

1ST PERSON

An Interview with
Richard Manzolina, CEO
Director of Engineering
Gaylord Resort and Convention
Center at National Harbor

by Robert Elliott

“Everybody Is A STAR”

I had the pleasure of first meeting Richard Manzolina upon the recommendation of Dave Stipanuk, retired professor of Hospitality Facility Management, Cornell University. Dave assured me he had a very high level of professionalism and I was excited to interview the Director of Engineering of the new Gaylord National Resort and Convention Center located in the newly created National Harbor, Maryland. Richard started his career not far from Cornell at the Grand Hyatt New York, New York City. After a few years with Hyatt he moved to the Hilton hotels as Assistant Director of Engineering for the prestigious Waldorf Astoria, NYC. Richard told me he thought if he could make it in New York City he could make it anywhere. Then after stops at the Hilton Alexandria Mark Center in Alexandria, Virginia, and the Capital Hilton in Washington DC, Richard was lured over to the Gaylord. So, Dave if

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NAHLE ADDS NEW MEMBER SERVICES

Members' Forum and Warranty Document Management System

Forum

The National Association of Hotel & Lodging Engineers is proud to announce two new members' services. The first is a forum where members can discuss any issue or subject they like from maintenance tips to personnel issues all in a private 'member's only' section. Members can create a topic and responses are threaded allowing the receipt of comments via the Internet from anyone, anywhere, 24/7.

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EVERYBODY IS A STAR

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you're reading this, thanks for the introduction and my hat is off to you and the wonderful program at Cornell.

*I met with Richard on two occasions, well actually three if you count my last visit where I got to meet his staff and snag a few Star photos. And I'm not referring to Travis Tritt or Derek Trucks of the local National Harbor Concert Series found right outside of the Gaylord Resort. I'm talking about all the employees at the Gaylord who on a daily basis exude **S**mlies, **T**eamwork, **A**ttitude, **R**eliability and **S**ervice with a passion. STARS being the acronym Gaylord uses to describe each and every one of their employees.*

The first time I met Richard we discussed NAHLE and the objectives of our trade association. We also talked about what we thought would make interesting reading for our audience. The next step was for me to provide Gaylord's public relations team with NAHLE's mission statement and our reasons for requesting the interview. We quickly got a green light to proceed that was soon followed with my second meeting with Richard and Amie Gorrell, Gaylord's Director of Public Relations. Our interview lasted close to three hours and I easily got enough information to fill our magazine from cover to cover twice over. So, instead of trying to decide which questions and answers I should cut, I've decided to do just that, provide all the information in two issues. The interview seems to naturally divide itself into two basic themes; one is all about the people, Gaylord's professional staff of engineering Stars that make it all work under Richard's leadership. The second basic theme is obvious from the minute you step on the property and catch yourself saying your first "wow" as your eyes scan the 20 story glass curtain wall or when you go to the back-of-the-house and stand beside one of their four 2,000 ton chillers. So hear goes, Part One, I hope you like it.

Richard, can you start off giving us a little background on yourself and your experience as a hotel engineer?

I have a degree in Hospitality Facility Management from Cornell University. I started off at the Grand Hyatt New York in New York City as a management trainee and then moved across town to the Hilton family of hotels starting at the Waldorf Astoria. At first I thought if I could make it in New York I could make it anywhere. Then, I later thought if I can make it at the Waldorf, a four/five star property, I could really make it anywhere. It is a very large and old art deco building with much of the original finishes and infrastructure still in place from it's 1942 construction... very challenging to maintain. It was a fantastic experience working there. My first post as a Director of Engineering was at the Hilton Alexandria Mark Center (VA) and I later moved to the Capital Hilton in downtown Washington DC. The Capital Hilton was built within a year of the Waldorf and had very similar technologies. I joined the Gaylord National in spring of 2007.

You were actually on board during construction of Gaylord Resort and Convention Center at National Harbor. Can you describe your duties and were you able to impact construction or quality control?

Being here early on helps tremendously in retrospect, the earlier the better. I basically wore two hats, one was an engineering hat and one was a sales hat helping sell future business for the property by providing hard hat tours during construction. I really gleaned two major benefits from being here as early as I was. First and foremost I was able to build a rapport with the people who were responsible for constructing the building both from Gaylord's ownership side and the contractor's side. This reaps huge benefits when it comes time to maintain the building. I have the contacts, I know who to call, I can ask how something was constructed and who they recommend and so on. This has proven to be priceless. I've even hired a few of the contractors as permanent members of my maintenance team.

The second benefit was my ability to have some influence over how things were constructed... not so much from a quality control or design perspective, but with regard to field decisions which were best made by the hotel operator. I

could say give me an access panel here or there to make the facility more maintenance friendly. I'll give you an example. One day I was walking down to the loading docks and noticed all the air curtain heaters had been installed, but hadn't been plumbed in yet. So I asked them when you plumb them in give me a stop valve, a union and a bleed line on these. That way if I ever have to repair or replace them, all I have to do is open up the bleed, drain the coil, break the union and I can easily isolate the unit rather than having to do a large scale shut down and cut the lines making it a much more labor intensive process. Small things like this make maintenance and repair so much easier, especially in a property this size. Every tweak you make extrapolates into 2.4 million square feet, and my Stars get the benefit of those tweaks.

One of the challenges of starting a new property must be staffing your department. How many positions do you have reporting to you?

I have oversight of approximately 80 full time Stars. As you know, we refer to all of our employees here as "STARS." It is an acronym that stands for 'Smiles, Teamwork, Attitude, Reliability, and Service with a passion.'

These 80 individuals represent all facets of building maintenance; obviously there's a full compliment of your general maintenance personnel including painters, HVAC technicians, electricians, etc. But, beyond these trades is one of the unique benefits of a property as large as ours, I can justify having expertise on staff that you typically wouldn't have the luxury of. For instance, I have three full time kitchen mechanics because I have so much kitchen space and equipment. I have a locksmith, three full time carpenters, and two full time faux painters that keep our unique finishes looking flawless...they require a real artist's touch. Of course not only do I get the benefit of the expertise of these Stars, but I also get the timeliness of their response as well as a great sense of ownership since they are maintaining their own equipment; something absent when you use a contractor. So it's a three pronged win.

We also have 15 guest service engineers whose job it is to handle reactive main-



Engineering and Maintenance Staff at Gaylord Resort

Left to right: Kevin Thompson, Andre Dunston, Rotha Early, Juan Merino, Huan Cao, Sherman Lanham, Ryan Cruz, David Washington, Sasha Speed, Micheal Walker, Franklin Sanchez, Orlando Salazaar, Steve Anadale, Alan Covington, Jonathon Espinal, Richard Manzolina, Pio Quintos, Jason Harris, Alonzo Patillo, Oscar Medrano, Albert Lee Campbell, Henry Soto, Michael Faison, Diandra Clayton.

tenance; guest and fellow Star requests that pop up. Plus we have a robust front-of-house preventive maintenance team, called the KFI team. The KFI team is eight Stars strong, and their job is to do preventive maintenance in all the guest rooms, public areas, lighting and restaurant venues. In guest rooms, Gaylord's standard is to perform preventive maintenance four times a year, or once a quarter, which in my experience is about double the industry standard. This accelerated frequency relates directly with our Gaylord service basic of 'Look Sharp', which is intended to apply to Stars' uniforms and work areas, but we extend this to apply that to our property as well since it's a huge element in providing flawless service which is our vision. We get to keep the unique benefit of inheriting a brand new product. By keeping the property looking sharp from day one, we make sure we don't lose that newness any faster than we have to.

In addition to myself I have two assistant directors, one handles the aesthetics side of the operation and one handles the mechanical and electrical. The aesthetics

side is mostly the finish trades. Our guest service engineers, KFI team, carpenters, carpet tech, locksmith and paint team all fall under the aesthetics assistant director, who also has a manager and three lead technicians reporting to him. Lead technicians are a key part of our organizational structure. I joke with them often as having the hardest job because they are as much hands on technicians as they are leaders. To be successful, they really need to be dual faceted.

The mechanical/electrical side is handled by a phenomenal talent, Huan Cal. He handles all the HVAC, the central plant operation and the electrical department which is quite large. We have 14 full time electricians who, in addition to maintaining the building's electrical systems, also provide temporary power to our convention customers. The latter represents a huge portion of this team's responsibilities as well as our hotel's revenue base. We have done some extremely elaborate temporary power distribution systems to accommodate the needs of our convention and exhibition clients. It can be some pretty fun stuff. We recently did Harley

Davidson and NCAA both quite an undertaking, but pales in comparison to our first big show which was Army Aviation Association of America; a whole house group that arrived just one week after we opened. This group actually had several pieces of aircraft in the exhibit hall including their largest Army helicopter, the Chinook. That was a lot of fun. We were actually running power to the planes so they could run the cockpits because obviously they can't fire up the planes indoors. (laughing) That was some pretty interesting stuff.

Did you have the option of determining what maintenance services would be out-sourced and which ones would be handled in house?

It's pretty much an internal decision as far as what we outsource and what we don't and who we use. Sometimes it is dictated and sometimes it is not. We have some strong strategic alliances at the corporate level with some of our maintenance vendors which is fantastic and often gives us the opportunity to do business

on a larger scale with some partners that we have great success with. We also exchange business in some cases so it's truly a win-win. For instance, we have a strategic alliance exchange with our exterior landscaping contractor who does a phenomenal job for us.

Beyond these alliances, we have several local vendors we use for specialized maintenance. For instance, we have a 100,000 square feet of marble flooring that is all outsourced. It's a specialized process and very labor intensive. This is an asset that can easily be destroyed if not maintained properly. Plus it's a huge part of our 'WOW' Factor... when guests first walk into our facility the shine off the floor can really set the tone of their stay as it's the first thing they see. It's got to be perfect at all times. We partner with an excellent architectural finishes contractor to keep this floor looking brilliant. Lastly, a lot of maintenance that is traditionally outsourced we do in house. Again, this is a functional benefit of having so much specialized talent on staff.

You have started a training program for your employees. This entails a classroom/ lab right on your property. Can you speak to this and describe some of the skills and training you will be teaching?

Part of our Star guarantee is to provide our Stars with support for their own development and growth. That includes training not only for the job they are in, but for the job they aspire to. So we really try and focus on giving the Stars what they need to succeed. Moreover, our training efforts represented a large part of our selling points when we recruited all these Stars, so we're really just kind of coming through on our word by doing what we're doing. Right now, we're constructing a full-time training facility for the engineering Stars, as well as for Stars who may want to become engineers. Within it will be dedicated spaces for locksmith training, refrigeration, HVAC, etc., etc. We even put an electrical panel in the room so we could teach about load balancing and power distribution.

Having a dedicated classroom space is really rather unique. It goes a long way in not only benefiting the Stars and the hotel, but also in boosting moral. It really gets the guys thinking about their careers and not just their jobs. Even the construction of the space has been a morale booster since we did it all ourselves... again playing on that sense of ownership. The Stars created the space for their own benefit.

The curriculum for this facility will be geared in part toward topics that relate directly to the equipment and materials we have to maintain. But also, it is going to be taking full advantage of the American Hotel & Lodging Association's certificate of maintenance program. In doing so, our Stars will be able to become certified in building maintenance, which for them is not only a great learning tool, but a resume builder as well. There is a lot of enthusiasm around AH&LA's Educational Institute's (AH&LEI) certification process. Dave Stipanuk, one of my professors at Cornell University, is the author of EI's



Franklin Sanchez, "Gaylord's Star Locksmith"



Gaylord's Paint Staff. Left to right: Lead Technicians Michael Walker, Solomon Anthony, Juan Merino, and Rotha Early

textbook used in conjunction with their Certified Engineering Operations Executive certification (CEOE). I also helped write some case studies for Dave's recent update of this textbook.

Today's hotel engineer must have a good handle on technology and software applications to help them track and maintain the property. Among others, you use a system that LE finds of interest. One software program you use, HotSOS, tracks guests complaints/requests and the amount of time that it takes for your staff to initially respond and to finally resolve

the issue. Can you explain in more detail how this systems helps you track room service calls and the resources expended for that call?

Certainly. HotSOS (pronounced 'hot sauce') which stands for Hotel Service Optimization Software is the backbone of my operation. It was created by a company called M-Tech out of Miami. We also use it in housekeeping, safety services, and front services. All departments use the software to track their normal duties; the cleaning of guestrooms, the delivery of guest package and so on and so forth.

From an engineering perspective, I use HotSOS in several ways. All my reactionary maintenance, breakdowns or guest calls all go through HotSOS following a customized protocol that we've designed to distribute those calls to my staff. It's a rather robust process and all automated. This is great for us because it eliminates the need for human intervention when dispatching calls and makes the process a lot faster, reducing guests' wait times.

Here's how it works. My staff carries Nextel two-way radios that have the ability to receive text messages. So a guest calls down to a CID operator (Consider It Done) and says, "I'm having trouble with my television." CID will create a service order in HotSOS for the TV not working and somewhere in the background of the software exists a custom business rule. This is basically a formula that says if you have a problem with a television in a guest room the person responsible for that is X. In this case it is the guest service engineer. So following that rule, HotSOS will go and look for the applicable guest service engineer on duty based on where the problem is and it will say, "I am going to go ahead and dispatch this call to Carl who is handling that section of the building today. Then it will take that call and send it to Carl's Nextel radio, which will include the room number, service order number, guest's name, and a written description of the deficiency. Within minutes of the guest calling, Carl can be at the door of that room ready to respond and knowing exactly what he needs to do. When he knocks on the guestroom door he presses start on his Nextel and that tells the HotSOS system how much time it took to respond to the guest. That's our reaction time or more specifically our response time which is something we track closely. After he finishes the repair he leaves the customer and presses the complete button on his Nextel which again talks remotely to HotSOS. Now we have the labor time identified, or the amount of time it actually takes to make the repair which is very handy information for us to track over time. Labor time plus response time equals completion time, another measure we track very closely. We want that number to average 45 minutes or less for any guest call. Once the call is completed the CID oper-



Underground Maintenance Access

HVAC Tech II Albert Lee Campbell

ator can see this on their screen, which is their queue to call the customer back and ensure their satisfaction. After that call, they close the service order in the system. That is the actual end of the life cycle for a service order which all together is called resolution time. We use HotSOS to track all this data daily to ensure we are meeting standards and exceeding our guest's expectations.

In addition, Engineering uses HotSOS to track all of our preventive maintenance efforts. We have thousands of pieces of equipment that are part of our normal routine maintenance program. We also print productivity reports and can drill down on issues by slicing and dicing the data to look for common denominators and identify larger, macro issues. For instance, I can run a toilet clog report that will show me that my problem isn't with one or two rooms, but a whole stack that shares a common vent which may be blocked,

that sort of thing. If you didn't have the database to handle all this data, you'd never find some of these smoking guns. A manual system would never allow you this much flexibility.

We also have business rules for escalations which allows for a call that is not be responded to promptly enough to be automatically dispatched to another Star or their supervisor so we can ensure service orders don't fall through the cracks. These escalation rules are really very powerful tools that keep us focused to make sure we are meeting guest expectations and providing quality service.

You have taken your software a step further and created your own system that creates teams for your workers and sets target goals for response times. As you know, this system is communicated to your staff by several

large scoreboards found in your basement that creates a friendly competition among your department's teams. Could you describe your Property Condition Index in more detail and how this motivates your staff?

Before I can explain Property Condition Index, I need to give you a little background information. The hotel has taken full advantage of a process called The Four Disciplines of Execution (4DX) offered by Franklin Covey. The whole focus of 4DX is on creating a few, very important organizational goals, and then really focusing on the execution of a plan to achieve these goals. One of the key words here is few. It is important to limit your goals to just a few really important ones, what we call "wildly important goals" (WIGs). A wildly important goal is a goal that if not achieved, renders all other accomplishments inconsequential. That's how important it is. Also, a key element to achieving



Gaylord's Heating Water Boilers...three (3) of the plant's six (6) total boilers

your goal is to literally keep score, and do so in a manner that is transparent where all can see it and it is obvious to the casual observer as to whether the team is reaching their goals.

The hotel has a few Wildly Important Goals, and the engineering department was asked to devise its own WIGs that would roll up to help the hotel achieve theirs. So when I thought about goal setting for engineering I wanted to come up with something that was both inclusive of every STAR in my department, but also measured something the Stars had total control over. So I created something called the 'Property Condition Index.' Basically, it is a numerical value that measures the engineering department's ability to maintain the building.

In this vein, preventive maintenance is completely within our control and it is the key to keeping our building running smooth and looking sharp. So we broke the engineering department up into key operating areas and put a numerical goal in front of each one. We measure ourselves on that goal and we come up with a long term score which we try to achieve.

As an example, I mentioned earlier that we have a guestroom preventive maintenance team and their goal is to get into every guest room four times a year. Our first round of scoring was Jan 1st through June 30th and the goal was to get into all of the rooms two times, which equated to 3,992 PM's. So, we just divided 3,992 by the number of days in the period and quickly created a chart that shows where this team is compared to their goal. At the bottom of the chart are five little dials, one for each Star on the team. So on any given day, the Star's arrow would be in the green, the yellow or the red depending on their productivity the day prior. And, while I didn't put anyone's name on the board, everyone knows privately who's who and quickly we had a healthy sense of competition among the Stars. No one wanted to be bringing the team down so that positive competition was having an overall team benefit. And, by seeing their score change right there on the wall every day, the Stars could quickly realize what it's going to take to be successful or catch negative trends before it's too late. So this one score, rooms PM, represents one eighth of the department's overall Property Condition Index. Other areas we

measure that make up the index include mechanical PM's, meeting room PM's, guest responsiveness and completion time, etc., etc.

Every day my administrative assistant, Sasha Speed, goes into HotSOS and runs productivity reports for the day prior in each of the eight areas. She then enters these 8 scores into a spreadsheet that spits a total score, which is our index. Each of the 8 teams have their own goals, and we measure and track progress very openly.

To keep track, we have a main score board by the time clock that shows everyone's score, and it's updated daily. Sasha and other leaders populate their respective scoreboards every morning so the team can see how they are doing. To make it even simpler, we put a little symbol next to each team's score, and the symbol changes depending on whether or not the team is achieving its goal. So if they are making their goal they get a chili pepper icon while underachievers get a toilet bowl. (laughing) So if you're in toilet you want to get out, the best thing to do is achieve your goal. These seemingly simple little things actually make a huge difference and every Star owns a little piece, which is very powerful.

As you know, you have a large new property which by itself presents a challenge to your Stars just to find the room or area that needs maintenance. Could you talk to the four teams you have created to help alleviate this problem?

In concert once again with the HotSOS system we determined quickly that we needed to break up the building into manageable size pieces. Getting from one end of the building to the other was sometimes taking so long that it affected our ability to respond to guests promptly. And, since being prompt is a key factor in measuring our success, we devised a creative solution. We broke the building up into four large sections, each of which is comprised of roughly 500 rooms, and we named each section after a local pro sports team. So we have a Redskins section, Nationals, Wizards and United sections. Each of those sections has an associated Nextel device that's programmed to it. So if a call comes in from Redskins

territory, it goes to the Redskins Nextel and I'll have one STAR that is relegated to that area so they never have to go very far to get to the call. When occupancy dips down, we combine areas since the Stars can handle more territory. In this manner, we can manage our response and completions times while still having a little fun with the process.

Our next issue will talk about the physical attributes of the property and some of the more interesting engineer speak such as the number of guestrooms, boilers, energy consumption, parts inventory, customized room carts, chillers and of course Gaylord's own ICE!



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WHEN EXPERIENCE MUST ANSWER TO INEXPERIENCE

By Tim Arwood

This issue I want to touch up on another topic that will be covered in greater depth in my forthcoming book. A book that should have, but has never been written on the real world that Chief Engineers in the hospitality industry deal with each and every day.



First, before going into the subject matter of this article, I would like to say today I find myself blessed to work for

a great company along side of a great leader and many seasoned professionals, who can practically finish my sentences. It's like many times all of the Executive Committee know what each other are thinking.

However, you may feel like you are on the wrong side of a rabbit hole if you new boss' work experience is less than your own. So, for the sake of anyone who goes out there and tries something new, whether you are a Chief Engineer answering to a GM or a GM answering to a Regional; and you find your new boss' work perspective is not in sync with your own, don't despair. Read on and I'll try and help you with your journey.

Let me start by saying that you should never categorize anyone when you first meet him or her, you must let each and every person be seen as an individual and give them the chance to show you what they are capable of. Some people can go right out of the starting gate with a sense of the business that takes some of us decades to build. Where others, who

are extraordinarily proficient in their own field, may have a sluggish start. If someone has an instinctual feel and excels in Engineering, F&B, front desk, etc., that does not mean that once promoted to a position with a broader scope of responsibilities they will have acquired the appropriate skill set to lead. This is when the entire executive team at a property must rise to the occasion to give their full support and the benefit of their own experiences to make sure that their new leader succeeds. For their success is your success, but their failure could be a reflection on your ability and that of your fellow EC members to guide them. I am sure that you may find that you are on a team with an excess of over a century of combined experience at your disposal. The final decision may not be your own, so if you fail to communicate all options along with their possible outcomes in a way that will give clear meaning, your advice and knowledge may not be utilized properly. You may then find yourself having to fol-

low a plan that may lack the depth and foresight needed to achieve the desired results. Remember, even if the plan that didn't succeed wasn't of your design you may find that you are "accountable" for the results. Many new leaders feel once the plan is established as long as it is followed it will give you the proper results. However from an engineer's prospective we have seen too many times that complications arise. We may have several contingencies built in just in case. If the implemented plan doesn't work, that is where your greatest conflicts will arise.

New leaders many times may have the virtue of high confidence, but their unbridled enthusiasm may lead them astray. In time, this will be replaced by the strongest of foundations: good management, experience, wisdom, and knowledge of the business. Early on a new leader will feel that a less than perfect outcome of a plan is the result of their team members' failure to use the right "Tools" that he or she has provided for their staff to be "Successful."



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This idea could possibly be the weakest link in the team. All of us know as leaders of our own departments that the greatest tool for success is the guidance we provide to those that we supervise. When you are involved in creating a plan with the team let your expertise shine through. Whether it is a monthly action plan or a five year Rockefeller style plan, as those blank areas on the page are filled in with things that you have contributed, know that you are also involved in building the knowledge of all those involved in the process as well.

There will be times you will be instructed to implement policies in your department that are contrary to local or industry standards. Once a Chief told me during better economic times when good maintenance personnel were very hard to recruit and his pay scale was average for his comp set, he was asked to eliminate all overtime. His overtime issue had occurred that week due to emergency guest room issues during a full house on the

last day of the pay week. So to prevent all overtime, he was instructed to follow a new policy for every line employee in his department, the implementation of a 37-hour workweek (the same as the front desk). At that time all of the competing hotels in the area were running 40-hour schedules in their maintenance departments. His crew's reaction was, "Great we will be home a half hour early every day." However, the next day his shop was nearly a repeat of the scene in the original Frankenstein movie, when the villagers stormed the castle with torches and pitchforks. After speaking with their spouses the night before every member of the maintenance department knew to the very penny how many thousands of dollars less they would earn each year on a 37-hour work week instead of 40. The potential to lose the entire crew to the surrounding properties abruptly brought this policy to an end. Dealing with situations such as this have a positive side, because someday you may be asked to step up to

the next level and the mistakes that you have seen from newly promoted bosses that so frustrated you in the past have actually become part of your own experience and you will not be making those same mistakes.

So this leads us into my next upcoming article on how to hire good personnel in the hospitality industry. We should never let a flashy resume beguile us. Just remember a guy who has worked, as the steadfast Assistant Chief in Kalamazoo, MI or Normal, IL for seven years may be a better bet than someone who went here and there. Maybe spending three months in LA & ten minutes at a big casino in Vegas and then on and on to flashier and flashier locations doesn't always mean the person is a good candidate for employment or will perform well for you. Until next issue.

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UPDATE

Fire Alarm System Inspection and Testing Requirements

John F. Devlin, P.E.

Schirmer Engineering Corporation

<http://www.schirmereng.com>

The proper operation of a building's fire alarm system is essential to ensure occupant life safety and continuity of operations. Fire alarm systems technology has become more advanced than ever before. Technology has yielded more intelligent and sophisticated fire detection sensors and notification appliances making possible the integration of fire alarm systems with other building systems. These advances combined with way finding and mass-notification technologies have created a myriad of different inspection and testing requirements specific to fire alarm systems.

To remain current with these technical advances the codes and standards governing fire alarm systems testing and maintenance are changing. It can be challenging to a building owner and facilities engineer knowing when the codes and standards change, their applicability, and the specific requirements.

In general, the inspection, testing and maintenance requirement for fire protection and life safety systems is governed by the fire code. In virtually all jurisdictions throughout the United States and Canada, the National Fire Protection Association (NFPA) Standard 72, National Fire Alarm Code, is the standard referenced by the fire code and defines the scope of system's inspection, testing and records documentation.

Inspection and Testing

NFPA 72 – 2007 edition, the most current adopted edition, contains some significant changes from previous editions that apply to systems inspection and testing. The most significant change is the requirement for “an inspection, testing and maintenance program” to be implement-

ed to ensure the integrity of the fire alarm system. This requirement is intended to identify the type of system installed and devices utilized within the system, the method by which each device is to be tested and required frequency of testing, and documentation required to confirm proper testing. Detailed records of systems testing records are required to be maintained that includes information such as test frequency, persons performing the testing, and functional test of detectors. (See Section 10.6.2.3 of NFPA 72 2007 edition for complete list)

Table 1 summarizes the primary fire alarm system components and testing frequencies prescribed by NFPA 72-2007. NFPA 72-2007 Table 10.4.2.2 outlines the acceptable testing methods of fire alarm systems and devices and has been updated to include the testing methods for recent technology such as multi-sensor or multi-criteria detectors, exit marking audible notification appliances, and fire safety functions including fan control, smoke damper operation, elevator recall, etc. The inclusion of these items and the identification of their testing methods increases the knowledge base required for persons performing system testing.

Another important change to NFPA 72 – 2007 edition is the minimum qualifications for persons performing system inspection, testing and maintenance of fire alarm systems. Qualified personnel shall include, but not be limited to, one or more of the following:

- (1)*Personnel who are factory trained and certified for fire alarm system service of the specific type and brand of system
- (2)*Personnel who are certified by a nationally recognized fire alarm certification organization acceptable to the authority

having jurisdiction

(3)*Personnel who are registered, licensed, or certified by a state or local authority

(4) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of fire alarm systems

Under subparagraph (1) it is possible for building engineering staff to perform the required periodic inspection and testing and possibly even routine maintenance if they are factory trained and certified on that specific equipment to perform these functions.

Contract Agreements

Inspection, testing and maintenance of fire alarm systems are often left to the responsibility of an independent contractor as part of an annual service and maintenance agreement. The contract agreement language prepared by the independent contractor defining the scope of systems testing, frequency of tests, and record documentation format is sometimes vague. To assure the systems' inspection and testing are satisfactorily performed in accordance with the local fire code, confirm that the contract agreement includes language that clearly states the scope, frequency, and methods of all inspections and tests will comply with NFPA 72, current edition, and all local and state fire codes and ordinances. Require the contractor to include as an appendix or attachment to the contract agreement:

A matrix or table of the systems components to be visually inspected and the specified frequency of inspection. (Reference NFPA 72-2007 Table 10.3.1)

A summary of the testing methods pro-

TABLE 1: SUMMARY OF FIRE ALARM SYSTEM COMPONENT AND TESTING FREQUENCIES

REFERENCE – NFPA 72-2007 TABLE 10.4.4

COMPONENT	INITIAL / REACCEPTANCE	MONTHLY	QUARTERLY	SEMI-ANNUALLY	ANNUALY
Control Equipment - Building Systems Connected to Supervising Station	X				X
Control Equipment - Building Systems Not Connected to a Supervising Station	X		X	X	X
Engine Driven Generator	X Weekly				
Batteries - Fire Alarm System	X			X	X
Power Supply	X		X	X	X
Fiber-optic Cable Power	X				X
Control Unit Trouble Signals	X				X
Emergency Voice / Alarm Communications Equipment	X				X
Remote Annunciators	X				X
Initiating Devices	X			X	X
Alarm Notification Appliances	X				X
Supervising Station Fire Alarm Systems Transmitters	X				X

posed for each type of device specific to your system. (Reference NFPA 72-2007 Table 10.4.2.2)

Asample inspection and testing report with the contract agreement proposal. (Reference NFPA 72-2007 Figure 10.2.6.3)

In each case, compare the proposed scope to the inspection and testing requirements of NFPA 72.

As fire alarm system and device manufacturers continue to provide new and innovative products, the codes and standards that regulate the testing and maintenance

of these products will change accordingly to ensure system availability and anticipated performance reliability is properly maintained. Performing all inspections, testing and maintenance in accordance with the most recent edition of NFPA 72 is a reasonably sure way to meet compliance with your property's applicable fire codes and standards.

John F. Devlin, P.E., is Vice President with Aon Global / Schirmer Engineering Corporation, international fire protection and

risk engineering consultants. Mr. Devlin has over 25 years experience in the fire protection engineering consulting industry, is a registered fire protection engineer in numerous states, and serves on several NFPA Technical Committees.

Editor's note: See NAHLE's new membership service for records documentation. (www.nahle.org)



UPCOMING INDUSTRY EVENTS

September

24 Sep 2009, Puget Sound Hotel Engineer's Association - 5:15 PM
Silver Cloud-Stadium

October

1 Oct 2009, CFHLA Hospitality Expo and Tradeshow "HEAT" Thursday,
at The Hilton Orlando

2 Oct 2009, International Window Cleaners Association - Safety Training
Seminar, Los Angeles, CA

7-9 Oct 2009, International Facility Management Association's World
Workplace 2009 Conference & Expo, at the Orange County Convention
Center

November

6-10 November 2009, AH&LA Fall Conference held in conjunction with
the International Hotel/Motel & Restaurant Show Jacob K. Javits Con-
vention Center New York, New York

Don't Let Them Bite!

By Stoy A. Hedges, BCE

Manager, Technical Services, Terminix International

<http://www.terminix.com>



Of course, there's an exception to every rule!

Sixty years ago, our grandmothers and fathers were very familiar with a small, reddish-brown ectoparasite called bed bugs. For 40 years, bed bugs had been essentially eradicated from the U.S. until the mid-1990's. Now they are back and out for blood.

Bed bugs are not just associated with "seedy" motels; lack of good sanitation is not what causes them. This insect is an accomplished hitch-hiker and it only takes a few eggs or a single fertile female carried on a piece of luggage or a box to start an infestation in another building. Vigilance in storing and inspecting one's possessions when traveling is the best way to prevent carrying them home.

Tiny nymphs, about the size of a letter on a penny, hatch from eggs and must go

through 5 molts, or life stages, to reach maturity. Each molt requires a blood meal, and the meals occur after dark, when the host – a person – is sleeping. The bite is painless, and the meal takes about 10 minutes to complete. A bed bug may eat too much and may exude excess blood from its abdomen as it retreats across the bed to its hiding spot. Little blood spots on sheets are a sign of bed bug activity.

Being nocturnal, bed bugs spend most of their time resting in cracks and voids, usually in or near the bed. About 70% of an infestation is found in the bed, another 23% is associated with upholstered furniture, and the remaining 7% could be anywhere in a guestroom.

The headboard and the front end of the mattress and box springs are the most common sites to find bed bug activity. Signs of bed bugs include live bugs, shed skins from molting, dark fecal spots, and eggs. These are usually located in protected sites such as cracks and under folds and tucks in the mattress and box springs. They may also be found in the bed frame, baseboards, nightstands and any item under or near the bed.

Low-level or new bed bug infestations can be difficult to detect. Bed bug nymphs and eggs are small and easily hidden in small cracks. Even so, training of housekeeping and maintenance staffs in bed bug recognition is critical for bed bug prevention. Infestations are far easier to eliminate if caught early. Even the best inspectors can easily overlook bed bugs. However, sometimes the first indication is a guest who reports being bitten by bugs.

When this pest is found, treatment is best left to an experienced professional. An effective bed bug program employs a variety of strategies and techniques that are too varied to discuss in detail here. Bed

bug eggs are the most common reason for continued infestations which is why steam and freezing are useful tools in treating mattresses and box springs.

Physical removal of bugs and cast skins using a vacuum is an important technique. The steam or freezing is then used to ensure the death of exposed eggs. Residual treatments are then applied into all cracks and voids where bed bugs could be hiding out of sight.

It is recommended that bed bug-proof encasements be placed over the mattress and box springs. An encasement traps any bed bugs that may have survived treatment inside, and they eventually starve or contact a treated surface. Other bed bugs cannot then gain access into the mattress or box springs making it easier to see and find them. The extra cost of encasements is well worth it to protect these valuable items.

A hotel can take steps during remodeling to make a room less hospitable to bed bugs. Encasements are a start. Wood box "pedestals" on which the bed is placed should be avoided and replaced with metal frames that provide far fewer hiding spots for bed bugs. Headboards should have every crack on them sealed as best as possible and use of carpeting as decorative baseboards should be avoided. Any step taken to "design out" cracks where bed bugs can hide is helpful and sealing any cracks that cannot be eliminated is necessary.

Minimizing bed bugs is a cooperative effort between the hotel and its pest management provider. Good communication, early detection, proper preparation and regular inspections and possibly preventive treatments are all part of not letting the bed bugs bite.

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Green Operations Management...

Rangers Lead the Way

How can I make a difference? And where do I begin?

By Art Attaway

<http://www.ductpro.com>



With the seemingly daunting task of converting to Green, and the past emphasis being on building systems

and capital equipment being left up to the building owners and management companies, you may ask "How can I as an operations person even make a difference?"

Well, the answer to this is you can make the most "immediate" difference, because what you can do does not cost additional money, will probably save money, and will impact the indoor environment of your property that day. It is sort of like voting, and the old adage that "every vote counts" and "one person can make a difference" does apply. If you are doing it, then the housekeeper will, the stewards will...all management will join in. And the Ranger is the one out there, searching, reconing, and gathering useful and actionable intelligence and most often alone and far away from the safety of the group. In the modern day military, it is simply said, "Rangers Lead the Way"...they are on the cutting edge of the battle.

So lies the challenge for you to "lead the way" in your property. Be the Ranger. You will have the honor of being the unsung hero of the day, but you will know. And, you will make a difference.

Here are some specific areas where any operator can make a swift and valuable change on the operations level, set the standard, and even save operational cost and be the sung hero, at least for the day when the next P&L comes out.

Eliminate VOC's (volatile organic compounds) in all products and services used in the daily operation of the property. VOC's are present in most chemical compounds and you probably use them every day, at home as well as in the hotel/motel, and do not even realize it. Most products developed from the 1950's to present, aside from the research and development of the Green movement, are laden with chemicals that outgas after their use, and many do so for years. In fact, these are the primary cause of "Indoor Air Pollution" and are the greenhouse gases of your building. The Federal government produced a study almost a decade ago that demonstrated that indoor air pollution was more of a problem than outdoor pollution. Thus the ban on cigarettes, which also outgas and permeate the area. And the "requirement" that all government buildings test and maintain a certain level of indoor air quality.

So, where do these enemy VOC's hide?

Cleaning products: almost all cleaning products of the recent past are loaded with chemicals that outgas, and are harmful for the user, but also linger in the area and affect everyone around. There are a number of green products now available; everything from enzyme cleaners to other organic compounds that offer the same

service and results. Enzyme cleaners don't kill the mold, mildew, and dirt, they attack (consume) the bacteria that mold, mildew, and dirt need to live, so without the presence of that bacteria, then they simply cannot survive, and they disappear.

These cleaning products include house-keeping, carpet maintenance, stewarding, and laundry,

Whether a product is "green" or not is measured by the volume of VOC's that outgas from it when used. Ask your supplier for MSDS that show the VOC level. In fact, just tell your supplier you want green products and put the burden of finding the right ones on them. When users demand the products the suppliers will respond.

Adhesives: If you do any of your own repair work, change the carpets or vinyl flooring, fix the trim, etc., address the adhesives you use and insure they are low "VOC". If you change carpet, buy carpet and padding and adhesives that are low VOC. They are out there.

Fabric protectors: Scotchguard recently revamped their formula to reduce emissions. There are other products available as well, and research will provide several alternatives.

Stain removers: Almost all are bad. Again, look for a cure from your local suppliers, or online.

Paints: This one is easy; just look for alternate paint products for your ongoing touch-up. Any paint can be pigmented to match an existing color.

Dyes: (carpet fibers and upholstery, bed linens, drapes, etc.). Have any replacement products or attic stock be of low VOC presence. This one is tougher because of flame retardant treatments required in most states, cities, and municipalities. So drapes and bedspreads may be difficult to locate.

In addition, you probably use many outside service providers for various aspects of maintenance in your property. Here are some areas to look closely at to see if changes can be made:

SERVICE PROVIDERS

Carpet cleaners: All carpet companies now have access to effective and cost efficient products and processes that do a great job and use no to low VOC products. I am sure many companies that have these systems are beginning to advertise as well. The IICRC (Institute of Inspection, Cleaning, and Restoration Certification) should have some information on their website about what companies have been trained and certified by them in these products.

Natural stone floor maintenance: Avoid the use of any chemical processes here. The use of diamond pads and water is the only way to go. Again, this can cost less over an annualized period and make your floors look like the natural product they are, and not plastic. The use of chemical processes may cause damage to your floors, based on the products, training level of the applicator, and application frequency. Regardless, all of these chemicals outgas VOC's. Require sealers that are organic compounds and water based, if you must use a sealer at all. Avoid waxes and other coatings unless your provider can certify them to be green. The MIA (Marble Institute of America) has standards and specifications in their "Design Manual", which sets the standard for the stone industry.

Air duct cleaners: Ensure your service provider is not using any chemical compound in the ducts. Some mold killers and deodorizers are laden with toxins. There are numerous processes to get dirt to release and be vacuumed out. If mold is present, there are green products to handle the situation.

HVAC maintenance: Your coil cleaning is the real energy saver here, and you should have a program to keep them free

of build-up without chemicals. Air duct cleaners certified by NADCA (National Air Duct Cleaners Association) are qualified to maintain your coils, or any licensed HVAC contractor.

Painters: Just like if you were doing it yourself, low VOC paint products, stains, and other finishes are readily available. Require MSDS on all products being used in your facility, and simply set the requirement of green products.

Plumbers: Do not allow the use of chemicals to clear drains and other blockages at joints. Have your plumber use a camera to locate the problem and a snake to clear it.

PTAC units: These have to be cleaned just like large HVAC coils, and you will save money and create a better indoor environment. Enzyme products will keep mold from coming back, or significantly delay that process. A particular product names titanium dioxide, when used with natural or artificial UV light, kills all mold, mildew, and eliminates all odors. Air duct cleaners, some HVAC companies, and some specialty companies offer a PTAC maintenance program.

Plant maintenance: There are many pesticides that have no VOC presence.

Trash removal: Insure your provider recycles all waste. Establish a program.

Window cleaning: There are relatively new systems out that provide high quality low cost cleaning using recycled "water only" that leaves no soap residue on your windows, thus keeping them clean four times longer. Building exteriors up to eight stories can be cleaned with these systems. No soap, no chemicals, less water, less cleanings, and less cost...and cleaner windows longer!

OTHER AREAS OF CONSERVING ENERGY AND SAVING OPERATIONAL BUCKS

Most of these actions will save you 35% -50% on energy cost, and the payback on most of these products is six months.

Room energy management systems There are several wireless remote individual room energy management systems on the market, as well as PTAC's that come with a wireless thermostat. Basically, unless the guest is in the room, it returns to pre-set parameters of lighting and HVAC usage. At about \$400 per room, this is

a very responsible and cost efficient way to conserve energy and put dollars back on the bottom line rather than the "energy expense" column.

PTAC Replacement When the time comes to replace these units, shop. Research what is new and available. There are only about 7-10 companies (3-4 that are dominant), so it won't take long. I can tell you what is available today, but that doesn't mean it will be current next month. However, the primary function should be to control use when there is no guest presence, and to allow comfortable parameters for use when there is a guest in the room. Several systems are currently available to do this, and they may cost a little more, but what they save when that meter turns is even greater.

Electricity surge management – products that collect normal energy during the day to redistribute the collected energy, so that when spikes happen there is less surge volume, thus less use of energy.

UV lights For keeping indoor environments germ free and deodorized constantly. This is tough to put a tangible value on, but if the rooms and public areas did not have any odors to spend your time with, pour chemicals on, or hire contractors to fix, it just seems logical that savings would occur. And if your employees experienced less illness, thus less absence, how much value would that deliver?

Not long ago there were few alternatives to high VOC chemical products that worked, but that is now a different story. Virtually every month new products and services appear that support the "Green" movement. Most of these make sense. Many save money both short and long term, and help the environment at the same time. Be the Ranger on recon patrol, and be vigilant about eliminating the enemy.

Basically, if it comes in a plastic or metal container, look closely at the VOC level. Require service providers to produce MSDS's that show VOC levels of products they will use in your property. Be on the lookout for alternative products that can make life better for guests and employees. Don't allow mediocrity. Set the standard. Make the difference. Be the Ranger.

Rangers Lead the Way!

RE-CRYSTALLIZATION of Your Stone Floors *The Pros and Cons*

By Frederick M. Hueston

<http://www.stoneforensics.com>



Ask any stone restoration company if re-crystallization of marble is the right process to maintain your marble, limestone or terrazzo floors and you will get

those who think it's the best method since the invention of the internet to those that will tell you that it will ruin your stone beyond repair. The debate of this process has been going on for over 20 years. Both sides put forth convincing arguments. So how does a hotel engineer decide if this process is right for their stone floors? As a forensic expert who has seen the good and bad with this process I will present both sides of the argument below and provide you with some guidelines to make this decision.

What is Recrystallization?

Recrystallization is a polishing method used to polish calcium based stones such as marble, limestone and terrazzo. Re-crystallization may also be called crystal-

lization or vitrification. The process uses a standard floor buffing machine, some steel wool and the crystallization fluid. The fluid is sprayed on the stone and then worked into the stone with the steel wool until a shine is developed on the stone surface.

So what is in this crystallization fluid? The main ingredient used in crystallization fluid is a group of compounds called fluorosilicates. Three types of fluorosilicates can be found in re-crystallization fluids: (1) Aluminum Fluorosilicate (2) Magnesium Fluorosilicate and (3) Zinc Fluorosilicate.

First used in 1883, fluorosilicate compounds were used in an attempt to preserve marble statues that were crumbling. It was found that fluorosilicates deposit enamel on the surface of the stone. The stone suffocates, begins to break apart and rot. The results of these studies can be found in the book *Stone Decay and Conservation* written by Giovanni G Amoroso and Vasco Passins---ELSEVIER, Amsterdam, Lausanne, Oxford, New York 1983.

The re-crystallization process uses an acid that attacks the calcium carbonate in the stone. Technically speaking, this

reaction destroys the calcium carbonate and releases the calcium ion. The fluorosilicate compound then attaches itself to the calcium ion forming a new compound. This new compound, calcium fluorosilicate forms a film on the surface of the stone. Unlike waxes and other coatings that just sit on the surface, the fluorosilicate enamel that is formed is chemically attached to the stone. This new surface is where the debate enters into the picture.

THE PROS

The following are some of the benefits put forth by the manufacturers and users of this process:

The crystallization process...

... is very easy to use and is less messy ... than traditional polishing methods.

... produces a slip resistant surface.

... provides a harder and long lasting surface when compared to traditional polishing.

... is more cost effective than traditional polishing methods.

... provides a breathable surface (more on this later).

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THE CONS

The following are some of the negative statements put forth by those against this process.

... It is detrimental to calcium based stones since it blocks the pores of the stone and does not allow it to breathe.

... It takes longer to achieve a polish than traditional polishing methods.

It does not make the stone harder, it actually places a thin brittle film on the surface of the stone.

It will darken and discolor light colored stone and will cause white marbles to yellow.

The acids in the crystallization fluid become trapped under the enamel layer that is formed and eats away at the stone.

Who Wins this Debate?

There are have been several articles written on this subject over the years and unfortunately the debate goes on. I have written several articles on the details of this process that can be found on the blog at www.stoneandtilepros.com. You can also find articles both pro and con in some of the trade journals. These points can be

argued and have been argued for years. Based on my experience and research here are some of my recommendations and comments:

If misused, the recrystallization can cause damage to marble, limestone and terrazzo surfaces. For this reason it is absolutely critical that your staff or your maintenance contractor be trained on the proper application.

Certain marbles should not be crystallized including but not limited to Thassos White, green marbles and some other white marbles.

I have found it best that if the recrystallization process is used that it be alternated with traditional methods. This prevents the buildup of the fluorosilicate enamel.

Keep a close eye on your stone and look for signs of discoloration, darkening and spalling and pitting. If you see evidence it is time to investigate what is causing these problems.

Conclusion

Over the years I have inspected stone floors destroyed using this process as well as floors where the process has been suc-

cessful. Most of the damage was caused by over-application, misuse, unskilled applicators and the process being used on certain types of stone. The hotel engineer should question the maintenance contractor or in house staff to make sure which process is being used and if it is being applied correctly. If in doubt please consult a stone expert who can design the proper maintenance program and who can inspect your stone for damage.

Fred Hueston is the Director of Stone Forensics (www.stoneforensics.com), the Chief Technical Director at www.Stoneandtilepros.com and the "Go To Guy" for many including This Old House. He consults with hotels throughout the world on stone and tile issues.

Have questions you'd like answers for? Visit www.Stoneandtilepros.com. It's a great resource where you can search the database of previously asked and answered questions, or you can submit your own questions to Dr. Fred (Fred Hueston)

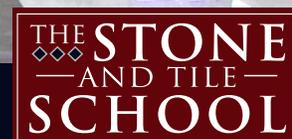


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A CLOSING NOTE FROM YOUR ASSOCIATION

As our nation's 26th President, Theodore Roosevelt said...

"Every man owes a part of his time and money to the business or industry in which he is engaged. No man has a moral right to withhold his support from an organization that is striving to improve conditions within his sphere."

As NAHLE is completing our first year of business this October, I want to thank each and every one of you for your support and hard work. I must admit it has been both challenging and a lot of fun and we have made a lot of progress, but we still have a long way to go. However, I need your support, both financially and as contributors of ideas, leadership and articles for Lodging Engineer. So if you like what we are trying to do here, make an affirmative statement and JOIN! Bring in a vendor. It's still only \$39.95 through the end of the year for a full year engineer's membership.

Robert Elliott
Executive Director



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NAHLE Membership Services

NAHLE Announces New Membership Services!

- * Forum - web-based forum to exchange ideas and information among your peers with threaded discussions (be the first to post...its brand new),
- * Warranty / Document Management - a document management system that tracks warranties, inspections, permits and licenses for you in one spot and with its built in time clock sends you an email of an impending expiration or upcoming inspection.

Current Member Services:

- * Magazine - an electronic newsletter (Lodging Engineer) that members download featuring informative articles and product advertisements specific to hospitality engineering and maintenance,
- * Blog – an electronic forum where you can discuss articles in Lodging Engineer, current events, news items, products or exchange ideas and information with your peers,
- * Job Bank - a single source for finding and posting hotel engineering and maintenance job openings,
- * Events – lists upcoming events, meetings and local chapter functions of interest in calendar format,
- * Institute - a searchable database of past articles, federal

regulations, and ADA / maintenance checklists,

- * Buyer's Product Guide - an electronic buyer's guide which lists service vendors, suppliers and product manufacturers and searches for vendors near you,

- * Links – to websites including commonly used standards and regulations such as OSHA Lockout / Tagout safety or Department of Justice' ADA checklist, Material Safety Data Sheets and other trade associations promulgating standards or of mutual interest.

Membership Services in Development:

- * National Registry - an electronic registry listing all lodging related building maintenance professionals including; NAHLE designations, AH&LEI and other trade association certifications, local jurisdictional licenses, and union cards,
- * Educational Training - engineering and maintenance texts in all disciplines. Completing training leads to a certificate of completion and listing on NAHLE's National Registry. AH&LA's Education Institute is providing educational content,
- * Seminars - regional meetings and review seminars for building maintenance educational training.

ADVERTISERS AND SERVICE PROVIDERS

CONSULTATION

Click on the web address for direct link to company website

- Craanen Technical Services, LLC.** (516) 782-7280 www.craanen.com (SEE DISPLAY AD THIS PAGE)
- Stone Forensics Stone and Tile Consulting** (888) 314-9077 www.stoneforensics.com (SEE DISPLAY AD PAGE 18)
- Water Management Consultants and Testing, Inc.** (850) 837-1336 www.watermc.net (SEE DISPLAY AD ON PAGE 3)

GUESTROOM SUPPLIES

- Serta Mattresses.** (407) 862-7600 www.serta.com (SEE DISPLAY AD ON PAGE 2)

HVAC / DUCT CLEANING

- DuctPro** - www.ductpro.com 1-888-DUCTPRO (SEE DISPLAY AD PAGE 11)

PAINTS/ WATERPROOFING/ FLOORANDWALLCOVERINGS

- Coatings Application and Waterproofing Co. (CAW)** (866) 278-4440 www.cawco.com (SEE DISPLAY AD PAGE 22)

PEST CONTROL

- Terminix** - www.terminix.com (SEE DISPLAY AD ON PAGE 15)

STONE AND TILE RESTORATION & MAINTENANCE

- STONE AND TILE PROS** Ask the PROS your Questions. Locate Stone and Tile Contractors nationwide. (877) 715.5313 www.stoneandtilepros.com
- MARBLELIFE - Southeast Florida** Natural Stone, Tile & Grout Restoration & Maintenance - (888) 362-7607 www.marblelife-seflorida.com
- Stuart Dean** - (703) 578-1885 www.stuartdean.com (SEE DISPLAY AD PAGE 9)

WATER CONSERVATION

- Water Management, Inc.** (800) 394-5325 www.watermgt.com (SEE DISPLAY AD PAGE 10)

CRAANEN TECHNICAL SERVICES, LLC

DEPARTMENTAL REVIEWS

- Prepare policies and procedures for engineering / maintenance departments
- Emergency & contingency planning
- Review of job descriptions
- Staffing schedules, competency evaluation
- Training need assessments
- Maintenance contracts review

DEVELOPMENT & TRAINING

- Review and preparation of job descriptions
- Development profiles and training

EVALUATION OF PROPERTY MAINTENANCE CONDITIONS

- Review preventative maintenance programs
- Review of work order and maintenance request procedures
- Evaluation of maintenance programs
- Property maintenance inspections
- Maintenance contracts review

SURVEY INVESTIGATE AND INSPECT PROPERTIES

To determine capital improvements required for physical plant, guest rooms or tenant spaces and equipment

- Condition surveys
- Determine useful life of equipment and systems
- Prioritize system and equipment replacement (prioritize expenditures)

ENERGY CONSERVATION

- Staff training
- Energy walk-through evaluations
- Energy management programs
- Energy conservation training
- Energy audits



ENVIRONMENTAL AWARENESS PROGRAMS

ACQUISITION INSPECTIONS

OUTSOURCING EVALUATIONS AND OUTSOURCING CONTRACT REVIEWS.

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 866-278-4440
 800-510-0080

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 Website: www.cawco.com

Hotel / Resort Restoration

Tile Roof & Façade Restoration

In 2004 & 2005 Hurricanes Charlie and Wilma swept across south Florida causing severe structural damage throughout the area. One of the properties that suffered such damage was the **Ritz Carlton Beach Resort** in Naples, Florida. This 14 story massive structure had a tile roof, which had been severely damaged during the hurricanes. Also damaged was various areas of the building's façade. Most of the damage to the façade was due to flying debris.

CAW was given the difficult task of the complete roof and façade restoration to include: tile and decking removal, replacement to the 150 foot high resort structure, repairs to the lower tile roofs, along with cleaning and repairs to the façade structure. One of the major challenges was utilizing one staging area to minimize the impact on hotel guests. This project required a unique personal fall protection system that would accommodate a 40

man crew. A debris fall prevention system had to be set in place to prevent any of the 500,000 tile roof pieces and 1,200 sheets of deteriorated plywood that was removed from falling over 150 feet to the occupied courtyard and public ground areas.

In spite of the record rain fall during the 4 month project time, CAW rose to the challenge and successfully completed another almost impossible project.



Ritz Carlton Beach Resort
 Naples, Florida



Roof top hydraulic hoisting stage area.



Ground staging area. Used for loading and un-loading roof.

Restoration Specialists

Thermoplastic Roofing Systems

Modified Roofing Systems

Spray Polyurethane Foam Roofing Systems

Epoxy Injections

Wall Sealants & Waterproofing

Window Glazing & Caulking

Deck Coatings

EIFS Repairs

Wall Coatings

Planter Restoration



View of roof top hoist area



Installing new decking



Ramp access to other roof areas



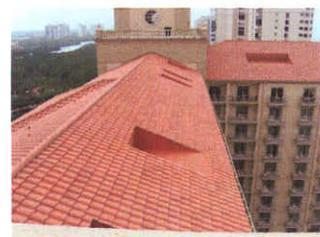
Installation of safety systems



Overall view



View of low roof areas



Newly completed tile roof



Newly completed tile roof