THE LONG ISLAND SOUNDER

February 2010

ASHRAE Long Island Chapter, Region 1...*Founded in 1957*

www.ashraeli.org

American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.

Inside this issue:

President's Message

We had a standing-room-only crowd at last month's meeting. John Mazza, P.E., from Hauppauge-based Airpath Engineering, PC, delivered an insightful presentation on how to interpret HVAC testing, adjusting and balancing procedures and reports.

This month, we will hear from Ronald Wilkinson, P.E., LEED AP, senior commissioning engineer at AKF Engineers. Mr. Wilkinson will pit existing building commissioning (EBCx) against energy audits. Existing buildings in the U.S. use about 40 percent of the energy consumed by the country. People are increasingly aware of that stat and are turning to energy audits for a quick fix. Guess what? The results will be short-lived. Conversely, EBCx can save energy when properly applied and, even more importantly, can equip the building staff to continue to save energy for years to come.

National Engineers Week is February 14-20. What better way to recognize, celebrate and move our profession forward than by empowering local students and inviting them to our meeting this month, which is our second Student Activities Night of the year. Please contact Student Activities committee chair Thomas Fields, P.E., LEED AP, at 631-737-6200 or t.fields@fpm-group.com with any questions.

Looking ahead, please keep in mind that our March 9 meeting will be Resource Promotion Night, which was very successful in the fall. Please contact Resource Promotion chair Andrew Manos, LEED AP, at 631-592-2660 or amanos@emtec-engineers.com with any questions.

Looking further ahead, please save the date for **L.I. ASHRAE'S Annual Golf Outing on May 3**. This event fills up fast, so please register ASAP. Checks must be in by April 19th. Please visit http://www.ashraeli.org/Forms/ashrae%20golf%20outing%202010.pdf for details. If you have any questions, please contact event chairs for information: Steven Friedman, HFDP, 212-695-1000 or Peter Gerazounis, P.E., LEED AP, 212-643-9055 or peter.gerazounis@mgepc.net.

I look forward to seeing you all on February 9th.

Steven Giammona, P.E., LEED AP
President - Long Island Chapter

CHAPTER MONTHLY MEETING

DATE:	**Tuesday, February 9, 2010**
TIME:	6:00 PM - Cocktails/Dinner 7:00 PM - Dinner Presentation 8:45 PM - Conclusion
LOCATION:	Westbury Manor South Side of Jericho Tpke. 25 Westbury, NY 11590
FEES:	
Members -	$35.00
Guest -	$40.00
Student -	$15.00

Reservations requested, but not required.
Call (516) 333-7117

Long Island Chapter Officers & Committees

ASHRAE 2009/2010 OFFICERS

POSITION	NAME	PHONE	FAX	EMAIL
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Board of Governors	**Steven Friedman, P.E., HFDP, LEED AP**	212.695.1000	212.695.1299	sfriedman@lilker.com

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Nominating	**Michael Gerazounis, P.E., LEED AP**	212.643.9055	212.643.0503	michael.gerazounis@mgepc.net
Reception & Attendance	**Anita Singh, LEED AP**	516.827.4900	516.827.4920	abs@cameronengineering.com
PR & Engineering Joint Council of LI	**Peter Gerazounis, P.E. LEED AP**	212.643.9055	212.643.0503	peter.gerazounis@mgepc.net
Golf Outing	**Peter Gerazounis, P.E., LEED AP** **Steven Friedman, P.E., HFDP, LEED AP**	212.643.9055 212.695.1000	212.643.0503 212.695.1299	peter.gerazounis@mgepc.net sfriedman@lilker.com

Chapter Monthly Meeting - Program for 2009/2010

September 15, 2009 * At Westbury Manor - **1 PDH** Dinner Presentation - Chilled Beam Systems **MEMBERSHIP PROMOTION NIGHT**	**February 2010** **NATIONAL ENGINEERS WEEK DINNER**
October 20, 2009 * *At Westbury Manor* - **1 PDH** Dinner Presentation - Going Green-Reducing Emissions and Improving Fuel Efficiency in Commercial and Industrial Boiler Applications **STUDENT ACTIVITIES NIGHT**	**March 9, 2010** * *At Westbury Manor* Dinner Presentation - Stack Effect **RESOURCE PROMOTION NIGHT**
November 10, 2009 * *At Westbury Manor* - **1.5 PDH** Dinner Presentation - Introduction to LEED NC Building Commissioning **JOINT MEETING WITH USBGC** **RESOURCE PROMOTION** **MEMBERSHIP PROMOTION NIGHT**	**April 13, 2010** **FIELD TRIP - Allegria Hotel Facility**
December 8, 2009 Holiday Party - Westbury Manor	**May 3, 2010** * *Cherry Valley Club, Garden City, NY* **ANNUAL GOLF OUTING**
January 12, 2010 * *At Westbury Manor* Dinner Presentation - Interpretation of HVAC Systems Test/Balancing Procedures and Reported Data	**May 11, 2010** * *At Westbury Manor* Dinner Presentation - Refrigeration **REFRIGERATION NIGHT** **ASHRAE DISTINGUISHED LECTURER**
February 9, 2010 * *At Westbury Manor* Dinner Presentation - Energy Audits & New ASHRAE Standards **STUDENT ACTIVITIES NIGHT** **ASHRAE DISTINGUISHED LECTURER**	**June 8, 2010** * *At Westbury Manor* **PAST PRESIDENTS & OFFICER INSTALLATION**
February 2010 ASHRAE Winter Meeting	**June 8, 2009** ASHRAE Annual Meeting **PAS PRESIDNETS NIGHT**
August 2009 - Chapter Regional Conference Region I	

PAOE POINTS FOR 2009/2010

Chapter Members	Membership Promotion	Student Activities	Research Promotion	History	Chapter Operations	CTTC	Chapter PAOE Totals
301	310	295	425	50	120	150	1,330

February Program

You are cordially invited to our February 2010 Meeting…

Dinner Presentation

"Existing Building Commissioning is Not an Energy Audit"

Presented by

Ronald Wilkinson, P.E., LEED AP
Sr. Commissioning Project Manager
AKF Engineers, LLC

Attendees Will Earn 1 PDH!

DATE:	**TUESDAY, FEBRUARY 9, 2010**		
Time:	6:00 PM – Cocktails and Hors D'ouevres 7:00 PM – Dinner Presentation 8:45 PM – Conclusion	**Fee:**	$ 35.00 Member $ 40.00 Guest $ 15.00 Student
Location:	**WESTBURY MANOR** (516) 333-7117 Jericho Tpke (South Side), 3/10 of mile east from Glen Cove Rd., Nassau County, NY. **Directions are posted at @ www.ashraeli.org.**		
Presentation:	Existing buildings in the USA use about 40% of the energy consumed by the country and contribute more CO2 to the atmosphere than some entire nations. When it comes to energy security, existing buildings are becoming the elephant in the room. Few of them had the benefit of commissioning when built and even fewer have been through an existing building commissioning (EBCx) process. EBCx can save energy when properly applied and, even more importantly, can equip the building staff to continue to save energy for years to come. The problem is that clients are asking for EBCx but listing services that amount to an energy audit. This seriously shortchanges the services that need to be included in the EBCx process and undercuts the potential for future, continuous, improved energy performance and environmental health and safety. Although the immediate savings sell the audit, the EBCx process adds many benefits to the traditional audit that will be lost if the owner's focus is strictly on the short term. The extra benefits of EBCx come before, during and after the tasks that comprise the energy audit. This program will explore the benefits of EBCx by comparing it to the traditional energy audit and show why clients should require the full EBCx range of		
About our Speakers:	**Ronald Wilkinson, PE, LEED AP** - A member of the editorial board of Heating/ Piping/ Air Conditioning Engineering magazine, Ron Wilkinson is an international speaker on commissioning practices and has been published in the ASHRAE Journal, HPAC, CSE, Energy User News, Engineered Systems and Engineering News-Record magazines. He is an ASHRAE Distinguished Lecturer and an AIA Continuing Education Lecturer. He was co-chair of the Commissioning Guideline Committee of the National Association of State Facilities Administrators. He is currently serving as Recording Secretary for ASHRAE GPC 1.2 / 0.2, Guideline for Commissioning Existing Buildings, and is Chair of the AIA Building Science and Performance Commissioning sub-committee. He earned his BSMAE from the Illinois Institute of Technology in 1971 and his master of Public Administration from the Evergreen State College in 1985. He is currently a Sr. Commissioning Project Manager for AKF Engineers, LLC, in New York City.		

Board of Governors Meeting Minutes

On Tuesday, January 12th, 2009, a meeting of the Board of Governors was held at the Westbury Manor. Attendees were: Steven Giammona, Steven Friedman, Nancy Roman, Carolyn Arote, Brian Simkins, Janeth Costa, Andy Manos, Richard Rosner and Tom Fields. President Steven Giammona called the meeting into session at 5:06pm.

RESOURCE PROMOTION: Andy Manos stated that he is doing well with Resource Promotion at this time. But definitely needs to continue to solicit $ from people. He would like a link to the vendor book on our website.

PROGRAMS: Nancy Roman is set up with all speakers for meetings. She also has a back-up lecturer for February meeting in case she needs to call upon it.

HISTORIAN: Carolyn Arote has to update the PAOE points.

WEBMASTER: Janeth Costa will invite Anthony B. to February meeting to discuss progress on the website. PAOE points are to be updated monthly for web.

TREASURER: Andy Manos gave the board a financial update on Savings/MM accounts was given. He also stated we need to get update software and said he would do it as soon as possible.

MEMBERSHIP: Richard Rosner stated he has 15 new members to date – (6) are students and (9) are regular members. He also stated that there are (23) delinquent regular members and (4) delinquent student members. PAOE points are to be updated monthly for membership promotion.

STUDENT ACTIVITIES: Tom Fields discussed upcoming Student Activities Night. PAOE points are to be updated monthly for student activities.

CHAPTER TECHNOLOGY TRANSFER (CTTC): PAOE points are to be updated monthly for CTTC.

OPEN BOARD DISCUSSION: Steve Giammona talked up setting up ASHRAE 90.1 event. Carolyn from ADE confirmed it is no problem to use her office to host this event. We also confirmed that ASHRAE will take a showcase table at the 'Show Me The Money' USGBC-LI event at the LI Children's Museum on January 25th, 2010. Tom Fields will head up this endeavor with the support of Nancy Roman, Steve Giammona and Janeth Costa.

Having discussed all open issues, the meeting was adjourned at 5:58pm.

Janeth Costa
Chapter Secretary, 2009-2010

Research Promotion

I would like to thank all the companies who have participated in the annual 2010 Product Directory of Manufacturers and their Representatives.

The Product Directory has been prepared as a service to all its members and as a service to the local HVAC industry. It will be will be made available to all ASHRAE and non-ASHRAE members at no-cost and can be obtained from our monthly meetings or directly from our web-site.

The Directory is intended to provide better communications between manufacturers and their sales representatives; engineers who specify products; contractors who purchase and install the equipment; and other interested parties. Product Directory listings are not limited to ASHRAE members and the listings are not to be considered as advertising or endorsement by ASHRAE of any product, manufacturer or representative.

This year's overall resource promotion goal is $2,001,900 with over 75 research projects on board. Our chapter is expected to raise approximately $12,881 towards the overall goal of which we have already raised $10,405. I am hoping I can count on the continued support of all of our past contributors who have generously supported us over the years.

I also look forward to gaining the support of new contributors this coming year. Please help support ASHRAE in any way you can.

I would like say 'thank you' to all the contributors listed below whom have already donated to ASHRAE this year:

INDIVIDUALS

Mr Andrew E Manos
Mr Andrew J Garda
Mr Arthur A Huebner
Mr Brian C Simkins
Ms Carolyn Arote
Mr Christopher M Schwarz
Mr Fred H Weber
Ms Janeth Costa
Mr Jerome T Norris
Mr Jerome A Silecchia
Mr John D Nally
Mr Michael Gerazounis,
Mr Michael O'Rourke
Ms Nancy Roman
Mr Patrick J Lama
Mr Raymond O Combs
Mr Raymond G Schmitt
Mr Richard L Rosner, PE
Mr Ronald J Kilcarr, PE
Mr Steven D Friedman,
Mr Steven R Giammona, PE
Mr Thomas Fields, PE
Mr William L Mahon

COMPANIES

Accuspec Inc
A D E Systems Inc
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A O Smith Water Heaters
Applied Technologies of NY Inc
ASAP Sales
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Tower Enterprises of New York & New Jersey
Trane
Viessmann
Wales Darby Incorporated
Wallace Eannace Associates

Continued on Pg. 7

Research Promotion (Cont'd. from Page 6)

CONTRIBUTIONS CAN BE MADE IN THE FOLLOWING WAYS:

1) You can mail your checks, made out to ASHRAE Resource Promotion, to:

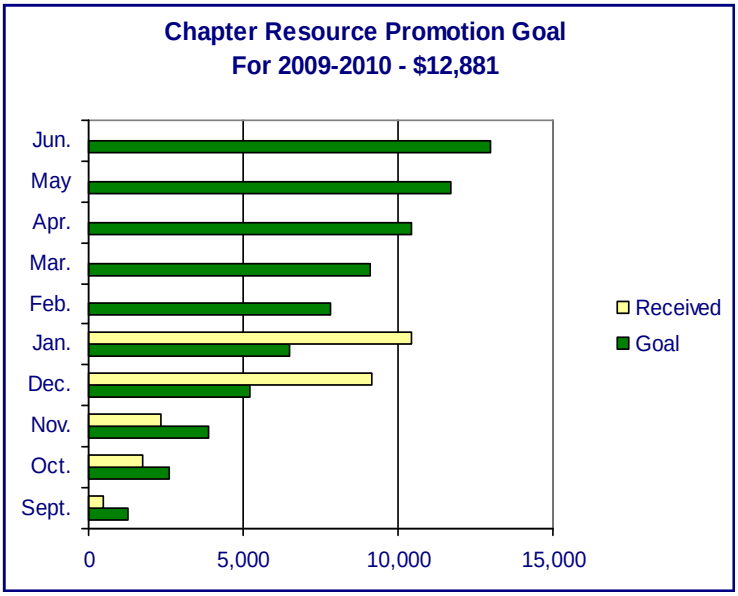
Andrew Manos
ASHRAE Research Promotion Chair
c/o Emtec Consulting Engineers
3555 Veterans Memorial Highway
Ronkonkoma, NY 11779

2) You can bring your check to any of the meetings and give it to me. I will mail it into headquarters.

3) You can contribute via paypal from the ASHRAE LONG ISLAND web site just click on the donate button.

4) You can contribute directly on-line. www.ashrae.org

**** Please make sure your accredit your contribution to the LONG ISLAND CHAPTER 006 ****



Andrew Manos, LEED AP
Resource Promotion Chair

Membership

The New Year is off to a fast start and much is happening in the world and in our local chapter. We have many new members, associates, students and upgrades, thank you all for making my job easy. Don't forget to let your colleges know of our meetings and organization but most important of all make sure you come down to the meetings yourselves and enjoy the networking and friends in a relaxed atmosphere while also picking up some new ideas from our guest speaker. This meeting will also offer PDH credits for engineers and architects and certificates will be handed out at the meeting.

For those needing to check their membership status or for general membership information please go to http://www.ashrae.org/members/ or see me at the meeting.

Richard Rosner, P.E.
Membership Chairman

CTTC

Energy Audits In Large Commercial Office Buildings

Office building have more floor area (12.2 billion sqft) than any other building type in the US and have the highest total energy consumption (1.1 quadrillion Btu) of any building type. Furthermore, the largest buildings have a higher energy use intensity (energy consumption per sq foot) than any other size of building. This scale creates many opportunities for energy savings. A good place to begin is with an energy audit of the building.

The challenges of energy audits in large office buildings are many. For example, large HVAC plants and controls can be complex for new energy auditors, and even for experienced engineers. High-rise build-ings have unpredictable and un-controlled airflows, driven by interactions among stack effect, exhaust fans, and higher-pressure air-distribution systems. The clients are often seasoned businesspeople, accustomed to hard negotiations who seek to save costs on energy au-dit fees.

The buildings are large, so energy audi-tors can be swamped with field data. They often find themselves confused back at the office, unable to remember details about individual HVAC components, details on spaces, and potential improve-ments. The sheer size of the audit can lead to “audit exhaustion,” ending in a limited set of improvements.

Sometimes, the exciting technical chal-lenges of advanced improvements, such as demand-controlled ventilation or chiller plant improvements, or solar energy, will draw the attention of enthusiastic energy auditors, leaving other improve-ments such as envelope (air sealing, windows, and insulation), lighting, and operation/maintenance inadequately ad-dressed. All of these challenges, led by a concern that building owners might not be willing to pay for comprehensive energy audits, can lead engineering firms to tend towards simpler walkthrough audits.

A consensus increasingly has grown that defines three levels of energy audits: Walkthrough, general, and investment grade. However, requirements for each of these levels can still lack detail, leaving decisions to the energy auditor as to what data to gather and witch improvements to evaluate. It has been acknowledged that the three levels do not have distinct boundaries. Common mistakes can compound the problems. Simple walkthrough audits can result in a limited set of recommended improvements. Absence of detail in energy audits can lead to unclear recommendations and re-ports that cannot be easily translated into a work scope or into designs to achieve the energy savings outlined in the au-dit. A review of 10 comprehensive energy audits indentified many common mistakes, including overestimation of energy savings and lack of consideration of the latest retrofit technologies.4

Opportunities

Although large office buildings present a broad set of chal-lenges, they also bring unusual opportunities. The size of the buildings allows for economies of scale in energy audits and implementation, and energy savings can be large. A single owner, frequently a private entity or individual, can allow for easier decision-making. Repeating space types, from area-to-area and floor-to-floor and building-to-building, can simplify the energy audit: offices, corridors, stairwells, kitchenettes, toilets, first floor/lobby, and conference rooms. A few large loads can offer large energy savings opportunities: ventilation, HVAC plant, HVAC distribution components such as large mo-tors for air handlers and pumps, and adjustments to incor-rectly operating HVAC systems. Repeating (often identical) loads also make things easier: computers and peripherals, kitchenette appliances, lighting, and windows. Lighting, in particular, has long hours of use, unlike in many other building types for which occupancy is more sporadic, and so offers greater opportunity for energy savings.

A Comprehensive Approach

A comprehensive approach can be used to leverage the op-portunities offered in large commercial office buildings and to minimize the risks presented by their challenges.

This approach, looking at all loads and all equipment, offers the most savings and the biggest selection of improvements from which the owner can choose. Methodical data collec-tion further maximizes savings, makes analysis easier, and documents recommendations in a way that greatly simplifies implementation.

Continued on Pg. 9

CTTC (Continued from Pg. 8)

Solid energy modeling and billing analysis can further help and can identify unusual energy losses and opportunities. Cal -culation procedures should place an emphasis on calibrating the building's energy use with weather-corrected billing data before beginning evaluation of potential improvements. The interaction among improvements should be accounted for to avoid double-accounting for savings between two improvements that affect each other, for example, HVAC plant replacement and space temperature control improvements.

In addition to the routine analysis of repeating loads and equip-ment, the energy auditor should treat each building as unique, not as a commodity, and should look for anomalies in use, wearing the hat of a building scientist or diagnostician to identify building-specific energy efficiency opportunities. Gathering actual HVAC operational data, such as tempera-ture trends, equipment use, and flow rates, can augment the understanding of building-specific problems and energy savings opportunities.

Lighting offers an example of the methods that can be used. *Tables 1* and *2* show an example of a data sheet from an actual commercial office energy audit.5 Lighting measurements are taken in every room. Note the dramatic variations in light levels in the small sample of offices, ranging from 55 to 115 footcandles (592 to 1238 lux). Some offices are highly overlit and so offer opportunities for reducing lamps or fixtures. As data is taken while still in the building and before leav-ing each room, the energy auditor formulates a variety of recommenda-tions. The end result is a customized energy au-dit with specific recommendations and multiple improvements possible for each room and with a report that provides suf-ficient detail for the owner to proceed with implementation.

Location	Existing Condition					De-Lamp		Replace Bulbs or Fixtures			New Ballasts?	Recommended Controls						SIR
	Bulb Model	Number of Bulbs Per Fixture	Number of Existing Fixtures	Hours/Day (Average)	Average Light Level (Footcandles)	Number of Fixtures to Remove	Number Bulbs/ Fixture to Remove	Replacement Bulb Model	Number of Fixtures to Modify	New Number of Bulbs/Fixture		Number of Timers	Number of Photosensors	Number of Motion Sensors	Number of Bi-Level Fixtures	Number of Fixtures Controlled	New Hours/ Day (Average)	
106 Hallway	EXITINC20	1	1	24	0			EXITLED2	1	1								5.6
133 Boiler Room	F32T8	4	8	8	18							1		2		8	3	1.7
134 Transformer Room	F40T12	2	8	8	25			F32T8	8	2	X	1		1		8	3	1.7
204 Office	F32T8	4	2	7	55								1			2	3	2.2
205 Office	F32T8	4	2	7	65								1			2	3	2.2
206 Office	F32T8	3	4	7	115								1			4	3	3.3
207 Hallway	EXIT INC20	1	1	24	0			EXITLED2	1	1								5.6
211 Office	F32T8	2	3	7	55								1			3	3	1.6
213 Main Lobby	FLOOD65	1	2	8	58								1			2	3	3.2
213 Main Lobby	F32T8	2	6	8	58								1			6	3	3.8
213 Main Lobby	F32T8	4	4	8	58								1			4	3	5.1
213 Main Lobby	FLOOD65	1	3	8	58	2												22.2

Table 1: Existing conditions and recommendations (from an actual commercial office energy audit).

Continued on Pg. 10

CTTC (Continued from Pg. 9)

An example of a specific office further illustrates the potential approaches and savings. A 120 ft2 (11 m2) executive office was found with two light fixtures, each with four lamps. A simpler walkthrough energy audit might have noted that the existing lamps are T8, and the ballasts are electronic, and so would not have made any recommendations. A comprehensive energy audit measured light levels at 150 footcandles (1615 lux), far above the IES-recommended range of 30 to 70 footcandles (323 to 753 lux) for offices. The audit recommended removing four of the eight lamps and replacing the single toggle switch with a dual switch (one switch for each of the two fixtures) and an occupancy sensor and photocell integrated into the switch. A tenant education program helped the office occupants learn how to use the new double switch and switch-integrated photocell and occupancy sensor effectively. The results are savings of more than 70%, since only two lamps are used most of the time (instead of the original eight); savings accrue when the occu-pancy sensor or photocell turns off the lights. Note the multiple improvements (delamping, controls, tenant education) made possible by a comprehensive and room-specific approach.

What is meant by “comprehensive energy audit”? A compre-hensive energy audit includes evaluating all energy loads and equipment in a building: the HVAC plant (in a commercial office building, typically chillers and boilers); the HVAC distribution systems; envelope improvements (walls, windows, roof, founda-tions, insulation); lighting; plug loads such as appliances and computers; operation and maintenance improvements; tenant education; and more. The energy audit should capture room-specific opportunities and document recommendations in the audit report to allow for clear implementation of improvements. Improvements should focus not only on equipment efficiency, but also ensuring that the equipment meets the required load. For example, do not just replace T12 lamps with T8; also measure light levels to make sure that each space is not overlit. Another example: Do not merely change the boilers to high-efficiency; also make sure that the new boilers are not oversized.

Location	Recommended Change			Savings Analysis				
	Lighting Changes	De-Lamping	Control	Annual Energy Savings, kWh/Yr	Annual Cost Savings, $/yr	Cost of Retrofit	Simple Payback, Years	SIR
106 Hallway	Replace EXIT			166	$28	$115	4.1	5.6
133 Boiler Room			Occupancy Sensor Plus Timer	1,754	$167	$1,166	7.0	1.7
134 Transformer Room	Replace Bulbs, Ballasts		Occupancy Sensor Plus Timer	1,635	$178	$1,225	6.9	1.7
204 Office			Light Sensor	376	$36	$194	5.4	2.2
205 Office			Light Sensor	376	$36	$194	5.4	2.2
206 Office			Light Sensor	564	$54	$194	3.6	3.3
207 Hallway	Replace EXIT			166	$28	$115	4.1	5.6
211 Office			Light Sensor	282	$27	$194	7.2	1.6
213 Main Lobby			Light Sensor	279	$17	$194	11.3	3.2
213 Main Lobby			Light Sensor	658	$62	$194	3.1	3.8
213 Main Lobby			Light Sensor	877	$83	$194	2.3	5.1
213 Main Lobby		Remove Fixtures		431	$36	$91	2.3	9.2

Table 2: Lighting results (from an actual commercial office energy audit).

The trend towards comprehensiveness in energy audits likely started in residential buildings more than 10 years ago. On-site measurement of HVAC plant efficiency, such as combustion testing for furnaces and boilers and even advanced testing of air conditioners and heat pumps, are becoming increasingly common. Analysis of distribution systems, for example through duct leakage testing, has arrived. Evaluating the replacement of plug loads, such as appliances, has become commonplace. Diagnostic tools, such as blower doors and infrared thermogra-phy, have allowed advanced analysis of the building envelope. Advanced techniques for retrofit insulation, such as spray foam and dense-pack cellulose, have largely been developed in the residential field, but are not yet common in commercial

Continued on Pg. 11

CTTC (Continued from Pg. 10)

building retrofits. In addition to these technologies, advances in model-ing have made common the use of hourly energy models and interactive calculations among energy improvements. Techni-cian accreditation is widespread, as are en-ergy auditor train-ing programs. There is broad dissemination of best practices and extensive ongoing applied energy conservation research. A national energy audit standard has recently been adopted.6 Evaluating “the building as a whole” has become a mantra in the residential energy field, but is not at all common in commercial buildings. Compre-hensiveness has been almost universally recognized and adopted in residential energy audits. Anything short of compre-hensiveness is often frowned upon.

How is the room-by-room aspect of a comprehensive audit conducted in commercial office buildings? At a minimum, light levels and lighting inventories should be taken on a room-by-room basis, along with occupancy levels and sched-ules for oc-cupancy and lighting use. Room-specific HVAC issues, such as distribution problems or mistaken tempera-ture control setpoints, also can be noted. In addition, information on plug loads, such as computers and office kitchen appliances, can also be inventoried on a room-specific basis. Field data sheets should be structured to allow energy auditors, as they are standing in each room, to check off exactly what improvements will be evaluated for each particular room. Although measurements in all spaces might appear to be time-consuming, they can be completed quickly, even in large buildings, if data input is well-organized. There are time-savings during analysis, because much of the analysis can be automated.

Room-specific data collection allows more accurate calcula-tions to be performed, and, more significantly, the recommen-dations can be made in a fashion that guides implementation. Rather than providing general recommendations that are difficult to implement (“Replace all lighting, delamp to meet IES standards, and install photosensors on fixtures close to windows.”), room-specific recommendations allow a work scope to be given by the owner to maintenance staff or to a contractor. Tables are provided such as the ones in the previous example, which give sufficient information that might translate as: “Office 201: Replace two four-lamp fixtures with two two-lamp T8 fixtures with high-efficiency electronic bal-lasts, and add a second light switch to allow the fixtures to be controlled independently, with a photosensor for the fixture close to the window, and an occupancy sensor to turn lights off if no oc-cupants are detected.”

Detailed reports reduce duplication of effort, as the energy auditor’s descriptions of improvements are conveyed in detail to those responsible for implementation, whether design engineers, architects, contractors, or construction managers.

The Improvement Mix

What improvements are best suited to commercial office buildings? The occupancy-driven nature of office spaces make occupancy-based controls attractive, such as demand-controlled ventilation, programmable temperature controls, and variable capacity distribution systems (VAV air handlers, variable speed pump drives, etc.). Large office spaces often result in interior/core spaces with an associated high cooling demand, so econo-mizers make sense in many climate zones, as do systems that recover core heat for use on the perimeter, such as water loop heat pumps. High-efficiency replacement HVAC is also always an option. Significant savings often can be achieved through operational adjustments to HVAC controls.

Reducing overlighting is a frequently missed improvement, so a light meter in the toolkit is essential. While energy codes typically require a maximum of 1.0 to 1.1 W/ft2 (0.09 to 0.10 W/m2) for office lighting power density,7 and existing build-ings often consume much higher than even these levels, 0.75 W/ft2 (0.07 W/m2) or lower are easily obtainable and should be used as a goal; these levels can be further reduced on a time-average basis through task lighting, daylighting, and occupancy-based lighting. These lighting savings are amplified by a reduction in air conditioning use in such typi-cally core-dominated buildings. Installing pendant lighting fixtures in spaces with tall ceilings will also reduce lighting power densities. Energy savings are often accompanied by improvements in visual quality as well. In corridors and stair-wells, 5 to 10 footcandles (54 to 108 lux) are adequate, and typical existing 24-hour use merits both reducing lighting to this level, in addition to occupancy sensors to turn off lights when the corridors and stairwells are not occupied, and photo controls for lights near windows. Low-level lighting can be maintained for safety and security.

Continued on Pg. 12

CTTC (Continued from Pg. 11)

Plug loads, such as computers and kitchenette refrigerators, contribute substantially to electricity use and can be replaced with high-efficiency substitutes through purchasing policies, or used more efficiently, such as by setting display screens to turn off, or implementing policies regarding turning off screens and computers. Plug loads require engaging tenants in energy efficiency, which is a good thing.

For engineers, who often feel most at home in the boiler room or looking at the chiller and air handler, envelope improvements often seem foreign. What can we do with the envelope in a high-rise office building? Stack effect and associated infiltration losses can be reduced through weather stripping of windows and caulking window frames, and by compartmentalization of the building interior (such as weather stripping of stairwell doors) and other air-sealing (plumbing chases, roof penetra-tions, and more). Such improvements will also dramatically reduce discomfort caused by airflow induced at the entrance to the building and on lower levels. Window replacements and storm windows can reduce heat loss in winter by half or more and similarly reduce heat gain in summer. Creative improve-ments, such as interior or exterior shades, can further reduce loads and reduce glare in offices. Even wall and roof insulation should not be ruled out.

Two Examples

Comparing two actual energy audits, a walkthrough audit and a comprehensive energy audit, provides insight into the difference between these approaches. *Table 3* summarizes these two audits. The comprehensive energy audit identified savings of 46%. Interestingly, the predicted energy savings appear to have been exceeded by those improvements, which were implemented by the owner. Natural gas savings were measured at 53%, following replacement of the boilers, window replacement, installation of summer boilers for service hot water, and separation of the heating plant into multiple zones.5

Meanwhile, the walkthrough audit in a different large commercial office building identified savings of only 7%. Sometimes presented as a preliminary audit, or a precursor to an in-depth audit, the walk-through audit runs the risks of delivering small savings, satisfying the owner's need to make energy improvements, allowing "greenwashing" claims, giving the false impression that significant savings are not possible, preventing the owner from considering comprehensive work, and deferring in-depth improvements for years into the future.

	Walkthrough Audit	Comprehensive Audit
Percent Savings	7%	46%
Room-by-Room	No	Yes
Number of Improvements	8	12
Lighting Improvements	No	Yes
HVAC Plant Improvements	No	Yes
HVAC Consolidation/Reduction	No	Yes
Controls Improvements	Yes	Yes
Health/Safety/Comfort Improvements	No	Yes
HVAC Distribution Improvements	No	Yes
Demand/Purchasing Recommendations	Yes	Yes
Motor Improvements	No	Yes
O&M Recommendations	No	Yes
Service Hot Water Improvements	Yes	Yes
Tenant Education Recommendations	No	Yes
Envelope (Insulation, Air Sealing) Improvements	Yes	Yes
Plug Load Improvements	No	No

Table 3: Comparison of two example commercial office energy audits.

Continued on Pg. 13

CTTC (Continued from Pg. 12)

Further risks derive from the possibility that energy savings estimated in an energy audit can easily be eroded between the energy audit and final implementation. These risks are illustrat-ed in *Figure 1.* Beyond the risk of energy savings not material-izing because the audit itself is not clear or because the auditor missed energy measures, there is the risk of the owner choosing not to implement all the savings, the risk of contractors mak-ing mistakes or substituting less efficient products, the risk of inadequate commissioning of energy conservation installations, and the risks of poor operation and maintenance. All of these can erode the originally recommended savings. Comprehensiveness is the best hedge against the erosion of these savings between energy audit and closeout of implementation.

Finally, projected savings as small as 7% present a high risk of actual savings not being measurable, as real savings are lost in the “noise” of fluctuating energy use in a building.

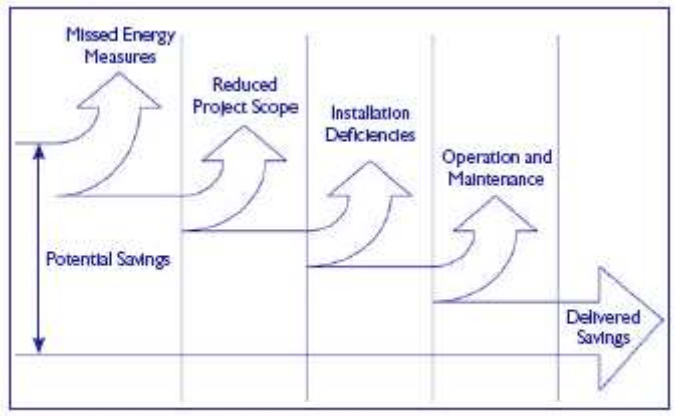


Figure 1: Erosion of energy savings.

Case Study

A different example points to audit costs and projected savings of a comprehensive audit.8 A 77,000 ft2 (7154 m2) office building in upstate New York has annual electricity costs of $130,000, and annual gas costs of $210,000, for total annual fuel costs of $340,000. A comprehensive energy audit identified 14 improvements, all of which meet a posi-tive life-cycle cost test (savings-to-investment ratio greater than one). The recommended improvements include HVAC plant (new high-efficiency boilers), HVAC distribution (new VAV system, premium efficiency motors, pipe insulation), HVAC con-trols, ventilation (new energy recovery ventilation system), envelope (door weather stripping, storm windows), lighting (extensive delamping, relamping, and controls), and appliances (replace an oversized ice-maker, intelligent power con-trol on vending machines).

Projected annual savings are $125,000 per year, or 37%. The cost of the audit was approximately $27,000. The ratio of estimated audit cost to annual energy costs savings is 0.22. In other words, the energy savings will pay for the audit in 0.22 years, or approximately 2.6 months.
The final report provides a variety of detail that may be helpful for the owner in proceeding with implementation, including infor-mation on all 32 motors to be replaced (location, load description, horsepower, quantity, existing efficiency, recom-mended minimum replacement efficiency, etc.), 20 pages of lighting data with room-specific recommendations, and more. Much of the scope of work for implementation is already defined in the energy audit.

We estimate that the cost of a walkthrough audit might be $5,000 and provide 7% annual savings, as shown in the prior example, or approximately $24,000 energy cost savings per year if applied to the same building. But a hidden cost is that a walkthrough audit rarely provides sufficient data to describe the scope of work for implementation. Assuming that this work scope development, whether done by an engineer or by a design-build contractor, might cost an additional $5,000, the ratio of audit-plus-work scope costs to annual cost savings is 0.42, or almost one half as cost effective as the com-prehensive audit.

Continued on Pg. 14

CTTC (Continued from Pg. 13)

Significantly, the comprehensive audit report also presents six improvements that were evaluated and could provide further savings, but that do not meet the positive life-cycle cost test. These include chiller replacement, roof insulation, replacing electric heat in the core of the building with a gas furnace (due to the high cost of electricity relative to gas), and service hot water improvements. While helping to prioritize recommended improvements (on the basis of estimated installation cost, estimated annual savings, estimated useful life, non-cost trade-offs, and more), the comprehensive audit significantly assists the owner in *not* making poor economic decisions by explic-itly showing the results for non-recommended improvements. Meanwhile, the owner is provided with useful information that might tip the scales to proceed with a non recommended improvement, if the complete picture that portrays non-cost issues (health and safety, comfort, equipment nearing end-of-life, etc.) along with energy savings for a particular improve-ment, add up to justification for implementation.

Structured Techniques

A variety of structured techniques can help make energy audits in large commercial office buildings easier. Analyze utility bills before doing the field visit. Disag-gregate use by season, fuel, building, and meter. Look for anomalies in energy use patterns to guide the search for unusual energy loads and savings opportunities.

Assign two people for the site visit, each with a walkie talkie or cell phone. An effective combination of staff can be an engineer familiar with HVAC plant and controls and an energy technician familiar with lighting, envelope, and plug loads. Look for incorrectly operating HVAC systems, such as programmable setpoints that have not been correctly set (reset controls for hot and cold water temperatures, space temperatures, ventilation schedules, etc.).

Come prepared with a data collection plan, including data sheets. Schedule adequate time for fieldwork. One day is inadequate for an effective site visit for a large commercial office building, even for a two-person team.

Bring a small set of useful tools, most of which fit in a small tool bag or even on a belt: infrared thermometer, CO_2 meter, tape measure, reduced scale plans, light meter, lighting ballast checker. Involve building staff; ask probing questions about schedules, controls, and suspected energy inefficiencies and savings opportunities.

After the site visit, immediately write a detailed building description and list the improvements planned for evalu-ation. This essentially jump-starts the final report; more important, it allows a supervisor or peer to identify possible missed opportunities early on. By identifying all opportuni-ties that need analysis up front, the analysis will not need to be repeated after the report is finished, which is much harder than if missed improvements are identified early.

Calibrate energy models against utility bills before modeling improvements. In modeling, account for interactions among improvements. Describe non-cost trade-offs of each improvement, such as health and safety issues, comfort impacts, operation and maintenance, anticipated persistence of savings, etc.

Use life-cycle costing, such as savings-to-investment ratio on a net present value basis, accounting for the time value of money, as well as the projected inflation of fuel costs. These all account for costs and benefits in a more complete manner than simple payback.

Summary

Large commercial office buildings present a variety of chal-lenges that are specific to the sector. An incremental approach (walkthrough audit first) runs a significant risk of not leading to significant or measurable energy savings. The higher cost of comprehensive audits is well justified by the greater energy sav-ings opportunities identified and by avoiding duplication of effort, as many improvement descriptions, which guide implementation can be provided in the audit. A comprehensive approach using structured techniques can make the work easier and provide a framework for substantial and measurable energy savings.

Brian Simkins
CTTC

Article In: ASHRAE Journal, January 2009. Please see article for all references and credits.
By Ian Shapiro, P.E.

Student Activities

This February meeting is the second Student Activities Night of the year. Please encourage any engineering students to attend. This is a wonderful chance for them to network with the regional engineering community and to gather insight into the field. As always, please seek out any students attending this meeting and introduce yourself. Involving the students now will lead to active members in the future. We will be reaching out to the various local colleges to alert them to this month's meeting.

Please note that the deadline for ASHRAE Engineering Technology Scholarships is May 1st. The one-year $3,000 scholarships are available annually to full-time undergraduate Engineering Technology students. Students must be enrolled in or accepted to a post-secondary educational institution for a bachelor degree or an associate degree and pursuing a course of study which has traditionally been a preparatory curriculum for the HVAC&R profession. Please visit the Student Zone at www.ashrae.org/students for more information or to apply.

As a reminder, Student Members are sponsored by full-grade Members or Associate Members. The student must be studying or have an interest in an HVAC&R industry-related field. A student eligible for ASHRAE student membership is a person matriculated in an approved course of study in a university, college, junior college, or technical institute, who is being educated in the arts and sciences covered by the Society's objectives. Membership forms are available through me or at online at the Student Zone.

Thomas Fields, PE, LEED AP
Student Activities Committee Chair

Charles Lesniak
Vice Chair

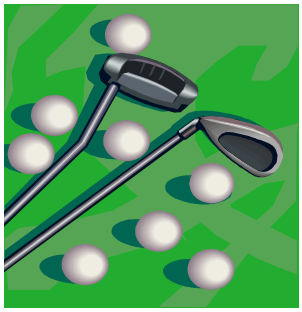
Long Island Chapter - Past Presidents

1958	H. Campbell, Jr. PE	1984	Raymond Combs
1959	Clyde Alston, PE	1985	Edward W. Hoffmann
1960	Sidney Walzer, PE	1986	Jerome T. Norris, PE
1961	Sidney Gayle	1987	Abe Rubenstein, PE
1962	William Kane	1988	Michael O'Rouke
1963	Louis Bloom	1989	Mel Deimel
1964	Milton Maxwell	1990	Robert Rabell
1965	Will Reichenback	1991	Gerald Berman
1966	Joseph Minton, PE	1992	Donald Stahl
1967	Irwin Miller	1993	Ronald Kilcarr
1968	Walter Gilroy	1994	Jerald Griliches
1969	Charles Henry	1995	Walter Stark
1970	William Wright	1996	Joe Marino
1971	Louis Lenz	1997	Norm Maxwell, PE
1972	Ronald Levine	1998	Alan Goerke, PE
1973	Henry Schulman	1999	Frank Morgigno
1974	Myron Goldberg	2000	Michael Gerazounis, PE, LEED AP
1975	John N. Haarhaus	2001	Ray Schmitt
1976	Richard K. Ennis	2002	Steven M. Stein, PE
1977	Kenneth A. Graff	2003	Andrew Braum, PE
1978	Evans Lizardos, PE	2004	Claudio Darras, P.E.
1979	Albert Edelstein	2005	Craig D. Marshall, P.E.
1980	Ralph Butler	2006	John Nally
1981	Robert Rose, PE	2007	Peter Gerazounis, PE, LEED AP
1982	Timothy Murphy, PE	2008	Steven Friedman, PE, HFDP, LEED AP
1983	Leon Taub, PE		

ASHRAE Golf Outing 2010 - Monday, May 3rd, 2010

11th Annual LI ASHRAE GOLF OUTING

Monday – May 3rd, 2010



Place:	**Cherry Valley Club**
Brunch:	**11:00 am**
Shotgun:	**12:30 pm**
Reception:	**5:30 pm**
Dinner:	**6:30 pm**

This Event fills up fast, to guarantee a spot RSVP Soon.

(2) Foursome Limit Per Company.

Proper golf attire and shoes are required. Locker room and shower privileges are included.

CHECKS MUST BE IN BY APRIL 19, 2010 (No Exceptions)

Fax entire sheet or cut this half and return

Name: _____ Company: _____

Address: _____ Phone: _____

City, State, Zip: _____ Fax: _____

Guest 1: _____ Company: _____

Guest 2: _____ Company: _____

Guest 3: _____ Company: _____

Please make check payable to:

ASHRAE – Long Island Chapter

Mail Checks To:
MG Engineering, P.C.
Attn: Peter Gerazounis, P.E. LEED AP
116 West 32nd Street
New York, NY 10001
Fax No.: (212) 643-0503

Golf & Meals:	**$ 300 pp x ____**		**= $_____**
Reception & Dinner:	**$ 130 pp x ____**		**= $_____**
Sponsor Dinner:	**$1,000**	☐ **Yes**	**= $_____**
Sponsor Lunch:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Reception:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Prizes:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Beverage Cart:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Hole:	**$ 200**	☐ **Yes**	**= $_____**

ASHRAE Golf Outing 2010 - Monday, May 3rd, 2010

11th Annual LI ASHRAE GOLF OUTING

Monday – May 3rd, 2010

Cherry Valley Club
28 Rockaway Avenue at Third Street
Garden City, NY
Telephone: (516)746-4420
Fax: (516)746-4421

Program:

11 a.m. Brunch in the Clubroom & Lounge – including Omelet station, deluxe deli board with rolls, chicken scarpiello, danish, croissants, bagels & cream cheese, sliced nova, fresh fruit and cheeses, Good Humor ice cream cart.

12:30 p.m. Shotgun Start Golf – Playing individual scores. Prizes for long drive, closest to the pins, low gross and callaway. Refreshments at the halfway house will include packaged snacks and whole fresh fruit, hot dogs, beer & soda. A snack cart will also be on the course. Carts, forecaddies, driving range, locker room and showers are all included in the price.

5:30 p.m. Following Golf - Open Bar with hot and cold horsd'ouvres in the Main Lounge. Fresh mozzarella with sun-dried tomatoes, cajun chicken, spring rolls, baby lamb chops, sesame chicken, turkey canapés, fried oysters, cheeses, fresh fruit, lobster halves, fresh clams & oysters, shrimp and crab claws.

6:30 p.m. Reception Dinner – Awards and raffle in the Main Dining Room. Carving stations of beef tenderloin & turkey breast. Chafing dishes of chicken & salmon featuring the chef's specialty, pasta station with marinara or vodka sauce, and choice of tossed or Caesar salad. Viennese dessert table following the dinner featuring pastries, fruit, cookies, assorted cakes and pies. Full beverage service throughout is included.

Women are also invited to attend and participate. There are locker room facilities available. The Cocktail hour and Dinner will also be available for those who cannot attend during the day for the golf.

Note: We are limited to 128 golfers. Openings will be filled on a first come-first serve basis. Corporate sponsorships will be available and raffle items will be welcome. Proper golf attire is a requirement for the golf course. Soft spikes are required. Please wear a jacket for the dinner.

Directions:

From the North Shore of Long Island: Take the Long Island Expressway to Exit 34 South (New Hyde Park Road Southbound), Grand Central Parkway (Northern State Parkway) to Exit 26 South (New Hyde Park Road Southbound) or Jamaica Avenue (Jericho Turnpike) Eastbound to New Hyde Park Road. Travel Southbound on New Hyde Park Road for approximately 5 to 7 miles to Stewart Avenue (You will cross over a set of railroad tracks). Take Stewart Avenue eastbound for approximately 1-1/2 miles to Cherry Valley Avenue. Travel Southbound on Cherry Valley Avenue for 1/2 mile, Cherry Valley Avenue becomes Rockaway Avenue. Continue on Rockaway Avenue and the entrance to Cherry Valley Club will be on your right.

From Local Points North: Take Old Country Road or Stewart Avenue to Franklin Avenue. Travel Southbound on Franklin Avenue to Fourth Street (just after crossing over railroad tracks). Turn right on Fourth Street and continue until it ends (Rockaway Avenue). Cross over Rockaway Avenue into the Cherry Valley Club's parking lot.

From the South Shore of Long Island: Take the Southern State Parkway to Exit 19 (Peninsula Boulevard-Hempstead/ Garden City). Travel Northbound on Peninsula Boulevard for approximately 1/2 mile to President Street. Bear left on President Street (Northbound) for approximately one mile and cross over Hempstead Turnpike. President Street will become Cathedral Avenue. Continue on Cathedral Avenue for one mile to Fourth Street. Make a left on Fourth Street (Westbound) and continue until it ends (Rockaway Avenue). Cross over Rockaway Avenue into the Cherry Valley Club's parking lot.

From Local Points South: Take Hempstead Turnpike to Franklin Avenue. Travel Northbound on Franklin Avenue to Fourth Street. Turn left on Fourth Street and continue until it ends (Rockaway Avenue). Cross over Rockaway Avenue into the Cherry Valley Club's parking lot.

ASHRAE Golf Outing 2010 - Monday, May 3rd, 2010

11th Annual LI ASHRAE GOLF OUTING

Monday – May 3rd, 2010

Cherry Valley Club
Golf Outing Guidelines

To add the enjoyment of your day, we ask that you abide by Cherry Valley Club's basic rules of The Club, dress, golf etiquette & safety, golf carts, and care of the course.

Club Rules

1. **Smoking is not permitted in the Club House.**
2. **Cell Phones are permitted in the parking lot only. Use of Cell Phones beyond the parking lot is strictly prohibited. This includes the Golf Course.**

Dress Code

1. Jeans, designer or otherwise, are not acceptable on club property. This not only includes pants, but skirts, and cut-offs.
2. T-shirts and tank tops are not in keeping with the atmosphere of the club and as such, are not acceptable. The definition of T-shirt includes those with psychedelic coloring or suggestive printing.
3. If the Main Dining room is going to be utilized for any purpose, jackets are required.
4. Short shorts are not permitted on the golf course, practice tee or putting green by either male or female. Bermuda shorts of acceptable length are permitted. Jogging attire and denim pants are not considered proper attire for the golf course.
5. **Soft spikes** are mandatory at all times on our fine golf course. If your shoes need soft spikes, arrive early so we can change them. There is a nominal fee. There is **no** exception to this rule.

Golf Etiquette and Safety

1. Slow play shows lack of consideration for the players in your group and, more important, for the players behind you. Golf is made much more enjoyable if all players adhere to the following points in the conduct of play:

    - Minimize the time spent looking for balls by watching the flight of balls hit by everyone in your group. If a ball appears to be lost or out of bounds, hit a provisional ball before leaving the tee.
    - Signal the players behind you to play through if it becomes apparent that a ball will not easily be found and you are holding up play.
    - Don't rush addressing and striking the ball but move briskly between shots.
    - If your ball is some distance from the golf cart and the exact club selection is in doubt, take several clubs with you when you leave the cart to walk to the ball.
    - When play reaches the area of the green, park the golf cart(s) behind the green or adjacent to the next tee. Walk briskly off the rear or side of the green after putting out. Mark your score cards after your group is off the green.
    - Once a score of double par has been posted, pick up and move on to the next hole.

2. No player should play until the players in front are out of range.
3. If your ball appears headed for a player or group of players immediately shout "fore" in a loud clear voice.
4. No one should move, talk or stand close to or directly behind the ball or the hole when a player is addressing the ball or making a stroke.

ASHRAE Golf Outing 2010 - Monday, May 3rd, 2010

11th Annual LI ASHRAE GOLF OUTING

Monday – May 3rd, 2010

Cherry Valley Club

Golf Outing Guidelines (Cont'd.)

Golf Carts

1. No more than two people are to be in a cart at one time.
2. No more than 2 bags are to be carried on one golf cart.
3. Members and their guest must observe all cart directional signs and use cart paths and designated golf cart parking areas where provided.
4. Good judgment, reasonable care, and observation of club rules are expected of any member or guest when operating a golf cart. Damaged golf carts will be repaired at the responsible member's expense. Each member or guest who rents a golf cart agrees to indemnify and hold Cherry Valley Club harmless of and free from any and all damages, judgment, court costs, attorney's fees or other expenses incidental to and incurred by Cherry Valley Club which may arise from misuse of a golf cart by such member or guest.
5. Members and their Guests must keep golf carts at least 10 yards away from greens trees or traps. They should keep a reasonable distance away from soft or wet areas and they must respect directional signs.

Care of the Course

1. Before leaving a sand trap, a golfer should carefully rake and smooth over all holes and footprints made by him.
2. From tree to green, a player should ensure that any turf cut or divot displayed by him is replaced at once and pressed down, and that any damage to the putting green made by a ball is carefully repaired.
3. Golf bags should never be brought onto a green. The flagstick should be carefully handled to ensure that no damage is done to the hole or the putting green. Don't dent the green with the flagstick or by leaning on your putter.
4. In taking practice swings, players should avoid causing damage to the course by taking divots. This is particularly true on the tees and in the vicinity of the greens.
5. Only putters are to be used on the practice greens. A separate practice green adjacent the driving range is available for chipping and sand trap practice.

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