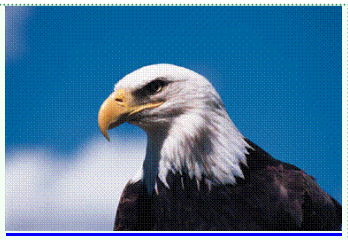
# SpotLight on Maintenance

OPFMA Newsletter - Connecting Knowledge with Public Facilities' Needs!
Summer 2010




## Ohio Public Facilities Maintenance Association

OPFMA is a not for profit 501(c) (3) independent educational trade organization



***Inside Edition:***



Editor's Note:
Next Edition - September 2010
Submit your article or ad by Aug 31, 2010. Terms on page 8!

## *OPFMA - 2010 Second Quarter Activities*

**From the Administrator's Desk**

During this quarter OPFMA strived to provide its membership with educative opportunities in support of public maintenance employees' ongoing professional development.

In the April - June period, OPFMA had organized and administered a total of ten BOC training classes - in the Columbus and Dayton areas.

Four other educational seminars on topics of interest to our members have been promoted and posted on our website as well.
OPFMA had sponsored two other informative seminars organized by our Corporate Members encouraging the membership to attend the free educational events!
Siemens Technologies Inc. - a new OPFMA Corporate Member - held the "Sustainable Columbus" educational seminar on June 3rd 2010.
OPFMA sponsored the event and, to expand OPFMA awareness, a booth was organized and attended by Constantin Draganoiu, OPFMA Membership Committee's Chairman.

OPFMA website had been renewed - frequent updates are posted for:
- BOC classes
- Job postings
- Seminars
- Conference and Trade Show
- Educational events

The new "Contact Us" button is the simplest way to communicate with our office - just click "Contact Us"!

OPFMA Board of Trustees priority is satisfying membership's educational needs and organization's stability! The Board held a meeting in April and will hold a phone conferencing on June 30th.
To contact OPFMA board members, visit: www.opfma.org

### OPFMA 2010 Conference & Trade Show

**Oct 25th & Oct 26th**
**Early-Bird Registration**
**Deadline - Aug 31st, 2010**

**Register Early to Enter**
**Special Early Bird Raffle**
**Reserve your room early to benefit from OPFMA Group special rate!**

Registration Form posted on: www.opfma.org

### 2010 Trade Show

**Registration is in full swing!**

**In 2009 OPFMA had to turn away seven willing exhibitors when Grand Ball Room's maximum capacity was reached.**

**Register Early to Reserve Your Booth!**

Registration Forms posted on:
www.opfma.org

**Special Appreciation**
**OPFMA 2010 Conference Sponsors!**

**Johnson Controls**
**The Brewer- Garrett Company**

OPFMA Conference Committee had worked intensely to design the two-day workshops layout and gather the best possible speakers for the selected 21 topics.
To speed up the process, Ron Atkins, the Chairman of Conference Committee, has held 3 phone-meetings!
**The 2010 Workshop Schedule has been completed. Check it out! Visit: www.opfma.org**

## Building Operation Certification Program - 2010 Second Quarter Activities

Building Operating Certification Program is OPFMA's focus year round as we are looking at offering classes in areas having higher demand for the Building Operation Certification Program!

OPFMA had organized and started two BOC level-1 series, one on March 2nd in Columbus and the other BOC Level-1 series on April 9th in Dayton.
Also a BOC Level-2 series was organized and started on Jun 11th in Columbus!

While the country is going through a difficult economy, OPFMA and its membership are relying on each others support!

**Special Appreciation to OPFMA Members Volunteering to Help:**

Randy Crossley - Lima City Schools - had registered (3) employees
Tom Hand - volunteered to promote the BOC series to his sphere of influence that resulted in (3) registrations of non-members
Mitchell Fogel - *Troy Hayner Cultural Center* - promoted the BOC classes in Troy area and registered for the BOC Dayton April 9th Series.

OPFMA had created plans for possibly a couple of BOC Level-1 series for the Cleveland Metro School District.

Also, a September BOC Level-1 series in Columbus area is under development!

BOC Committee Chairman, Wayne King, visits BOC Level-2 series on the first day of class on June 11th 2010!

The Chairman congratulated the class for completing the BOC Level-1 as well as for continuing their professional development by taking BOC Level-2. He introduced the class to OPFMA membership benefits and opportunity to join OPFMA committees.

## NFPA 70E 2009 Edition

Electrical Safety in the Workplace

### Are YOU in Compliance?

By Craig E. Kasper, Hull Associates, Inc.

As facility managers and professionals responsible for installing, operating, maintaining electrical systems, you likely have experienced the NFPA 70E safety standard in previous safety-related work practices.
This article will focus on the newest compliance issue - Electrical Arc Flash Hazard Protection.

**What is "electrical arc flash hazard?"**

Electrical arc flash hazard differs from electrical shock hazard in that a worker may be exposed to an arc flash while some distance away from the energized component and not in contact with it. In an arc flash incident, the electrical current does not pass through the body; rather, it exposes the body to very high temperature arcing accompanied by a severe mechanical arc blast. An arc flash causes injury or fatality through severe burns to the body and damage to internal organs. An arc flash can occur on any three-phase electrical circuit energized at 208-volts or higher.

**How are workers protected from arc flash hazards?**

An electrical arc flash does not occur on a properly deenergized electrical circuit, but some work, such as trouble-shooting and diagnostics, require the circuit to be energized. In these cases, the worker must trained in the proper use of the appropriate personal protective equipment (PPE) and must use this PPE as long as exposed to the energized equipment as specified under the NFPA 70E Standard governing safe work practices.

**How does one comply with NFPA 70E for arc flash hazard protection?**

In order to ensure that the arc flash hazard is understood and proper PPE and other safety-related practices are being used, the building electrical system must be assessed for the potential of arc flash occurrences. Once this assessment is completed the level of arc flash intensity is known for each switchgear and electrical device in the system. Labels describing this level of hazard intensity, safe boundary distances and the proper PPE required are affixed to each piece of equipment. Training for the workforce about avoiding electrical arc flash hazards and using safe work practices is then conducted.

Both OSHA and the Public Employment Risk Reduction Program (PERRP) reference NFPA 70E Standard as the guide to ensure that safe work practices are followed whenever work on energized electrical equipment is required. This subject will be a workshop topic at the OPFMA Annual Conference on October 25, 2010 where details of the compliance process will be presented.

**Editor's Note:**

Further information on **Arc Flash Hazard** is available from cekasper@hullinc.com

Hull & associates, inc.

## BOC Graduate's Opinion on the BOC Certification Training Program

This was definitely, hands down the most informative course that I have invested in.

I paid for your course out of my own pocket up front, and then got reimbursed after I passed the course, but I would do it all over again.

I did learn a lot more than I thought that I would. I will take the BOC Level 2 course in the near future.
*Thanks,*
Robb
*One of BOC March 2010 Grads*

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## BOC Graduates - Members of 2010 BOC Committee!

Susan Samuels and Robert Nieman are both employees of the Franklin County Children Services, Columbus. **They are both BOC Level-1 certified!**

Sue and Rob are also OPFMA members and great supporters of OPFMA activities for years.

OPFMA appreciates that Sue and Rob promptly accepted the BOC Committee Chairman's, Wayne King, invitation to be part of the 2010 BOC committee!

**BOC Graduates' Input is of Great Value to OPFMA –**

**Thank You Graduates!**



## OPFMA New Members - Welcome Aboard!

**Corporate Members**

**Jacco & Associates** - Mr. Greg Drensky - Vice President

**Hull & Associates Inc. -** Mr. Craig E. Kasper - Electrical Eng.

**Siemens Building Technologies** - Mr. Jim Duckworth - Senior Sales Executive

**Institutional II**

**Hubert Heights City Schools** - Mr. David Manning - Maintenance Supervisor

**Individual Members**

**Mr. Michael Tharp** - Head of Maintenance - Fairfield Union School District

Four Seasons Environmental, Inc.

## ♦ LEED Commissioning ♦

By Mark Hayden, LEED AP, Commissioning Group Manager FSEI

Are you pursuing LEED certification for your construction project? Have you hired your Commissioning Authority? What is a Commissioning Authority anyway and what does it have to do with LEED?

Commissioning is a peer review process designed to ensure that all key systems are installed and functioning efficiently and correctly. There are two levels; Fundamental and Enhanced. While Fundamental is required for all LEED projects, Enhanced is optional and earns the project one point. Even though Fundamental and Enhanced both include construction phase commissioning, only Enhanced includes design phase peer review *before* construction and post-occupancy follow up *after*. When the time comes to make the decision, careful consideration should be given to the impact of excluding these "book ends" from the commissioning process.

When faced with that decision, the Cincinnati Chapter of the American Red Cross selected enhanced Commissioning for the new 50,000 square foot Disaster Operations Center. The design review revealed items that most likely would have resulted in costly change orders and although post-occupancy commissioning has not yet begun, it will be customized with specific emphasis on energy conservation and on identifying any unresolved warranty issues.

**Editor's Note:**

For More information on LEED Commissioning, please visit USGBC.org.

## The Most Cost-Effective Way to Reduce the Utility Bill

*Richard G. Lubinski, President of* ***Think Energy Management LLC***

Electricity costs vary widely across the United States and even within states and regions. The cost value of the kWh has a dramatic impact on the ROI for energy management investments.
Unlike natural gas, electricity cannot be stored, so the demand can only be produced as it is needed. This makes the electricity market different and less flexible than natural gas in both regulated and deregulated markets.
As a result, what you use and when you use it affects your building's average cost for electricity.

Each building has a load profile that reflects when energy is used. Because electricity in all markets is more expensive in the summer, using a lot of electricity at that time will result in a higher average cost per kWh.

**What to Do?**

The first step is to contact the utility company to obtain a 12- to 24-month summary of your consumption and billing history. This report lists your monthly consumption in kWh, sometimes the peak load (measured in kW or KVA) and the billing amount. It also shows if the meter reading was actual or estimated for each month. This utility summary will reveal what your building uses and when it uses it.
If your city has formed an energy-buying cooperative called an ***aggregation pool***. Under this arrangement, your home, office building, or plant is automatically included in the pool, unless you elect to opt out in writing.
The voluntary programs set up by local government and some trade associations are called opt-in plans.

The aggregation pools provide a standard cost for the electricity generation part of the bill. The cost savings is relatively small.

Another way to save money is to help your EDC save money by reducing consumption during the peak summer months. This new relationship between the electric utility and its customers is called demand response (DR). If you curtail the load of your home, office or plant *at the time that helps the utility*, the utility will share part of its cost savings with you.

This kW load reduction is produced by turning up A/C thermostat settings, turning off water heaters, turning off some lights, or starting your generator. The utility company keeps score by installing more intelligent electricity meters (advanced metering). In some areas the utility will send out a radio signal to new generation DR thermostats or radio-controlled relays to automatically reduce some of its customer loads on hot summer days when every A/C unit is running nonstop.

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In exchange for your cooperation, most utilities will give you a billing credit on your electricity bills.
Some utility companies offer a "free thermostat" controlled by them to "help the environment."

Another version of DR program is Demand Side Management (DSM)
Under DSM the utility companies supply energy-efficient compact fluorescent lamps (CFLs) or will help you pay for them with a DSM rebate.

Most utility companies or the State Energy Office (via a kWh tax on the electricity bills) provide DSM programs.

To determine if your area has DSM programs available check the **U.S. government website**.

The Complete Solution Includes the Supply Side.
This entire discussion has been focused on supply-side energy management. However, to find the most cost-effective way to reduce the utility bills, we must also address the other side of the coin called Demand-Side Management - also known as **Energy Conservation.**

An ideal energy management plan addresses both your supply-side and demand-side energy management opportunities.

**Energy conservation is the most cost-effective source of new energy supply for the utility company and your building.**



## Keeping Green Roofs "Green" Through System Design

Eric J. Seaverson, P.E. - StructureTec Corp

With rising energy costs and a focus on green technology and LEED accreditation, many corporations are looking to green technologies for energy savings, reduced environmental impact, and corporate marketing. One major concept with all green technologies is to weigh reduced environmental impact during manufacturing and installation versus service life.
That is, replacing a "green" technology after only a few years may not be very green, due to the impact of the waste and manufacturing of more materials.
With green roofing, the impact of replacing a system is significant, because the overburden materials must be completely removed to replace/repair the membrane system.

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# Keeping Green Roofs "Green" Through System Design

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Although green roofing is a seemingly new concept, the technologies required are not necessarily new.

Because the membrane systems are constantly exposed to moisture, conventional roof systems may not be an appropriate selection. Instead, plaza waterproofing systems, specifically designed and manufactured for constant moisture exposure, should be used. Similarly, plaza waterproofing concepts and detailing must be implemented to ensure longevity of the system.

In general, the term "green roofing" refers to landscaping installed over a weatherproofing system. However, "green roofing" may also refer to green technologies such as photovoltaic energy cells installed over a roof system. This article focuses on the primary definition, which pertains to landscaped roofs.

Green roofs provide many benefits to the building and environment, including:

- Control of storm water
- Improved air quality (for the environment)
- Reduction in energy costs
- Increased service life of the membrane
- Aesthetics and employee wellness

Storm Water Control – The planting system, including soil media, will reduce the overall volume of run-off, reduce peak volume rate requirements of the drainage systems, and reduce contaminants in the runoff water, all of which reduce the demand on the storm water drainage and treatment systems.

Air Quality – Increasing the amount of plantings in any area allows for natural "air treatment", reducing air borne contaminants.

Energy Savings – The planting system provides a buffer between ambient temperature and the insulation, reducing the high and low daily temperature swings as well as reducing the rate of temperature changes. Both of these provide reduced load on the heating and cooling mechanical systems. Additionally, the added planting media provides varying levels of increased thermal value (the thermal value of the plantings is inversely proportional to the moisture content).

Service Life – Assuming a reliable installation, green roof membrane systems have increased service life over conventional roofing systems because they are protected from UV rays (since they are covered), and do not experience thermal shock stresses since the membrane temperature is buffered by the planting media.

Aesthetics / Wellness – If the green roof is visible and/or accessible, people benefit from this. Some research has indicated that nature scenes and access to them can increase productivity as well as general health.

Although there are many benefits to green roofs, there are disadvantages that must be considered, including:

- Increased cost
- Access to the membrane
- Unwanted wild life and insects
- Maintenance

Increased Cost – Depending on the planting / overburden system selected, a green roof system can cost up to twice as much as a conventional roof system.

Membrane Access – If leakage does occur, the membrane system is buried below the planting / overburden systems, which must be removed to determine the cause of leakage and make repairs. As with any roofing, this is challenging because the interior leakage may not align with the breach in the membrane.

Unwanted wild life and insect – The planting systems provide suitable habitat for birds, insects, and other wildlife, which may be unwanted. Additional "protection" may be required to prevent unwanted wildlife and insects from inhabiting the green roof.

Maintenance – While conventional roofing membranes require periodic maintenance to repair membrane degradation, green roofing requires periodic landscaping maintenance to remove unwanted weeds and other plants from overtaking and detracting from the green roof plantings.

There are two general types of green roof planting systems: Extensive and Intensive.

**Extensive:**

- Exist for environmental benefit, not accessible roof-top gardens.
- Shallow soil / media (2 to 6 inches deep).
- Vegetation: shallow root structure plantings (sods and sedums), designed for harsh environments ("drought resistant" species).
- Irrigation: Little to none required, typically only during the "startup" period.
- Weight: 15 to 50 lbs/sf.

**Intensive:**

- Mixed environmental benefit and accessibility.
- Deep soil / media (9 to 18+ inches deep).
- Vegetation: Varying depth of root structures, including trees and shrubs.
- Features: Architectural features such as paving, alkways, benches, etc.
- Irrigation: Required.
- Weight: 80 to 150 lbs/sf.

Based on the type of green roofing desired, the rest of the system can be selected, including the waterproofing membrane and insulation type/location.

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# Keeping Green Roofs "Green" Through System Design

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Green roof systems are covered and constantly wet. The membrane must be capable of withstanding constant water exposure, based on this; green "roof" systems should include plaza waterproofing membranes, which are designed for this type of exposure.

Conventional roofing membranes "modified" for green roof systems may not be suitable for green roof systems. Membranes time-tested for plaza waterproofing applications should be considered.

The type and placement of the insulation is based on the type of green roof plantings. In general, the insulation is typically located above the membrane. This prevents the weight of the green roofing from compressing the insulation and damaging the membrane. In some instances, lighter weight extensive green roof systems can include the insulation below the membrane system.

Just like conventional roofing, the membrane of green roof systems must be sloped to drain. Although the membrane systems are capable of withstanding constant water exposure, it is good practice to remove water promptly and away from details to reduce the potential for leakage. Depending on the type of structural deck, slope to drain can be provided by tapered insulation or tapered concrete.

Tapered concrete adds significant weight to the structure and is more expensive than tapered insulation, but provides adequate support of the membrane in any type of green roof system and is more versatile than insulation.

Tapered insulation weighs less than concrete, but the membrane system must be installed over the insulation, limiting the type of green roofing planting types. Also, due to the installation process, tapered insulation is less versatile for non-symmetric roof plans.

In addition to the primary components list above, the following secondary systems must be included in the system, when appropriate:

Drainage Composite: Molded plastic sheet with adhered filter fabric. Allows water to migrate from overburden and migrate to the drains within the composite.

Root Barrier: When deep root structure plants are used (trees, shrubs, etc.), root barriers should be used between the plantings and waterproofing membrane to reduce the potential of roots reaching the membrane and causing deterioration.

Vapor Retarder: Depending on the waterproofing system and building conditions, a vapor retarder may be required to prevent condensation forming within the roof system.

Water Retention Layer: Depending on the planting type, water retention layers / systems may be incorporated to pond limited amounts of water within the system to maintain moisture in the planting system between rain events.

As part of the selection of a suitable system, the system details must be considered, including:

Base Flashing: For conventional roofing, the top edge of the base flashing must be at least 8 inches above the membrane surface. In green roofing, the top edge of the flashing system should be at least 8 inches above the top of the planting system.

Penetrations: For all roof systems, penetrations must be minimized to reduce the potential for water leakage. Due to access constraints and challenges, this is more important in green roofing.

Gravel: Gravel should be installed at all perimeters and around all other penetrations / details to allow water to promptly flow from these areas.

Drains: Dual-level drainage must be provided, ensuring that water can drain from the top surface of the overburden, as well as the waterproofing membrane layer.

Planters: For deep root structure plants, like trees and shrubs, independent planter boxes should be provided to separate the roots from the waterproofing system.

## Additional Considerations

Warranties: Don't rely on them. Installation first, warranty second.

Manufacturer: When possible, use manufacturers that supply all the components from the waterproofing membrane up to the planting system. This not only provides a single-source warranty, but these warranties typically include burden removal to find leakage sources.

Installation: Ensure proper design and installation by engaging a design professional. Each roof is different. Don't rely on "boxed" systems.

Flood Testing: Before installation of the overburden, a flood test of the system should be performed. Water should be at least 2 inches deep at all details. If a detail fails, it must be retested after repairs.

EFVM: Electronic Field Vector Monitoring is a technique using electrical charges to trace leakage paths. Although a suitable technology for existing membrane systems with leakage, they may not be as effective as flood testing for new systems. Flood testing backs-up water against details providing pressure which may cause improper detailing to fail and open. However, EFVM uses only a mist of water, and improper detailing may not fail and open until after the overburden is installed.

Green roofing offers significant benefits to the environment and the building owner. However, to ensure longevity of the system, proper materials and detailing must be provided. Otherwise, the cost to repair or even replace a leaking green roof system dramatically reduces the "green-ness" of the system.

*Eric J. Seaverson, P.E. is Manager of Restoration - Kalamazoo, MI headquartered StructureTec (www.structuretec.com), a total building envelope consulting firm.*

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**2010 Board Meetings Schedule:**

Feb 24th
April 21st
Dec 1st

**Board Meetings Host**

**M.E. Companies**
**635 Brooksedge Blvd.**
**Westerville, OH 43081**

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**Phone - Conferences**

Conf Comm. - Jan 13th
Board Session - Jan 27th
Board Session - Jun 30th
Phone - Conf as needed

**Conference Committee**

Feb 24th
April 21st
July 28th
Sept 1st
Oct 24th

**2010 Conference & Trade Show**
**Oct 25th & Oct 26th**

*For newsletters archive, visit our website!*
**www.opfma.org**

## 2010 OPFMA Board of Trustees and Contact Information

**President:** **Mark Wantage** - Ohio School Facilities Commission
Mark.Wantage@osfc.state.oh.us

**Vice-President:** **Ron Atkins** - Vandalia-Butler City Schools
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***Note from the Editor:***

Dear member, OPFMA publishes the "SpotLight on Maintenance" for your benefit; to better serve your interests - your feedback is of a paramount importance!

**Suggestions - Sharing Experiences - and Constructive Criticism!** Your contribution could help by adding to the newsletter topics and ideas that are of special interest to you!

Let your voice be heard - Just drop a note at: editor@opfma.org or visit our web site and simply click on "Contact Us" - I would be happy to bring your ideas in The SpotLight!

Thank you,
Alex

## Publication and Submission Terms

**"Spotlight on Maintenance"** is the official publication of the **Ohio Public Facilities Maintenance Association,** a 501(c)(3) not for profit organization for educational and professional development of public facilities maintenance employees.
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A special edition would be added as events dictate.
All materials published are copyrighted. The editor/publisher is Alexandra Schneider.

Deadline for articles and photos' submission is the 1st day of the month of publication.

All documents for submission must be **submitted in Word format** and sent as an email attachment.
All photos must be in **JPEG or TIFF format** and sent as an email attachment.

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