Choosing Expansion Joints

Florida “Trouble” Jobs Hold Some Valuable Lessons

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In the construction business, we often start taking our “Commodity” supplies and components for granted—until trouble comes along.

Such is the case with plaster and masonry expansion/control joints. They’re supposed to be the sort of “commodity” you can install and forget. Indeed, when the engineer specifies the right one for the conditions, and the contractor installs it correctly, that’s exactly what happens.

But recently in Florida, there has been a rash of lawsuits filed against specifiers and masonry and plastering contractors. The complaint: surface discoloration of masonry due to “bleeding” of rust from expansion joints. There is expansion joint-related litigation underway on more than 20 major projects. Any one of them could easily put three or four contractors out of business.

Local symptom, National Problem . . .

While what’s happening in Florida may seem just local, in reality it has national implications—particularly for new construction in marine environments. It’s the extremely high level of waterfront construction in Florida that brings that state’s spate of lawsuits such visibility. There’s a lesson here for specifiers and masonry, and wall-and-panel contractors along the entire Atlantic, Gulf, and Pacific coasts. And that takes in a lot.

The fact is, all masonry expansion/control joints are not alike. The proper choice is always important-particularly where salt corrosion, humidity, and bright sunlight are involved. In these marine regions, expansion joints are very heavily used for the very reason masonry construction is favored in the first place: the corrosive environment. Corrosive environments also occur inland. Sulphates are very harmful to galvanized coatings in towns such as Pittsburgh, PA; Newark, NJ; and Columbus, OH.

Which Material?

Let’s talk about expansion joint materials first. For quality construction, it’s generally accepted that metal will far outlast plastic expansion joints, especially where sunlight exposure is involved. Reason: the plastic simply doesn’t stand up to the sun’s ultraviolet rays.

For interiors and light loads, plastic may indeed be adequate. But not outdoors in sunny, salt water-exposed locations.

Among metals, there are two basic choices, and then some follow-up choices as well.

The basic choice is between galvanized and solid zinc expansion joints.

Galvanized is the most commonly used metal expansion joint, and in fact, some of the buildings under
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lawsuit are done with galvanized expansion joints. Of the metal expansion joints, galvanized is usually the least expensive.

The problem is inadequate galvanization coating thickness. Galvanized expansion joints come in three grades, according to thickness of the galvanized coating. G-30 is the lightest, with ½-oz/sq. ft. of zinc coating. G-60 has 1-oz/sq. ft. zinc and G-90 has 1½-oz/sq. ft. zinc.

A close look at the Florida lawsuits will indicate that the problem mainly centers around 1-oz/sq. ft. or lower galvanized joints. The reason is simple: the coating is so thin and the exterior construction materials so abrasive, that the coating was easily breached. Then moisture got in and, like an infection that spreads, the corrosive reaction began, scarring an otherwise attractive structure. That’s when the contractor and specifier got in trouble.

Solid Zinc...

The other metal alternative is the solid zinc expansion joint, but here, too, there is a follow-up choice. No question, zinc is far more corrosion-proof. But it is also more expensive than galvanized and mechanically not as strong, inch for inch of thickness.

Which brings us to the important follow up choice among zinc expansion joints: metal thickness. The two standard thicknesses for zinc expansion joints are 0.012 in. (6 gauge) and 0.017 in. (8 gauge). Except for very light sections of masonry, always specify and install the heavy-gauge zinc joint if you go the solid zinc route. The reason: to provide needed extra mechanical strength to avoid failure. Remember, if you take out the steel, you’ll need a lot more zinc to replace it. The few Florida lawsuits involving zinc joints center on mechanical failure of the thin-gauge joints, and none involve the heavy gauge zinc joints.

Choice For Outdoors . . .

For exterior joints, the heavyduty zinc expansion joint will unquestionably give the best service. The more humid and salt-laden the environment, the more strongly they
should be favored if you want a quality construction job.

Indoors, some judgement must prevail. One idiosyncracy of construction along shorelines is a lot of plazas and patios that are both indoor and outdoor. A good rule of thumb is, the more exposed the joint, the more humid and saline the environment, and the coarser the texture of the ground being worked, the more solid zinc should be favored.

On true indoor masonry surfaces with fine-textured ground material, G-90 galvanized is probably adequate. But remember in these climates, if the zinc coating is in any way breached, it is just a matter of time before staining appears.

Once the proper joint is selected in these severe environments, it’s important to remember the basic guidelines about proper placement and installation of the joints. Here are a few key tips:

• Place expansion joints at least every 100 square feet and above openings.
• If you’re dealing with light colored and dark colored panels, the darker panels will need more control joints because they absorb more radiant heat.
• Always include a control joint where dissimilar materials meet.
• Keep kinks out of expansion joints. They weaken the ground at that point, and can provide a propagation point for a crack.
• Break the entire wall assembly at an expansion or control joint.
• The greater the temperature difference between inside and outside surfaces of the membrane, the more expansion joints you’ll need.
• Use casing bead at membrane edges. It keeps the edges from moving, and helps keep out moisture.
• Try to make your panels as close to square as possible. The squarer the panel, the less chance of cracking. For rigidly attached membranes, try to keep the length-to-width ratio on panels within 2:1. For less rigidly attached membranes, up to 2½:1 is probably the safe limit.

If you’re ever tempted to take expansion joints for granted, particularly in marine environments, just remember what’s going on in Florida right now, and benefit from the experience of others. It will pay off in the long run.

Finally, what about cost? Obviously, G-90 galvanized costs more than G-30, solid zinc costs more than galvanized, and heavy duty zinc costs more than light gauge zinc. And metal will always cost more than plastic.

It’s also true that expansion joints represent less than 1% of the total cost of any job. So, cost of the joint material rarely becomes an issue on the job. In fact, contractors and specifiers often enhance their image with the owner by recommending a joint that will keep the building intact and good looking longer. So, particularly in humid, marine environments, it will pay to go with the strongest, most corrosion-resistant metal expansion joint available. It goes in easily, makes a better job, and eliminates callbacks. And who can beat that?