2339 Stanwell Circle, Suite D, Concord, CA 94520-4875

925-356-7773
925-356-7777 fax
www.PacificBuildingConsultants.com

Pacific Building Consultants, Inc.

A DNG Group Company

April 23, 2007

Mr. Reed B. Hitchcock
General Manager
ASPHALT ROOFING MANUFACTURERS ASSOCIATION
1156 15th Street NW, Suite 900
Washington, DC 20005

RE: Steep-Slope Residential Roof Covering Cost Survey
Cool Roof Premiums

Dear Mr. Hitchcock:

This report presents the results of a "snap shot" survey we performed of cost premiums associated with installing "cool" roofs as part of steep-sloped roof coverings on new residential buildings in the State of California.

In this report, "cost" is defined and used as the amount of money for the roof covering system, that would be paid at end point of use with all mark-up, taxes etc. – e.g. paid by the builder to the roofing contractor etc. For the purposes of this report, cool roof "cost premiums" are defined as the differences in installed costs between conventional (non-cool) steep roof systems and ones of the same general type but that have been modified to meet "assumed cool" solar values we understand are currently under discussion by the California Energy Commission (CEC).

In addition, we verbally surveyed some of the respondent contractors regarding an additional "assumed cool" cost premium for reroofing, due to the use of higher mark-up for profit margins.

Currently, steep-sloped "cool roofs" are not defined in the 2005 California Energy Code or in the currently proposed language for the pending 2008 Standards. However, we understand the CEC is considering a strategy of establishing a requirement for aged solar reflectance of 0.20 and/or 0.25 as prescriptive "cool" for asphalt shingle products and establishing an aged solar reflectance value of 0.25 as prescriptive "cool" for tile roof products. Both of these steep roof products would also likely call for an aged emittance value of around 0.75.

Currently available, conventional asphalt shingle and clay/concrete tile roof products do not meet the proposed strategy aged reflectance values. The required modifications depend on the roof system.

- Some asphalt shingles manufactured have achieved initial solar reflectance values between 0.20 to 0.25 using special mineral aggregate granules. Note: The higher reflectance values correspond various shades of very light, almost white colored shingles.

- We are aware of one clay tile product that purports to achieve an initial solar reflectance in the range of 0.35 to 0.40 by utilizing a surface glazing with special pigmentation.
- Conventional concrete tile do not have a measurement method yet due to surface texture, roughness and curvature but might achieve initial solar reflectance values of about 0.25 by utilizing very light colors special pigmentation applied on the surface of the products. Similar to asphalt shingles, these tile would be expected to correspond to very light, almost white/light grey/light tan colored tile.
- We understand wood shake and wood shingle products, based on their aged surface color and cellular structure, have been shown to provide an equivalent solar reflectance in the range of .30 or higher, which for the purposes of this report, we presumed as qualifying as "cool".

To gather information regarding installed costs, we contacted residential roofing contractors from across the State of California, who are actively involved in new roof construction. We asked them to provide us estimates of the installed costs for several steep-sloped roof covering systems, both as "non-cool" installations and as possible "cool" installations. Six contractors agreed to assist us by providing costing for four distinct regions of California.

- Two costing sheets were from the San Francisco/Bay Area contractors,
- One from Northern Central Valley – Sacramento region,
- One from Southern Central Valley – Fresno Region,
- Two from the greater Los Angeles region.

Cost estimates were requested for various predefined configurations of common, steep-sloped roof coverings installed in California. Since there was only one response for a synthetic (4) and no responses on metal (6), these two roof coverings are not shown in the tables.

1. Asphalt Shingles,
2. Concrete tile,
3. Clay tile,
4. Synthetics,
5. Wood,
6. Metal.

Table Figure 1 lists the basic "non-cool" roof configurations. **Table Figure 2** lists the basic "assumed-cool" roof configurations.

The steep roof systems defined for costing are systems common to California and meant to obtain a minimum Class B external fire listing even though most can achieve Class A listing, a more stringent test classification.

Only wood decks were considered since California primarily utilizes wood decks on residential building constructions. For each basic roof covering configuration, costs were requested for both a "non-cool" and a possible "cool" roof option. In general, possible cool options for asphalt shingle coverings were limited to 2 available shingle styles from one manufacturer.

For concrete tile roof coverings a possible cool option for costing was limited to the installation of a system utilizing the convective airflow with venting. Costing of an aftermarket paint coating was initially considered, but it is not a roofing contractor or manufacturer application, is not desirable since its long term performance is not yet known, and raises questions and concerns for tile warranty issues

For clay tile roof coverings, the possible cool option was limited to the installation of a system utilizing one manufacture's surface glazed tile and was compared to the same clay tile without glaze surfacing.

Wood roof covering systems were assumed of equal reflectance value for "non-cool" and "assumed cool".

Manufactured roof products (synthetics visually resembling other type roof covering materials such as shakes or slate) were requested for costing but responses were very limited and therefore are also not included. Metal roof coverings of any type were not responded to and therefore are also not included.

Cost Estimating Assumptions

The same table of roof systems and the same set of instructions were sent to each contractor. The following are selected excerpts from correspondence requesting the cost information requests.

> *"The cost information is related to Title 24 Part 6 (T24P6) aka Energy Efficiency Standards Updates and roofing and what might be proposed and coming in the 2008 code."*
>
> *"The cost information for each system needs only to reflect a system total for materials including mark-up for overhead and profit as well as a system total for labor including mark-up. The systems listed below indicate the systems on the attached spreadsheet for the needed cost information for the various different roof systems we are interested in. Please provide typical cost information for as many of the indicated roof systems as you have bidding experience."* …

"Assume new roof installations, located within 25 mile radius of the contractor's operations, typical residence – DRAWING INCLUDED WITH ALL FEATURES NOTED. Include typical related sheet metal costs BUT do not include any roof attic vents."

"The purpose of the costing is to obtain independent and objective approximate costs from contractors for non-cool vs. cool ("possible cool" since not defined yet) cost comparisons, ultimately showing if there is a premium or surcharge to go cool on some systems and to be able to share this information with the CEC.

"It is important to recognize, that while "cool" for steep slope is not defined yet, our assumptions are as indicated on the spreadsheet – so we're not trying to test your knowledge or create trick questions for the cool columns."

"Selected Definitions and Other Comments

- *"Fire Rated" means the system has been tested and qualifies for a Class B or better external fire rating (ASTM E108).*
- *System install is in standard (not high wind) location.*
- *House is generally 1 story in height but could include multi-family higher structures and accessible for lift truck, conveyor or forklift. "*

Steep-Slope Residential Roof Findings

The 2006 "snap-shot" survey is from licensed California roofing contractors, with costs that would be provided to a general contractor / home builder at that moment in time. The survey responses showed there is a cost premium for an "assumed cool" roof covering system for **new construction**.

The roof covering system **new construction** costs and premiums vary by roof system type, by configuration and by geographic location.

The **new construction** **cost premiums** obtained are as follows:

- Asphalt Shingle Roof Coverings $0.36 to $0.64 per sq. ft.
- Concrete Tile Roof Coverings $0.44 to $1.75 per sq. ft.
- Clay Tile Roof Coverings $0.00 to $0.71 per sq. ft.
- Wood Shake & Shingle Roof Coverings $0.00 per sq. ft.

Please note that the cost information is general and approximate in nature and should not be relied upon for specific projects or cost estimating. The reporting of information on the tables include the range of costs obtained shown as a per sq. ft. basis, if there was more than one contractor in a geographic region providing information. The average method used and reported shown as a per sq. ft. basis, is the adding of all the line item costs from all contractors for that line item, divided by the quantity of respondent costs provided, for that line item.

Table 3, indicates the range and an average of installed **new construction** costs for each generic type asphalt shingle roof covering system and the "assumed cool" roof cost premium associated with these average prices.

Table 4, indicates the range and an average of installed **new construction** costs for concrete tile roof covering system configurations including S-tile and flat surface tile such as slate and shake look and the "assumed cool" roof cost premium associated with these average costs.

Table 5, indicates the range and an average of installed **new construction** costs for clay tile roof covering system configurations including S-tile and mission style 2 piece and the "assumed cool" roof cost premium associated with these average costs.

Table 6, indicates the range and an average of installed **new construction** costs for wood shake and wood shingle roof covering system configurations including standard and premium grades and no "assumed cool" roof cost premium associated with these average costs. .

Table 7, is a summary of the ranges of roof system costs and cost premiums by general roof system type and by geographic region for **new construction**. The ranges of cost "premiums" relate to system configuration comparisons and, therefore, do not necessarily track with the range of installed costs for that system type.

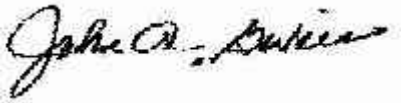
Based on follow-up discussions with most of the contractors that provided costs for the survey, **reroofing can add an additional 10 to 20% to the new construction survey cost premiums**, resulting from adjustment for additional mark-up and profit margin that the purchaser directly pays for.

Although the data is limited to six contractors in four major metropolitan areas, it is clear from this snap shot that there are significant "cost to the consumer" premiums associated with making adjustments to non-cool roofs so they qualify as "assumed cool".

If we can answer any questions please give me a call.

Sincerely,

PACIFIC BUILDING CONSULTANTS, INC.



John A. Goveia, President
Principal, Senior Consultant

JAG/
Sent Digitally

enclosures:
Table Figure 1: "Non-Cool" Steep-Slope Roof Covering Configurations
Table Figure 2: "Assumed Cool" Steep-Slope Roof Covering Configurations
Table 3: Asphalt Shingle Roof Covering Survey Costs
Table 4: Interlocking Concrete Tile Roof Covering Survey Costs
Table 5: Clay Tile Roof Covering Survey Costs
Table 6: Wood Shake & Wood Shingle Roof Covering Survey Costs
Table 7: Geographic Steep-Sloped Roof Covering Survey Cost Summary

Figure 1 – Base Line "Non-Cool" Steep-Slope Roof Configurations – Residential New Construction Cost Survey

Roof size used – diagram with dimensions provided

- 2800 sq. ft. containing rake, hip, ridge and valley configuration
- Residential structure
- New construction
- Assumed within 25 miles of contractor base of operation
- Wood deck
- 5 unit in 12 unit slope
- Class B or better fire listing

Asphalt Shingles

- No. 15 ASTM D226 Type I underlayment felt
- Electro-galv. staples or nails for shingle attachment
- Std. four fasteners per shingle unless mfg. requires otherwise
- California cut valley
- 20 year 3-tab metric
- 25 year 3-tab metric
- 30 year 3-tab metric
- 40 year architectural metric
- 50 year architectural metric

Concrete Interlocking Tile

- No. 30 ASTM D226 Type II underlayment felt
- Wood battens with limited tile attachment or no battens all tile attached – locality determined
- Standard weight tile
- Double jack system, batten extenders at valleys and pan flashings
- Concrete S tile
- Concrete shake or slate tile

Clay Tile

- No. 30 ASTM D226 Type II underlayment felt
- Standard weight and moisture absorption density tile
- S tile
- Two piece Mission tile

Wood Shake & Shingles

- No. 15 ASTM D226 Type I underlayment felt for shingles
- No. 30 ASTM D226 Type II 18-inch wide interlayment felt for shakes
- Staples or nails for attachment
- Class B fire treated medium 24 inch wood shakes – California acceptable treatment supplier
- Class B fire treated Perfection No. 1 16-inch wood shingles – California acceptable treatment supplier

Figure 2 – Base Line "<u>assumed Cool</u>" Steep-Slope Roof Configurations – Residential New Construction Cost Survey

Roof size used – diagram with dimensions provided

- 2800 sq. ft. containing rake, hip, ridge and valley configuration
- Residential structure
- New construction
- Assumed within 25 miles of contractor base of operation
- Wood deck
- 5 unit in 12 unit slope
- Class B or better fire listing

Asphalt Shingles

- No. 15 ASTM D226 Type I underlayment felt
- Electro-galv. staples or nails for shingle attachment
- Std. four fasteners per shingle unless mfg. requires otherwise
- California cut valley
- 20 year 3-tab metric ***– cool not available***
- 25 year 3-tab metric ***– cool not available***
- 30 year 3-tab metric ***– cool not available***
- 40 year architectural metric **– initial reflectance 0.25 special mineral aggregate granules**
- 50 year architectural metric **– initial reflectance 0.25 special mineral aggregate granules**

Concrete Interlocking Tile

- No. 30 ASTM D226 Type II underlayment felt
- Wood battens with limited tile attachment or no battens all tile attached – locality determined
- Standard weight tile ***– cool not available***
- Double jack system, batten extenders at valleys and pan flashings
- Concrete S tile **– used elevated batten on counterbatt system with ventilated ridge foil flashing**
- Concrete shake or slate tile **– used elevated batten on counterbatt system with ventilated ridge foil flashing**

Clay Tile

- No. 30 ASTM D226 Type II underlayment felt
- Standard weight and moisture absorption density tile
- S tile **– Initial reflectance 0.40 used MCA glazed clay tile system**
- Two piece Mission tile ***– cool not available***

Wood Shake & Shingles

- No. 15 ASTM D226 Type I underlayment felt for shingles
- No. 30 ASTM D226 Type II 18-inch wide interlayment felt for shakes
- Staples or nails for attachment
- Class B fire treated medium 24 inch wood shakes – California acceptable treatment supplier
- Class B fire treated Perfection No. 1 16-inch wood shingles – California acceptable treatment supplier
- Based on previous DOE analysis **– aged wood roof material reflectance of 0.30 or greater**

TABLE 3 - STEEP-SLOPED ASPHALT SHINGLE ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

NON-COOL ROOF OPTIONS			POSSIBLE COOL ROOF OPTIONS			PREMIUM	
ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Asphalt Shingle		**1.38 - 4.00**	**Aspahlt Shingle**		**1.93 - 4.64**	**0.36 - 0.79**	**16-40%**
Asphalt Shingle **20 yr. 3-tab metric** (6) 5 rec'd)	$1.57	**1.38 - 1.90**	Asphalt Shingle **20 yr. 3-tab metric**	CURRENTLY NO COOL PRODUCTS			
Asphalt Shingle **25 yr. 3-tab metric**	$1.74	**1.40 - 2.24**	Asphalt Shingle **25 yr. 3-tab metric**	CURRENTLY NO COOL PRODUCTS			
Asphalt Shingle **30 yr. 3-tab metric** (6) 5 rec'd)	$1.90	**1.42 - 3.22**	Asphalt Shingle **30 yr. 3-tab metric**	CURRENTLY NO COOL PRODUCTS			
Asphalt Shingle **40 yr. architectural metric (sim to *********) non-cool**	$2.11	**1.57 - 2.91**	Asphalt Shingle **40 yr. architectural metric** sim to ***********- cool**	2.62	**1.93 - 3.41**	0.36 - 0.50	23-40%
Asphalt Shingle **50 yr. architectural metric** sim to ******** **non-cool**	$3.10	**2.54 - 4.00**	Asphalt Shingle **50 yr. architectural metric sim to ******** - cool**	3.65	**2.96 - 4.64**	0.42 - 0.64	16-17%

Notes and Remarks

1. "Cost" is defined and used as the amount of money for the roof covering system, that would be paid at end point of use with all mark-up, taxes etc. – e.g. paid by the builder to the roofing contractor etc.
2. Cool roof "cost premiums" are defined as the differences in installed costs between conventional (non-cool) steep roof systems and ones of the same general type but that have been modified to meet "assumed cool" solar values.
3. The reporting of information on the tables include the range of costs obtained shown as a per sq. ft. basis, if there was more than one contractor in a geographic region providing information.
4. The average method used and reported shown as a per sq. ft. basis, is the adding of all the line item costs from all contractors for that line item, divided by the quantity of respondent costs provided, for that line item.
5. Please note that the cost information is from 2006 and is general and approximate in nature and should not be relied upon for specific projects or for cost estimating.
6. Costs received from 6 contractors unless noted otherwise.

TABLE 4 - STEEP-SLOPED CONCRETE TILE ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

NON-COOL ROOF OPTIONS			POSSIBLE COOL ROOF OPTIONS			PREMIUM	
ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Interlocking Concrete Tile		**2.71 - 5.23**	**Interlocking Concrete Tile**		**3.15 - 6.98**	**0.44 - 1.75**	**16-33%**
Tile-**concrete s-tile** (non-lightweight)	$3.39	**2.86 - 5.23**	Tile-**concrete s-tile** (non-lightweight) **over counter batt system**	4.88	**3.31 - 6.98**	0.45 - 1.75	16-33%
Tile-**concrete shake or slate** tile (non-lightweight)	$3.30	**2.71 - 5.23**	Tile-**concrete shake or slate** tile (non-lightweight) **over counter batt system**	4.85	**3.15 - 6.98**	0.44 - 1.75	16-33%

Notes and Remarks

1. "Cost" is defined and used as the amount of money for the roof covering system, that would be paid at end point of use with all mark-up, taxes etc. – e.g. paid by the builder to the roofing contractor etc.
2. Cool roof "cost premiums" are defined as the differences in installed costs between conventional (non-cool) steep roof systems and ones of the same general type but that have been modified to meet "assumed cool" solar values.
3. The reporting of information on the tables include the range of costs obtained shown as a per sq. ft. basis, if there was more than one contractor in a geographic region providing information.
4. The average method used and reported shown as a per sq. ft. basis, is the adding of all the line item costs from all contractors for that line item, divided by the quantity of respondent costs provided, for that line item.
5. Please note that the cost information is from 2006 and is general and approximate in nature and should not be relied upon for specific projects or for cost estimating.
6. Costs received from 6 contractors unless noted otherwise.

TABLE 5 - STEEP-SLOPED CLAY TILE ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

NON-COOL ROOF OPTIONS			POSSIBLE COOL ROOF OPTIONS			PREMIUM	
ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Clay Tile		**3.25 - 9.84**	**Clay Tile**		**3.25 - 10.55**	**0.00 - 0.71**	**0-7%**
Tile-clay **2-piece mission** (6) 5 rec'd)	$8.26	**6.17 - 9.84**	Tile-clay **2-piece mission MCA natural red F40**	8.55	**6.21 - 10.55**	0.04 - 0.71	1-7%
Tile-clay **S-tile** (6) 5 rec'd)	$5.52	**3.25 - 7.25**	Tile-clay **S-tile MCA natural red F40**	6.63	**3.25 - 7.25**	0.00 - 0.00	0%

Notes and Remarks

1. "Cost" is defined and used as the amount of money for the roof covering system, that would be paid at end point of use with all mark-up, taxes etc. – e.g. paid by the builder to the roofing contractor etc.
2. Cool roof "cost premiums" are defined as the differences in installed costs between conventional (non-cool) steep roof systems and ones of the same general type but that have been modified to meet "assumed cool" solar values.
3. The reporting of information on the tables include the range of costs obtained shown as a per sq. ft. basis, if there was more than one contractor in a geographic region providing information.
4. The average method used and reported shown as a per sq. ft. basis, is the adding of all the line item costs from all contractors for that line item, divided by the quantity of respondent costs provided, for that line item.
5. Please note that the cost information is from 2006 and is general and approximate in nature and should not be relied upon for specific projects or for cost estimating.
6. Costs received from 6 contractors unless noted otherwise.

TABLE 6 - STEEP-SLOPED WOOD ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

NON-COOL ROOF OPTIONS			POSSIBLE COOL ROOF OPTIONS			PREMIUM	
ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	ROOF COVER TYPE	Ave. ($/ft^2)	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Wood Shake & Shingle		**4.47 - 6.96**	**Wood Shake & Shingle**		**4.47 - 6.96**	**0.00 - 0.00**	**0%**
Standard Class B treated **Medium** Wood Shakes	$5.18	**4.47 - 6.32**	Standard Class B treated **Medium** Wood Shakes - considered cool	5.18	**4.47 - 6.32**	0.00 - 0.00	0%
Premium Class B treated **Medium** Wood Shakes	$5.26	**4.95 - 6.54**	Premium Class B treated **Medium** Wood Shakes - considered cool	5.26	**4.95 - 6.54**	0.00 - 0.00	0%
Standard Class B treated **Heavy** Wood Shakes	$5.55	**5.01 - 6.83**	Standard Class B treated **Heavy** Wood Shakes - considered cool	5.55	**5.01 - 6.83**	0.00 - 0.00	0%
Standard Class B treated **No. 1** 16" Wood Shingles	$6.32	**5.39 - 6.96**	Standard Class B treated **No. 1** 16" Wood Shingles	6.32	**5.39 - 6.96**	0.00 - 0.00	0%

Notes and Remarks

1. "Cost" is defined and used as the amount of money for the roof covering system, that would be paid at end point of use with all mark-up, taxes etc. – e.g. paid by the builder to the roofing contractor etc.
2. Cool roof "cost premiums" are defined as the differences in installed costs between conventional (non-cool) steep roof systems and ones of the same general type but that have been modified to meet "assumed cool" solar values.
3. The reporting of information on the tables include the range of costs obtained shown as a per sq. ft. basis, if there was more than one contractor in a geographic region providing information.
4. The average method used and reported shown as a per sq. ft. basis, is the adding of all the line item costs from all contractors for that line item, divided by the quantity of respondent costs provided, for that line item.
5. Please note that the cost information is from 2006 and is general and approximate in nature and should not be relied upon for specific projects or for cost estimating.
6. Costs received from 6 contractors unless noted otherwise.

TABLE 7 - GEOGRAPHIC STEEP-SLOPED ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

REROOFING - SO. CAL ADD APPROX. 10% TO PREMIUM AND NO. CAL ADD APPROX. 10% TO 20% TO PREMIUM

NON-COOL ROOF OPTIONS		POSSIBLE COOL ROOF OPTIONS		PREMIUM	
ROOF COVER TYPE	Cost ($/ft^2)	ROOF COVER TYPE	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Asphalt Shingle 20 yr. 3-tab metric	**1.38 - 1.90**	**Asphalt Shingle 20 yr. 3-tab metric**	**CURRENTLY NO COOL PRODUCTS**		
Fresno	1.38	Fresno			
Los Angeles Region	1.90	Los Angeles Region			
Sacramento Region	1.38	Sacramento Region			
SF Bay	1.55 - 1.63	SF Bay			
Asphalt Shingle 25 yr. 3-tab metric	**1.40 - 2.24**	**Asphalt Shingle 25 yr. 3-tab metric**	**CURRENTLY NO COOL PRODUCTS**		
Fresno	1.40	Fresno			
Los Angeles Region	1.98 - 2.24	Los Angeles Region			
Sacramento Region	1.40	Sacramento Region			
SF Bay	1.58 - 1.84	SF Bay			
Asphalt Shingle 30 yr. 3-tab metric	**1.42 - 3.22**	**Asphalt Shingle 30 yr. 3-tab metric**	**CURRENTLY NO COOL PRODUCTS**		
Fresno	1.42	Fresno			
Los Angeles Region	3.22	Los Angeles Region			
Sacramento Region	1.42	Sacramento Region			
SF Bay	1.61 - 1.84	SF Bay			
Asphalt Shingle 40 yr. architectural metric (sim to *******) non-cool**	**1.57 - 2.91**	**Asphalt Shingle 40 yr. architectural metric sim to **********- cool**	**1.93 - 3.41**	**0.36 - 0.50**	**23-40%**
Fresno	1.57 - 1.57	Fresno	1.93 - 1.93	0.36 - 0.36	
Los Angeles Region	2.62 - 2.91	Los Angeles Region	3.21 - 3.41	0.59 - 0.50	
Sacramento Region	1.57 - 1.57	Sacramento Region	1.93 - 1.93	0.36 - 0.36	
SF Bay	1.86 - 2.12	SF Bay	2.29 - 2.96	0.43 - 0.84	
Asphalt Shingle 50 yr. architectural metric sim to ****** non-cool**	**2.54 - 4.00**	**Asphalt Shingle 50 yr. architectural metric sim to ******** - cool**	**2.96 - 4.64**	**0.42 - 0.64**	**15-27%**
Fresno	2.54 - 2.54	Fresno	2.96 - 2.96	0.42 - 0.42	
Los Angeles Region	3.61 - 4.00	Los Angeles Region	4.15 - 4.64	0.54 - 0.64	
Sacramento Region	2.54 - 2.54	Sacramento Region	2.96 - 2.96	0.42 - 0.42	
SF Bay	2.77 - 3.15	SF Bay	3.21 - 4.01	0.44 - 0.86	

TABLE 7 - GEOGRAPHIC STEEP-SLOPED ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

REROOFING - SO. CAL ADD APPROX. 10% TO PREMIUM AND NO. CAL ADD APPROX. 10% TO 20% TO PREMIUM

NON-COOL ROOF OPTIONS		POSSIBLE COOL ROOF OPTIONS		PREMIUM	
ROOF COVER TYPE	Cost ($/ft^2)	ROOF COVER TYPE	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Tile-concrete s-tile (non-lightweight)	**2.86 - 5.23**	**Tile-concrete s-tile (non-lightweight) over counter batt system**	**3.31 - 6.98**	**0.45 - 1.75**	**9-33%**
Fresno	2.86 - 2.86	Fresno	3.31 - 3.31	0.45 - 0.45	
Los Angeles Region	2.90 - 5.23	Los Angeles Region	3.86 - 6.98	0.96 - 1.75	
Sacramento Region	2.86 - 2.86	Sacramento Region	3.31 - 3.31	0.45 - 0.45	
SF Bay	3.16 - 3.30	SF Bay	3.45 - 3.48	0.29 - 0.18	
Tile-concrete shake or slate tile (non-lightweight)	**2.71 - 5.23**	**Tile-concrete shake or slate tile (non-lightweight) over counter batt system**	**3.15 - 6.98**	**0.44 - 1.75**	**16-33%**
Fresno	2.71 - 2.71	Fresno	3.15 - 3.15	0.44 - 0.44	
Los Angeles Region	2.90 - 5.23	Los Angeles Region	3.86 - 6.98	0.96 - 1.75	
Sacramento Region	2.71 - 2.71	Sacramento Region	3.15 - 3.15	0.44 - 0.44	
SF Bay	3.11 - 3.15	SF Bay	3.43 - 3.69	0.32 - 0.54	
Tile-clay 2-piece mission	**6.17 - 9.84**	**Tile-clay 2-piece mission MCA natural red F40**	**6.21 - 10.55**	**0.04 - 0.71**	**0-7%**
Fresno	9.84 - 9.84	Fresno	10.55 - 10.55	0.71 - 0.71	
Los Angeles Region	7.82 - 7.82	Los Angeles Region	7.82 - 7.82	0.00 - 0.00	
Sacramento Region	9.84 - 9.84	Sacramento Region	10.55 - 10.55	0.71 - 0.71	
SF Bay	6.17 - 7.60	SF Bay	6.21 - 7.60	0.04 - 0.00	
Tile-clay S-tile	**3.25 - 7.25**	**Tile-clay S-tile MCA natural red F40**	**3.25 - 7.25**	**0.00 - 0.00**	**0%**
Fresno	7.25 - 7.25	Fresno	7.25 - 7.25	0.00 - 0.00	
Los Angeles Region	3.25 - 6.08	Los Angeles Region	3.25 - 6.08	0.00 - 0.00	
Sacramento Region	7.25 - 7.25	Sacramento Region	7.25 - 7.25	0.00 - 0.00	
SF Bay	4.34 - 4.97	SF Bay	4.34 - 4.97	0.00 - 0.00	

TABLE 7 - GEOGRAPHIC STEEP-SLOPED ROOF COVERING SUMMARY - RESIDENTIAL NEW CONSTRUCTION

REROOFING - SO. CAL ADD APPROX. 10% TO PREMIUM AND NO. CAL ADD APPROX. 10% TO 20% TO PREMIUM

NON-COOL ROOF OPTIONS		POSSIBLE COOL ROOF OPTIONS		PREMIUM	
ROOF COVER TYPE	Cost ($/ft^2)	ROOF COVER TYPE	Cost ($/ft^2)	Cost ($/ft^2)	Cost (%)
Standard Class B treated Medium Wood Shakes	**4.47 - 6.32**	**Standard Class B treated Medium Wood Shakes - considered cool**	**4.47 - 6.32**	**0.00 - 0.00**	**0%**
Fresno	4.66 - 4.66	Fresno	4.66 - 4.66	0.00 - 0.00	
Los Angeles Region	4.47 - 6.32	Los Angeles Region	4.47 - 6.32	0.00 - 0.00	
Sacramento Region	4.66 - 4.66	Sacramento Region	4.66 - 4.66	0.00 - 0.00	
SF Bay	4.93 - 6.03	SF Bay	4.93 - 6.03	0.00 - 0.00	
Premium Class B treated Medium Wood Shakes	**4.95 - 6.54**	**Premium Class B treated Medium Wood Shakes - considered cool**	**4.95 - 6.54**	**0.00 - 0.00**	**0%**
Fresno	5.08 - 5.08	Fresno	5.08 - 5.08	0.00 - 0.00	
Los Angeles Region	4.95 - 6.54	Los Angeles Region	4.95 - 6.54	0.00 - 0.00	
Sacramento Region	5.08 - 5.08	Sacramento Region	5.08 - 5.08	0.00 - 0.00	
SF Bay	4.78 - 5.13	SF Bay	4.78 - 5.13	0.00 - 0.00	
Standard Class B treated Heavy Wood Shakes	**5.01 - 6.83**	**Standard Class B treated Heavy Wood Shakes - considered cool**	**5.01 - 6.83**	**0.00 - 0.00**	**0%**
Fresno	5.28 - 5.28	Fresno	5.28 - 5.28	0.00 - 0.00	
Los Angeles Region	5.01 - 5.49	Los Angeles Region	5.01 - 5.49	0.00 - 0.00	
Sacramento Region	5.28 - 5.28	Sacramento Region	5.28 - 5.28	0.00 - 0.00	
SF Bay	5.42 - 5.49	SF Bay	5.42 - 5.49	0.00 - 0.00	
Standard Class B treated No. 1 16" Wood Shingles	**5.39 - 6.96**	**Standard Class B treated No. 1 16" Wood Shingles**	**5.39 - 6.96**	**0.00 - 0.00**	**0%**
Fresno	6.57 - 6.57	Fresno	6.57 - 6.57	0.00 - 0.00	
Los Angeles Region	5.49 - 6.96	Los Angeles Region	5.49 - 6.96	0.00 - 0.00	
Sacramento Region	6.57 - 6.57	Sacramento Region	6.57 - 6.57	0.00 - 0.00	
SF Bay	5.39 - 6.95	SF Bay	5.39 - 6.95	0.00 - 0.00	

Notes and Remarks

1. "Cost" is defined and used as the amount of money for the roof covering system, that would be paid at end point of use with all mark-up, taxes etc. – e.g. paid by the builder to the roofing contractor etc.
2. Cool roof "cost premiums" are defined as the differences in installed costs between conventional (non-cool) steep roof systems and ones of the same general type but that have been modified to meet "assumed cool" solar values.
3. The reporting of information on the tables include the range of costs obtained shown as a per sq. ft. basis, if there was more than one contractor in a geographic region providing information.
4. The average method used and reported shown as a per sq. ft. basis, is the adding of all the line item costs from all contractors for that line item, divided by the quantity of respondent costs provided, for that line item.
5. Please note that the cost information is from 2006 and is general and approximate in nature and should not be relied upon for specific projects or for cost estimating.