLUME VIII.

COMMERCIAL AND INDUSTRIAL PROPERTY MAINTENANCE CODE

SECTION VIII-1. Volume VIII of the Glendale Building and Safety Code, 2014, is hereby adopted to read as follows:

10. PURPOSE. The Council of the City of Glendale has determined that the economic vitality of the City is directly impacted by the visual character and physical condition of its commercial and industrial neighborhoods. It is the purpose of this code to provide minimum standards for maintenance of properties in these districts, improve community appearance, and to protect the public health, safety and welfare of individuals who live, work, shop and/or operate business within and surrounding these districts.

The goals of this code are to promote an attractive business community that will help serve the economic and social interests of the City, to enhance the value of all commercial and industrial property and promote the overall economic development within the City by preventing commercial and industrial properties from becoming blighted resulting in diminution in the enjoyment, use, and property values of properties in and around the commercial and industrial areas. In adopting this code, it is the Council's intention to set forth maintenance standards for commercial and industrial properties.

20. SCOPE. The standards set forth in this code shall apply to all lots and parcels in all commercial and industrial zoning districts, as defined in Title 30 of the Glendale Municipal Code, 1995 ("GMC") and all structures located on such real property.

30. DEFINITIONS. For the purpose of this code, the following words and phrases shall have the following meanings:

"COMMERCIAL LANDSCAPING AREAS" shall be as defined by Title 30 of the GMC or as a "condition of approval" of a discretionary action in any commercial, commercial/industrial or industrial zone.

"VISUALLY OPAQUE" shall mean material that does not allow the viewing of images through it.

40. AUTHORIZATION. The building official or his or her designee(s) is authorized and directed to enforce the provisions of this code. For such purposes the building official shall have the powers of a law enforcement officer. The building official shall have the power to render interpretations of this code and to adopt and enforce rules and supplemental regulations in order to clarify the application of its provisions.

50. MAINTENANCE OF PROPERTY, GENERALLY. All property, buildings and structures or portions thereof shall be maintained in clean, and neat condition, in good repair and free of graffiti.

It is unlawful and deemed a public nuisance for any person owning, leasing, occupying or managing any commercial, commercial/industrial or industrial zoned property to maintain property contrary to this code.

60. SUBSTANDARD PROPERTY. Any building, structure or portion thereof which is determined to be an unsafe building in accordance with Chapter 1 Division II Section 116, Volume IA, Glendale Building and Safety Code, 2014; or any building or portion thereof, or the premises on which the same is located, in which there exists any of the following listed conditions shall be deemed and hereby is declared to be a substandard building and a violation of this code:

1. Any building, structure or portion thereof that is dilapidated, dangerous, abandoned, partially destroyed, or unsafe as defined in the Glendale Building and Safety Code, 2014, resulting from decay, damage, faulty construction or arrangement, fire, wind, earthquake, flood old age or neglect, inadequate exits, human or mechanical damage, or improper occupancy;
2. Any building, structure or portions thereof on which the condition of the paint has become so deteriorated as to permit decay, excessive checking, cracking, peeling, chalking, dry rot, warping, or termite infestation;
3. Any building, structure, wall or fence on which graffiti has been placed which is visible from a public street;
4. Any premises, building or portions thereof that are unsanitary. Unsanitary conditions shall include, but not be limited to, infestation of insects, vermin or rodents, rubbish, trash or debris maintained in any doorway or vestibule, lack of adequate garbage and rubbish storage and removal facilities, and/or lack of or improper connection to required sewage disposal system;
5. All electrical service to any electrical wiring devices, appliance, or equipment which is found to be dangerous to life or property because they are defective or improperly installed or used;
6. Plumbing which was installed in violation of GMC requirements in effect at the time of installation or which has not been maintained in a sanitary and safe operating condition;
- 7.a. All mechanical systems, materials and appurtenances, both existing and new equipment which were installed in violation of the code edition under which

installed and/or not maintained in proper operating condition in accordance with the original design and in a safe and hazard free condition.

- b. Screening devices used to obstruct the view of such devices which are not maintained in a clean and neat condition;
 - c. Any equipment and/or screening device or part thereof that is defective, broken, damaged, or weathered;
8. Any building or portions thereof which has faulty weather protection which shall include, but not be limited to, deteriorated or ineffective waterproofing of exterior walls, roofs, foundations or floors, parapets, including broken windows or doors, defective or lack of weather protection for exterior wall coverings, including lack of paint, or weathering due to lack of paint or other protective covering, or broken, rotted, split, or buckled exterior wall coverings or roof coverings and damaged or non-functioning drainage structures;
 9. Any building, premises or portions thereof, device, apparatus, equipment, combustible waste or vegetation which is in such a condition as to cause a fire or explosion or provide a ready fuel to augment the spread and intensity of fire or explosion arising from any cause; or
 10. Except as provided in Title 30 of the GMC, the accumulation of weeds, vegetation, junk, abandoned or inoperable motor vehicles, dead organic matter, debris, garbage, offal, rat harborages, stagnant water, combustible materials or similar materials on a premises or property;
 11. Inadequate or inoperative night and security lighting on a premises or property.

70. DECLARATION OF SUBSTANDARD PROPERTY. Whenever the building official or his or her designee(s) finds that a substandard condition(s) exist on any property covered by this code, he or she shall declare the building, structure, and/or premises as substandard and require the owner to complete repairs, removal or clearing of such condition(s) within the time set forth in a notification to the property owner of the substandard conditions. All notices and orders to the property owner shall be issued and recorded pursuant to Chapter 11, Volume V, Glendale Building and Safety Code, 2014.

80. VACANT OR UNOCCUPIED BUILDINGS OR STRUCTURES. Vacant or unoccupied buildings or structures, and the property on which they are constructed, shall be continuously maintained to the standards set forth in this code.

90. PREMISES, GENERALLY. Premises of commercial, commercial/industrial and industrial zoned properties shall be maintained free of dirt, litter and debris.

Entryways, porticos, alcoves and vestibules shall be maintained free of dirt, litter and debris.

Windows and window displays shall be clean. Temporary window signs and display materials as permitted by Title 30 of the GMC which have become faded, torn or in disrepair are prohibited.

Awnings must be in good repair. Awnings which are faded or torn or on which lettering is becoming detached, faded or in poor repair are prohibited.

A violation of Section 90 shall be deemed an infraction punishable as provided in Section 1.20 and 1.24 of the GMC.

100. CONSTRUCTION SITES. Work must proceed in a timely manner pursuant to Chapter 1 Division II Section 105.5, Volume IA of the Glendale Building and Safety Code, 2014.

The accumulation of dirt, litter, debris, and equipment in or on the adjoining street, and/or sidewalk during construction shall be prohibited, unless otherwise permitted pursuant to a City of Glendale permit.

110. SIGNS. All signs and sign structures erected or placed on properties within the Commercial and Manufacturing Zones shall be maintained in a good and safe structural condition, shall be painted on all exterior parts at least as often as required to prevent fading, chipping, peeling and rusting, and shall be maintained in good condition and appearance as specified in Section 30.33 of the GMC.

A violation of Section 110 shall be deemed an infraction punishable as provided in Section 1.20 and 1.24 of the GMC.

120. LANDSCAPING AND IRRIGATION. All planting material and planting beds shall be permanently maintained in a clean, orderly and healthy manner at all times, pursuant to requirements set forth in Title 30 of the GMC. Any landscaping that is not in a healthy or living state shall be replaced. If a landscape plan is part of any City approval, the replacement of such planting material shall be in accordance with the approved landscaping plan. Proposals to modify an approved landscaping plan, which has been in effect for more than two years, may be reviewed and approved by the Director of Community Development, without the necessity of returning to the Design Review Board or other permitting authority. For those commercial or industrial properties within a redevelopment project area, any of the modifications under the

conditions set forth above, may be reviewed and approved by the Director of Community Development.

No landscaping shall be permitted in areas where such landscaping in any way endangers the health, or public safety by creating a traffic hazard, by obstructing vision, or which is detrimental or harmful to the use of surrounding properties.

All irrigation systems shall be maintained in good repair and working condition. Said systems shall be adjusted so as not to spray across or into any sidewalk, driveway, and/or street.

Violation of Section 120 shall be deemed an infraction punishable as provided in section 1.20 and 1.24 of the GMC.

130. PARKWAYS AND PUBLIC RIGHTS-OF-WAY. All sidewalks and parkways located adjacent to and adjoining commercial or industrial properties shall be maintained free of junk, trash, debris, litter, painted or inked survey marks (after the work is completed or work in connection therewith), appliances, furniture, overgrown and unpruned privately owned trees and shrubs, weeds and grass in excess of six (6) inches in height, by the owner or the responsible party in control of such property. Landscaping in parkways shall be permanently maintained in a clean, orderly and healthy manner at all times, pursuant to requirements set forth in Chapter 8.32 of the GMC.

140. PARKING SPACES, LOTS AND STRUCTURES. All parking lots and structures and their surfaces shall be maintained in a clean, and neat condition and in good repair free of junk, trash, debris, litter, weeds, appliances, furniture, and abandoned or inoperable motor vehicles. All drainage structures shall be maintained and operable and free of standing water. All parking stalls shall be clearly identified with paint or

other approved striping materials on the surface of the parking area. All parking lot improvements, including the striping of stalls, appropriate signing and lighting, shall be permanently maintained pursuant to Chapter 30.32 of the GMC.

The following conditions or activities are prohibited:

1. The repair or servicing of any type of vehicles in any parking lot or structure, except as expressly permitted by the GMC;
2. The use of required parking spaces during regular business hours, for storage of commercial or other vehicles, including but not limited to, busses, trailers, recreational vehicles, boats and motor homes, except as otherwise expressly permitted by the GMC, or as incident to the use permitted on the site;
3. Vehicles of any type, parked or stored for sale on any parking lot or vacant parcel except in conjunction with a bona fide vehicle sales agency.

A violation of section 140 shall be deemed an infraction punishable as provided in Section 1.20 and 1.24 of the GMC.

150. LOADING AREAS. All loading areas must be maintained free and clear of junk, trash, debris, appliances, furniture or any other items. Loading areas shall be maintained in a clean and neat condition, free of any refuse that might attract or harbor rodents, vermin and/or insects.

160. OUTSIDE STORAGE AREAS. Except as provided in Title 30 of the GMC, there shall be no outside storage of tools, equipment, supplies, materials or merchandise at any time in any commercial or commercial/industrial zoning district. Temporary sheds, tents, awnings and the like are prohibited.

170. REFUSE CONTAINERS AND STORAGE AREAS. Refuse storage containers and enclosures shall be maintained in the following manner:

1. All refuse and refuse containers shall be stored within an approved storage area or within an enclosed building;
2. All refuse storage areas shall be maintained in a clean and neat manner and refuse shall not project above the height of said enclosure; and
3. All refuse storage areas shall be readily accessible to the users they serve as well as for collection operations.
4. All refuse containers shall be maintained so as to be free of graffiti. All refuse containers shall be securely covered, maintained in good repair, with no jagged or torn metal, and sealed so as not to leak liquid waste.

180. UNIMPROVED PROPERTY. Unimproved real property in any commercial, commercial/industrial or industrial zoning district shall be maintained in such a manner so as to not be a detriment to other nearby properties and not adversely affect the public's health, safety and welfare. Unimproved property shall be maintained in a clean and neat manner free of junk, trash, debris, litter, abandoned or inoperable vehicles, stagnant water, abandoned excavations, appliances and furniture, vegetation that is not in a healthy or living state and overgrown vegetation. Living vegetation shall be maintained so as not to exceed an overall height of six (6) inches except for trees and shrubs that are exempt from this requirement. Vehicles of any type shall not be parked or stored for sale on any parking lot or vacant or unimproved parcel except in conjunction with a bona fide vehicle sales agency.

VOLUME IX. GREEN BUILDING STANDARDS

SECTION IX-1. Volume IX of the Glendale Building and Safety Code, 2014, is amended as hereinafter provided.

SECTION IX-2. Section 301.1 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby amended to read as follows:

301.1 Scope. Buildings and structures shall be designed to include the green building measures specified as mandatory in this code. Voluntary green building measures are also included in this code and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7.

SECTION IX-3. Section 4.106.4 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

4.106.4 Water permeable surfaces. Permeable paving is utilized for the parking, walking or patio surfaces in compliance with the following.

Not less than 20 percent of the total on-grade, residential uncovered parking, walking or patio surfaces shall be permeable.

Exceptions:

1. The primary driveway, primary entry walkway and entry porch or landing shall not be included when calculating the area required to be a permeable surface.

2. Required accessible routes for persons with disabilities as required by California Code of Regulations, Title 24, Part 2, Chapter 11A and/or Chapter 11B as applicable.

SECTION IX-4. Section 4.202 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby reserved:

SECTION 4.202

DEFINITIONS

(Reserved)

SECTION IX-5. Section 4.203 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

SECTION 4.203

BUILDING ENVELOPE

4.203.1 Radiant roof barriers. Radiant roof barriers shall be installed in concealed construction spaces located between the building roof sheathing and a permanently installed ceiling in all new and affected portions of existing and altered buildings. The radiant barrier must be tested according to ASTM C-1371-98 or ASTM E 408-71(2002) and must be certified by the Department of Consumer Affairs. Radiant barriers must also meet installation criteria specified in Section RA4.2.2 of the California Energy Commission Residential Appendices.

SECTION IX-6. Section 4.204 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

SECTION 4.204

RENEWABLE ENERGY

4.204.1 Space for future solar installation. A minimum of 250 square feet of unobstructed roof area facing within 30° of south is provided for future solar collector or photovoltaic panels. Rough-in penetrations through the roof surface within 24 inches (610 mm) of the boundary of the unobstructed roof area are provided for electrical conduit and water piping.

Exceptions:

1. For roofs with an area of less than 1000 square feet, the unobstructed space may be reduced to 25% of the roof area.
2. Buildings designed and constructed with a solar photovoltaic system or an alternate system with means of generating electricity at time of final inspection are exempt from this requirement.
3. Where it is not feasible to provide one contiguous area due to the roof configuration, two unobstructed roof areas with a minimum combined area of 250 square feet may be provided.
4. Buildings designed with a green roof making it unfeasible to provide this area are exempt from this requirement.

4.204.2 Future access for solar system. A minimum one-inch (25.4 mm) electrical conduit is provided from the electrical service equipment to an accessible location in the attic or other location approved by the enforcing agency.

SECTION IX-7. Section 4.509 Volume IX of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

SECTION 4.509

NATURAL LIGHT AND VENTILATION

4.509.1 Natural light. The minimum net glazed area shall not be less than 10 percent of the floor area of the room served.

4.509.2 Natural ventilation. The minimum openable area to the outdoors shall be 5 percent of the floor area being ventilated.

SECTION IX-8. Section 5.202 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby reserved:

SECTION 5.202

DEFINITIONS

(Reserved)

SECTION IX-9. Section 5.203 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

SECTION 5.203

BUILDING ENVELOPE

5.203.1 Radiant roof barriers. Radiant roof barrier shall be installed in concealed construction spaces located between the building roof sheathing and a permanently installed ceiling in all new and affected portions of existing and altered buildings. The radiant barrier must be tested according to ASTM C-1371-98 or ASTM E 408-71(2002) and must be certified by the Department of Consumer Affairs.

SECTION IX-10. Section 5.204 of Volume IX of the Glendale Building and Safety Code, 2014, is hereby added to read as follows:

SECTION 5.204

RENEWABLE ENERGY

5.204.1 Prewiring for future solar. Install conduit from the building roof or eave to a location within the building identified as suitable for future installation of a charge controller (regulator) and inverter.

5.204.1.1 Off-grid prewiring for future solar. If battery storage is anticipated, conduit should run to a location within the building that is stable, weather-proof, insulated against very hot and very cold weather and isolated from occupied spaces.

Passed by four-fifths (4/5^{ths}) vote of the Council of the City of Glendale on the

19th day of November, 2013.

ATTEST:


City Clerk


Mayor

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) SS.
CITY OF GLENDALE)

I, ARDASHES KASSAKHIAN, City Clerk of the City of Glendale, certify that the foregoing Ordinance No. 5813 was passed by a four-fifths (4/5^{ths}) vote of the Council of the City of Glendale, California, at a regular meeting held on the 19th day of November, 2013, and that the same was passed by the following vote:

Ayes: Friedman, Najarian, Quintero, Sinanyan, Weaver


Noes: None

Abstain: None

Absent: None


City Clerk

APPROVED AS TO FORM


City Attorney
DATE 11/21/13



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

Energy Cost-Effectiveness of Radiant Barrier Roofs in the Glendale Green Building Ordinance

May 18, 2012

Report prepared for:
Stuart Tom, P.E., CBO
Building Official
City of Glendale
633 E. Broadway, Room 101
Glendale, CA 91206
(818) 548-3200
Email: STom@ci.glendale.ca.us

Report prepared by:
Michael Gabel
Gabel Associates, LLC
1818 Harmon Street, Suite #1
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mike@gabelenergy.com

Table of Contents

1.0 Executive Summary	1
2.0 Radiant barrier Cost-Effectiveness in Climate Zone 9	2
3.0 Conclusions	6

1.0 Executive Summary

Gabel Associates has researched and reviewed the energy cost-effectiveness of the roof radiant barrier requirement within the City of Glendale Ordinance No. 5736, Section 4.205.1. This study considers the cost-effectiveness of a radiant barrier above an attic space in three prototypical single family homes. An analysis using state-approved compliance software, Micropas v8.1, has been conducted to evaluate annual site energy savings, site energy cost savings and cost-effectiveness of a radiant barrier. The conservative assumption made is that the radiant barrier has not already been specified in the base case design to meet the overall energy performance requirement of 15% better than state code. Omitted from the study are any external costs of climate change – either mitigation or adaptation – associated with increase in CO₂-e emissions; or widely predicted increases in summer temperatures in California which would tend to further increase cost effectiveness of cooling reduction measures.

2.0 Radiant Barrier Cost-Effectiveness in Climate Zone 9

A common approach to establishing cost-effectiveness of an energy measure is to consider the site impacts on prototypical buildings. Gabel Associates has performed such an approach which uses current state-approved compliance software to determine annual energy savings and energy cost savings associated with roof radiant barriers for three single family buildings:

- (1) 1,850 square foot 2-story slab-on-grade home
- (2) 2,450 square foot 2-story slab-on-grade home
- (3) 2,850 square foot 2-story slab-on-grade home

For each building prototype, two base case energy designs are first established which just meet the current Title 24 Building Energy Efficiency Standards without a radiant barrier. The buildings are run in Climate Zone 9, the local California climate zone that covers all buildings within City limits. In the first scenario, *Base Case 1*, there is neither a radiant barrier nor a cool roof. In the second scenario, *Base Case 2*, there is only a cool roof but no radiant barrier. To each of these, a radiant barrier is added and the computer models re-run to see incremental energy impacts. From the hour-by-hour computer simulations used within the compliance software, it is possible to obtain a relatively accurate picture of the change in annual electricity and natural gas use and in annual energy costs by the inclusion of the attic radiant barrier.

From data researched by Gabel Associates, and also confirmed by independent research by the City of Glendale, a typical range of incremental cost for a continuous radiant barrier on the underside surface of roof sheathing (e.g., foil faced plywood) is in the range of \$0.25 to \$0.27 per square foot. The average unit cost of electricity is assumed to be \$0.16/KWh and average unit cost of natural gas \$0.95/therm. From first cost and energy cost assumptions, a Simple Payback is calculated.

Base Case: 1,850 SF

1,850 SF Title 24 Base Case: No Cool Roof

Energy Efficiency Measures
R-38 Roof (Reflectance=0.08, Emittance=0.85)
R-13 Walls
R-0 Slab on Grade
Low E2 Vinyl Windows, U=0.36, SHGC=0.30
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-8 Attic Ducts
50 Gallon Gas Water Heater: EF=0.62
Pipe Insulation

1,850 SF Title 24 Base Case: Cool Roof

Energy Efficiency Measures
R-30 Cool Roof (Reflectance=0.55, Emittance=0.85)
R-13 Walls
R-0 Slab on Grade
Low E Vinyl Windows, U=0.40, SHGC=0.36
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-6 Attic Ducts
50 Gallon Gas Water Heater: EF=0.60

Incremental Cost: 1,850 SF

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier (from R-38 w/o Radiant Barrier): 1,110 sf @ 0.25 to 0.27/sf	Upgrade	\$ 278	\$ 300	\$ 289
R-13 Walls	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: 13 SEER	-	\$ -	\$ -	\$ -
R-8 Attic Ducts	-	\$ -	\$ -	\$ -
50 Gallon Gas Water Heater: EF=0.62	-	\$ -	\$ -	\$ -
Pipe Insulation	-	\$ -	\$ -	\$ -
Total Incremental Cost of Energy Efficiency Measures:		\$ 278	\$ 300	\$ 289
Total Incremental Cost per Square Foot of Home:		\$ 0.15	\$ 0.16	\$ 0.16

Base Case: 2,450 SF

2,450 SF Title 24 Base Case: No Cool Roof

Energy Efficiency Measures
R-38 Roof (Reflectance=0.08, Emittance=0.85)
R-13 Walls
R-0 Slab on Grade
Low E2 Vinyl Windows, U=0.36, SHGC=0.30
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-8 Attic Ducts
50 Gallon Gas Water Heater: EF=0.62

2,450 SF Title 24 Base Case: Cool Roof

Energy Efficiency Measures
R-30 Cool Roof (Reflectance=0.55, Emittance=0.85)
R-13 Walls
R-0 Slab on Grade
Low E Vinyl Windows, U=0.40, SHGC=0.36
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-6 Attic Ducts
50 Gallon Gas Water Heater: EF=0.61

Incremental Cost: 2,450 SF

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier (from R-38 w/o Radiant Barrier): 1,470 sf @ 0.25 to 0.27/sf	Upgrade	\$ 368	\$ 397	\$ 382
R-13 Walls	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: 13 SEER	-	\$ -	\$ -	\$ -
R-8 Attic Ducts	-	\$ -	\$ -	\$ -
50 Gallon Gas Water Heater: EF=0.62	-	\$ -	\$ -	\$ -
Total Incremental Cost of Energy Efficiency Measures:		\$ 368	\$ 397	\$ 382
Total Incremental Cost per Square Foot per Home:		\$ 0.15	\$ 0.16	\$ 0.16

Base Case: 2,850 SF

2,850 SF Title 24 Base Case: No Cool Roof

Energy Efficiency Measures
R-38 Roof (Reflectance=0.08, Emittance=0.85)
R-13 Walls
R-0 Slab on Grade
Low E2 Vinyl Windows, U=0.36, SHGC=0.30
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-8 Attic Ducts
50 Gallon Gas Water Heater: EF=0.62

2,850 SF Title 24 Base Case: Cool Roof

Energy Efficiency Measures
R-30 Cool Roof (Reflectance=0.55, Emittance=0.85)
R-13 Walls
R-0 Slab on Grade
Low E Vinyl Windows, U=0.40, SHGC=0.36
Furnace: 80% AFUE
Air Conditioner: 13 SEER
R-6 Attic Ducts
50 Gallon Gas Water Heater: EF=0.61

Incremental Cost: 2,850 SF

Energy Efficiency Measures	Change Type	Incremental Cost Estimate		
		Min	Max	Avg
R-38 Roof w/ Radiant Barrier (from R-38 w/o Radiant Barrier): 1,710 sf @ 0.25 to 0.27/sf	Upgrade	\$ 428	\$ 462	\$ 445
R-13 Walls	-	\$ -	\$ -	\$ -
R-0 Slab on Grade	-	\$ -	\$ -	\$ -
Low E2 Vinyl Windows, U=0.36, SHGC=0.30	-	\$ -	\$ -	\$ -
Furnace: 80% AFUE	-	\$ -	\$ -	\$ -
Air Conditioner: 13 SEER	-	\$ -	\$ -	\$ -
R-8 Attic Ducts	-	\$ -	\$ -	\$ -
50 Gallon Gas Water Heater: EF=0.62	-	\$ -	\$ -	\$ -
Total Incremental Cost of Energy Efficiency Measures:		\$ 428	\$ 462	\$ 445
Total Incremental Cost per Square Foot:		\$ 0.15	\$ 0.16	\$ 0.16

Results

As noted above, the following results assume that a radiant barrier has not initially been specified in the building energy design, but may contribute to the overall energy performance to achieve 15% better than state code as another section of the Glendale ordinance requires for new homes. In that sense, the radiant barrier is only one of the set of energy measures which achieves 15% better than Title 24 Part 6.

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
1,850 sf Base 1 + Radiant	235	2	\$289	\$40	7.3
1,850 sf Base 2 + Radiant	101	4	\$289	\$20	14.5
Averages:	168	3	\$289	\$30	10.9

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
2,450 sf Base 1 + Radiant	285	1	\$383	\$47	8.2
2,450 sf Base 2 + Radiant	124	5	\$383	\$25	15.6
Averages:	205	3	\$383	\$36	11.9

Building Description	Total Annual KWh Saving	Total Annual Therms Saving	Incremental First Cost (\$)	Annual Energy Cost Savings (\$)	Simple Payback (Years)
2,850 sf Base 1 + Radiant	317	1	\$445	\$52	8.6
2,850 sf Base 2 + Radiant	142	6	\$445	\$28	15.7
Averages:	230	4	\$445	\$40	12.1

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.

It is also worth noting that even without radiant barrier as a local mandatory measure, it is highly likely that the vast majority of new single family homes would include a radiant barrier in order to meet the 15%-better-than-Title 24 performance requirement.



GABEL ASSOCIATES, LLC
BUILDING ENERGY ANALYSIS & ENERGY CODE COMPLIANCE

December 3, 2013

Attn: Joe Loyer
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Title 24 Energy Analysis Proposal for Lamond Addition

Dear Joe:

I have reviewed the 11/26/13 letter to you which includes an analysis by Mr. Stuart Tom, P.E. and Chief Building Official of the City of Glendale on the cost-effectiveness of a roof radiant barrier. I concur that, based on our Gabel Associates study dated 5/18/13, it is a reasonable and relatively straightforward extrapolation to conclude that radiant barriers remain cost-effective in Climate Zone 9 under the 2013 Standards. I agree that the City's extension of their local energy ordinance requiring attic roof radiant barriers in new residential construction is cost-effective based on our original report in combination with Mr. Tom's additional analysis.

Sincerely,

Michael Gabel, Principal
Residential and Nonresidential CEA/ CEPE