



# The CIA Insider

Promoting Excellence Within Our Profession

Commercial Inspectors Association of America - P.O Box 49 Brighton, MI 48116 - 866.434.9779

## Legislation- "Unfair to Commercial Inspectors!"

CIA is a membership driven organization. When protecting your inspection company it is important for CIA to inform you when the industry has taken a new direction. Recently a number of state legislators have decided that they should provide legislation to who can and can not perform commercial inspections.

We at CIA agree that the competency level and integrity for a commercial inspection should be qualified. We also believe that these qualifications should be always updated and certified as to the ability level and new changes in the commercial market.

Many legislators and legislation are well intended with its main objective, to protect the public. However, sometimes there are those pieces of legislation that do not fulfill that criteria.

One state in particular, Georgia, has deemed only those individuals holding a civil engineering degree are qualified to perform a PC structure evaluation.

*Providing property conditions assessments (PCA), inspection reports or any other reports concerning the conditions, adequacy, safe or unsafe conditions, compliance with plans and/or codes of any commercial structure valued more than \$100,000 for a client is considered by this board the practice of engineering as defined in Georgia law section 43-15-2 and persons not registered as professional engineers in the state of Georgia shall be prohibited from performing or offering to perform such services.*

This is not only discriminatory in its very nature, but it does not provide an evaluation as to the ability level of somebody holding a civil engineering degree. This can be equated to the statement that, "Any doctor can perform surgery." We all know that the educational part is an important step of the equation. There are two other even more important steps; hands on experience, and testing. Both of these items, by their very nature, provide education. Consequently to complete the equation, individuals, requesting to perform surgery, need hands on training and more important, testing. It is these two requirements that are the most important to performing an adequate surgery. They do not rely on the title of a person but rather the ability level of that person.

Should that be any different to perform PCA evaluations? Wouldn't it be in the best interest of the public to have individuals that have hands training as well as levels of testing to be

certified perform the most comprehensive inspections including PCAs?

We at CIA believe that education is the cornerstone of the inspection industry. In many cases technical people who service equipment such as boilers, air handlers, roofing, wall curtains, etc., usually have the best expertise to assess property conditions. Furthermore, whether it is an engineer or a technical person it is in everyone's best interest to test the competency level. As you know CIA provides testing and a level of certification to all of its members.

The levels of certification are loosely based on Six Sigma®. Although our organization only has three levels, Six Sigma® is an association which provides competency levels for core industrial disciplines. CIA provides testing for those that are fully educated or has hands on field experience. Once achieving 80% on the test, an individual can receive a competency belt in the discipline that they have been tested, (structural, environmental, or energy).

We're underway in our membership drive throughout the United States and Canada; we encourage all commercial and home inspection companies to join our organization so that we may have a voice when legislators are providing certification or criteria of who can and cannot perform commercial PCAs.

## Join Today & become a:

Brown Belt, Green Belt, Yellow Belt or a Black Belt

Call our Office *Today* or visit our website at [www.ciaaweb.org](http://www.ciaaweb.org) to find out how!

## New Members!

Congratulations to CIA's newest members!

Steven Lethlean - Associate Member - 11/05/07  
LaCrosse Inspection Co.  
Onalaska, Wisconsin

Blair Pruitt - Pending Brown Belt 12/15/07  
Axiom Building Inspections  
Seattle Washington



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## Technical Information and Tips

Concrete is one of most durable man made materials, but even this old industry workhorse has its weaknesses.

Exposure to harsh weather, reactions with common elements, and poor construction can all lead to concrete failure.

### Five common ways that concrete can fail, and how to avoid them.

By Mike Nolan

1. **Corrosion of steel reinforcement** is probably the most common form of deterioration in cold climates, it's difficult to deal with because once the conditions are right for corrosion, and just fixing the damaged areas does not stop the ongoing corrosion.

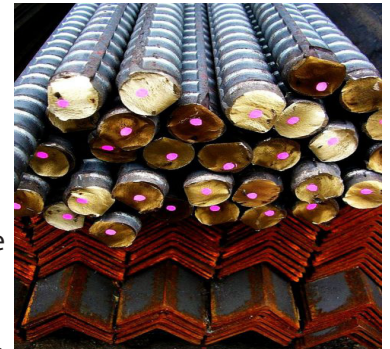
The deterioration occurs because the by-product of this electrochemical process (rust) takes up many times the volume of the original uncorroded steel. The resulting pressure created inside the concrete will cause cracking and severe deterioration to the structure over time.

The most common cause of steel rebar corrosion is exposure to de-icing salt used for roadways. If the concrete and rebar are not protected, the salts will eventually reach the depth of the rebar and cause corrosion. Exposed concrete structures such as parking garages, sidewalks, and bridges in cold climates are most at risk.

Luckily, there are several ways to protect steel reinforcement from corrosion. First, make sure to provide at least 1 1/2 to 2 inches of concrete cover over the reinforcement. In addition, create a concrete mix that is highly impermeable by using a mix with a low water-to-cement ratio (typically no greater than 0.40) "so that it takes longer for the chlorides or carbonation to reach the steel.

Other internal protection options include adding corrosion inhibitors to the fresh concrete and using epoxy-coated reinforcing steel.

External protection measures such as penetrating sealers or waterproof coatings applied to the exposed concrete can also inhibit ingress of chlorides and moisture.



2. **Sulfate attack** typically occurs when the concrete is exposed to water that contains a high concentration of dissolved sulfates. "We see this most often where there's sulfate-bearing groundwater," as in the Western states and the Northern Great Plains, and near industrial areas and seawater.

The two most common types of sulfate attack are physical attack, where the sulfate-containing water enters the surface of the concrete, crystallizes, and expands, disrupting the hardened concrete; and chemical attack, where the sulfate salts react with the portland cement paste, causing it to dissolve, soften, and erode. Another type of sulfate attack, internal sulfate attack, occurs mainly in precast concrete, and has been attributed to high curing temperatures or cement chemistry.

3. **Finish-related delamination** can occur when water or air gets trapped and accumulates just below the surface of the concrete. The accumulation of water raises the local water-to-cement ratio, which decreases the concrete strength in that area. In addition, air bubbles can be elongated and interconnected by the finishing process, thereby creating a weakened horizontal plane in that area.



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## Technical Information and Tips - continued

"Any sort of stress on the surface from wheel loads or volume change movement of the concrete can cause the concrete to fully fracture along that weakened plane, and you'll have pieces of the concrete popping up off the surface."



Trapped water/air and elongation of air voids typically occur when finishers apply a finish to the slab before all the bleed water can reach the surface. It can also occur when the ambient conditions of temperature, wind, and humidity result in a high evaporation rate for the bleed water, which causes premature drying and stiffening of the near-surface layer and traps bleed water and air below the surface.

Delamination is a common problem with floors with a hard steel-trowel finish, such as warehouses, factories, retail stores, and offices with exposed interior concrete floors.

To prevent delamination of slabs receiving a trowel finish, specify air content of no more than 3% and to test the fresh concrete to assure the maximum air content is not exceeded. Also, contractors should place the concrete when ambient conditions are not conducive to rapid evaporation of bleed water, and should avoid finishing the concrete slab prematurely.

**4. Freeze-thaw deterioration** occurs when concrete is saturated with moisture while exposed to freezing temperatures. The freezing water within the concrete creates hydraulic pressures within the concrete, causing micro cracking of the concrete. The near surface just crumbles away and exposes the aggregate.

To resist freeze-thaw deterioration, the hardened concrete must contain an air-void system that consists of tiny, closely spaced air bubbles, called entrained air. The voids provide space to relieve the pressure of the freezing water, thereby minimizing stress on the concrete. The process involves adding air-entraining admixtures to a fairly strong concrete mix (at least 4,500 psi).

**5. Alkali-silica reaction (ASR)** occurs when certain silica-containing aggregates react to form an expansive gel that causes the concrete to crack. The cracks typically form in a widespread "map cracking" pattern that is typically accompanied by deposits of white or grey gel on the concrete surface or inside air voids. While ASR is less debilitating than the other forms of deterioration, it can cause potholing and localized crumbling in pavements, curbs, driveways, and other structures.

Not all silica-containing aggregates are vulnerable to ASR. Only aggregates containing a disordered crystalline structure, such as strained quartz, chert, opal, or volcanic glass are susceptible.

When high-alkali cements and silica-bearing aggregate are exposed to humid conditions, a reaction occurs that creates a gel which, when exposed to water, can expand and fracture the aggregates and cement paste.

Repairs for concrete failures.

The repairs to spalled concrete, or surface delamination are usually fairly easy and inexpensive; they consist of removing the failed concrete back to the point of solid material, using a bonding agent, and replacing the material with a packaged concrete patching compound.

More extensive damage to reinforcing steel or structural components will require an engineering designer to provide details for the repairs.