

by Stan Barbarich

As reported last month, due to the fact that the zinc anodes installed on many homes appeared to be eroding faster than anticipated, FHA agreed to pay an international corrosion-consulting firm \$4200 to assess the effectiveness of this means of protecting our concrete hulls from corrosion of the reinforcing steel (“rebar”) and make recommendations for improvement. These engineers, with the help of Ted Eitelbuss, have worked for several days doing extensive testing of the waters and of a number of homes throughout the community. They have a bit more work to do before they write their final report and make recommendations, but since this is such an important topic, I wanted you to know their findings so far.

Background: a number of homeowners have, over the past couple of years, had zinc anodes installed on their hulls with a view to preventing corrosion of the rebar and the subsequent impact on their hull. This kind of “passive corrosion protection” has been successfully used for decades to protect steel-hulled ships and boat propellers, as well as for dams, bridges and other reinforced concrete structures in contact with water. In circumstances where such passive protection was found to be insufficiently effective, an alternative method, “impressed current” protection, where a small electrical current is applied to the rebar, has been used. Both of these methods are in use for many decades (even way back when I took electrical engineering class these were proven methods, and yes, electricity *had* already been discovered then) This project was undertaken to determine what would work well for our homes.

Even though a bit more work remains, the results of the measurements are already extremely clear to the engineers, so, barring some unlikely, major new finding, they and I are happy to report that they found that the passive protection method is working very well on the hulls that already have it installed. This was determined by accurately measuring the current flow through the rebar and the anodes. There are standard engineering formulae that have been established over the years, based on actual studies of the aforementioned concrete dams and other structures. By applying these standards to our homes, the engineers are objectively satisfied that this passive-protection approach is working properly. This means that the more expensive (about \$1500 for homes already having had zincs installed) and extensive impressed current method is not needed, and those of you with zinc anodes installed can feel protected. They also tested the waters to determine if there were any stray electrical currents flowing in the water that would affect hulls, and found that there were none.

But, what about the all-too-speedy disappearance of those zincs that has been observed? Well, again by the application of established engineering criteria, it was determined that aluminum anodes (the correct size and number of which depend on hull size) can

properly be used in place of zinc. This will give the correct amount of protection to the rebar, but at a much lower materials cost and the aluminum anodes should also last a lot longer than zinc, too. Good news all around.

The engineers also had recommendations on faster, less-costly methods of installation of the anodes. They report that the standard practice worldwide is to use mechanical fasteners to connect anodes to the cables that connect to the rebar, rather than by soldering, because both produce an equally-good electrical connection but mechanical means are faster. Also, they recommend against drilling holes in the hull to attach the anodes to a bracket directly attached to the hull. The only time that anodes need to be attached to a hull is if the hull is a conductor (made of steel). Standard practice around the world is to simply allow the anode to dangle at the end of its connector cable, just touching the mud at low tide (wet mud conducts current), which reduces installation cost, and avoids drilling holes in the hull below the waterline (placing unnecessary holes seems counter-intuitive in any event).

For the benefit of those who adhere to the alternative sciences (after all, the Flat Earth Society has continued to thrive, since 1547) and to confirm the engineers' conclusions in a real-world setting, I paid them to replace the zincs on our home with aluminum anodes, and to install them per their recommendations. They first took electrical measurements of the hull with zincs, then with no anodes, and, finally, after installing the aluminum anodes, they attached a recording device to the hull to track current flow over time. Results of this exhaustive experiment confirm that things are working well and are totally supportive of the engineer's findings and recommendations, so those of you who do believe in the scientific method should be assured.

Hopefully this gives you enough information to allow you to decide whether you want to add passive protection to your hull.

Another substantial benefit of FHA membership!