

Residential Seismic Retrofit Cost for Home Located in Tustin, CA

Abstract

Seismically retrofitting a residential home not only protects the homeowner, but also helps them prepare for the future. Needless to say, many older homes are not up to the 2018 International Residential Code. As a result, many owners are uninformed about how much it will cost to retrofit their home and what changes will have to be made. The solution for this is determining a cost per square foot ratio that will help homeowners calculate an estimate for the retrofit of their home. Those without construction backgrounds will then have a better understanding of where the costs are going. By forming this estimate and putting it into explicit terms, it will better educate homeowners and help them knowingly participate throughout the process. This is an important solution to a prevalent problem that can be integrated into the construction community to help bridge the gap between contractor and owner. This is not only beneficial for homeowners, but also contractors, as they can spend less time explaining the process, and simply perform the work.



Research Design & Methodology

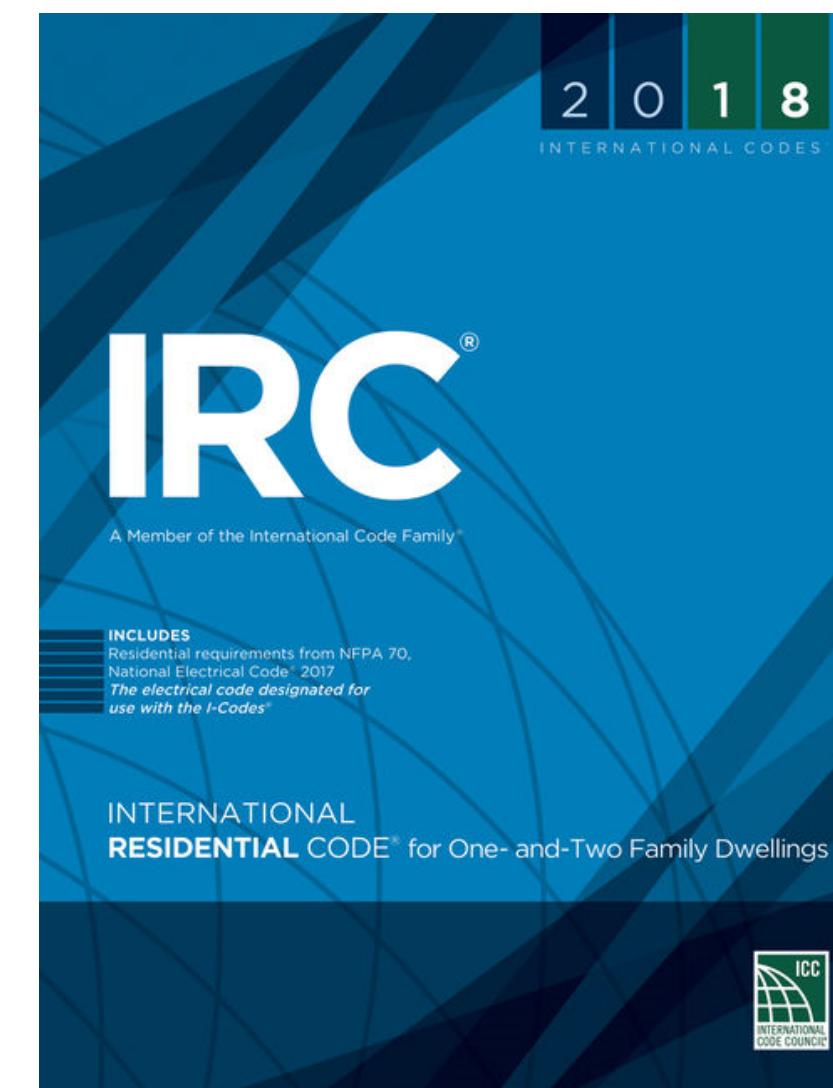
Research on seismic building code history, Federal Emergency Management Agency (FEMA) measures, and existing International Residential Codes (IRC) was conducted to give homeowners a better understanding of the costs and upgrades associated with a seismic renovation. A set of house plans were analyzed to determine what upgrades should occur given the existing conditions. Then, a quantity take off was prepared and an estimate was calculated using RS Means and IRC data. These costs were condensed into a total cost and an approximate cost per square foot for the upgrade.

Results

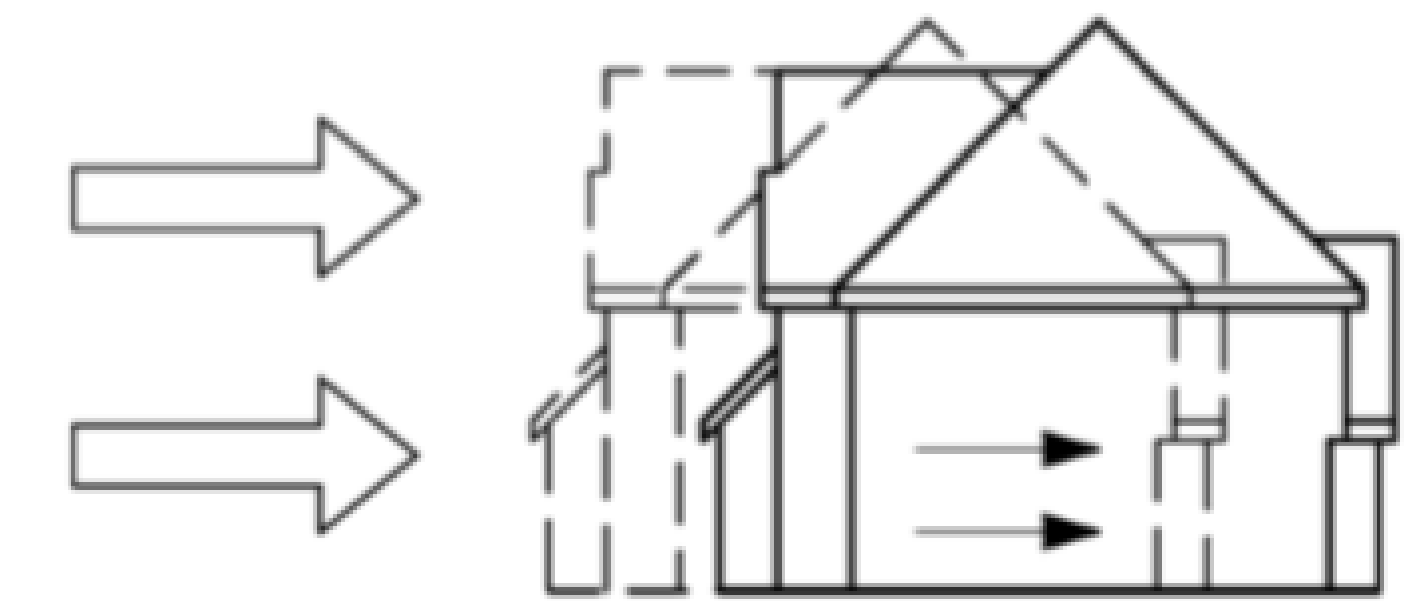
The total project cost for the home located in Tustin, California was \$7,401.90. With a square footage of 2,682 SQ FT, the average cost for the residential seismic retrofit was \$2.76/SF.

Conclusions & Recommendations

After conducting this project, it has become apparent that seismic retrofitting is not straightforward. A retrofit can depend on the home's location, existing conditions, previous additions or alterations, and when it was constructed. Using the 2018 IRC and FEMA was helpful, but determining the exact cost for a home will depend on local codes. It would be ideal to make residential seismic codes more well-known, as they are not as widespread as commercial codes. Although newer homes today are seismically sound, it is just as important to upgrade existing older homes.



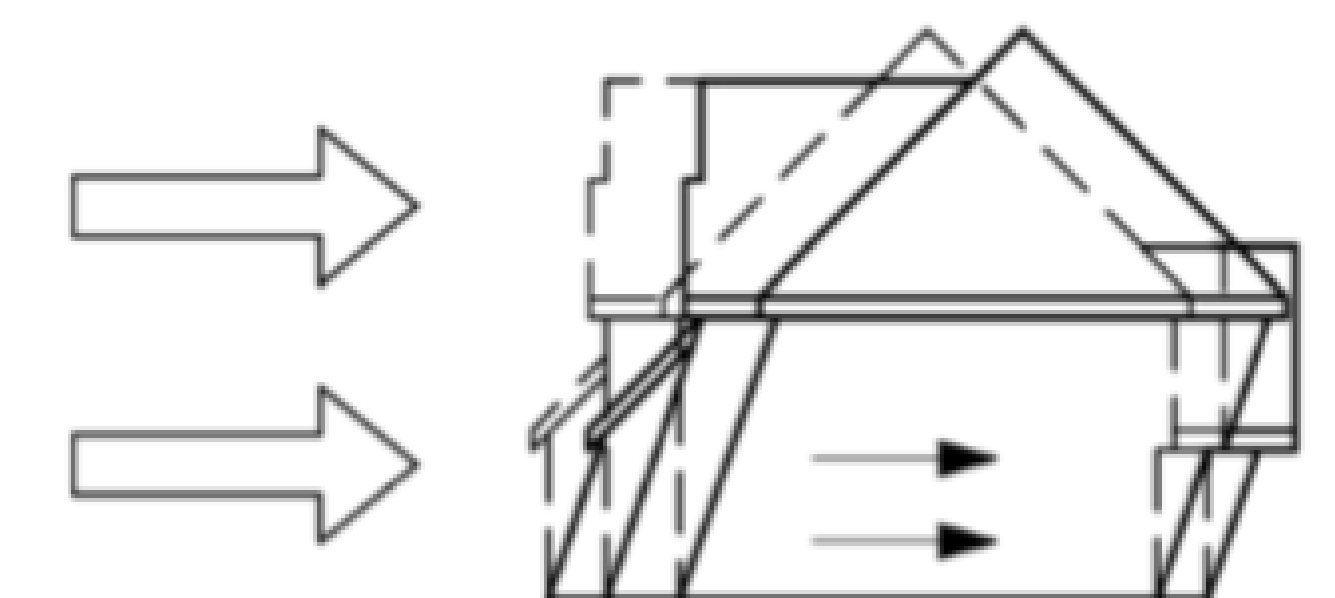
FEMA



Sliding

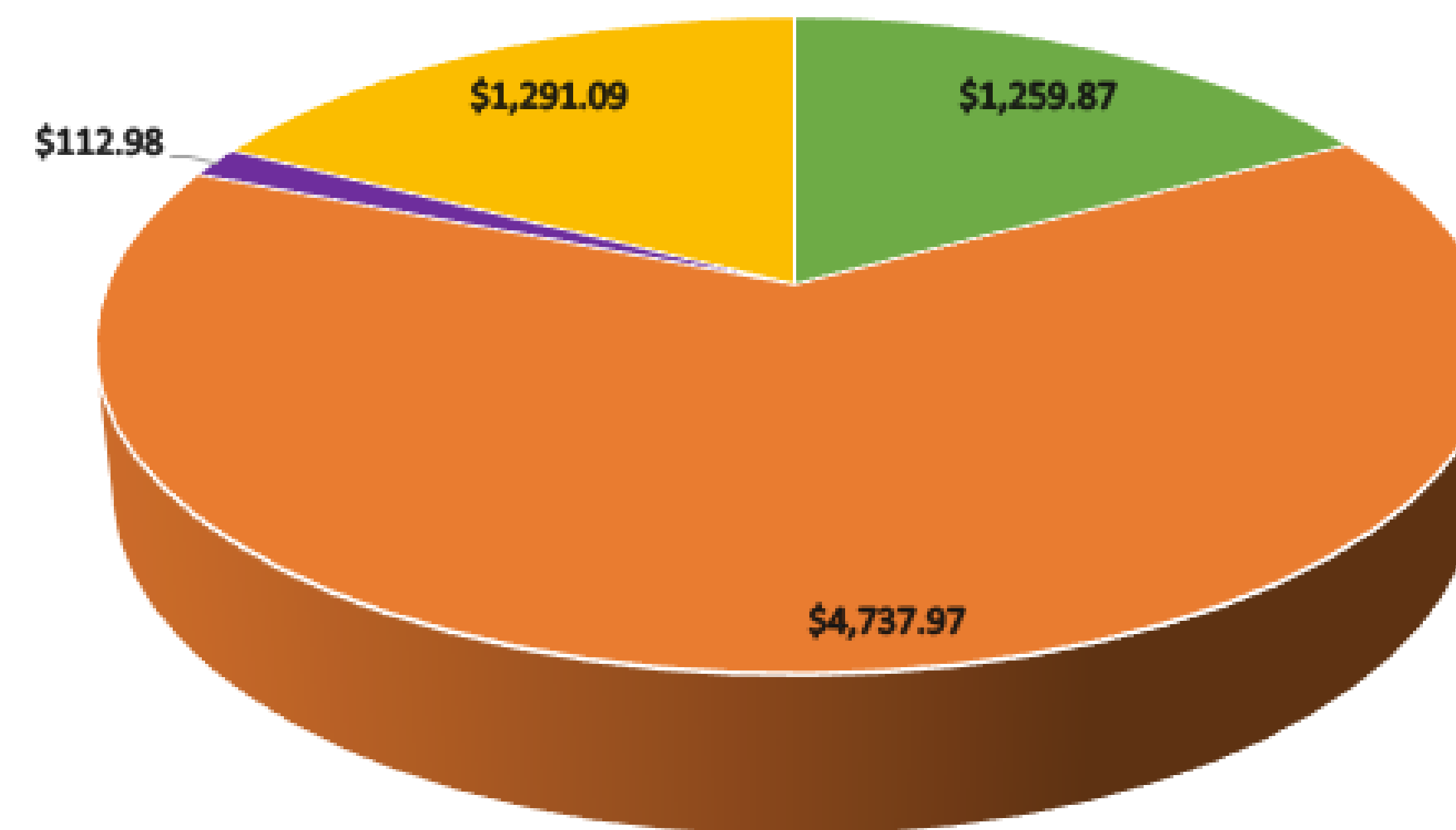


Overturning



Racking

Seismic Retrofit Cost Allocation



■ Material Cost ■ Labor Cost ■ Permit Fee ■ Overhead Costs