

## Deck/Balcony Replacements Condition assessments are critical for safety

By James Milito, AIA, Falcon Engineering and Architecture

We have all read headlines of tragic deck collapses over the years. The causes of these tragedies are typically either inferior design, construction, or of even greater concern, from failures due to age and condition that went unnoticed.

According to *North American Deck and Railing Association*, from January 2000 to December 2006, there were 179 reported deck collapses. Of those, 1,122 people were injured and 33 people died. According to the same source, reported deck collapses have increased at a rate of 21% per year over the same period. Most collapses

occurred in the months between June and August, when decks are in peak use and loading, while the other collapses that were reported over the winter months were typically due to excessive snow and ice loads. The failures occur when the structure can no longer resist the loading that is placed upon it.

The construction of a new deck or the replacement of an existing deck is required by law, to have proper permits and, have municipal inspectors issue certificates of occupancy after the deck construction. This requirement is based, at least partially, on past deck failures that resulted in injury, or death. The current International Residential Code (IRC) is one of the primary references for both deck designers and Code officials. Among other requirements, the IRC contains standards for proper design and construction of safe structures. Unfortunately, however, there aren't any requirements for inspections of existing decks. The International Code Council does, however recommend that exterior wood structures be inspected twice per year.

As deck structures age, the materials are subject to increased degradation, and the potential for failure increases. This becomes even more critical when the original design or construction of the deck was inadequate or even marginal, or the deck is, or was, not properly maintained. Periodic and detailed inspections are essential to ensure that decks are stable and safe.

Experts agree that the main source of collapse is failure of the connection between the house rim joist and deck ledger, as well as, post or railing failures. It is estimated that 80% of the deck collapses

occur at the ledger to rim joist connection, the location where the deck attaches to the building.



*Deck ledger to rim joist connection.*

Deck ledgers, should be screwed or preferably bolted to the building rim joist—not merely nailed. Bolts and screws can resist the expansion and contraction of the wood. They may however, loosen over time. Early signs that deck ledgers are loosening creates a gap between the house and deck. If nails were used, the deck may fail without warning from the repeated expansions and contractions.

Proper spacing and type of lag bolt is equally important. In a June 2003 deck collapse in Chicago, 13 people were killed and 40 people were injured. Some of the victims were below the deck that collapsed. Research into the event found that lag bolts were installed, however, they were spaced too far apart and bent prior to the collapse.

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## ***Deck/Balcony Replacement continued...***

Flashing installation is another important feature in deck construction. Flashing is the installation of metal coil to direct water from behind building materials. Missing or improper flashing may allow water to infiltrate behind the deck ledger and cause deterioration of building rim joists. This is a very difficult item to inspect through a non-invasive inspection. In addition, aluminum flashing should not contact pressure treated wood, due to a highly corrosive chemical reaction of these two materials. New, pressure treated wood uses alkaline copper quaternary (ACQ) chemicals for preservation, which is even more corrosive than previous wood treatments. This means special attention must be given to all metal that comes in contact with the wood. Aluminum will dissolve very quickly in the presence of ACQ. Additionally, this change in chemical treatment does not allow repairs to existing decks. ACQ in new wood will corrode existing connectors within three (3) years. Decks need to be replaced in their entirety once decay has been observed.

Post supports and attachment to the deck and footings are major structural supports for the deck that need to be properly designed and installed.

Railing stability is equally important to that of the structure. There are many Code guidelines for railing design and requirements for installation. These requirements include height, grasping ability, design loads in both vertical and horizontal direction, space between railings, and even spindle location. Railings also need to be securely fastened to the deck framing with thru bolts. Deck posts should be separate from railing posts, and notching is an unacceptable practice. Inspection of the railing system of aging decks is critical for safety. A structurally stable deck may still have railing deficiencies that need repair.

Aging wood is not always the main problem. The previously-mentioned Chicago deck was only five (5) years old when it collapsed in 2003. With proper construction and maintenance, a typical deck should have a useful life of 20 – 25 years, depending on its construction and site (sun)

orientation. Decks that lack sun exposure can degrade faster, because the wood does not dry properly—especially if the wood has not been stained or painted. When wood degrades, it loses its structural capabilities, as well as, the ability to hold a fastener.

As wood ages it will expand and contract, causing graying, splintering, and cupping. These are indications that the wood is losing its structural capabilities and nearing the end of its life cycle. Nails and screws may start to withdraw from the wood.

Deck removal and/or replacement can be expensive. In some instances, during a deck replacement, wood rot on the main building is discovered, which adds costs to the replacement. Additionally, there may be instances in which the existing decks of the community do not meet Code with regard to size or footings, and adjustments may need to be made to the new design to ensure code compliance.

Multi-family dwellings that have separate owners on top and bottom are now classified as apartments, and each unit may now need a set of stairs with less of a rise and a larger tread. This may require landscape and/or hardscape adjustments.

Wood decks are very susceptible to the elements and their condition can change rapidly. Original designs or installation practices may have been sub-standard, which can increase the risk of a failure. Due to the potential of injury or loss of life that can occur from a deck failure, it is essential that your Association ensure that these structures are properly constructed and in “safe and sound” condition. A periodic capital reserve inspection may provide a general idea of the deck's remaining useful life based upon age; however, detailed inspections, as described above are normally not within the scope of such work. A separate, detailed inspection and analysis should be made for decks that are over 10 years old, or any structure about which you may have concerns. Proper design, methods and materials should be used for all repairs and replacements. If you have aging deck structures or just have a concern about their stability, contact a qualified professional to ensure the safety of your residents.

## ***Be Prepared. Be Prepared. Be Prepared.***

### ***Recommended process to reduce timeframes for fire reconstruction projects***

**By James Milito, AIA, Falcon Engineering and Architecture  
Robert E. Barlow, Jr. PCAM, CIRMS, ADP Barlow Insurance**

There are many construction code requirements in place to prevent or limit building fires; however any structure is susceptible to fire damage. Obviously safety is the greatest concern. Currently, buildings must be constructed with a method to alert the occupants of a potential fire; it must be sufficiently loud to wake a sleeping family (fire detection systems). Buildings are also designed to slow the spread and development of a fire through fireblocking components. Fire needs a continuous flow of oxygen to burn. Walls in most buildings provide ideal air supply for fire, so air stops (blocking) are installed to limit the air movement. Through

the combination of fireblocking, firewalls and (functioning) fire detection systems, occupants should be able to get out of a building safely in the event of a fire.

Unfortunately, fire is still able to spread quickly and efforts to extinguish the fire may take time, resulting in significant damage to the structure. In addition, water damage from fire suppression systems or efforts by the local fire department to extinguish the fire, can cause an entire, or portions of a building, (or even individual units) to be destroyed- and require replacement.

## Fire Reconstruction continued...

The goal of the fire reconstruction project needs to be to rebuild a quality structure, as quickly, and with as limited inconvenience to the community, as possible. This is an enormous task and subject to coordination of various professionals and tradespeople. Often, these projects get delayed for extended periods and the frustration for all involved is colossal. Sometimes, the project ends in litigation as a result of improper planning and deficient construction.

Many factors affect the timing, costs and quality of the reconstruction project, but the most important aspect of the project is proper and combined efforts of the community's management, the insurance company, the engineer/architect and the contractor.

First and foremost, the Association's insurance agent should be contacted to ensure that the Association has adequate coverage on the buildings and common elements of the community.

The Association's first step in achieving peace of mind comes from working with an insurance professional who is experienced with Community Associations. An experienced agent will review the Association documents and collect detailed information about the property, including how the Association is being managed. The agent should then present the insured with a detailed proposal outlining the recommended coverage. The Association's coverage should minimally include: property, general liability, fidelity, directors' and officers' liability, umbrella liability and workers' compensation. These provisions, along with the documents, should guide the Insurance adjuster's review of what is covered/may not be covered in the event of a claim. For the purpose of this article, the adjuster should verify the building valuation, deductibles, and extensions of coverage to know what to include in a settlement.

Most Association-specific policies are tailored to the unique needs of the community to include important considerations and conditions such as replacement cost or guaranteed replacement cost, ordinance or law, water damage, back up of sewers and drains, debris removal and outdoor plants, trees and shrubs.

In the event of a loss, the insured submits a claim through their agent, or in some cases, directly to their insurance company. Adjusters are assigned by the insurance carriers to deal with these claims. The adjuster's main role is to investigate the claim(s), negotiate settlements, and authorize payments. They must determine whether the customer's insurance policy covers the loss, whether it exceeds the deductible, and how much of the loss should be paid to the claimant.

Adjusters plan and schedule the work required to process a claim. Adjusters investigate the claim by interviewing the claimant, consulting the fire company, and inspecting property damage to determine the extent of the company's liability. Adjusters may consult with other professionals, such as architects, construction workers, and engineers, who can offer a more expert evaluation of a claim. The information gathered—including photographs and statements—is part of the report that is used to evaluate the claim.

An Association incurs out of pocket expenses with their deductible and, in situations in which boards have chosen a coinsurance option to reduce insurance premiums, the out of pocket expense can increase if the property values at the time of loss are greater than at the inception of the policy. When coinsurance is involved, the likelihood increases that a coinsurance penalty could be triggered, since current rebuilding costs exceed the rebuilding value of the policy. In addition, public adjusters hired by the Association, in most cases, will not be reimbursed through the insurance policy nor, depending on the circumstances, will professionals hired by the Association to help with the claim. These professionals would have to be approved by the adjuster and insurance company during the claim evaluation process.

Once the adjuster has determined a scope of loss, a contractor needs to be engaged to rebuild the buildings. The contractor will interact with the adjuster regarding the scope of loss and ultimately will reach a price agreement with the adjuster. This means the contractor agrees to perform the work as specified in the scope of loss for the price set forth. A proof of loss is then given to the Association to finalize the claim with, usually, a 10% hold back provision to verify that work is done to specification. The final contract between the Association and the contractor should not be executed until a proof of loss has been agreed to between the Association, adjuster and contractor.

After a fire occurs, the management team needs to get involved immediately to coordinate efforts such as, cordoning off dangerous spaces, and, the contact with the insurance adjuster.

The Association should immediately hire an engineering and/or architectural firm (dependent upon the amount of damage) to perform a damage assessment and start a photographic log of the incident. The engineer or architect should review the insurance company reports and be in agreement with what, if any, part of the building(s) may be salvageable. On occasion, an insurance company adjuster may say that a portion of the structure is salvageable, but the engineer or architect may find that the structure is too badly damaged; this would need to be brought to the insurance company's attention. Ideally, the insurance company will ultimately provide the Association with the proper coverage for the required construction.

Architectural plans and specification details need to be prepared in a timely manner for the reconstruction. The existence of the original design plans for the buildings is extremely helpful in expediting this process. Without the original plans, significant field inspections, measurement and re-design are needed.

For proper management of a community or building, and especially before tragedy strikes, all Associations should ensure that they have original plans for all of the buildings under their domain. This can eliminate weeks, or months, of delays in obtaining building permits for any project.

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## Fire Reconstruction continued...

Building codes will likely have changed since the building was originally constructed and the building department may require the new building or unit(s) to meet current codes. The engineer or architect should have a preliminary meeting with the local building department to discuss the updated codes and how they may affect the layout and design of the new structure. Documentation of these requirements is vital to project efficiency.

Similarly, a zoning study should be performed to determine if changes in local zoning code have occurred since the original building was built-which could trigger a variance requirement. If the building is currently non-conforming, the Association may need to appear before the municipal board of adjustment to receive a variance. Typically these boards will grant variances with little or no objection due to the nature of the application; if not researched and handled properly however, the process could add a month or two to the project, or cause a work stoppage. The municipality may also have the right to require updated parking requirements, including handicapped spaces or accessible ramps. As stated previously, the engineer or architect should communicate with municipal officials to facilitate a swift approval process.

While any zoning or design issues are being discussed, the building plans should be started. If the building is relatively new and the codes have not changed, the same plans may potentially be submitted-which could save 2 - 6 months, as well as, professional design fees.

The single largest issue with obtaining these types of building permits started in 2003, when NJ adopted the 2000 Building Code. This changed the zone classification of buildings with separate tenants living above each other from an "R-5" use to an "R-2" use. Essentially, the Code states that if a resident does not own the space from the ground to the roof, the space is an **apartment** (R-2), not a **townhouse** (IRC). Apartments (R-2) have more restrictive codes, including: stairs that are not as steep as typical residential stairs. This will require more interior space to reach the same floor elevation and will consume previous living space. A percentage of kitchens will need to be wheelchair adaptable, which means space for a wheelchair to turn around and a sink that can be easily lowered an extra 6 inches, with a wheelchair roll beneath. Additionally, all the doors will need to be 36 inches wide. Anticipating and addressing these issues will save significant time during the project.

If required, typically, new architectural plans can take 2 - 6 months to prepare. Once a full set of drawings is complete, copies should be submitted to the township for final building permits. At the same time, sets should be sent to the contractor(s) for review and final bid. A meeting should be held to discuss the project and expectations. The contractor should review the plans to ensure that his or her bid contains every element of the work, including the methods and materials as specified on the plans. If additional monies are needed from the insurance company due to required code upgrades or other factors, the management company should begin this discussion with

the agent. Scheduling should be discussed to emphasize the importance of expediting construction to get displaced people back in their home(s). Using a contractor that specializes in fire reconstruction projects should be considered. The contractor needs to be aware that once the plans are approved by the town the project **MUST** begin without delays.

Both the Municipal review process and preparation of final bids by the contractors should take about one month. Ideally, the Municipal approvals of the drawings and bid proposals will be received concurrently. The project contract can be awarded to the contractor, materials can be ordered, and a fast-track construction schedule should be set.

The engineer or architect and contractor should communicate during the construction process to reduce the chance of inappropriate changes to the design or to discuss needed field changes. Qualified construction inspection of the project should be arranged for by the Association to ensure a quality finished product with regard to all aspects of construction, as well as, approvals for payment. Typically, municipalities only perform required construction inspections. These required inspections should be requested at shorter intervals to speed up the building process. A request to this effect should be made to the construction official and if not initially offered, communication with the Mayor early in the process may help.

Near the end of the project, the contractor should focus on a Temporary Certificate of Occupancy from the building department. This will allow the unit owners to move back in while the site is brought to an acceptable condition. For example, clean-up and landscaping installation or exterior finish work can be completed while people are moving back into their units.

A fire is a tragic event; replacement of some items will be impossible, for others, financially difficult. The management, insurance company, contractor and design team need to work as one. Keeping harmony and diplomacy in a stressful situation is vital to the successful resolution of the unfortunate ordeal created by a fire. Effective communication from the beginning, regarding expectations, timelines, and results will allow those affected to return to normalcy as quickly as possible.

## What's New?

### Welcome to:

**Teakia Sabb**, Reserve Specialist, B.S. Civil Engineering

**Robert Pisano, PE.**, joins our firm as Senior Engineer

### Congratulations to the following people on their promotion to Senior Project Managers:

**J. Stewart Willis, R.S.**, Licensed Building Inspector

**Joseph Ehrhardt, HHS**, Licensed Building Sub Code, Licensed Construction Official