

2006 Effective & Innovative Practices Award Winners Show

APPA's Effective & Innovative Practices Award

continues to solicit and highlight an ever-growing list of wonderful programs and processes that enhance service delivery, lower costs, increase productivity, improve customer service, generate revenue, or otherwise benefit the educational institution. The five 2006 award-winning entries focused on staff safety, stormwater management, energy services performance, customer service achievement, and in-vessel composting.

Up to five E&I submissions are eligible each year for a cash award of \$4,000, which is generously sponsored by Sodexho Campus Services. Entries can describe either a new program or significant restructuring of an existing program or process for success. The Professional Affairs Committee selects the winning entries based on a point system. There were 24 entries this year from 20 institutions. The five successful schools received special recognition, and a check, at the joint APPA/ NACUBO/SCUP conference, the Campus of the Future: A Meeting of the Minds, in Honolulu, Hawai'i in July.

The deadline for the 2007 Effective & Innovative Practices Award is February 15, 2007. For more information or to retrieve the award application, please visit www.appa.org/recognition/effectiveandinnovativepractices.cfm.

Imagination and Practical Solutions





BROWN UNIVERSITY:

Safety Fair

By Carl O. Weaver

Carl Weaver is the former director of physical plant at Brown University, Providence, Rhode Island. This is his first article for Facilities Manager.

Brown University embraces safety training as an integral portion of its overall training program. Each year employees within the Facilities Management Department are required to complete several programs on various aspects of safety. Over the years these programs have become somewhat complacent and frankly a bit boring. In an effort to revive the overall safety awareness we embarked on the planning for a "safety fair." To ensure success we enlisted the help of our Environmental Health & Safety Department as well as our insurer and several vendors that supply our safety equipment.

We have now held the safety fair for two years and we have already begun plans for the 2007 safety fair. Of the 250 individuals that need to receive training we have had a 92 percent attendance rate each year. People who were either on vacation or on sick leave and will receive separate training. In an effort to determine the overall effectiveness of the fair we devised a test of 32 questions that addressed topics that were covered at each station. The test results were quite good as 93 percent of the attendees received a score of 85 percent or better. For those people that got more than five wrong answers, additional training in those areas was mandatory. We would estimate that we have saved many work hours by consolidating the training, not to mention that the safety knowledge attained at the fair was done in an interesting and fun environment. It is our belief that the knowledge gained at the fair will be retained longer than utilizing the traditional classroom lecture method.

Institutional Benefits

Brown has benefited in several ways by having an annual safety fair.

Congenial Environment. The safety fair was held in a different type of environment than the usual classroom type setting and it is our belief that "fair" type of environment fosters a more comprehensive learning setting than the classroom. The fair setting allows for various types of interaction. Participants were not only able to interact with the presenters but also with each other. As the people walked from table to table they were given a short presentation about a particular topic at each table and were able to question the presenters about the topic. Also, as they moved from table to table they also were able to discuss what they learned with each other which further enforced the learning experience. While the fair covers a great deal of training we also need to have some classroom sessions to meet OSHA requirements. This year we covered a one-hour session on Blood Borne Pathogens for 30 custodians and also a four-hour session on Fall Protection.

Condensed Time. We determined that the best time of year to run the safety fair was during Winter Break. This is a period where there is minimal university activity and therefore our physical plant personnel have time to devote to training without much interruption to their routine duties. We ran the fair over a two-day period of time. One day starting at 10:00 a.m. and ending at 3:00 p.m. and the second day starting at noon and ending at 5:00 p.m. This schedule allowed for each shift (AM, Day, and Evening) to have at least two hours of paid time to attend the fair. A mobile truck was parked outside of the area where the fair was being held, and we were able to perform the annual Hearing Conservation Program on the 60 individuals that required the testing. In addition, we arranged to have medical personnel administer respirator training, fit testing, and medical evaluation for 55 of the staff that utilize respirators.

Record Keeping. The condensed time period allowed for all of the records to be completed in a two-day period. Our old method consisted of a classroom setting of 15 to 50 people per session until all 250 staff was trained on each of ten topics. Typically the training would take the better part of a year to complete. At the fair each person was registered as they arrived at the site, which began the training log. When the test was graded, the log was completed and a copy of the test was filed with the log. If the individual was a candidate for a respiratory medical or hearing test, that information was made part of their record at that time. The shortened timeframe for training also allows for a quick analysis of the results, so that we can see where additional training may be necessary.

Expanded Expertise. The design of the fair was to have ten tables with a particular topic addressed at each table. Each table featured an expert in that field. Below is a table that illustrates the various topics as well as the presenting entity. Utilizing our past methodology, the presentations were

done on an in-house basis and therefore did not have the diversity of a multi-talented group.

Innovation and Creativity

The idea of having a safety fair did not originate with Brown University, but we did add some features that we have not found in other events. First of all, most fairs are generally a demonstration of a vendor's product and as people approach the table they are given a demo of the products and a sales pitch. What we did differently was to have each vendor describe their product in the context of safety training and to provide information to enable participants to answer the test questions as part of their presentation. The fair attendance is mandatory for all Physical Plant personnel. Each attendee had a printed test of 32 questions. Each table discussed the topic and, as the person listened to the talk, determined the answer to several multiple-choice questions. So as the people passed from table to table they 1) viewed a product; 2) viewed the product demonstrated in the realm of safety; and 3) received

specific verbal information that would help in the test completion.

The interaction between the attendee and the presenter was invaluable, as was the interaction among the attendees. Once each attendee turned in their completed test it was scored and, if a passing grade of 85 percent was achieved, their name was entered into a raffle. If the attendee's score was below 85 percent, they were sent back to the areas in which they experienced difficulty. They then returned to the scoring table and had their test recorded and they were then entered into the raffle. The raffle prizes (numbered about 25) consisted of tools, personal protective gear, artwork, and other items. In addition to the raffle, we also provided sandwiches, dessert, and drinks. It was interesting to overhear the discussions at the food tables. Rather than the usual conversations their discussion centered about safety.

Portability and Sustainability

Since all institutions need to provide safety training, this type of event could certainly be utilized by anyone. The topics

presented at each table could be the same or changed to meet the institutions unique requirements. One of the changes for our second safety fair included two separate rooms where a more in-depth discussion on specific topics was conducted.

In one room we presented training on Blood Borne Pathogens. The second room had a four-hour Fall Protection program for staff that regularly work at heights over six feet. Next year we will change these programs to Confined Space Rescue Training and Arc Flash NFPA 70E Training.

Since most of the training is required on an annual basis, this type of event lends itself to relatively easy annual planning. While the vendors that we used deal with Brown University, it would be easy enough to have your own group of vendors provide similar presentations. It is beneficial for the vendors as it gives them the opportunity to market their products and to also receive feedback from the customer about the product.

Management Commitment and Employee Involvement

The safety fair concept was developed and implemented by a diverse group of managers and supervisors

BROWN SAFETY FAIR TABLE SETUP

Table	OSHA Top 10	Training	Training Company
1		Working in extreme temperatures	Brown EMS
2	2	Asbestos Awareness Biohazard Awareness Lead Awareness	Brown EMS
3	6 and 9	Electrical Safety	Square D Electric Co.
4		Safe Lifting Snow Shoveling Slip & Fall Ergonomics	Beacon Mutual Insurance Co. Rubbermaid (Signage)
5		Emergency Action Plan and Fire Extinguisher Training	Brown EH & S
6	5	Eye Protection Safety Shoes Respiratory Protection Hand Protection Hearing Protection	AEARO Iron Age North Safety Wells Lamont Bacou-Dalloz
7	3	Fall protection Ladder safety	Miller Werner
8	7 and 10	Power Tool Safety Hand Tool Safety	DeWalt Tools Stanley Proto Tools
9	4	Lock Out, Tag Out Right to Know/Hazard Comm.	Brady Corporation Beacon Mutual
10		Accident Reporting	Brown Insurance Office

The knowledge gained at the fair will be retained longer than utilizing the traditional classroom lecture method.

from Facilities as well as Environmental Health & Safety, Fire Marshal, Emergency Medical personnel, and our Insurance Office. Having this size of a group not only got buy-in from all involved, but it was also large enough to get input and ideas. At the beginning, the concept of a safety fair was not given much faith that it would work. However, as discussions ensued and ideas were developed, the naysayers soon came on board. At the conclusion of the event the entire management team felt that we had collectively hit a "home run." About two weeks after the event the team reassembled and went through the "lessons learned" while they were still fresh. These thoughts were recorded and will assist in the planning for next year.


As for the employees, the feedback was incredible. Even the staunchest critics were impressed with the format, context, and atmosphere of the event. All are looking forward to next year's event. We have selected three representatives from the collective bargaining unit to assist with the planning for 2007.

Documentation, Analysis, Customer Input, and Benchmarking

Of the 250 individuals required to attend the safety fair, 228 registered and completed the test. The remaining 22 people were either out on vacation or on sick leave. Our initial target was to have 90 percent attend; the actual attendance was 91 percent.

The safety fair test results were quite interesting and to some degree proved the theory that hands-on, interactive learning produces better results than the lecture methodology. We asked 32 questions; the test results indicated that 52 attendees, or 23 percent, had a perfect score. In addition, on a cumulative basis, 68 percent or 154 attendees answered 30 or more questions correctly, and 93 percent or 210 answered 27 or more questions correctly. Our goal of having the majority of the attendees receive a score of 70 percent or better was easily exceeded.

We have not calculated the number of workhours saved, but the estimation is that the number is in the hundreds. This is based upon the past methodology that we would typically have one topic per session and that anywhere between 15 and 50 people would attend. To cover the topics presented at the fair we would have had to have over 70 sessions. One in-house presenter would provide the instruction, with over 70 sessions the possibility of having vendors present would not be practical and thus would lose the advantage of having "outside" viewpoints. 🏰



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BRYN MAWR COLLEGE: An Innovative and Collaborative Approach to Stormwater Management

By Glenn R. Smith

Glenn Smith is director of facilities services at Bryn Mawr College, Bryn Mawr, Pennsylvania. He can be reached at gsmith@brynmawr.edu.

Colleges and universities are increasingly impacted by local regulations that govern procedures for the management of stormwater. Capital construction projects must comply with stormwater collection and discharge rules, often requiring expensive and marginally effective underground basins/tanks. Bryn Mawr College recently took a far more innovative approach to this issue, electing to look at stormwater as a resource to be managed in a way that benefits not only the institution, but also the surrounding neighborhood and downstream communities. Rather than dealing with stormwater on a project-by-project basis, the college collaborated with local and state regulatory agencies to construct a pond, completed in 2002, to manage stormwater regionally.

The benefits to the college include a local township exemption from independent stormwater systems on future projects, the addition of an aesthetically pleasing water feature on campus, the potential to use water from the pond to irrigate playing fields, and the opportunity for faculty to utilize the pond as a natural laboratory. The surrounding community has benefited from better controls over the rate of discharge into natural streams, a higher quality of water being discharged, and the ability to collect and treat stormwater from a drainage basin extending well beyond the college's boundaries.

Institutional Benefits

The macro-level approach to managing stormwater as a resource has revolutionized the way Bryn Mawr College prepares and approves capital improvement projects. Prior to the installation of the pond, regulatory requirements made it necessary to install stormwater management rate and volume

controls for any new or rehabilitation project. Due to space constraints, the college installed underground stone or piped storage facilities that both infiltrated water into the ground and controlled the outfall. These systems are costly to install and their long-term function is debatable.

Our concerns all converged during the design of a new Facilities Services Building in 2000. Space constraints and utility requirements for this project required the civil engineer and college to think "out-of-the-box" and consider alternative approaches to traditional underground stormwater storage facilities. At the same time, an aging gabion retaining wall, installed through a marginal wooded area to protect a downstream athletic field, was beginning to fail. In addition, the facilities staff began to question the sustainability of installing underground stormwater facilities and consider the feasibility of using stormwater as a resource. The fact that the college maintains two tournament level athletic fields that consume over one million gallons of irrigated water a year started to enter into the equation. At first glance, these issues were unrelated and considered separate projects. Then, the realization came that a macro approach to stormwater management would address and potentially solve all of these issues.

The college's civil engineer developed a solution that replaced the failing gabion retaining wall with an earthen embankment. The system would create a pond to clean the water and better control runoff from approximately 50 acres, the majority of which extends beyond the boundaries of the college. Working with local regulatory agencies (primarily Lower Merion Township), the college was able to enter into a binding agreement whereby this pond would serve as compensation for any required stormwater management on future projects within its 50-acre main campus. This agreement would thus allow the college to proceed with capital improvements and retrofits without installing localized storm water management systems for each project.

This agreement with Lower Merion Township provided sufficient payback incentive to where the cost of installing the pond was no longer an overriding concern, but that was only one of many institutional benefits realized by the college. This macro approach to storm water management drew the attention of Pennsylvania's Department of Environmental Protection and resulted in a Growing Greener grant of \$150,000 being awarded to the college, further offsetting the cost of construction. The grant money aside, the positive public relations from receiving the award was a huge boost to the college's reputation for environmental and ecologic sensitivity.

Meanwhile, following the completion of the pond in 2002, it has been an unexpected delight to observe the involvement of the faculty and students. The pond has literally become an outdoor living classroom. Several faculty members utilize the pond for their classes and students study the topography, planning, geology, and biology of this new natural resource. In addition to the immediate college community, the pond is used as a demonstration project for other engineers, institu-

tions and land owners throughout the region. Tour groups have included: Bryn Mawr College Earth Day, Villanova University Engineering Students, Villanova Urban Storm Water Partnership, Pennsylvania Department of Environmental Protection, Pennsylvania Regional Conservation Districts, and American Society of Civil Engineers World Water & Environmental Resource Congress 2003.

Finally, from an aesthetic aspect, the pond has created unparalleled views on campus. An historic dormitory, Rhoads Hall, sits atop a slope on the east side of the pond. Looking from the west side, the dormitory's reflection can be seen in the pond. What was once referred to as "Rhoads Beach," for the sunbathing that takes place in the spring and summer, now has a true water feature!

Innovative and Creative Qualities and Characteristics

While the concept of a wet-pond is not a new or particularly innovative solution to stormwater management, we believe that our particular approach was innovative and creative in many ways. Many of the elements that we describe in the next section, elements that can easily be adopted by other institutions, were innovative departures from traditional approaches. The strategic planning process, the integration of financial planning, and the collaboration with academics, public relations and the community were all new perspectives for us. We started to think of stormwater as a beneficial resource to be effectively managed, rather than a waste byproduct to be removed. In supporting our request for a Growing Greener grant, Michael Weilbacher, executive director of the Lower Merion Conservancy, pointed out that "the proposed project is the first of its kind in Lower Merion and will serve as a demonstration project for other educational institutions and local governments." But to a large extent, the greatest degree of innovation can be found in the design of the basin itself. Robert Traver, an associate professor of civil and environmental engineering at Villanova University, stated:

From the design aspect, Bryn Mawr College is incorporating some unique features that make this project stand out. First, it is creating a stormwater pond... that will reduce pollutants... Second, it stores and uses runoff for irrigation.

The concept of capturing the stormwater, and then returning it to the water cycle, is both innovative and practical. Not only are they reducing the runoff (thereby protecting stream banks), they are also reducing usage!

When approaching stormwater management, the traditional methods either convey the stormwater as fast as possible off site or install underground basins to meter the rates of runoff. But underground basins are extremely expensive and their long-term function is questionable. This concern led to a macro-level stormwater management solution that would address the inherent shortcomings of traditional stormwater management approaches. The next innovative step was to

look beyond our campus boundaries. As a relatively small campus, we had to consider what nature was providing us in terms of existing drainage systems. In our case, the most practical location for a pond actually collected a high percentage of stormwater runoff from off campus. This reality led to collaboration with local township officials and environmental agencies. It eventually resulted in the Growing Greener grant from Pennsylvania and an exemption from the township on the need for isolated stormwater control systems on future projects—all as a direct result of shifting our paradigm and thinking about stormwater management on a more macro scale.

Once into the actual design phase, we elected to replace a failing gabion wall with an earthen embankment which retains the water, thus creating a pond. Flows from low volume, high frequency storms enter an off-line fore-bay, allowing larger particulate matter to settle out prior to the water entering the main pond. This smaller area can be cleaned without needing to drain the entire pond. Larger volume, low frequency storms bypass this fore-bay to avoid resuspending any solids and delivering them into the main pond. In the pond itself, there is a perimeter "bench," no more than 18 inches deep, to support wetland plants. These plants were selected to consume pollutants out of the water. This bench also provides a level of safety, as anyone will need to walk 15 feet into the pond prior to encountering deeper water. After the water enters the main pond, it slowly makes its way to a multi-faceted outlet structure. The primary discharge draws water from several feet below the normal water surface to allow cool(er) water to exit the pond. Below the primary outlet is an inlet pipe and system to allow for the withdrawal of water for irrigation. The pumps are not yet installed, but the system is ready. The final component of the outlet structure is a valved discharge two feet from the bottom of the pond. This allows the college to regulate the level of the pond for impending storms or completely drain the pond for maintenance.

By controlling and treating off-site water, installing a fore-bay and 15,000 square feet of wetlands, integrating valve control outlets, and considering irrigation potential—while simultaneously creating a beautiful new feature to our landscape—the stormwater management basin became far more than a simple "wet pond." It was truly a testament to creative, innovative thinking and design!

Portability and Sustainability (how this practice can be used by others)

At first glance, one might think that this project and the local regulating agency exemption from stormwater controls on future projects depict circumstances unique to Bryn Mawr College. But upon closer inspection, we believe that there is significant transferable value to other institutions in terms of the project, our process, and the strategic approach of treating storm water as a resource rather than a nuisance byproduct.

There is clearly portable value at the project-specific level. The construction of a functional stormwater management pond is not something that most of us, as facilities professionals, have a lot of experience with, and there are many aspects of its design and operation that can be shared—some of which are described above. Arguably more important, however, were several integrated planning components of our efforts that offer provocative “lessons learned” on a macro scale for consideration by others. These include:

The Strategic Planning Process

The conception of this project was the result of global thinking. The act of articulating the issues and objectives before rushing to “the solution” allowed us to imagine alternatives that could solve multiple needs. We stopped and asked ourselves, “Just what is it we are looking to accomplish with our campus stormwater management initiatives?” This allowed us to see beyond our immediate specific project-by-project needs and envision a broader approach. Treating stormwater as a resource to be developed and managed on the scale of an entire drainage basis is something all institutions should consider.

The Integration of Financial Planning

Part of the success of our initiative was the integration and communication of the financial implications and opportunities. Acknowledging and including financial considerations from the beginning contributed to the broad campus support for the project. The life-cycle analysis proved payback and cost/operational savings in less than three years. Also, the successful effort to obtain grant funds to assist in funding the project only further justified the value of the financial investment. In an era of reduced sources of external funding, we have discovered that the availability of outside support for environmental improvements is on the rise. Receiving support from off campus also provides added validation for the project. It also changed the way Facilities Services is viewed by senior administrators and trustees. We are not just a department that spends money, appearing only on the expenditure side of the ledger, but one that is willing to seek out resources for applicable projects. We have become a source of revenue.

Collaboration with Academics, Public Relations, and the Community

In spite of the many benefits, too many operational/administrative initiatives on campuses fail to capitalize in these important areas. Similar to the integration of financial planning, we sought engagement from faculty, staff, students, our campus public affairs office and the local community from the beginning. These connections broadened the support and value of the



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project far beyond our wildest hopes. Other institutions should explore opportunities for improving collaborative relationships among these all too often disparate groups and a macro approach to stormwater management affords such an opportunity.

The “Pond” Itself

Last, but not least, the specific retention pond paradigm can be applied directly to other campuses. It can be implemented as a best management practice for stormwater rate control, water quality improvement and a potential source for irrigation. As we designed the retention pond, we used hypothetical models to predict some of the measurable benefits. By actual monitoring since completion, we have met or exceeded all of these benefits. We would enthusiastically endorse the use of this approach to storm water management to any campus with similar needs and circumstances.

Management and Employee Commitment and Involvement

Our Facilities Services mission statement reads, “To maintain, preserve, enhance, and promote the campus character of Bryn Mawr College.” While the notion of ***maintaining*** and ***preserving*** deal with the physical plant that already exists, the concept of ***enhancing*** requires that we stay flexible, embrace change, be innovative, and think out of the box to improve the way our physical spaces and features support our academic mission and the quality of life of our students. The need to provide a means of stormwater management for our new Facilities Services complex forced us to start thinking in creative and innovative ways. At the same time, the words of our president, Nancy Vickers (“What this campus needs is a nice water feature”), gave us an inspirational clue to a solution. The first time we heard her say that, most of us in the Facilities Services Department cringed, but now we began to formulate a plan that would manage stormwater as a resource and, at the same time, enhance the aesthetic beauty of the campus, while providing educational opportunities for our students.

From those simple beginnings, the vision of a stormwater management pond rapidly gained support and commitment throughout the campus community. The gentle slope on the west side of our dormitory, Rhoads Hall, terminated at a small, swampy grove of old and decaying trees. The thought of replacing those trees with a pond won immediate favor with the students—a love affair that continues today, four years after the pond was constructed. Our student Greens group has also embraced the environmental aspects of the pond, specifically its ability to remove solids and other pollutants from the drainage basin ecosystem and regulate flow volumes downstream during flood conditions.

The senior administration, generally cautious about any major change to the campus landscape, agreed that this was an exciting opportunity to enhance the landscape while addressing long-term stormwater management concerns across

campus. Their support, and that of the college’s governing trustees, was firmly established once Lower Merion Township agreed that the pond would satisfy future stormwater management requirements on the main campus for any and all future projects. Alumnae have also become vocal advocates for this new addition to the campus landscape, and it has become a highlight of the campus tour given by Facilities Services each year during Reunion Weekend.

But what about the faculty? In truth, they have become the staunchest supporters of this initiative. In the words of Victor Donnay, one of our math professors:

As the pond was being built, faculty from a range of departments (Geology, Chemistry, Anthropology, Mathematics) formed a study group to examine ways that we could make use of the pond in our work with students. I had a student do some research with me on mathematical modeling. Her project was to create a computer simulation of the pond system that would take into account rainfall, flow in and flow out of the pond, and predict the changing water levels in the pond during storms. Working with the pond faculty group has greatly stimulated my interest in environmental issues and I now include a large component of environmental modeling in my differential equations course.

Finally, the team within Facilities Services tasked with maintaining the pond and operating the valve station have developed a healthy sense of ownership. They monitor weather forecasts to prepare for and respond to any potential flooding conditions. They developed a creative way to camouflage the concrete valve station with natural plantings, much to the pleasure of President Vickers. They have effectively addressed concerns over mosquitoes and geese, and they have embraced the need to learn how to maintain this new landscape feature as it matures over time. We have already cleaned out the fore-bay one time—a mucky, but fun time for all, and we take great pride in our latest equipment addition—a small rowboat.

Results, Analysis, Customer Feedback

It has been approximately four years since we completed construction of the pond and put it in operation. Has it lived up to its billing? Would we do it again? Would we recommend this approach to others? Without hesitation, we would answer “Absolutely!” to all three questions. In fact the pond has across-the-board exceeded our most optimistic expectations.

The pond has become an “overnight” favorite landscape feature of the campus. Students, faculty, staff, senior administration, trustees, and alumnae, seemingly without exception, agree that it has added immeasurably to Bryn Mawr’s beautiful campus. (See picture page 51.)

But its performance as a stormwater management instrument has been the most impressive. On three occasions during the past four years we have effectively drained down the pond in anticipation of major predicted storms, and each

time we have been able to collect greater volumes of stormwater runoff and gradually release it over time into the downstream creek. Furthermore, we originally calculated that the following pollutants would be removed from the stormwater runoff (in lbs/year): suspended solids (14,700), total phosphorous (25), total nitrogen (105), oxygen demand (2955), trace metals (23). Actual measurements indicate we are meeting or exceeding these projections. Dominic Rocco with the Watershed Management Section of the Pennsylvania DEP says:

Bryn Mawr College was really innovative and ahead of the times when they built their stormwater wetland basin... They embraced the idea of looking at stormwater as a resource.

The college worked collaboratively with state, county and local authorities and organizations... the final product had many additional functions and values—such as habitat improvement, water reuse and water quality treatment.



On the subject of collaboration, Robert Duncan, Lower Merion Township manager, had this to say:

Their innovative design of a stormwater management pond and the collaboration they fostered with the state and county, as well as Lower Merion Township, set a positive example for other institutions... to emulate. The fact that their pond draws much of its stormwater runoff from off campus points to the true partnering nature of this initiative.

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Improved public relations throughout the community and state is hard to measure, but we are convinced that the respect and trust earned on this project led to a \$385,000 Growing Greener Grant only one year later for an unrelated stream bank realignment project. On the educational front, the pond continues to receive strong support from the faculty. Blythe Hoyle, a laboratory lecturer in our Geology Department, describes how she and her students are learning from this stormwater ecosystem:

The pond is an invaluable outdoor laboratory in which students in geochemistry and environmental science gain hands-on experience with real water management issues, including water quality, nutrient cycling, and carbon storage. In addition, we study the creek into which the pond water is released. Having access to the entire hydrologic system, from the inflow



“Lake Vickers” in 2003 reflecting Rhoads Hall

culvert bringing water into the pond, to the pond’s outflow into a local creek is a rare resource that allows our students to learn how larger systems function.

The one as yet unrealized benefit of the pond is the potential to use the water to irrigate our two athletic playing fields. We are actively seeking funds for the irrigation pumping station, and hope to have it functioning in the near future.

But perhaps most importantly, the pond has pulled various factions of the Bryn Mawr community together, unlike anything those of us in Facilities Services have ever before experienced. It is a shining example of senior administrators, facilities professionals, students, faculty, trustees, township officials, and state environmentalists all working together collaboratively toward the common benefit of all. It is a “win-win” many times over! 🏰



**CALIFORNIA STATE UNIVERSITY
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CALIFORNIA STATE UNIVERSITY-
SAN BERNARDINO

The Comprehensive Energy Services Master Enabling Agreement

By Tony Simpson

Tony Simpson is director of facilities services at California State University, San Bernardino; he can be reached at tsimpson@csusb.edu. This is his first article for Facilities Manager.

It is the goal of the California State University to improve campus-building performance and achieve the lowest environmental impact feasible, by continuing to practice responsible stewardship using available resources. While the 23 campuses of the CSU system have aggressively pursued energy conservation and sustainability programs, their ability to implement these projects was constrained by state procurement requirements, project funds, and access to the intellectual capital of firms experienced in energy optimization and retrofitting existing plant and facility systems.

The Chancellor’s Office Plant, Energy and Utilities group, working with the Contract Services and Procurement, General Counsel, and the Finance and Treasury departments, developed a program to enable CSU campuses to aggressively seek and implement conservation opportunities. *The Comprehensive Energy Services Master Enabling Agreement (CESMEA)*, program provides campuses with a cost effective, efficient delivery system to promote the development of utility and infrastructure improvement projects to lower operating costs, reduce deferred maintenance backlog and complement CSU’s sustainability initiatives.

The CESMEA is designed to streamline project assessment, development, construction and implementation of utility and infrastructure improvements, while enabling timely responses



to executive initiatives, grant and incentive programs. The agreements were signed in 2005 and already 21 campuses are participating in the program.

CESMEA Institutional Benefits

The California State University (hereafter called the CSU) is the largest system of higher education in the nation. The CSU comprises 23 campuses located in diverse geographic regions throughout California representing a wide range of campus sizes and program requirements. The CSU has campuses as far north as Humboldt State University in Arcata, California and as far south as San Diego State University in San Diego, California. A 24-member Board of Trustees governs the system. The Office of the Chancellor, commonly known as the Chancellor's Office, is the corporate headquarters for the system.

During fiscal year 2004-05 CSU campuses expended approximately \$100 million on water, gas, electric and sewer. Over the last 30 years the CSU has reduced energy use intensity by 49 percent. During the past 15 years several campuses have aggressively pursued energy conservation and have already incorporated a number of energy conservation measures. Given the size and complexity of building systems, there remain many additional opportunities to enhance building systems efficiency and reduce overall utility costs. Opportunities for energy projects exist at campuses in lighting systems, HVAC systems, building controls, automation, central plants, and energy infrastructure including combined heat & power (CHP) systems. Additionally, the application of renewable energy projects on campuses, an objective of CSU's sustainability initiative, provide further opportunity for energy savings.

The Comprehensive Energy Services Master Enabling Agreement (CESMEA) program provides campuses with a cost-effective, efficient delivery system to promote the development of utility and infrastructure improvement projects to lower operating costs, reduce deferred maintenance backlog and compliment CSU's sustainability initiatives. If the energy

savings achieved are only 10 percent of the total energy expense, CSU will be saving \$8 million. If the savings increase to 15 percent, the savings are closer to \$12 million. Reinvesting \$8 million in savings can fuel more than \$60 million in improvements to provide better facilities for students, faculty, and staff. It can also meet institutional goals for greenhouse gas reduction and compliance with state and federal guidelines.



An Innovative Program and Practice

This agreement proves that the California State University Chancellor's Office is committed to energy efficiency and sustainability and they are supplying the resources and money to their campuses to help us meet these commitments. In a very tangible way, we are showing our students, staff, faculty, and fellow Californians that we intend to lead the way to a greener California. If each of the campuses had to design and implement this program on their own, it would be redundant, inefficient and often overwhelming. The innovation of the Master Enabling Agreement is that it helps our campuses by providing us:

- Seven qualified companies to work with
- A simple process to choose the best firm for that campus from the seven
- Training and support on the necessary contracts and paperwork
- Access to financing

In March 2004, the California State University, Office of the Chancellor, Contract Services and Procurement issued a request for qualifications (RFQ) to identify through competitive means a list of qualified firms to provide cost-effective and reliable energy related services to the various CSU campuses throughout California. This RFQ was the qualifying process to satisfy competitive means pursuant to the CSU Energy Conservation Contract Authority, Section 10709 of the Public Contract Code. This competitive process established a list of the best-qualified firms that have the size, resources,

financial ability, expertise, and necessary experience to provide the services required for this program.

The process is simple and works as follows:

- A campus selects no more than three, and no less than two, firms from the approved list to do a preliminary review of potential energy efficient projects on campus and write a report of the findings—a *Preliminary Assessment (PA)*. All fees for the PAs were negotiated as part of the original RFP.
- The results of the PA from the selected firms are reviewed by a third party Independent *Peer Reviewer* to verify feasibility and energy savings projections. After the peer review, the campus selects one firm to move forward to the next phase.
- The selected firm is contracted to perform a more detailed and specific review and audit of the proposed energy efficient projects and prepares a detailed written *Investment Grade Assessment* report of the findings and cost proposal.
- The Investment Grade Assessment is reviewed by the campus and a third-party Independent Peer Reviewer to verify energy savings, costs, feasibility, and that the project meets the required criteria to obtain financing.
- Following a successful peer review of the Investment Grade Audit, the campus will decide whether to move forward and will then negotiate the price and enter into a *Design/Build Agreement* to construct the project.
- When financing is required, the construction of the energy efficient project is the *Project Delivery (PD)* phase. The suggested minimum dollar amount for an energy efficiency improvement project, under this program, is \$1.5 million total project cost.
- The final phase is the Performance Period which measures project performance in accordance with the International Protocol for Measurement & Verification standards. *Schedule and Performance Risk Value* is a dollar amount valued at 6 to 8 percent of the project construction cost and is withheld and paid in arrears during project closeout if the project performs as designed—thus limiting the campuses risk for a successful project.
- The process has been designed to leverage the existing university

equipment lease financing terms, which are preferable to most ESCO financing terms.

This Program Can Work for Other State University Systems

Nationwide, there are as many or more state university systems as there are states. These colleges and universities provide access to higher education to students who might otherwise be unable to afford a quality education. Without an educated populace, our country cannot compete in a global economy. Yet, rising tuitions, shrinking state contributions

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and shifting populations are challenging all of our state systems: so saving money and operating more efficiently is becoming more important than ever before. Similarly, U.S. colleges and universities are taking a more global approach to environmental and economic issues and the need to find renewable, sustainable energy sources while reducing our dependence on foreign oil.

At the same time, many states, like California, have mandates for improved energy usage. In our state it is the Governor's Executive Order S-20-04 which calls for the state to commit to aggressive action to reduce state building electricity usage by retrofitting, building, and operating the most energy and resource efficient buildings by taking all cost-effective measures described in the Green Building Action Plan for facilities owned, funded, or leased by the state and to encourage cities, counties, and schools to do the same. And that state agencies, departments, and other entities under the direct executive authority of the governor cooperate in taking measures to reduce grid-based energy purchases for state-owned buildings by **20 percent by 2015**, through cost-effective efficiency measures and distributed generation technologies; these measures should include but not be limited to:

- Designing, constructing and operating all new and renovated state-owned facilities paid for with state funds as "LEED Silver" or higher certified buildings; and
- Identifying the most appropriate financing and project delivery mechanisms to achieve these goals.

The bad news is that without creative, innovative delivery solutions like the CESMEA, our university system and others will be hard pressed to meet aggressive energy purchase reduction guidelines. The good news is that we believe that with adequate support from the governing body of a university system, a willingness to think about procuring services differently and a team of dedicated employees willing to shepherd and champion the process, this CESMEA can exist in other states.

The lessons learned we will share with other colleges and universities are these:

- This is a team effort—no central office, single campus, or single department is as important as the whole team.
- Make it easy to participate and deal with funding and borrowing issues up front.
- Satisfy all procurement regulations, state guidelines with standard terms and conditions and leave the project specific information to the discretion of the campus.

- Provide technical review support—this is not always available at a local level.
- There are organizations like APPA and the National Association of Energy Services Companies that will help you structure your program and provide information.
- The companies we qualified act as our partners and are treated like partners.
- Sometimes you have to be willing to give up some control (which many worry about with a design/build process) to get to success. Make sure you have a way to measure success and you will shed risk and decrease your worry.
- Communicate the plan, educate the participants and never stop asking questions. Every program can be better.
- It may take longer than you would like, but the rewards will be great.
- Thank the people who make it happen.

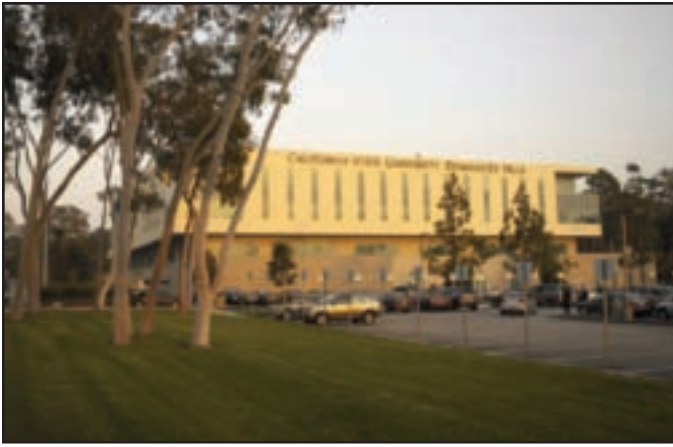
Employee Commitment Drives the CESMEA Success

The Comprehensive Energy Services Master Enabling Agreement is a great example of what can happen in a state university system when central office programs are instituted to meet local campus needs. It is truly an enabling tool to help us reduce operating expenses and improve our campus facilities.

A tool like the CESMEA does not get put together without the effort of a large team of dedicated managers and employees. The Chancellor's Office Plant, Energy and Utilities group, under the direction of Elvyra San Juan, tasked Len Pettis, the Chief of Plant, Energy and Utilities to work with the Contract Services and Procurement, General Counsel and the Finance and Treasury departments to develop a plan to help campuses become more energy efficient. Len worked tirelessly with Haaziq Muhammad, public works contract specialist in the Contract Services and Procurement department, and Marlene Jones of General Counsel to design the RFQ to find the partners to help the campuses.

As part of that process, they had to assure that they not only found the right partners and established the benchmarks for success; they also had to make sure they were following CSU general conditions guidelines for contracting services. The original RFQ also established General Terms and Conditions for program, including design/build contracting requirements, insurance levels, and small business preferences.

In other words, the general terms of the programs were established at the chancellor's office level, while the campus specific conditions, including provisions tailored to meet local campus needs, e.g., utilities to be included in base bid, issuing keys, traffic and parking control, were assigned to the individual campuses to customize. To be sure the local campuses were part of the process; Len established a selection committee to provide advice and comments on the process and the RFQ.



As previously stated, one of the barriers to campus participation has been access to capital to finance or pay for the initial investment in energy efficiency equipment and upgrades. In the RFQ, it was established that the Financing and Treasury department shall provide all financing arrangements for projects. Walter Marquez of the Financing and Treasury group at the Chancellor's Office is supporting the process and through a separate public competition has negotiated lease terms and conditions with seven financing companies.

However, no program is successful without the educational component to get people up to speed on how to use a tool like the CESMEA. Training sessions have been held for campus plant managers, procurement officers, and financial staff that have included the seven Energy Services Company partners. After Haaziq Muhammad's retirement, Irene Patriotis has picked up the contracting support role for the project. Together, she and dozens of others at the CSU Chancellor's Office assure that we at the campuses have adequate access to and support of the CESMEA.

The Comprehensive Energy Services Master Enabling Agreement is a Success!

This program is fairly new, yet is already showing significant participation from the CSU campuses. From our perspective as one of those campuses in the system, we feel most confident in the process because the terms of the Comprehensive Energy Services Master Enabling Agreement provide us a level of security that the projects must perform.

Specifically, the *Schedule and Performance Risk Value* is a dollar amount valued at 6 to 8 percent of the project construction cost. The measurement for schedule and performance threshold is 80 to 100 percent. If the performance is less than 80 percent of what is proposed in the Design/Builder's PD Proposal, the Design/Builder has the option to correct failures at its own expense.

The Schedule and Performance Risk Value is withheld and paid in arrears during the project closeout upon satisfactory completion and acceptance of the following:

- Completion of the entire project scope:

- ❖ Design and Preconstruction Services.
- ❖ Energy Conservation and Capital Improvements.
- Commissioning.
- Successful performance test of systems and equipment to establish that the systems and equipment meets or improve on the performance standards set up in the Special Conditions and/or Design/Builder's PD Proposal.
- Application for utility incentives, if any.

At CSU San Bernardino, we are finalizing an IGA with DMJM Harris Energy & Power that includes new high efficiency electric chillers, a thermal energy storage tank, roof mounted solar panels, controls system modifications and upgrades including VFDs and CO² monitoring, high efficiency lighting, personal computer network energy management system, water conservation program and a new well for irrigation.

Systemwide, the following campuses are already participating in the process:

Bakersfield—audit proceeding to IGA
 Chico—developing scope for PA
 Channel Island—developing scope for PA
 Dominquez Hills—developing scope for PA
 East Bay—IGA
 Fresno—IGA
 Fullerton—developing scope for PA
 Humboldt—completed a cogeneration plant
 Long Beach—developing scope for PA
 Los Angeles—developing scope for PA
 Maritime Academy—developing scope for PA
 Northridge—developing scope for PA
 Pomona—developing scope for PA
 San Bernardino—IGA
 Sacramento—IGA
 San Francisco—developing scope for PA
 San Jose—developing scope for PA
 San Luis Obispo—developing scope for PA
 San Marcos—developing scope for PA
 Sonoma—developing scope for PA
 Stanislaus—developing scope for PA

IGA = Investment Grade Assessment
PA = Preliminary Assessment

If these campuses find the same energy efficiency projects and renewable energy opportunities that we have found at San Bernardino, the largest state university system in the United States will be the greenest too. After all, *every dollar saved on energy is one more dollar invested in California's college students.* 🏛️



GEORGIA INSTITUTE
OF TECHNOLOGY:

Building Services Customer Achievement Program Award

By Tommy Little

Tommy Little is manager of building services at the Georgia Institute of Technology, Atlanta, Georgia; he can be reached at tommy.little@facilities.gatech.edu. This is his first article for Facilities Manager.

This program was established in the Building Service Department/Facilities Division at the Georgia Institute of Technology in June 1997. The goals and objectives of the Building Services Customer Achievement Program Award was to design a system that would improve customer service, foster teamwork, create an employee incentive program, improve communications, and correct deficiencies before they become problems. This program was first implemented as a pilot program and funded for one year by our senior vice president for finance and administration, Robert K. Thompson. The results have been so positive that we are now in our eighth year and have been profiled in a national campus facility maintenance magazine.

Institutional Benefits

Georgia Tech, like most public colleges and universities, has had to tighten its belt and look for innovative ways to improve operations across the board. Our Building Services Customer Achievement Program Award has aided in this endeavor. Having the responsibility of managing six million square feet of cleaning space, this program has provided instant feedback from our customers as to the quality of work performed in their area by the Building Services Department. The program has given the Georgia Tech community a sound mechanism to correct deficiencies before they become problems. The program has also fostered a better working

relationship between Facilities and the academic and administrative units throughout the Georgia Tech community.

Characteristics or Qualities that Make This Program Different:

In order to ensure the success of this customer service program, much effort was placed on employee involvement. Our goal was to design a program that would benefit all parties and show each how they would benefit. The parties that made up this program were management, the customer, and the employee.

Every four months the Building Services Department sends a customer evaluation form out to the campus community requesting their assessment of the custodial services provided in their building. The evaluations are marked with a due date to return to the building services manager's office. Once the due date has expired all evaluations are divided into nine custodial zones and graded in nine different categories. Once all the guidelines have been met, the winning zone members receive a plaque to be displayed in our building and are treated to a catered meal.

The customer and management benefits from this program by receiving a cleaner building and improved communication between their department and Facilities. Each zone is in competition to win this award. Therefore, the employee actively seeks out improvements that can be made in their building and solicit suggestions from the customer. The program also fosters teamwork because it requires all 30 employees in each of the nine zones to work together to produce a winner.

On the day of the award the building services manager meets with the entire department and invites the senior leadership of the Facilities Division to participate in the award presentation.

How This Practice Can be Used by Others

This practice can be easily duplicated at other universities or custodial operations. The keys to making this program successful are:

1. Gain the trust and respect of your employees, customer base, and leadership
2. Establish your target market
3. Show the employee population how they will benefit from this program
4. Involve the senior leadership at your institution
5. Make sure that your Corrective Action Procedure work and ensure consistency

Management Commitment and Employee Involvement

Employee involvement is critical to the success of any business organization. It is the employees that will make or break your organization. This program was designed with the employee in mind. The employee is the key architect, building relationships with our customer base. Without strong motivated employees this program would fail.

Management must ensure that the commitment is there from top to bottom. Toward that end, management has been success in securing funds to support this program for the past seven years. Management has provided the leadership to keep

the program on track. Management has ensured the success of the program by involving the customer and the employee. The employees are empowered to take appropriate steps to address cleaning and service issues. 🏢

Graph 1

All Zones (Zones 1-9)

Customer Service Evaluations (October 2004)

Number of evaluations: 53

	Excellent 100%	Good 85%	Average 70%	Fair 50%	Poor 0%	Number of Responses	Average based on # of responses
Courteousness of staff	39	13				52	96%
Appearance of staff	28	24				52	93%
Classroom cleanliness	18	20				38	92%
Bathroom cleanliness	21	23	6	1	1	52	87%
Hallway cleanliness	28	22	2			52	93%
Stairway cleanliness	21	19	8	3		51	87%
Floor cleanliness	24	22	5	2		53	89%
Fixture cleanliness	23	22	4	1		50	90%
Office cleanliness	24	22	4	2		52	89%

Overall Average: 91%

Waytha's Evaluation Graph

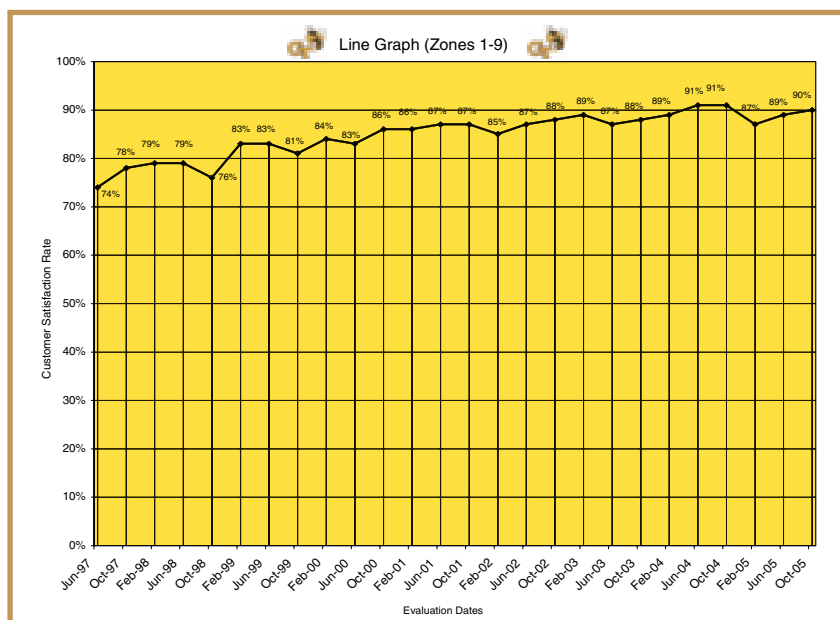
Supervisor: Waytha Gordon (Zones 5)

Customer Service Evaluations (October 2004)

Number of evaluations: 7

	Excellent 100%	Good 85%	Average 70%	Fair 50%	Poor 0%	Number of Responses	Average based on # of responses
Courteousness of staff	7					7	100%
Appearance of staff	5	2				7	96%
Classroom cleanliness	4	3				7	94%
Bathroom cleanliness	2	5				7	89%
Hallway cleanliness	5	2				7	96%
Stairway cleanliness	3	3	1			7	89%
Floor cleanliness	3	3	1			7	89%
Fixture cleanliness	3	4				7	91%
Office cleanliness	4	2	1			7	91%

Overall Average: 93%





UNIVERSITY OF BRITISH COLUMBIA:

UBC's In-Vessel Composting Facility and Organics Collection Program

by Rachel So

Rachel So is communications coordinator, waste management, for the University of British Columbia, Vancouver; she can be reached at rachel@recycle.ubc.ca. This is her first article for Facilities Manager.

The University of British Columbia is a committed leader in campus sustainability, and has employed an innovative method of diverting valuable organic waste material away from landfill disposal. UBC Plant Operations' In-Vessel Composting Facility is the first of its kind at a Canadian university; it promotes a closed loop system by processing food and landscape waste on-site into a rich compost material for use in campus gardens. At peak capacity, the facility can process five tonnes of food waste daily, and can yield compost in just two weeks. This system exceeds the capabilities of traditional composting, as it can process pre- and post-consumer food wastes including meat, grain and dairy as well as paper towels, cups and plates.

Following the inaugural year of the program, the campus community has benefited from: diversion of 97.5 tons of campus food waste from the landfill, increased education and research opportunities for faculty and students, and advancement opportunities for staff. Composting has also resulted in a 57 percent reduction in bark mulch required for campus gardens. As the program expands, UBC will continue to reduce landfill disposal, decrease off-campus truck traffic, and decrease expenditures on waste disposal and soil amendments and fertilizers for campus gardens.

Innovative Characteristics of the Program

As the first Canadian university to adopt and implement a *Sustainable Development Policy* to oversee the impact of our actions as a campus community, the University of British Co-

lumbia remains committed to sound environmental practices. Diverting organic material from the landfill is a significant environmental issue that UBC Plant Operations and its UBC Waste Management group seek to address. Landfills do not possess an infinite spatial capacity to handle waste, contribute to the emission of landfill gases, and perturb the carbon and nitrogen cycles by preventing the decomposition of organic matter. In September 2004, UBC Plant Operations was proud to introduce its In-Vessel Composting Facility and the accompanying Organics Collection Program. Together, the two programs have greatly enabled the Waste Management to tackle the issue of waste reduction at an expanding university.

Currently, UBC is the first and only Canadian university with an on-site system that processes organic wastes into valuable compost for garden beds on campus. The In-vessel Composting Facility enables the university to process up to five tonnes of food waste daily, and generates the compost from the organic material following a retention time of only two weeks. The in-vessel system exceeds the capabilities of the traditional means of large-scale composting: pre- and post-consumer food waste, meat, grain and dairy products as well as paper towels, cups and plates can all be composted. The enclosed system maintains the optimal temperature, moisture, oxygen and initial carbon to nitrogen ratio levels for accelerated microbial decomposition, such that the finished compost is free of any chemical additive. Moreover, the enclosed composting system eliminates vector and odour problems that often accompany the decomposition of putrescible material in large-scale open composting processes. The in-vessel process ensures that environmental and health risks are eliminated: leachates are recycled and odourous exhaust air is passed through a bio-filtration system.

In the past year, the In-Vessel Composting Facility and Organics Collection Program have already helped the campus community compost 97.5 tonnes of food wastes! It is anticipated that as the program continues to grow, the material that is diverted by our recycling and composting programs will substantially outweigh the amount of material that requires disposal at the landfill.

Institutional Benefits, Results

The Organics Collection Program collects materials from campus locations that generate large volumes of food waste, such as residences, food outlets, private housing as well as department lunchrooms. This program is a great step towards reaffirming the university's policy of reducing our environmental impact by taking responsibility for waste disposal practices. Currently, the university's population consists of over 55,500 students, faculty and staff. The university is committed to campus sustainability and addressing the long-term waste management requirements for a growing university town, which will include over 10,000 new on-campus residents by 2021. It is expected that in actively promoting sustainability and responsible waste management

The in-vessel system exceeds the capabilities of the traditional means of large-scale composting and ensures that environmental and health risks are eliminated.

practices, composting will be regarded as a social norm in the campus community.

The composting program has benefited many members of the campus community. Departments on campus producing a great deal of organic material that can be diverted from the landfill, such as paper disposables and kitchen scraps, have achieved their environmental goals by participating in the program. Other units within UBC Plant Operations, such as the landscape crew, have benefited directly from the use of the final compost that is produced. Academic departments have used the opportunity to involve the In-vessel Composting Facility in their coursework. Faculties, such as Land and Food Systems, have gained an invaluable undergraduate and graduate learning opportunity. In continuing with actively promoting the campus compost program, it is anticipated that campus community involvement, awareness, support and research opportunities will continue to expand.

In the past year, UBC has composted over 385 tonnes of organic material from both the campus and the local community. In terms of food wastes generated on campus, the In-Vessel Composting Facility has processed over 2800 bins, each with the capacity of 35 gallons of food waste in volume. This volume accounts for the diversion of 97.5 tonnes of organic material from the landfill! Campus yard wastes are also diverted from the landfill. In the past year, 200 tonnes of yard waste were composted. Yard waste is used as a carbon source for the In-Vessel Composting process. In terms of the organic waste from the local community, UBC Waste Management has also developed a partnership with a non-profit organization, Quest Outreach Society. Quest Outreach Society is a non-profit

organization that secures food sources for those in need. The university has enabled this group to compost 91 tonnes of food waste since the start of the partnership in July 2005.

Composting on campus translates into an immediate institutional cost savings, as the local landfill disposal fee is \$65 per ton of waste. In addition, further cost savings are also gained from the time and cost of labour that is required for trucking the wastes off-campus. The productive secondary use of our organic waste has allowed for the landscape crew to shift its strategy in maintaining campus landscapes. By hav-

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As a result of increased enthusiasm for the program, UBC Waste Management has observed an eight-fold increase the number of organic collection sites in just 13 months!

ing fresh compost at hand, the landscape crew has decreased the volume of topsoil used in gardens by almost four-fold!

By processing food wastes on campus, UBC Waste Management is also effectively contributing to the university's target for emissions reduction. Truck traffic to and from campus is reduced by processing the majority of food wastes on-site, as opposed disposal at an off-campus location. The final compost yield also helps reduce the amount of off-campus bark mulch that must be purchased and brought onto campus as topsoil for garden beds. The use of UBC produced compost for campus landscaping has resulted in a 57 percent decrease in bark mulch delivery traffic. As UBC Waste Management extends its services on campus, it is anticipated that the entire amount of topsoil on campus landscapes may potentially be produced directly on site. Subsequently, reducing emissions from in-coming truck traffic.

Portability and Sustainability

The concept of a large-scale enclosed composting system can be easily applied for any large community that is keen to make an investment in responsible waste disposal. In-Vessel

composting may also be suitable for communities that may be facing diminishing landfill space as well as unrealistically high waste disposal or landscaping costs. While the technology is applicable to any community at large, the applicability for institutions would be limited to the fact that there is a large amount of organic material that requires disposal.

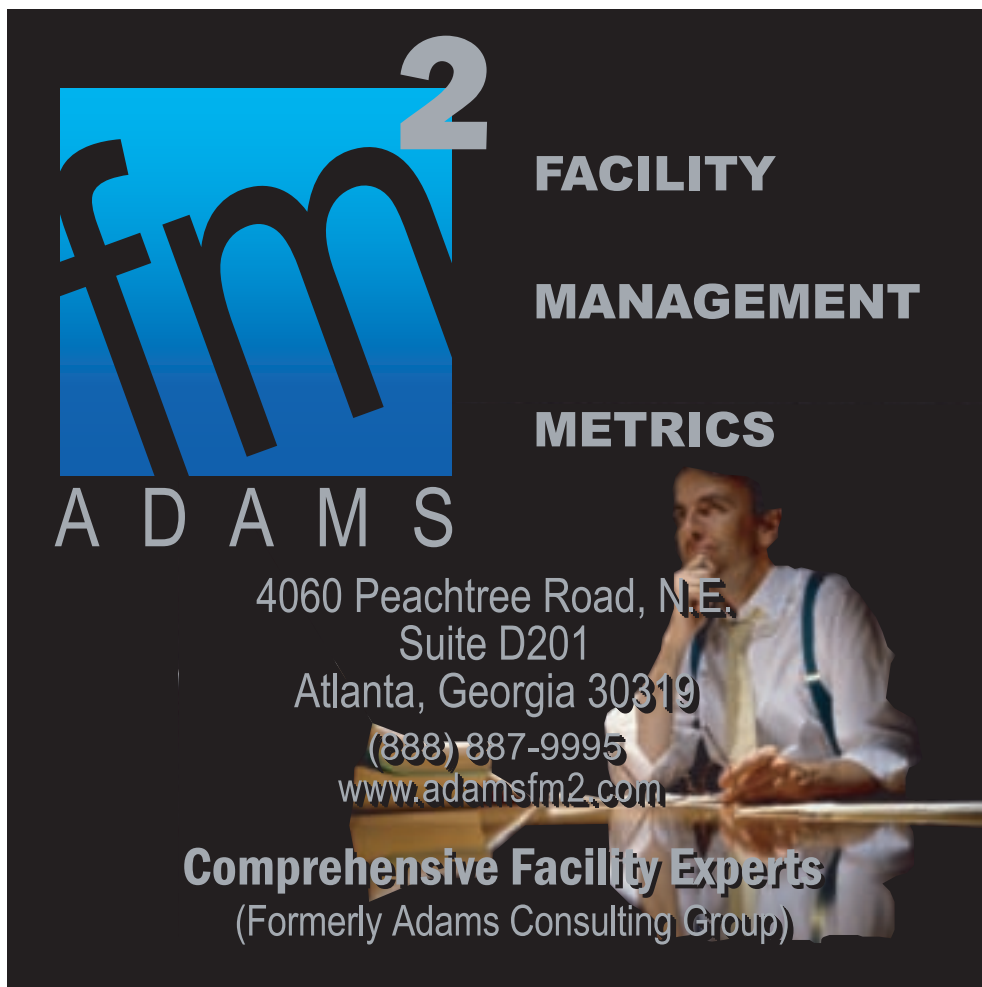
UBC's In-Vessel Composting Facility operates as an integral part of UBC Plant Operations. In generating awareness of an In-Vessel Composting Facility early on in the planning process, the project was well received by the campus community upon its completion as a response to the issue of campus waste reduction. Other organizations, such as Quest Outreach Society, have also benefited from the use of the In-Vessel Composting Facility. UBC Waste Management has developed a partnership with Quest Outreach to ensure that this technology can be made available to groups that may not have similar financial support for a large-scale compost program.

Organizations, such as the Granville Island Markets, Red River College and Simon Fraser University, have met with UBC to discuss the feasibility of implementing a similar program in their respective communities. The concept of

community-wide composting is gaining more attention in many communities, and UBC Waste Management continues to embrace the opportunity to work with organizations in developing an effective large-scale composting program.

Management Commitment and Employee Involvement, Results

There is a great deal of support from both management and employees involved with the In-Vessel Composting Facility. Management has gone to great length to secure personnel that are committed to ensuring an efficient and successful compost operation by creating new training and advancement opportunities. Management has also demonstrated its commitment to the in-vessel composting venture by providing operating personnel with all the infrastructure and equipment that they require for the efficient and effective operation of the facility. Employees have responded positively by taking real ownership over the composting program and routinely communicating



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their ideas for operational improvement and development of new promotional programs. Regular meetings are held between all operational stakeholders, in order to communicate concerns as well as new ideas.

The commitment and participation of the campus community in furthering the composting program has been resounding. Campus departments such as the Sustainability Office, UBC Food Services, the Alma Mater Society, UBC Housing, as well as student groups such as the Student Environment Centre and Graduate Student Society, have been actively involved with UBC Waste Management in the development and promotion of composting on campus. Working closely with such departments has generated teamwork amongst staff, faculty and students, and has resulted in increased financial support as well as assistance with program implementation. Such efforts have resulted in increased academic-based coursework relating to the In-Vessel Composting system, volunteer-run promotions and displays as well as research opportunities. In addition to program development, many individual staff members have taken active roles in promoting composting amongst their colleagues. Many enthusiasts have ensured that their departments remain active with the Organics Collection Program by developing materials specifically oriented to their colleagues. Compost enthusiasts have also helped initiate building-wide composting programs as well as the expansion of compost programs into private housing on campus. As a result of increased enthusiasm for the program, UBC Waste Management has observed an eight-fold increase the number of organic collection sites in just 13 months! It is anticipated that this number will steadily increase as new housing developments and food outlets become involved with the Organics Collection Program.

Customer Feedback and Resulting Benchmarks

Participants of the Organics Collection Program are quick to provide feedback to the department. The client and service-provider relationship that compost coordinators have with UBC Waste Management ensures that the department is held accountable for its programs by upholding and enhancing customer satisfaction. Participants have been very enthusiastic in being involved in creating a more sustainable campus, and recognize that their feedback is invaluable in assisting the university to adjust the program to better suit their needs. UBC Waste Management's Com-

munications Coordinator performs customer surveys following every school term, in order to ensure that the Organics Collection Program is effective and that each department's needs are considered individually. From the annual Plant Operation client survey, UBC Waste Management ranked at the top with a customer satisfaction rating of 94 percent in the past year. 🏆

Collecting Data for FY 2005-06



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¹Software developed in consultation with Jack Dudley, P.E., Editor and Co-Author of the First Edition of the *Custodial Staffing Guidelines* and Co-Author of the Second Edition. Mention of APPA does not imply endorsement of the product.

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