Building in the Danger Zone

For the past 15 years, Mark Sigler has been exploring ways to build safe homes in dangerous places, including hurricane zones, landslide territory, and most recently, mountain fire zones. He engineered his first home in Pensacola Beach to withstand hurricanes and a humid environment. In 2004, Sigler's domed beachfront home survived a direct hit from Hurricane Ivan. He and an NBC television crew stayed overnight while the storm surge ripped off the front stairs and swept open the garage doors — all of which were designed to break away (A). Here's why Sigler's structure so impressively weathered the storm:

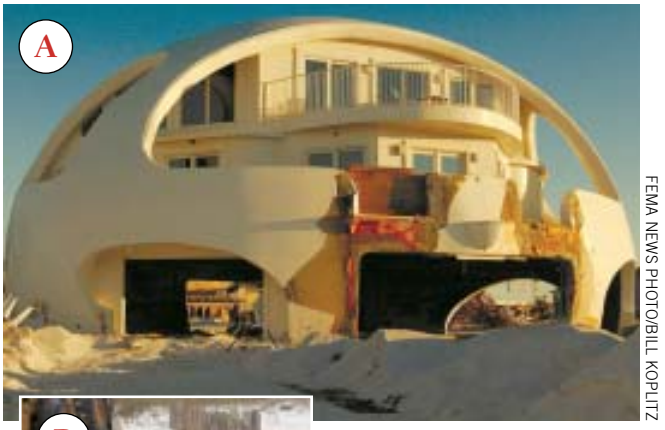
The 16 high-tech piles are made of recycled polypropylene with fiberglass reinforcement, making them impervious to corrosion in a salt environment (B). The piling acts like a big cleat to hold the concrete-reinforced ring beam to the beach (C).

To construct the home, Sigler and his crew entered a fiberglass balloon that was secured to the ring beam and inflated with a blower (D). A man-lift, plus all the rebar required to support the dome, was loaded inside beforehand.

The first layer of the dome consisted of 4 inches of spray-urethane foam, applied in 1-inch lifts. Wire ties were inserted between lifts to hold up a rebar cage and reinforcing for the beams over each opening (E). The reinforced area was then sprayed with 150 yards of shotcrete. "It's like installing an upside-down pool," explains Sigler.

Next, the openings were cut away like a giant jack-o'-lantern (F). The exterior was plastered with stucco, then sprayed with a rubber truckbed liner (G) that provides a tough enough skin to resist penetration from wind-blown debris and moisture.

Every bedroom of the completed 6,000-square-foot home (2,000 square feet of conditioned living space) opens onto a deck facing the water (H).



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