



Installed Cost of Residential Siding Comparative Study – September 2023

PREPARED FOR BRICK INDUSTRY ASSOCIATION



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PROJECT OVERVIEW

Brick Industry Association (BIA) is the national trade association representing distributors, manufacturers and suppliers of clay brick and related products and services. Since its founding in 1934, the association has been the nationally recognized authority on clay brick construction and represents the industry in all model building code forums and national standards committees.

BIA is concerned that residential builders appear to steer homeowners away from choosing brick as a material of choice.

BIA engaged **RSMeans** to collect data and perform analysis on the installed costs of various wall systems compared to brick. The results will be used to show the incremental difference in installed costs, as well as provide detailed comparisons of material and labor cost of each system.

The focus of the project is as follows:

Markets – entire U.S. market, focusing on regions where brick is used extensively.

Siding Materials – Brick Veneer over Wood Framing compared to Manufactured Stone, Fiber Cement, Wood Siding, Wood Shingles, Vinyl Siding, and Cement Stucco.

Models – RSMeans Residential Home Models will be used to determine the comparative cost of brick to other siding types across four (4) size ranges of average residential homes across the U.S.:

- Under 1,800 S.F.
- 1,800 and 2,400 S.F.
- 2,400 and 3,000 S.F.
- Over 3,000 S.F.

BIA will be provided a customized **MS Excel spreadsheet** which will allow members to enter a 3-digit zip code to calculate and display the brick installation cost for any location throughout the U.S.

METHODOLOGY

RSMMeans evaluated seven (7) siding types installed on exterior wall wood frame construction. Typical wood frame construction consists of wood studs and the exterior sheathing and building paper. The exterior siding consisting of wood, vinyl, fiber cement, stucco, brick veneer or manufactured stone veneer as illustrated below in Figure #1.

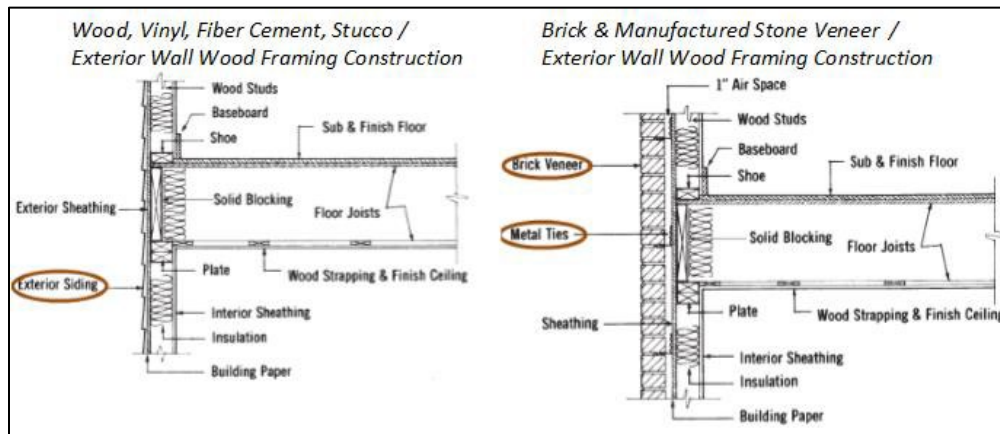


Figure #1 – Typical Exterior Wood Wall Construction System

Cost Comparisons for Various Siding Options

RSMMeans evaluated the cost for various siding options for typical 1-story and 2-story homes across a range of size levels using the RSMMeans Residential Cost Data book. This cost publication estimates residential construction for the entire structure using major building components and by unit costs.

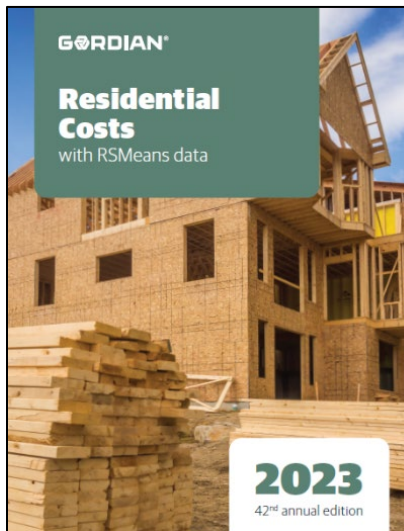


Figure #2 – RSMMeans Residential Cost Data book

The **siding costs per S.F. of wall area** are based on RSMeans average, 1 and 2-story residential building models.

The methodology used to generate this report was:

1. Use RSMeans standard 1 and 2 story residential building models. The average quality level was selected for this study. Used were four different size ranges:

<u>Square Foot of Living Area</u>	<u>BIA Requested Size</u>
• 1,400 S.F. of Floor Area	(Under 1,800 S.F.)
• 2,100 S.F. of Floor Area	(1,800 and 2,400 S.F.)
• 2,700 S.F. of Floor Area	(2,400 and 3,000 S.F.)
• 3,200 S.F. of Floor Area	(Over 3,000 S.F.)

2. All siding costs are based upon U.S. national averages for material, labor and equipment. The RSMeans location factors can be used to adjust costs to a particular location.

3. The brick veneer costs have been developed using RSMeans standard cost research. Materials were based upon queen or modular sized residential, grade SW, brick.

All costs are given in U.S. dollars.

SIDING COST ANALYSIS

The siding system is based on 16' wide, 10'-6" high wall, with a window opening 3'-4 w x 4'-0 tall. RSMMeans standard residential labor rates are used to calculate installation cost for the siding systems (see Appendix – RSMMeans Labor Rates Used). Labor rates obtained during RSMMeans standard cost research (mentioned previously) are used for the brick veneer.

No cost for staging or scaffolding is included in any of the siding systems we developed. The cavity for residential construction is specified 1" nominal. Ties and wall anchors are assumed installed every 2.0 S.F.

Brick Veneer / Wood Wall Framing System

Qty.	Description	Unit	Material Cost w/ O&P	Install Cost w/ O&P	Total Cost w/ O&P
20.00	Self-adhering sheet or roll flashing, cross laminated, HDPE, 25 Mil, 12"	L.F.	\$20.68	\$12.32	\$33.00
32.00	Self-adhering sheet or roll flashing, cross laminated, HDPE, 25 Mil, 6"	L.F.	\$16.54	\$17.06	\$33.60
155.00	Residential brick veneer, queen size	S.F.	\$595.05	\$885.30	\$1,480.35
155.00	Washing brick, smooth brick, acid wash	S.F.	\$11.94	\$136.85	\$148.78
8.00	Joint sealants, caulking and sealants, bulk acrylic latex, 3/8" x 1/2", in place	L.F.	\$3.61	\$14.23	\$17.84
0.80	Masonry anchors, veneer wall ties, corrugated, galvanized, 22 ga., 7/8" x 7"	C	\$14.78	\$38.02	\$52.81
24.00	Lintel angle, structural, painted, under 500 lb., shop fabricated	Lb.	\$33.53	\$21.67	\$55.20
Total Cost			\$696.12	\$1,125.46	\$1,821.58
Cost per S.F. of Wall Area			\$4.14	\$6.70	\$10.84

Figure #3 – Brick Veneer / Wood Stud Walls System Costs

Methodology for calculating square footage of exterior wall siding for the siding system (e.g., Figure #3 above) is as follows:

1. Calculate the siding system total square footage of wall area:

Formula: 16' Wide x 10.5' High Wall = 168 S.F. of Wall Area

2. Divide the Material, Installation and Total Cost by the S.F. of Wall Area calculated in step 1:

Formula:	<u>Material</u>	<u>Installation</u>	<u>Total</u>
Total Cost:	\$696.12	\$1,125.46	\$1,821.58
S.F. Wall Area:	168	168	168
Cost per S.F./Wall Area:	\$4.14	\$6.70	\$10.84

Note: This method of wall area calculation is followed for all siding types.

Total Installed Siding Cost Comparison

The total installed cost of each typical wall siding system is presented in the chart below (e.g. Figure #4). This total is the sum of material cost plus installation cost.

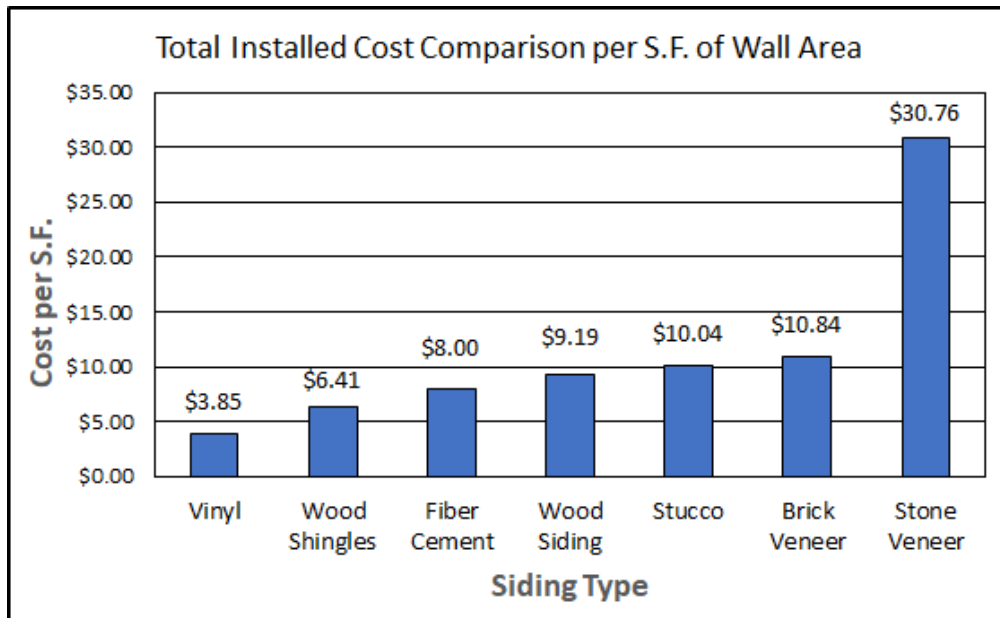


Figure #4 – Total Installed Cost Comparison – per S.F. of Wall Area

Siding Installation Cost Comparison

Figure 5 below indicates the installation labor and equipment cost for each of the systems.

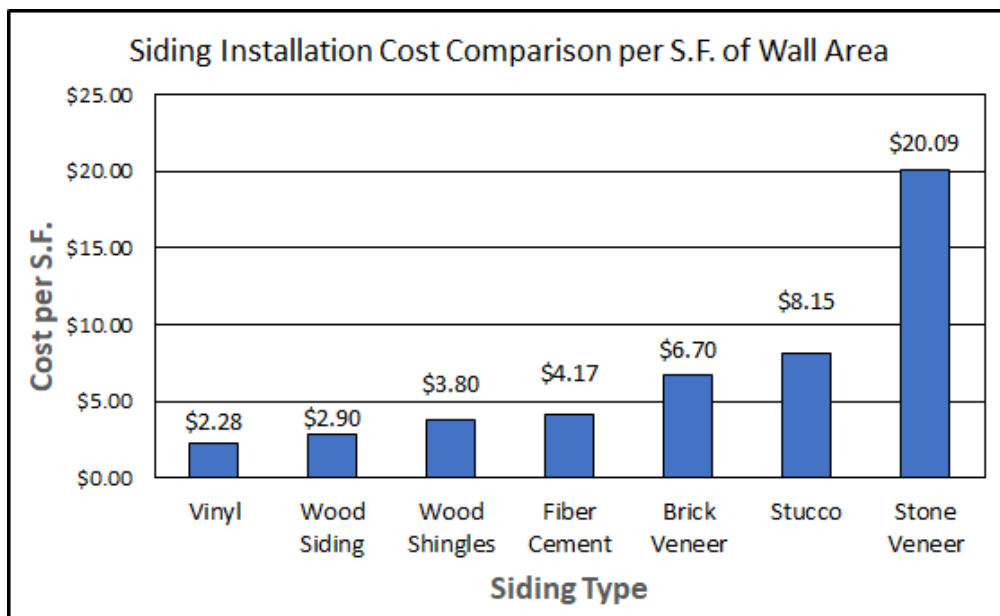


Figure #5 – Siding Installation Cost Comparison – per S.F. of Wall Area

Siding Material Cost Comparison

The chart below (*Figure #6*) gives the bare material cost of each system with a 10% mark up for profit.

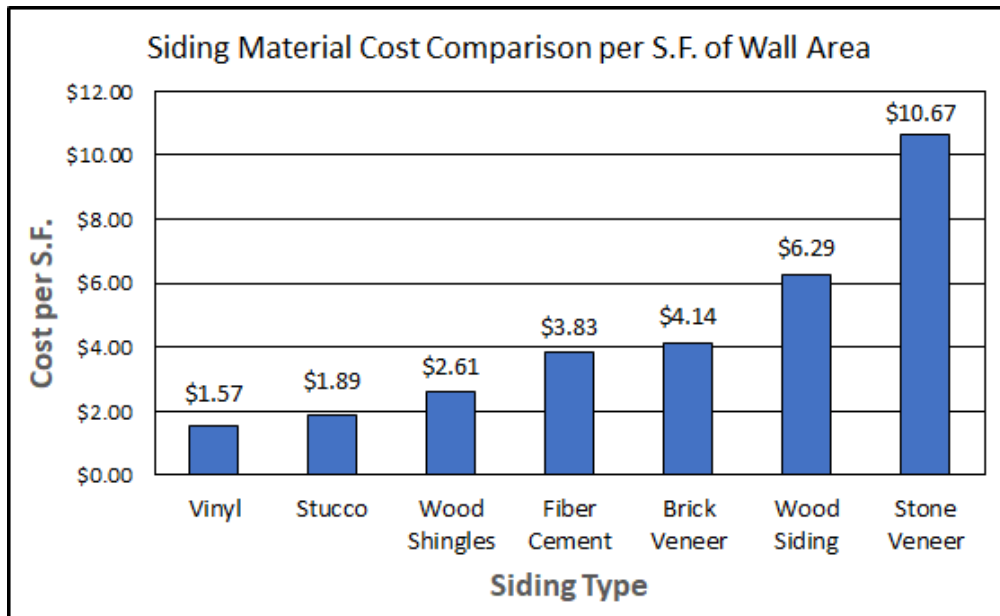


Figure #6 – Siding Material Cost Comparison – per S.F. of Wall Area

RESIDENTIAL 1-STORY HOME SIDING COST COMPARISON

The installed cost for the siding systems are calculated based on the S.F. of exterior wall area used in the RSMMeans Residential models — not the square footage of the floor area.

Methodology for calculating square footage of exterior wall siding for a RSMMeans 1 story house at 1,400 SF with 8’ high exterior walls (Assumption: 12% is considered windows and doors).

1. Take perimeter used in 1,400 SF RSMMeans Residential home (155.5554 L.F.)
2. Multiply perimeter (155.5554 LF) times wall height (8 Feet) which equals (1,244.443 total exterior wall SF)
3. Multiply total SF of exterior wall (1,244.443) times (.88) to calculate wall area minus doors/windows which equals (1,095.111 SF of exterior wall siding)
4. *The Gable area would add another 103.756 to the overall SF total in this example.
 - For 1,400 S.F., use **1,198.867 (1,095.111 + 103.756*) S.F. of Exterior Wall Area**
 - For 2,100 S.F., use 1,498.583 (1,368.889 + 129.694*) S.F. of Exterior Wall Area
 - For 2,700 S.F., use 1,691.781 (1,545.366 + 146.415*) S.F. of Exterior Wall Area
 - For 3,200 S.F., use 1,813.412 (1,656.471 + 156.941*) S.F. of Exterior Wall Area

Residential, Average, 1-Story, Brick Veneer Example

Find below (*Figure #7*) the brick veneer cost per S.F. of wall area converted to the siding cost per S.F. of living area of the 1-Story home:

	(A)	(B)	x	(C)	=	(D)	(E)
	Home S.F. of Living Area	Siding S.F. of Exterior Wall Area		Brick Cost per S.F. of Wall Area		Brick Total Cost for Wall Area	Brick Cost per S.F. of Living Area
	<u>Area</u>	<u>Area</u>		<u>Area</u>		<u>Area</u>	<u>Area</u>
1,400 S.F.	1,400	1,198.867	x	\$10.84	=	\$12,996	\$9.28
2,100 S.F.	2,100	1,498.583	x	\$10.84	=	\$16,245	\$7.74
2,700 S.F.	2,700	1,691.781	x	\$10.84	=	\$18,339	\$6.79
3,200 S.F.	3,200	1,813.412	x	\$10.84	=	\$19,657	\$6.14

Figure #7 –S.F. Wall Area Calculation Example

The chart on the next page compares the brick veneer siding cost per S.F. of living area (e.g., column (E) above in *Figure 8*) to the total cost of an average, 1-story house across a range of four (4) size values.

RSMeans used 1,400 S.F. as the base model home for the under 1,800 S.F. size category. The total cost to construct an average, 1-story, 1,400 S.F., brick veneer sided home is \$203,647 ^{#1} (\$145.46 x 1,400 S.F.) using the RSMeans Residential Cost Data book.

The brick veneer siding cost is \$12,996 (\$10.84 x 1,198.867 S.F. of wall area), or 6.4% of the total construction cost. See *Figure #8* and the table below for the cost of the other size ranges.

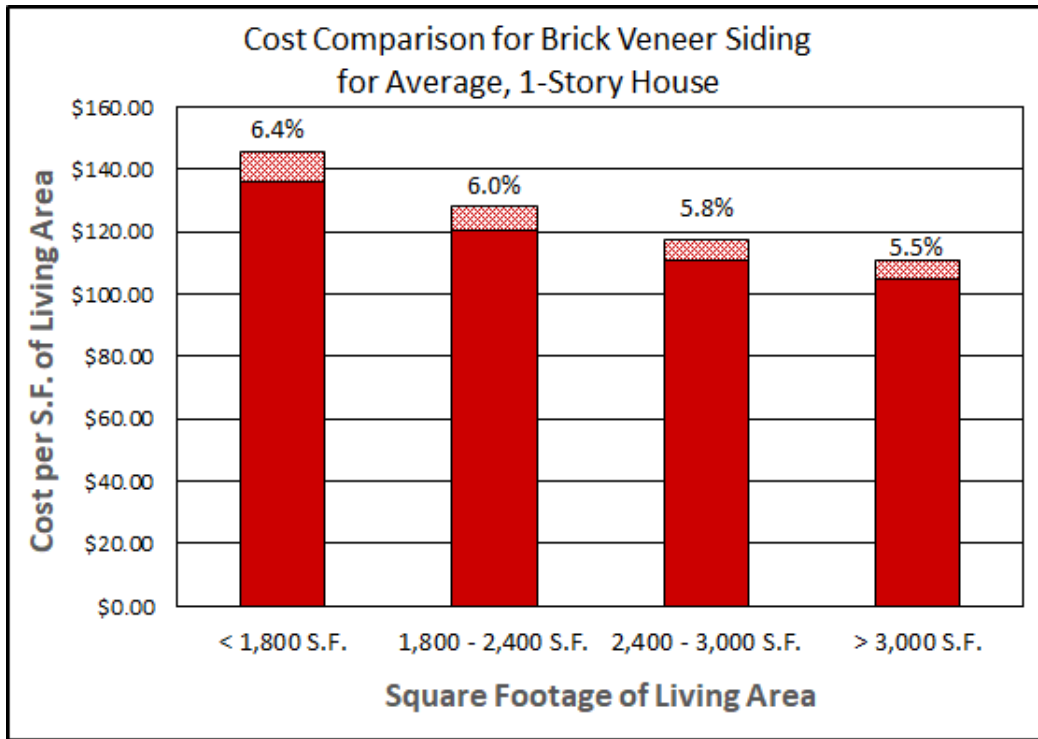


Figure #8 –Brick Veneer Siding Cost as a Percentage of the Total Cost for an Average,1 Story House

Cost Comparison for Brick Veneer Siding for an Average, 1-Story House	Brick Veneer Siding Cost per S.F. of Living Area	Average, 1-Story Home Cost per S.F. of Living Area	Siding % of Total Home Cost per S.F. of Living Area
< 1,800 S.F.	\$ 9.28	\$ 145.46	6.4%
1,800 - 2,400 S.F.	\$ 7.74	\$ 128.40	6.0%
2,400 - 3,000 S.F.	\$ 6.79	\$ 117.51	5.8%
> 3,000 S.F.	\$ 6.14	\$ 110.71	5.5%

^{#1} RSMeans includes a 17% builder mark up in the price of the total construction costs of the average 1 and 2 story residential home models.

The exterior siding costs per S.F. of living area is compared to an average, 1-story, 2,100 S.F. residential house with various sidings in *Figure 9* below.

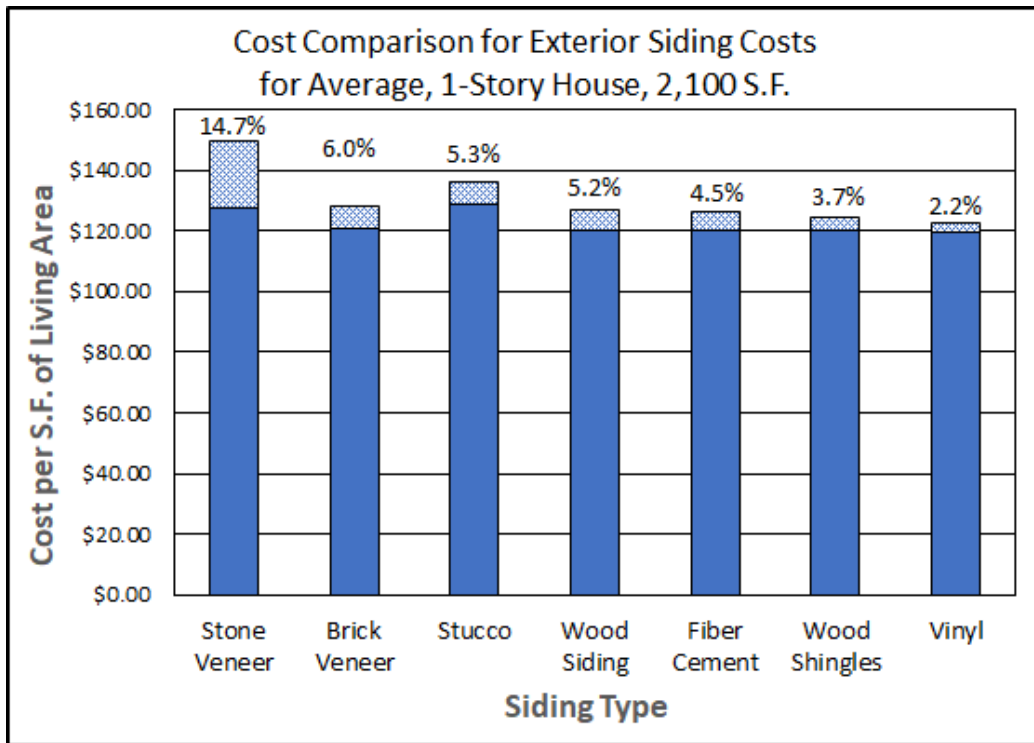


Figure #9 –All Exterior Siding Cost as a Percentage of the Total Cost for an Average,1 Story House, 2,100 S.F.

The total cost to construct an average, 1-story, 2,100 S.F., brick veneer sided home is \$269,637 (\$128.40 x 2,100 S.F.) using the RSMMeans Residential Cost Data.

The brick veneer cost is \$16,245 (\$10.84 x 1,498.583 S.F. of wall area), or 6.0% of the home’s total construction cost. See *Figure #9* above and the table below for the cost of the other size ranges.

Siding Options	Siding Cost per S.F. Living Area 2,100 S.F.	House Cost per S.F. Living Area for Home 2,100 S.F.	Siding Cost as a Percentage Living Area 2,100 S.F
Stone Veneer	\$21.95	\$ 149.46	14.7%
Brick Veneer	\$7.74	\$ 128.40	6.0%
Stucco	\$7.16	\$ 136.00	5.3%
Wood Siding	\$6.56	\$ 127.02	5.2%
Fiber Cement	\$5.71	\$126.03	4.5%
Wood Shingles	\$4.57	\$124.70	3.7%
Vinyl Siding	\$2.75	\$122.56	2.2%

RESIDENTIAL 2-STORY HOME SIDING COST COMPARISON

The installed cost for the siding systems are calculated based on the S.F. of exterior wall area used in the RSMMeans Residential models — not the square footage of the floor area.

Methodology for calculating square footage of exterior wall siding for a RSMMeans 2 story house at 2,700 SF with 8’ high exterior walls (Assumption: 12% is considered windows and doors)

1. Take perimeter used in 2,700 SF RSMMeans Residential home (160.93 LF)
2. Multiply perimeter (160.93 LF) times wall height (8’) times number of stories (2) which equals 2,574.883 SF of total exterior wall
3. Multiply total SF of exterior wall 2,574.883 times (.88) to calculate wall area minus doors/windows which equals 2,265.897 SF of exterior wall siding
4. *The Gable area would add another 107.340 to the overall SF total in this example.
 - For 1,400 S.F., use 1,612.953 (1,540.000 + 72.953*) S.F. of Exterior Wall Area
 - For 2,100 S.F., use 2,124.365 (2,028.281 + 96.084*) S.F. of Exterior Wall Area
 - **For 2,700 S.F., use 2,373.238 (2,265.898 + 107.340*) S.F. of Exterior Wall Area**
 - For 3,200 S.F., use 2,457.833 (2,346.667 + 111.167*) S.F. of Exterior Wall Area

Residential, Average, 2-Story, Brick Veneer Example

Find below (*Figure #10*) the siding cost per S.F. of wall area converted to the siding cost per S.F. of living area for the 2-Story home:

	(A)	(B)	x	(C)	=	(D)	(E)
	(a)	Siding		Brick		Brick	Brick
	Home	S.F. of		Cost per		Total	Cost per
	S.F. of	Exterior		S.F. of		Cost for	S.F. of
	Living	Wall		Wall		Wall	Living
	<u>Area</u>	<u>Area</u>		<u>Area</u>		<u>Area</u>	<u>Area</u>
1,400 S.F.	1,400	1,612.953	x	\$10.84	=	\$17,484	\$12.49
2,100 S.F.	2,100	2,124.365	x	\$10.84	=	\$23,028	\$10.97
2,700 S.F.	2,700	2,373.238	x	\$10.84	=	\$25,726	\$9.53
3,200 S.F.	3,200	2,457.833	x	\$10.84	=	\$26,643	\$8.33

Figure #10 –S.F. Wall Area Calculation Example

The chart on the next page compares the brick veneer siding cost per S.F. of living area (e.g., column (E) above in *Figure 10*) to the total cost of an average, 2-story house across a range of four (4) size values.

RSMMeans used 2,700 S.F. as the base model home for the 2,400 – 3,000 S.F. size category.

The total cost to construct an average, 2-story, 2,700 S.F., brick veneer sided home is \$333,300 (\$123.44 x 2,700 S.F.) using the RSMMeans Residential Cost Data.

The brick veneer siding cost is \$25,725.90 (\$10.84 x 2,373.238 S.F.), or 7.7% of the total construction cost. See *Figure #11* and the table below for the cost of the other size ranges.

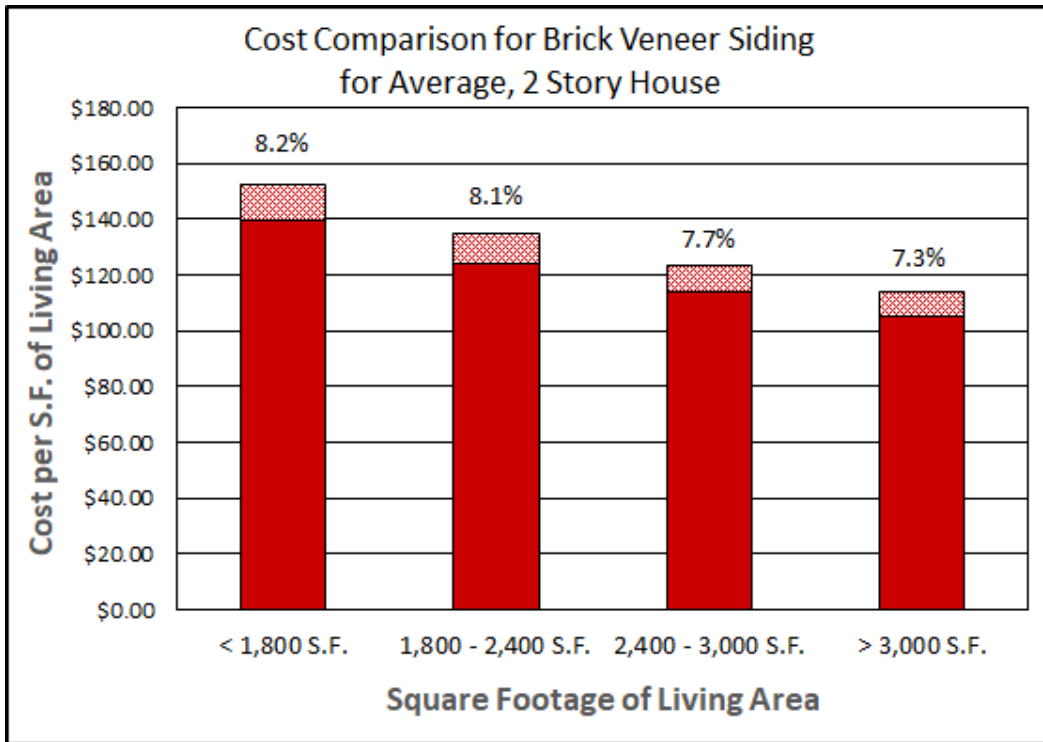


Figure #11 –Brick Veneer Siding Cost as a Percentage of the Total Cost for an Average, 2 Story House

Cost Comparison for Brick Veneer Siding for an Average, 2-Story House	Brick Veneer Siding Cost per S.F. of Living Area	Average, 2-Story Home Cost per S.F. of Living Area	Siding % of Total Home Cost per S.F. of Living Area
< 1,800 S.F.	\$ 12.49	\$ 152.29	8.2%
1,800 - 2,400 S.F.	\$ 10.97	\$ 134.69	8.1%
2,400 - 3,000 S.F.	\$ 9.53	\$ 123.44	7.7%
> 3,000 S.F.	\$ 8.33	\$ 113.64	7.3%

The exterior siding costs per S.F. of living area is compared to an average, 2-story, and 2,700 S.F. residential house in *Figure 12* below.

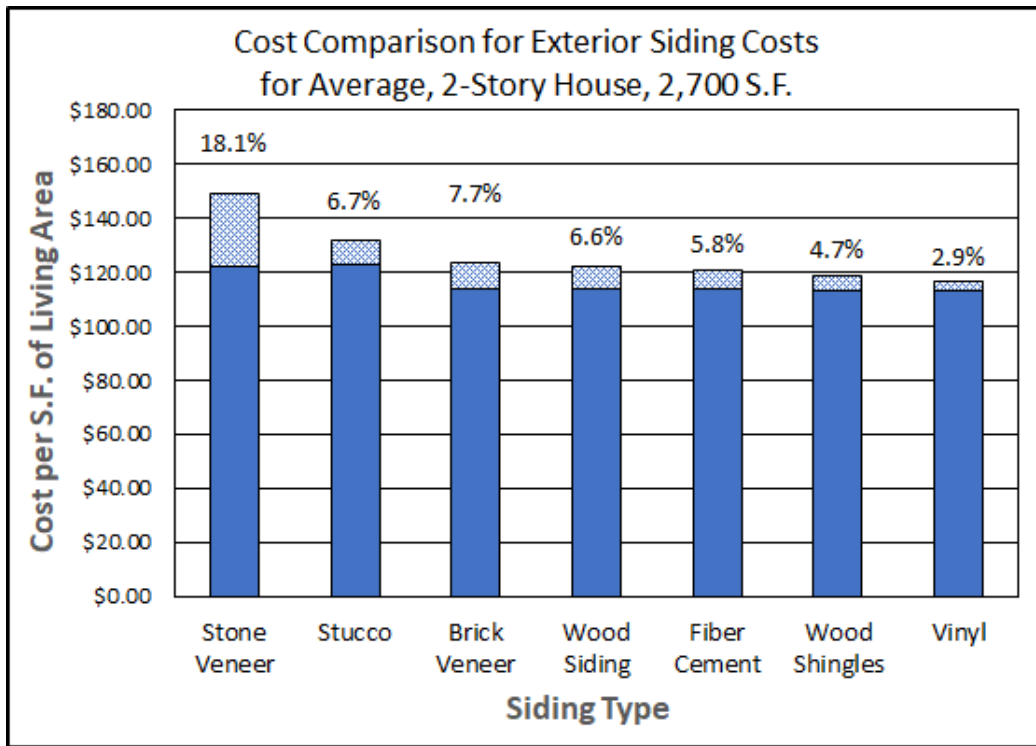


Figure #12 –Exterior Siding Cost as a Percentage of the Total Cost for an Average, 2 Story House, 2,700 S.F.

The total cost to construct an average, 2-story, 2,700 S.F., brick veneer sided home is \$333,300 (\$123.44 x 2,700 S.F.) using the RSMMeans Residential Cost Data.

The cost of the brick veneer is approximately \$25,725.90, or 7.7% of the home’s total construction cost. See *Figure #12* above and the table below for the cost of the other size ranges.

Siding Options.	Siding Cost per S.F. Living Area 2,700 S.F.	Home Cost per S.F. Living Area for House 2,700 S.F.	Siding Cost as a Percentage Living Area 2,700 S.F
Stone Veneer	\$27.04	\$149.34	18.1%
Stucco Siding	\$8.82	\$131.68	6.7%
Brick Veneer	\$9.53	\$123.44	7.7%
Wood Siding	\$8.08	\$121.75	6.6%
Fiber Cement	\$7.03	\$120.52	5.8%
Wood Shingles	\$5.63	\$118.89	4.7%
Vinyl Siding	\$3.38	\$116.26	2.9%

CITY COST INDEXES

RSMeans City Cost Indexes (CCI) are used to adjust cost to specific locations within the U.S. Find below (*Figure 13*) the adjusted cost per S.F. of wall area for brick veneer siding using residential labor rates for New York City, Philadelphia, Baltimore, Washington D.C., Atlanta, Dallas, Indianapolis, and Chicago.

Brick Veneer Cost per S.F. of Wall Area (Localized for Select U.S. Cities)

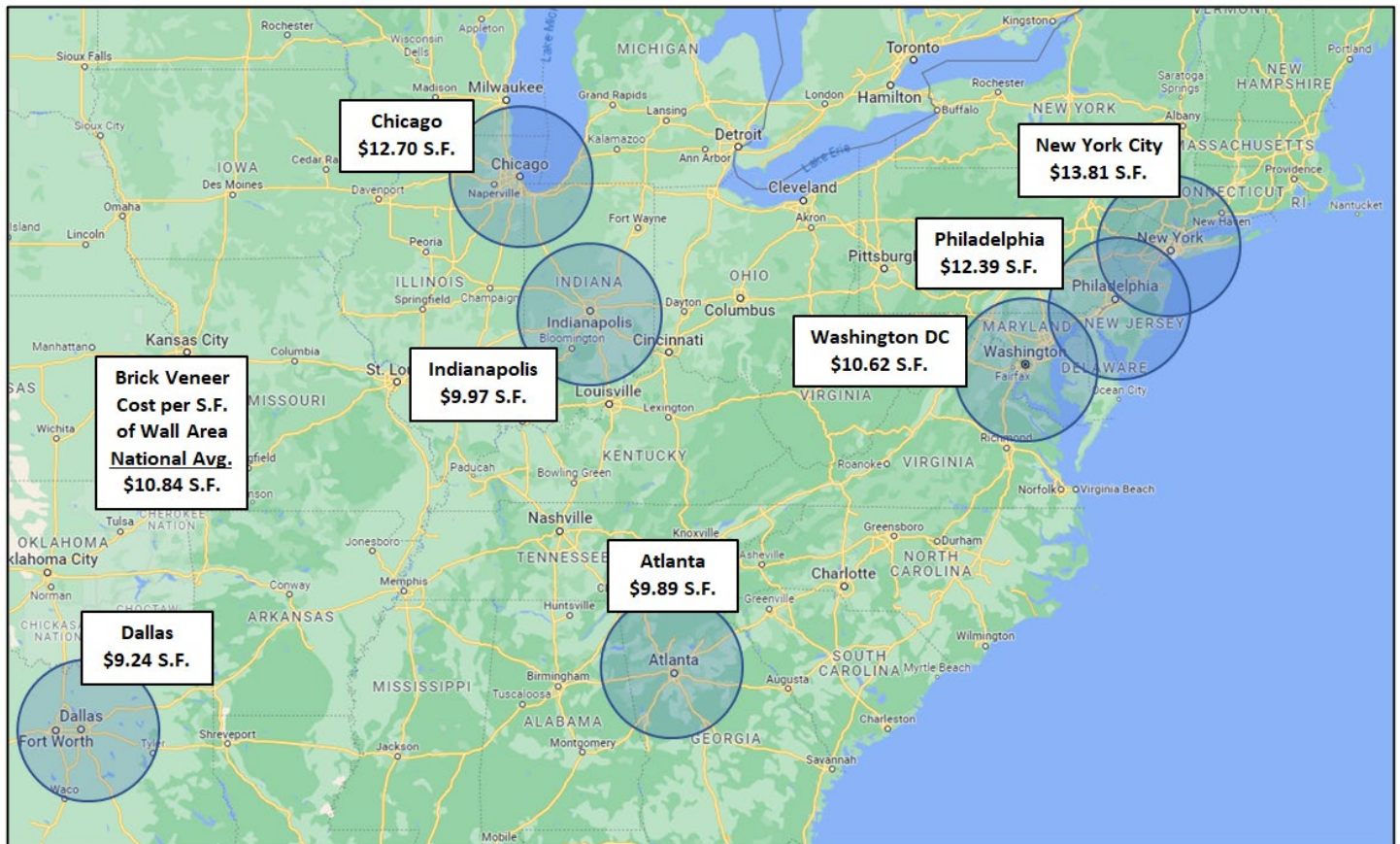


Figure #13 – Brick Veneer Siding Cost Adjusted by RSMeans City Cost Indexes for an Average, 1 Story House, 2,100 S.F.

The table below is used to adjust on a cost per S.F. of living area basis for the brick veneer siding cost and total construction cost for the average, 1-Story, 2,100 S.F. home sided with brick veneer.

U.S. Cities	3-digit Zip code	Siding Cost per S.F. of Wall Area	Siding Cost per S.F. of Living Area 2,100 SF	Residential Home Cost per S.F. of Living Area 2,100 SF
National Avg.	-	\$10.84	\$7.74	\$128.40
New York City	100	\$13.81	\$11.11	\$173.30
Philadelphia	190	\$12.39	\$9.48	\$147.87
Washington DC	200	\$10.62	\$7.29	\$113.71
Baltimore	210	\$10.40	\$7.04	\$109.81
Atlanta	300	\$9.89	\$6.57	\$102.48
Indianapolis	461	\$9.97	\$6.84	\$106.69
Chicago	606	\$12.70	\$9.88	\$154.11
Dallas	752	\$9.24	\$5.99	\$93.44

Refer to Appendix for a more detailed explanation of how the City Cost Index is developed and how costs are adjusted.

FINDINGS AND CONCLUSIONS

Brick siding, with its exceptional combination of aesthetics, water resistance, low maintenance and durability, is in a class of its own.

However, for purposes of this study, RSMean strictly looked at the installed cost for the various wall systems compared to brick veneer including the incremental differences for residential homes.

The estimated total construction cost for an average, 2-story, 2,700 S.F. home with various exterior siding options using RSMean Residential Cost Data can be found in *Figure #14* below.

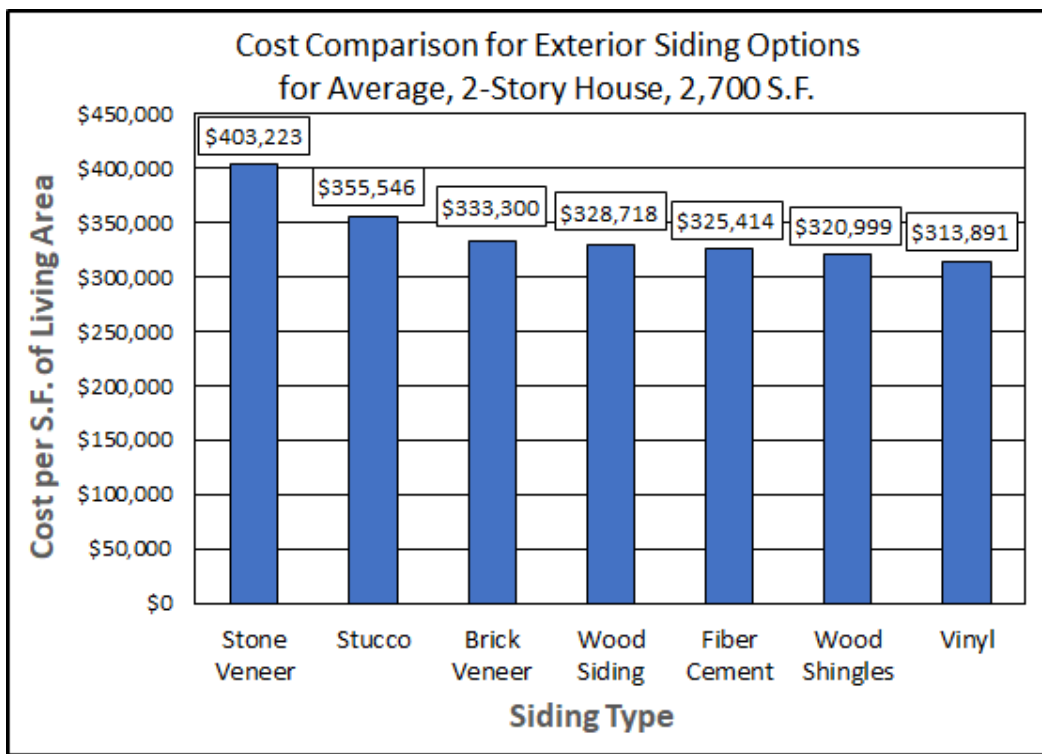


Figure #14 – Total Cost Comparisons for Exterior Siding Options for an Average, 2 Story House, 2,700 S.F.

The total construction cost of a brick veneer sided home is estimated at 6.7% less than stucco, 1.4% more than wood siding, 2.4% more than fiber cement siding, 3.7% more than wood shingles, and 5.8% more than vinyl siding. Stone veneer is estimated at 21% more than the comparable 2,700 S.F. home with brick veneer siding.

RSMean has attached to this cost study a customized MS Excel cost calculator allowing BIA to estimate costs for the brick veneer siding options for average, 1 and 2-story homes at sizes of 1,400 S.F., 2,100 S.F., 2,700 S.F. and 3,200 S.F. This utility will allow BIA to localize the brick veneer costs for any zip code in the U.S. based upon the information using the RSMean Residential Cost Data.

APPENDIX A – RSMEANS LABOR COSTS

RSMeans Labor Cost Used

Residential Labor:

Labor costs are based on the average of wage rates from 7 major U.S. regions for construction trades for the current year. Rates include employer paid fringe benefits.

Open Shop Labor:

Labor costs are based on the average of open shop wage rates from 30 major U.S. cities for construction trades for the current year. Rates include employer paid fringe benefits.

Union Labor

Labor costs are based on the average of wage rates from 30 major U.S. cities. Rates are determined from labor union agreements or prevailing wages for construction trades for the current year. Rates include employer paid fringe benefits.

APPENDIX B – CITY COST INDEXES

RSMeans City Cost Indexes (CCI) are an extremely useful tool to use when you want to compare costs from city to city and region to region.

This publication contains average construction cost indexes for 731 U.S. cities covering over 7030 three-digit zip code locations, as listed directly under each city.

Keep in mind that a City Cost Index number is a percentage ratio of a specific city's cost to the national average cost of the same item at a stated time period.

In other words, these index figures represent relative construction factors (or, if you prefer, multipliers) for Material and Installation costs, as well as the weighted average for Total In Place costs for each CSI MasterFormat division. Installation costs include both labor and equipment rental costs.

The 30 City Average Index is the average of 30 major U.S. cities and serves as a National Average. Index figures for both material and installation are based on the 30 major city average of 100 and represent the cost relationship as of July 1, 2014. The index for each division is computed from representative material and labor quantities for that division. The weighted average for each city is a weighted total of the components listed above it, but does not include relative productivity between trades or cities.

As changes occur in local material prices, labor rates, and equipment rental rates (including fuel costs), the impact of these changes should be accurately measured by the change in the City Cost Index for each particular city (as compared to the 30 City Average).

Therefore, if you know (or have estimated) building costs in one city today, you can easily convert those costs to expected building costs in another city.

What the CCI does not indicate

The weighted average for each city is a total of the divisional components weighted to reflect typical usage, but it does not include the productivity variations between trades or cities.

In addition, the CCI does not take into consideration factors such as the following:

- managerial efficiency
- competitive conditions
- automation
- restrictive union practices
- unique local requirements
- regional variations due to specific building codes

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