

How Do Siting and Design Decisions Affect the Owner's Costs?



FEMA



HOME BUILDER'S GUIDE TO COASTAL CONSTRUCTION FEMA 499/August 2005 Technical Fact Sheet No. 6

Purpose: To show the effects of planning, siting, and design decisions on coastal home costs.

Key Issues

- When building a coastal home, initial, operating, and long-term costs (i.e., life cycle costs) must be considered.
- Coastal (especially oceanfront) homes cost more to design, construct, maintain, repair, and insure than inland homes.
- Determining the risks associated with a particular building site or design is important.
- Siting, designing, and constructing to minimum regulatory requirements do not necessarily result in the lowest cost to the owner over a long period of time. Exceeding minimum design requirements costs slightly more initially, but can save the owner money in the long run.

Costs

A variety of costs should be considered when planning a coastal home, not just the construction cost. Owners should be aware of each of the following, and consider how siting and design decisions will affect these costs:

Initial costs include property evaluation and acquisition costs and the costs of permitting, design, and construction.

Operating costs include costs associated with the use of the building, such as the costs of utilities and insurance*.

Long-term costs include costs for preventive maintenance and for repair and replacement of deteriorated or damaged building components.

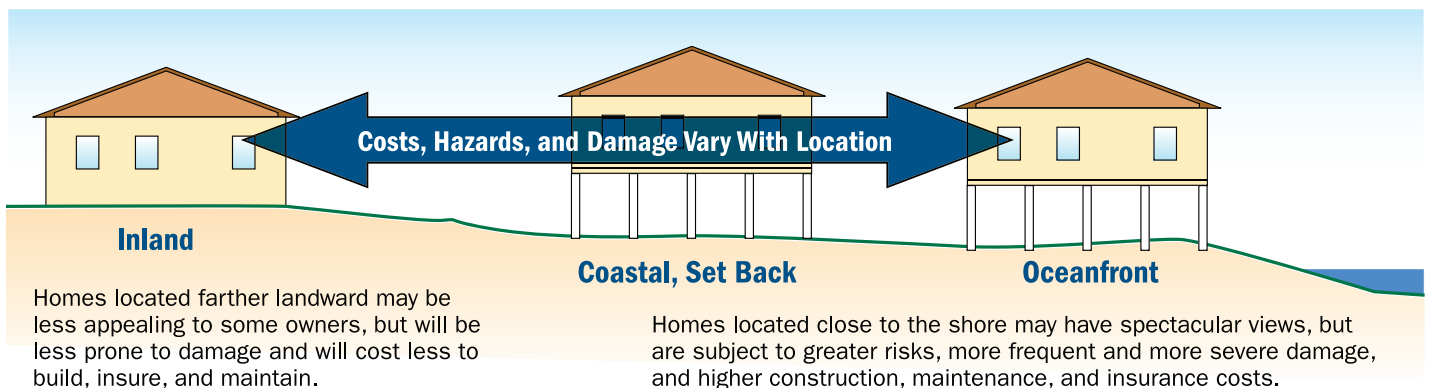
*Note: Flood insurance premiums can be reduced up to 60 percent by exceeding minimum siting, design, and construction practices. See the V-Zone Risk Factor Rating Form in FEMA's *Flood Insurance Manual* (<http://www.fema.gov/nfip/manual.shtm>).

Risk

One of the most important building costs to be considered is that resulting from storm and/or erosion damage. But how can an owner decide what level of risk is associated with a particular building site or design? One way is to

consider the probability of a storm or erosion occurring and the potential building damage that results (see matrix).

		Probability of Occurrence		
		Low	Medium	High
Potential \$ Loss	Low	Low Risk	Low Risk	Medium Risk
	Medium	Low Risk	Medium Risk	High Risk
	High	Medium Risk	High Risk	Extreme Risk



Building sites or designs resulting in extreme or high risk should be avoided — the likelihood of building loss is great, and the long-term costs to the owner will be very high. Building sites or designs resulting in medium or low risk should be given preference.

Siting

Note that over a long period, poor siting decisions are rarely overcome by building design.

Design

- How much more expensive is it to build near the coast as opposed to inland areas? The table below suggests approximately 10 - 30 percent more.
- What about exceeding minimum design requirements in coastal areas? The table suggests that the added construction costs for meeting the practices recommended in the *Home Builder's Guide to Coastal Construction* (beyond typical minimum requirements) are nominal.

Design Item (Items in bold are required by National Flood Insurance Program (NFIP) and/or local building code.)	Cross-Reference to Fact Sheets	Added Initial Costs (when compared to typical inland construction) Required by Code or NFIP	Added Initial Costs (to exceed Code/NFIP minimum requirements) for Home Builder's Guide to Coastal Construction Recommended Practices	Effect of Design Item on Cost					
				Reduce wind/storm damage	Reduce flood damage	Longer material life	Reduce maintenance	Lower insurance	Lower utility bills
A zone, pile/column foundation	1, 4, 11	High	High	✓	✓			✓	
V zone, pile/column foundation	1, 4, 5, 11	High			✓			✓	
Joists sheathed on underside		Low	Low		✓	✓			✓
Structurally sheathed walls		Medium		✓					
Corrosion protection	1, 8	Low		✓	✓	✓	✓		
Decay protection	1, 8	Medium		✓	✓	✓	✓		
Hip roof shape	1	Low	Low	✓					
Enhanced roof sheathing connection	1, 18	Low	Low	✓					
Enhanced roof underlayment	19	Low	Low	✓					
Upgraded roofing materials	1, 20	Medium		✓		✓	✓		
Enhanced flashing	1, 22, 24	Low		✓		✓	✓		
Housewrap	1, 22, 23	Low		✓					✓
Superior siding and connection	25	Medium	Medium	✓			✓		
Protected or impact-resistant glazing	1, 26	High	Medium	✓				✓	
Connection hardware	1, 8, 17	Low		✓	✓				
Flood-resistant materials	1, 8	Low			✓	✓		✓	
Protected utilities and mechanicals	1, 29	Low		✓	✓	✓	✓		✓
Estimated Total Additional Cost (% of building cost)		15 - 30	±5	✓	✓	✓	✓	✓	✓

Low	<0.5% of base building cost	Estimates are based on a 3,000-square-foot home with a moderate number of windows and special features. Many of the upgraded design features are required by local codes, but the level of protection beyond the code minimum can vary, depending on the owner's preference.
Medium	0.5% - 2.0% of base building cost	
High	>2.0% of base building cost	