April 2019

THE LONG ISLAND SOUNDER

ASHRAE Long Island Chapter, Region I...*Founded in 1957* www.ashraeli.org

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

Inside this issue:

President's Message

Welcome to the April edition of the Long Island Sounder. Thank you to all those who attended last month's meeting; it was great to see another large turnout to see Mr. Will Becchina - Director of Business Development at Energy Wall present the fundamentals of heat and moisture transfer as they relate to air-to-air energy recovery devices. The chapter was very engaged and had many well thought out questions.

Our April meeting will feature a Presentation by James Tauby, P.E, ASHRAE Fellow on Seismic Restraint of Mechanical Systems (1PDH/.1CEU)

The Annual LI ASHRAE Golf Outing is approaching quickly. Our 20th annual outing will be Monday, May 6th at the Cherry Valley Club in Garden City. The outing kicks off with brunch at 11:00 a.m., shotgun start golf at 12:30 p.m., followed by a 5:30 p.m. post golf cocktail hour and 6:30 p.m. dinner reception. Please note, this event fills up fast, and there is a two (2) foursome limit per company.

This is a great event and our major fund raiser to support the chapter for the upcoming year, we rely on our sponsors for the success of this event please make every effort to match or do better than what you did in previous years. Please see the flyer in this newsletter for more information on registering.

Finally, I want to thank all ASHRAE members for their help with Resource Promotion. Last month was RP night, and we are happy to report that we are on target to reach our goal this year. Please look for more information in the RP article in the newsletter from our RP Chair Andy Manos .

Rich Halley
President - Long Island Chapter

CHAPTER MONTHLY MEETING

DATE:	**Tuesday, April 9, 2019**
TIME:	6:00 PM - Cocktails/Dinner 7:00 PM - Dinner Presentation 8:45 PM - Conclusion
LOCATION:	Westbury Manor 1100 Jericho Tpke. Westbury, NY 11590
FEES:	
Members -	$45.00
Guest -	$60.00
Student -	$15.00

Check the ASHRAE Website for Society news and to join/renew membership!
http://www.ashraeli.org

Long Island Chapter Officers & Committees

ASHRAE 2018/2019 OFFICERS

POSITION	NAME	PHONE	EMAIL
President	Richard Halley	516.490.1616	president@ashraeli.org
President-Elect	Frank Paradiso	631.632.2791	president_elect@ashraeli.org
Vice President	James Hanna	718.269.3768	vice_president@ashraeli.org
Financial Secretary	Bill Artis	516.732.2519	finsec@ashraeli.org
Treasurer	Matthew Vitrano	212.643.9055	treasurer@ashraeli.org
Secretary	Murat Bayramoglu	631.312.8818	secretary@ashraeli.org
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Board of Governors	Elizabeth Jedrlinic	516.490.1621	bog2@ashraeli.org
Board of Governors	Andrew Blom	631.626.1695	bog3@ashraeli.org
Board of Governors	Michael Razzano	516.805.3084	bog4@ashraeli.org
Board of Governors	Andrew B. DuBel, PE	516.484.1020	bog5@ashraeli.org

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COMMITTEE	NAME	PHONE	EMAIL
Programs & Special Events	Frank Paradiso	631.632.2791	programs@ashraeli.org
Membership (MP)	Bill Artis	516.732.2519	membership@ashraeli.org
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Grassroots Government	Andrew Blom	631.626.1695	ggac@ashraeli.org
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Nominating	Michael Gerazounis, PE, LEED AP	212.643.9055	nominating@ashraeli.org
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PR & Engineering Joint	Andrew Manos, LEED AP	631.632.2792	pr@ashraeli.org
Golf Outing	Peter Gerazounis, PE LEED AP	212.643.9055	golf@ashraeli.org
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ASHRAE LI, P.O. Box 79, Commack, NY 11725			

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Chapter Monthly Meeting - Program for 2018/2019

September 11, 2018 * At Westbury Manor Dinner Presentation – Adiabatic Cooling Solutions Presenters: Robert Gebhard, Michael Silverstein, Alex Schafer ****1 PDH**** **Refrigeration Night**	**March 12, 2019** * *At Westbury Manor* Dinner Presentation - Fundamentals of Energy Recovery Ventilation Presenter: William Becchina ****1 PDH**** **YEA Night**
October 9, 2018 * *At Westbury Manor* Dinner Presentation— Refrigerants Presenter: William E. Dietrich ****1 PDH****	**April 9, 2019** Dinner Presentation - Vibration Isolation of Mechanical Systems Presenter: James R. Tauby, P.E. ****1 PDH****
November 13, 2018 * *At Westbury Manor* Dinner Presentation-- System Effect Presenter: Mark Terzigni ****1 PDH**** **Joint meeting with SMACNA** **Membership Promotion** **Student Activities Night and YEA Night** **Resource Promotion Night**	**May 6, 2019** * *Cherry Valley Club, Garden City, NY* **ANNUAL GOLF OUTING**
December 11, 2018 * *At Westbury Manor* Dinner Presentation-- Eliminating the High Cost of Over Pumping / Commercial Gas Detection System Overview & Application Presenters: Robert J. Rybka / Ronald Sweet ****1 PDH****	**May 7, 2019** * *At Westbury Manor* Dinner Presentation - TBD Presenter: ****1 PDH**** **Refrigeration Night** **Student Activities Night**
January 8, 2019 * *At Westbury Manor* Dinner Presentation– Condensing Boiler Combustion Technologies Presenter: Kyle Bottorff ****1 PDH****	**June 11, 2019** * *At Westbury Manor* **Free Buffet Dinner for Members** **PAST PRESIDENTS NIGHT & OFFICER INSTALLATION** **STUDENT SCHOLARSHIPS TO BE AWARDED** **ASHRAE History Quiz and prize Give-A-Ways**
January 20-24, 2019 ASHRAE Winter Meeting Chicago, IL	**June 8, 2019 (4pm-8pm)** * *Dixie II @ Captree State Park Boat Basin, NY* **ANNUAL FISHING TRIP**
February 12, 2019 * *At Westbury Manor –* Dinner Presentation– ASHRAE's BEQ Energy Labeling Program Presenter: M. Dennis Knight, P.E. ****1 PDH**** **Membership Promotion Night** **Resource Promotion Night**	**June 14, 2019** Joint YEA Event with LI, NYC & Westchester (Details to follow)
February 18-24, 2019 **NATIONAL ENGINEERS WEEK** **EJCLI Seminars**	**August 15-17, 2019** **CHAPTERS' REGIONAL CONFERENCE (CRC) REGION I**

March Meeting Pictures

March Meeting Pictures

Long Island Chapter - Past Presidents

1958	H. Campbell, Jr. PE	1988	Michael O'Rourke
1959	Clyde Alston, PE	1989	Mel Deimel
1960	Sidney Walzer, PE	1990	Robert Rabell
1961	Sidney Gayle	1991	Gerald Berman
1962	William Kane	1992	Donald Stahl
1963	Louis Bloom	1993	Ronald Kilcarr
1964	Milton Maxwell	1994	Jerald Griliches
1965	Will Reichenback	1995	Walter Stark
1966	Joseph Minton, PE	1996	Joe Marino
1967	Irwin Miller	1997	Norm Maxwell, PE
1968	Walter Gilroy	1998	Alan Goerke, PE
1969	Charles Henry	1999	Frank Morgigno
1970	William Wright	2000	Michael Gerazounis, PE, LEED AP
1971	Louis Lenz	2001	Ray Schmitt
1972	Ronald Levine	2002	Steven M. Stein, PE
1973	Henry Schulman	2003	Andrew Braum, PE
1974	Myron Goldberg	2004	Claudio Darras, P.E.
1975	John N. Haarhaus	2005	Craig D. Marshall, P.E.
1976	Richard K. Ennis	2006	John Nally
1977	Kenneth A. Graff	2007	Peter Gerazounis, PE, LEED AP
1978	Evans Lizardos, PE, LEED AP	2008	Steven Friedman, PE, HFDP, LEED AP
1979	Albert Edelstein	2009	Steven Giammona, P.E., LEED AP
1980	Ralph Butler	2010	Nancy Román
1981	Robert Rose, PE	2011	Carolyn Arote
1982	Timothy Murphy, PE	2012	Brian Simkins, LEED AP
1983	Leon Taub, PE	2013	Andrew Manos, LEED AP BD+C
1984	Raymond Combs	2014	Richard L. Rosner, P.E.
1985	Edward W. Hoffmann	2015	Thomas J. Fields, P.E., LEED AP
1986	Jerome T. Norris, PE	2016	Donald Kane, P.E.
1987	Abe Rubenstein, PE	2017	Andrew Dubel, P.E., LEED AP

PAOE POINTS FOR 2018/2019

Chapter Members	Chapter Operations	CTTC	Electronic Communications	GGAC	Historical	Membership	Research Promotion	Student Activities	Chapter PAOE Totals
282	895	575	50	800	350	610	900	100	4,280

April Meeting Program

Dinner Presentation

"Vibration Isolation of Mechanical Systems"

Presented by

James R. Tauby, PE
Chief Executive Engineer
Mason Industries Inc.
ASHRAE Fellow

Attendees Will Earn 1 PDH!

DATE:	**TUESDAY APRIL 9, 2019**		
Time:	6:00 PM - Cocktails and Hors D'ouevres 7:00 PM - Dinner Presentations 8:45 PM - Conclusion	**Fee:**	$ 45.00 Member $ 60.00 Guest $ 15.00 Student
Location:	**WESTBURY MANOR** (516) 333-7117 1100 Jericho Tpke., Westbury, NY 11590 **Directions are posted at @ www.ashraeli.org**		
Presentation:	This month's topic will bring you into the world of vibration isolation of mechanical systems. You will learn about varies vibration isolation types, their efficiencies, how to install them and most importantly, how to specify them. **All attendees will receive 1 PDH.**		
About our Speaker:	Mr. Tauby is Chief Executive Engineer for Mason Industries, Inc., a worldwide leader in the field of noise and vibration control products, as well as seismic and wind restraint systems. He is a professional engineer in 45 states. He holds a Bachelors of Science in Mechanical Engineering from the University of Alabama. He regularly lectures around the world on topics ranging from vibration isolation, seismic and wind restraint of mechanical systems to the use of elastomeric expansion joints for piping in seismic applications. He was a member of a team of engineers that inspected numerous buildings after the Loma Prieta and Northridge earthquakes. He has been a featured speaker at the American Society of Plumbing Engineers (ASPE) and ASHRAE National Conventions numerous times. He is a past chairman of ASHRAE's Technical Committee TC-2.7, "Seismic and Wind Restraint Design." He is currently the chairman of ASHRAE Standards Committee SPC 171P, "Method of Test of Seismic Restraints for HVAC & R Equipment." He is currently ASHRAE's liaison to the American Society of Civil Engineers' (ASCE) Wind Load Task Group. He is a member of the Standards Committee for ASHRAE. He was the lead author on ASHRAE design publication, "A Practical Guide to Seismic Restraint." This publication includes code requirements, specification considerations, seismic restraint connection methods, along with determining whether a piece of outdoor equipment is governed by seismic or wind loads on a particular project.		

Young Engineers in ASHRAE (YEA)

ASHRAE offers a wide variety of offerings for YEA members.

Leadership Weekend/ Leadership Weekend 2.0/ Leadership International

These weekends are designed to help YEA members get leadership training, career advice and networking skills. They occur four times a year all over the country/ Globe. Scholarships are available for Region I members.

https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/yea-leadership-international

LeaDRS

This Regional program allows for the development of future Regional leaders through their shadowing of current DRCs and support from the Region. LeadDRS would be a program that is run, funded, and administered by each Region in order to develop incoming or new Regional leadership. As a participant in this program, the DRC would select a participant from the Region to shadow the DRC at a Society Winter or Annual conference. The participant's travel expense would be covered by the Region as an investment in the development of their future leadership.

https://www.ashrae.org/communities/young-engineers-in-ashrae-yea/yea-events-and-programs/ashrae-region-leadrs-program

Please reach out to me if you have any questions on these experiences.

Elizabeth Jedrlinic
YEA Chair
Elizabeth.jedrlinic@trane.com

Research Promotion

I would like to thank the companies who have participated in the annual 2019 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. There's still time if you would like your company listed in the directory please contact me.

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 $2,500,000 with over 75 research projects on board. Our chapter is expected to raise approximately $19,950 towards the overall goal of which we have already raised $11,980. 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

Ronald J Kilcarr, PE, CEM
Peter Gerazounis, PE
Michael Gerazounis, PE
John D Nally
Andrew E Manos
William Artis, Jr
Michael Nigro
Matthew Vitrano
Donald Kane, PE
Elizabeth Jedrlinic
Frank Paradiso
Richard Halley
Murat Bayremoglu
Robert Fuchs
Andrew Dubel
Charles Lesniak PE
Brian Simkins
Andrew Blom
Thomas Fields
Kenneth Mueller
Richard Halley
Paul Freeman
James Tauby
Jerome Norris
John Fanneron
Robert Fuchs
Anthony Rosasco Sr

COMPANIES

Catan Equipment Sales
Accuspec, Inc
Gil-Bar Industries, Inc.
Trane
ASAP Sales
RPG Associated
Chimney Design Solutions
MV Controls
Chimney Design Solutions
VMC East, Inc
ADE Group
Miller Proctor Nickolas Inc.
Technical Air Systems Inc.
Vertiv – Liebert
Albert Weiss – Air Conditioning Products, Inc.
RPG Associates
Mitsubishi Electric
Rathe Associates
Mason East
PVI
Eastern Industrial Services of New York
SRS Enterprises

CONTRIBUTIONS CAN BE MADE IN THE FOLLOWING WAYS:

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

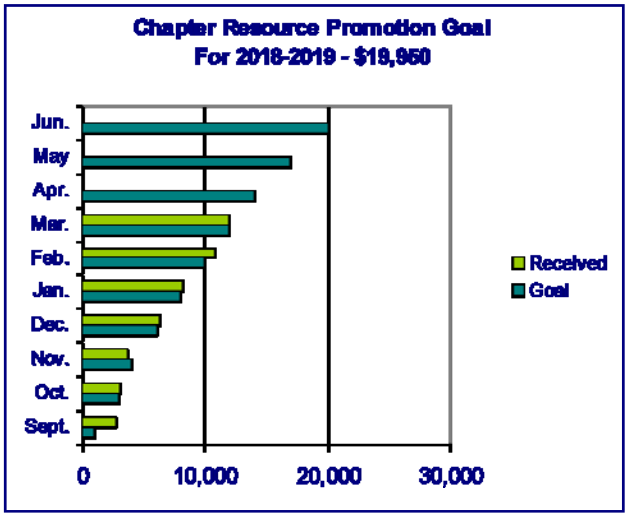
Andrew Manos, LEED AP BD+C
ASHRAE Research Promotion Chair
c/o Stony Brook University
Campus Planning, Design and Construction
Research and Support Services, Building 17, Suite 160
Development Drive, Stony Brook, NY 11794-6010

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 you accredit your contribution to the LONG ISLAND CHAPTER 006 ****



Thank you again for all of your support!

Andrew Manos, LEED AP BD+C
Research Promotion Chair

Membership Promotion

Welcome to the Membership Promotion section of the newsletter. Our MP Committee is responsible for recruiting and retaining members of ASHRAE Long Island, and to ensure our members are receiving value for their membership. Throughout the year, we will be hosting numerous meetings and events for our members to encourage professional development and networking. We will be using our MP Blog to update the chapter on all of our events, as well as posting information regarding chapter updates, and recognizing member achievements.

http://www.ashraeli.com/blog

Bill Artis
Membership Chair

Student Activities

Calling all Students! Just a reminder to please submit your Scholarship Applications! There is still time, but don't be late! Email applications to jhanna2@trane.com or frank.paradiso@stonybrook.edu.

Student Membership - 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.

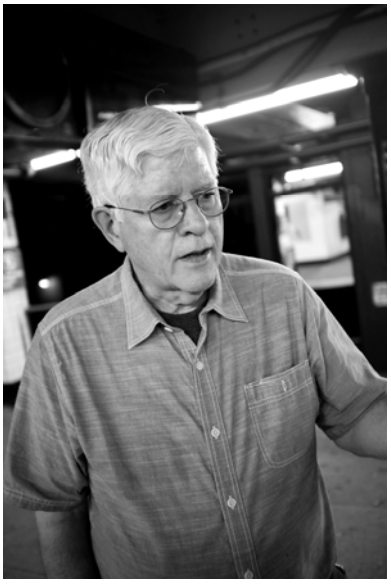
The Student Zone - The Student Zone web page offers valuable career and educational resources for ASHRAE Student Members.

Please visit: http://www.ashrae.org/students/ for more information on all the Student ASHRAE activities and opportunities.

Frank Paradiso
Research Promotion Chair

James Hanna
Research Promotion Chair

CTTC



Exercising Restraint

In recent years, revisions/upgrades to various codes and standards (IBC, ASCE7, ASHRAE) have been made to ensure that mechanical equipment essential for life safety can withstand the forces of nature (wind and seismic events) and not become hazards in themselves (picture roof top units ending up at grade and/or interior mounted equipment cascading down through the ceilings and floors).

But what good does it do if the condensers and air handling units have weathered a seismic event if the ducts, piping and conduits carrying the air, fluids and electrical power necessary for proper functioning of the climate control system are no longer intact? Where to turn for guidance? The ASHRAE Hand Books are a good starting point. Chapter 46 (section 9) of the 2016 Systems Volume provides general information on piping systems installation, allowable stresses, provision for expansion and vibration using various methods, including expansion joints and swivel joints. A passing reference is made to …"occasional loads such as ice, wind and *seismic forces*". Chapter 48 (section 3.8) of the 2015 Applications volume briefly references compliance with applicable building codes for seismic resistant construction. Chapter 55 of this same volume (Applications) provides more in-depth information related to the classifications of various geographical areas as to seismic hazard and provides details related to anchoring and restraint methods. Reference is made in this chapter to the SMACNA 2008 Seismic Restraint Manual, specifically referenced in earlier editions of the IBC, and certainly no less useful today, which provides guidance in the design of restraints for ducts, piping and conduits (other ASHRAE, DoD, NFPA, DoE, ASME and FEMA documents are also referenced).

SMACNA....piping and conduits???? A little history...(from the foreword to the SMACNA manual): As with many things, it all started in California. The 1971 San Fernando Earthquake resulted in 4 out of 11 medical facilities being damaged severely enough to require evacuation. At the very time when such facilities were drastically needed they were unable to fulfill their mission due, in some cases, to the failure of mechanical systems, even when the structure itself was still sound enough for use. As a result, the State of California mandated that hospitals should be built to remain operational after an earthquake. As a result of this mandate, in 1976, the Sheet Metal Industry Fund of LA published *Guidelines for Seismic Restraint of Mechanical Systems,* to be used as a technical guideline to meet these more stringent seismic requirements. While initially concerned with ductwork, a later edition, published in 1982 - in partnership with the Plumbing and Piping Industry Council (PPIC)- expanded the bracing guidelines for piping. Realizing that the requirements based on typical California seismic exposure may, in many cases, be excessive for those areas not subject to the same severity of seismic activity, SMACNA formed the Seismic Restraint Task Force and, in 1990 recommended the development and publishing of a manual of seismic restraint guidelines (to include non-technical explanations) expanded to include electrical conduits as well as larger sized ducts. These guidelines recognized that, even if a structure withstood the effects of a seismic event, the destruction or malfunctioning of the mechanical systems could, as a minimum, make the structure uninhabitable for an extended period of time and, in the worst case, result in severe damage and/or loss of life. It is important to remember that if a coolant pipe, for example, fails, it may not just result in the loss of cooling, the leaking liquid could damage electrical equipment and a falling section of pipe could damage other piping, including gas piping.

It is important to note that, while the manual provides guidelines for the restraint of ducts, piping and conduits, it does not cover normal ("gravity") support of these items. Also excluded are fire sprinkler systems, leaving that to the NFPA's applicable standards. While not necessarily related to the seismic performance of the systems, seismic restraint design must take into consideration and coordinate with the need to address thermal expansion of piping as well as vibration due to location and/or connected equipment, as the solutions to both problems may possibly be combined, and generally must be coordinated.

What then is the basis of seismic design of piping, ductwork and conduits? Restrain movement where it is not desired; provide for movement when it is needed; and ensure that anchor points are adequate to withstand resultant reaction forces or design to eliminate reaction forces in excess of the anchor point capacities.
The intent is to ensure that the transverse and/or longitudinal movement of system components does not result in damage to those components, building structure or to other systems and/or personnel, while limiting stresses to system components and/or anchor points to prevent failure of either.

CTTC

Certainly, we do not want piping “trapezes” swinging wildly about during a seismic event, nor would we want unrestrained motion which, if excited at a resonant frequency for the system, could result in damaging movement during “normal” operation. It is to this end that the SMACNA Restrain Manual provides guidance on how and where to install restraints and various types of restraint constructions available to use. These restraints may be solid links or may consist of paired cable stays. These restraint systems must be coordinated with the provision for thermal expansion/contraction for piping subject to large variations in temperature during operation. The SMACNA manual specifies the minimum required restraint spacing, based on piping deformability and the hazard involved (contents and function of the piping contents). For low deformability or hazardous contents, restraints are required every 20 feet transversely and 40 feet longitudinally. For high deformability material, these spacings are increased to 40 feet and 80 feet respectively, with a minimum of two transverse and one longitudinal restraints. For ducts, the SMACNA manual requires transverse restraint every 40 feet and longitudinal restraints every 80 feet.

For those locations where movement is anticipated and necessary, (for example, at structural seismic isolation joints) provision must be made to permit the duct/piping/conduits to move without overstressing the material or the anchoring means. This may be accomplished by several methods, and is frequently coordinated with the need for thermal growth resulting from heated or cooled liquids in piping causing “growth” of the piping. Most often used are bellows, loops, swivel (ball) joints, slip joints and, to a certain degree, grooved pipe connections.

Bellows may be lined or unlined (depending upon the need to streamline flow through that section of piping) and, when used, the liners may be a welded-in liner or a drop-in liner. While resulting in minimal pressure drop, the use of bellows may create a need for additional supports and/or guides. Generally, the use of bellows will not eliminate the anchor loads and care must be taken that the thrust rating of the joint does not exceed the column strength of the piping.

Piping loops may take the form of **solid piping** configured in “U” or “L” arrangements to allow for movement without overstressing anchor points. These loops are frequently already part of the design to accommodate thermal growth/contraction of the piping. While the use of solid piping loops is relatively inexpensive and does not complicate insulation installation, the additional pipe length and elbows can sometimes create enough pressure loss to require upsizing the piping. The directional changes in the elbows can also contribute to erosive wear of the piping material, depending upon the nature of the material being transported. This option requires little or no maintenance.

Flexible connections, comprising a bellows-like section generally covered by a metallic braid, lend themselves well to application crossing structural seismic isolation joints. The shorter length, compared to hard-piped loops, may be advantageous in reducing pressure drop however, some configurations will require additional supports and guides. If there is any deterioration of the internal bellows, it will not be readily apparent until leakage occurs. Flexible connections will reduce the anchor loads, but may require additional anchors to be installed.

Ball joints permit relative large amounts of angular movement, are easy to insulated and only minimally increase the pressure drop of the piping. They do require some degree of inspection/maintenance to ensure continued satisfactory operation.

Slip joints are useful where the anticipated movement will be axial (longitudinally) only. They can accommodate seismic as well as thermal growth related stress but do require maintenance on a regular basis. Pipe guides used have to accommodate the anticipated movement of the piping in the slip joint

Grooved joints provide some degree of movement, to the extents of the manufacturers angular limits. Where several joints are used in close proximity to each other, some additional bracing and/or support may be necessary.

In summary, both the ASHRAE Handbook volumes and the SMACNA Seismic Restrain Manual provide a general understanding of what is required to design a mechanical system which will survive seismic events, however both sources emphasize the need for the mechanical designer to consult with structural specialists to verify that material stresses are not exceeded during the anticipated seismic events for a particular area, based upon the category of use, Importance of equipment, soil characteristics and possible exemptions based on size, weight and location.

Donald W. Kane, P.E.
CTTC Chairman

History

This Month I interviewed ASHRAE LI past President Don Kane. Don is a longtime member ASHRAE and a major contributor to the LI chapter.

Name & Title:
Donald W. Kane, P.E.

Born & Raised:
Born in Mamaroneck, NY…Moved to Long Island in 1951

Schools:
Stevens Institute of Technology (Hoboken, NJ)

Degrees:
Bachelor of Engineering

What attracted you to engineering and the HVAC industry?

Having always been interested in how things work (or don't work), the call of an engineering education was too strong to resist. Receiving a general engineering education (electrical, mechanical and civil) at Stevens prepared me for a lifetime of learning and allowed for a varied career path (Underwriters Laboratories, LILCO, Penske GM Power, Long Island Rail Road, Cashin Spinelli & Ferretti and Nassau Suffolk Engineering & Architecture).

What was your first job in the HVAC industry and where did it lead?

Unlike many of my predecessors in the Chapter Presidential lineage, I have always been an engineering "generalist", as a result of the broad-based approach during my undergraduate work at Stevens Institute of Technology. The first 13 ½ yeas at the LIRR was spent dealing with the engineering of the rolling stock and, not surprisingly, a critical issue was always customer comfort. As the age of the fleet ranged from 30+ years old to "brand new" the challenge of providing cost effective comfort was a challenge. With the introduction of the "Bi-Level" coach configuration in Diesel Territory, I was involved with the qualification testing (at the manufacturer's Australian Facility) of the rooftop HVAC units, which were a first for the LIRR, and established a new "standard" for the rolling stock. When I retired from the LIRR and went to work for CSF (Surety Consulting) and NSEA (design of municipal facilities) HVAC became an increased segment of my work scope.

Describe the industry at that time.

Rail transit HVAC at the time was pretty much what had been done since the inception of heating and cooling on railcars; compressor/condenser equipment hung under the car (subject to mechanical damage and fouling from trackbed debris. The evaporators were incorporated into the overhead area of the car requiring significant "plumbing" to connect with the undercar equipment. While the semi-hermetic compressors were rebuildable, to do so required taking a car out of service for removal. If the failure was due to electrical causes, the entire system had to be purged and pumped down to eliminate all traces of contamination. All controls were relay based with simple thermostatic input. With the advent of redundant rooftop units employing microprocessor controls, the failure of a single unit would still allow for the maintaining of a reasonable comfort level until the equipment was shopped for a relatively rapid swap of the rooftop package.

4. How and when did you get started in ASHRAE?

While I had been familiar with ASHRAE standards, it wasn't until I started working for CSF/NSEA that Rich Rosner suggested I join ASHRAE and, several years later, suggested I get involved with the Chapter Operations.

5. What was your ASHRAE chapter, regional and Society experience?

In 2010, I started on the reception committee (the starting point for most BOG members) and the following year became a BOG member and Chair of the Chapter Technology Transfer Committee (CTTC). Following the progression (Secretary, Treasurer, Financial Secretary and Vice-President) my turn as Chapter President came in the 2016-2017 year, which coincided with our Chapter hosting the Region I Chapters Regional Conference (CRC), for which I was Treasurer.

History

6. What were the major issues facing ASHRAE during your presidency?

The major concerns were to improve the Chapter's financial status and to ensure that the Chapter hosted a successful CRC.

7. What was your presidential theme?

The successful hosting of the CRC became our Theme for that year.

8. What do you consider to be the major accomplishments during your term?

Working with Jim Price and Region I as a PIE Sponsor organization, we were able to provide technical content with continuing education credit to our members as well as to introduce or update our membership with regard to the latest HVAC/R technology and regulations. We were able to host a group viewing of the ASHRAE webinar as well as a successful YEA program.

9. Did any humorous events take place during your term?

Too busy with the CRC to notice :-)

10. Are there any things that you wish you could have done differently?

I would have liked to increase the participation of our membership in the various activities, however the need to focus on the CRC took precedence over other goals.

11. What events have changed the industry since your presidency?

Increasing regulations regarding Climate Change (refrigerants) and energy use.

12. What has ASHRAE meant to you personally?

Having worked in positions where I was the customer, the designer or the consultant to the Surety (when a project had gone "south"), the ASHRAE community has provided a network of individuals expert in their fields available to "pick their brains" as well as to have my brain "picked".

13. What advice would you give to a young person entering the HVAC field?

Delve into the history of HVAC/R. Learn the whys of where we are at today, and how we got there. Learn from Dan Holohan's" Dead men".

14. What other interests and/or hobbies do you have?

Fishing, wood working, metal working (welding) and auto mechanics and, when the weather permits, motorcycling.

Elizabeth Jedrlinic
History Chairman
Elizabeth.jedrlinic@trane.com

Refrigeration

Saarbrücken research team uses artificial muscles to develop an air conditioner for the future—By Hannover Messe

It can be used to cool or heat the air in a room or to cool or heat liquids. And it looks like something that Q – the tech specialist and gadgeteer in the James Bond films – might have come up with. The prototype device, which has been developed by a research team led by Professors Stefan Seelecke and Andreas Schütze at Saarland University, is able to transfer heat using 'muscles' made from nickel-titanium. Nickel-titanium or nitinol, as it is often known, is a shape-memory material that releases heat to its surroundings when it is mechanically loaded in its superelastic state and absorbs heat from its surroundings when it is unloaded. This unusual property is the reason why nitinol is also referred to as a 'smart alloy' or as 'muscle wire'. This effect has been exploited by the Saarbrücken researchers who have developed an environmentally friendly heating and cooling system that is two to three times more efficient than conventional heating and cooling devices.

The EU Commission and the US Department of Energy have both assessed the new process and consider it to be the most promising alternative technology to existing vapour-compression refrigeration systems.
The team of Saarbrücken engineers will be exhibiting their technology at this year's Hannover Messe from the 1st to the 5th of April at the Saarland Research and Innovation Stand (Hall 2, Stand B46).

The rules are clear enough: To cool something down, you need to remove heat from it. And to warm something up, thermal energy has to be supplied to it. The prototype system that the engineers at Saarland University have developed does both these things. But their system transports heat using a novel method that avoids the problems and disadvantages associated with conventional heating and cooling systems. 'Our system does without the conventional refrigerants that are so damaging to the environment,' explains Professor Andreas Schütze of Saarland University – an expert in the field of sensor and measuring technology.

The underlying principle is simple and essentially involves subjecting a particular shape-memory alloy (SMA) – in this case nickel-titanium – to controlled loading/unloading cycles. 'The resulting phase transitions that occur in the alloy's crystal lattice release or absorb latent heat, depending on which part of the cycle the material is in,' says Professor Stefan Seelecke, who holds the Chair in Intelligent Material Systems at Saarland University. This effect is particularly pronounced in wires made from nickel-titanium. 'When pre-stressed nitinol wires are unloaded at room temperature, they cool down by as much as 20 degrees,' says Felix Welsch who has been working on the prototype as part of his doctoral research project, along with his team colleague Susanne-Marie Kirsch. This phenomenon makes it possible to remove heat from the system. 'When the wires are mechanically loaded they heat up by a similar amount, so that the process can also be used as a heat pump,' explains Welsch.

The prototype is the first continuously operating machine that cools air using this process. The team has designed and developed a patent-pending cam drive whose rotation ensures that bundles of 200 micron-thick nitinol wires are alternately loaded and unloaded in such a way that heat is transferred as efficiently as possible. Air is blown through the fibre bundles in two separate chambers: in one chamber the air is heated, in the other it is cooled. The device can therefore be operated either as a heat pump or as a refrigerator.

But what sounds so simple turns out to be difficult and complex to implement. The engineers at Saarland University and at Zema (Center for Mechatronics and Automation Technology) in Saarbrücken have spent a number of years working on the problem in different projects, including the DFG-funded priority programme 'Ferroic Cooling'. Using a combination of experimental investigations and numerical modelling they were able to identify how to maximize the efficiency of the underlying mechanism, the wire loading level needed to achieve a specific degree of cooling, the ideal rotational speed and how many nitinol wires need to be included in a bundle. 'The greater the surface area, the faster the heat transfer, that's why bundles of wires provide the best cooling capabilities,' explains Susanne-Marie Kirsch. 'We use a thermal imaging camera to analyse precisely how the heating and cooling stages proceed.' As a result of their research work, the engineering team now has a range of parameters that they can adjust to tailor their system to meet different needs. 'We have taken the results obtained so far and have developed a software program that allows us to precisely tune our heating and cooling technology on a computer for specific applications. Once the computer modelling and planning has been completed, the system can then be built,' explains Kirsch.

Refrigeration

This basic research may well have interesting industrial applications, because the novel heating and cooling technology developed in Saarbrücken is highly efficient. Depending on the alloy used, the heating or cooling power of the system is up to thirty times greater than the mechanical power required to load and unload the alloy wire bundles. That already makes the new system at least twice as good as a conventional heat pump and three-times better than a conventional refrigerator. ‘Our new technology is also environmentally friendly and does not harm the climate, as the heat transfer mechanism does not use liquids or vapors. So the air in an air-conditioning system can be cooled directly without the need for an intermediate heat exchanger, and we don’t have to use leak-free, high-pressure piping,’ explains Professor Seelecke.

The team is currently working on further optimizing heat transfer within the system in order to boost the efficiency of the new technology even more. ‘Our objective is to get to a stage where almost all of the energy from the phase transition is being used for heating or cooling,’ says doctoral student Felix Welsch.

Michael Razzano
Refrigeration Chair

Grassroots Government Activities Committee (GGAC)

The following is from the ASHRAE’s government affair update:

U.S. Congress Holds Hearings on the DOE Budget

Congress has begun holding appropriations hearings this week after receiving the fiscal 2020 budget request that President Donald Trump released on March 11. The Administration's budget proposes several cuts to programs at the Department of Energy (DOE) including an 85.6% cut to the Energy Efficiency and Renewable Energy (EERE) office.

The Energy and Water Development, and Related Agencies Subcommittee of the House Appropriations Committee held a hearing on March 26 focusing on the DOE's budget. Secretary of Energy Rick Perry testified at the hearing. In the Senate, the Energy and Water Development Subcommittee of the Appropriations Committee will also hold a hearing on the DOE's budget. It will take place on March 27 at 2:30 p.m and Secretary Perry is again scheduled to testify. That hearing can be viewed here.

U.S. House Science, Space, and Technology Subcommittee Hearing on the Energy and Water Research Integration Act of 2019

On Wednesday, March 27 at 2 p.m. the Subcommittee on Energy of the U.S. House Science, Space, and Technology Committee is hosting a hearing on the Energy and Water Research Integration Act of 2019. The bill aims to "ensure consideration of water intensity in the Department of Energy's energy research, development, and demonstration programs to help guarantee efficient, reliable, and sustainable delivery of energy and clean water resources." You can watch the hearing here.

Andrew Blom
Grassroots Government Activities Chair

BOG Meeting Minutes

BOG Meeting, Long Island Chapter
March 12, 2019 / 5:00 PM / Location: Westbury Manor, Westbury, NY

Board of Governors		
President	Richard Halley	X
President Elect	Frank Paradiso	X
Vice President	James Hanna	X
Financial Secretary	William Artis	X
Treasurer	Mathew Vitrano	X
Secretary	Murat Bayramoglu	X
BOG-1	Michael Nigro	
BOG-2	Elizabeth Jedrlinic	X
BOG-3	Andrew Blom	X
BOG-4	Mathew Catan	X
BOG Immediate President	Andrew B. Dubel	X
Committee Member	Don Kane	X
Committee Member	Brian Simkins	
Committee Member	Andy Manos	X

Roll Call: The above noted individuals were present.
Call to Order - 5:10 PM :

10 people (Richard Halley, Frank Paradiso, James Hanna, W. Bill Artis, Andrew Dubel, Murat Bayramoglu, Elizabeth Jedrlinic, Matthew Catan, Andrew Blom, Andrew Dubel)

Secretary (Murat Bayramoglu**)**
Meetings minutes - Comments/Additions– Feb meeting was approved by all present BOGs.

1. MOTION BY Richard Halley: Past meeting minutes approval
2. Seconded by W. Bill Artis
3. Chair (Richard Halley) stated the motion,
4. The chair put the motion to a vote,
5. All present board members favored the motion,
6. MOTION WAS APPROVED.

President (Richard Haley) Chapter Operations [min-600/Par-1200) Total Points: 895

- PAOE- Keep updated
- Newsletter: Newsletter and meeting notice separate.
  1st of the Month: E blast with presenter Meeting reminder, presenter information, and bio
  1st Tuesday of Month: The Tuesday before the meeting is when the second blast goes out (or at Bill's discretion).
  Day Prior to ASHRAE Meeting: Newsletter goes out the day prior to the meeting.
  Committee Articles: The articles are due the first Tuesday of the month.
  Templates: two templates – one has a newsletter, one doesn't have a newsletter.
  Make sure you copy Bill on all the newsletter emails.

Programs (Frank Paradiso)

- April meeting: James R Tauby (Seismic Restraint Mechanical Systems) Un-allocated DL presenter
- May meeting: Field trip (Covanta field trip) 2. Tuesday (North Shore Towers), Big Apple Ice, Javits, Grumman, Barclays
- June meeting: Centerport Yacht Club
- Andy Manos is scheduling Fishing trip June 14th, 2019 between 4:30 PM t 8:30 PM

Chapter Technology Transfer (Don Kane Chair, Michael Nigro) [min-550/par-1050) Total Points: 575

- Facebook updates
- DL requests 1st DL was confirmed. DL scheduled for April meeting.
- Need to get all the speaker and topics lined up (CEU)
- Unallocated DL was approved (Tauby)

BOG Meeting Minutes

Financial Secretary (Bill Artis)
- Sponsor report: Trane $5000. $5000 short of goal.
- Mitsubishi Chapter Sponsorship ($1000)
- Budget
- Bill is going to handle taxes by Friday
- Chapter financial status. The Chapter's bank account will be audited.
- Monthly meeting sponsor are $500 for vendors, $350 for engineering
- Bill and Andy will set up a Dropbox account. Andy has set the Dropbox account.

Treasurer (Mathew Vitrano)
- Treasurer's report has been received.
- Rich Halley asked that the Financial Committee review the budget year to date actuals verse plan and report back with yearend projections.

Government Affairs (Andrew Blom) [min-500/par-650] Total Points (800)
- Activities: We are doing Day in the Hill Again. In September Cuomo introduced HFC initiatives. It should be pretty good this year. Organization will be planned in June. Conference call is scheduled next Monday.
- USGBC
- Public relations Andy Manos

Historical (Elizabeth Jedrlinic) [min-100/par-300] Total Points (350)
- Articles/interviews of past president's Potential life-members/fellows. An old article will be picked up.
- Life member fellow will be in April Sounder.
- History of YEA in the spring presentation. In March, History of YEA presentation.

Honors and Awards Chair (Brian Simkins)
- Service awards/Technical Awards
- Candidate Projects
- If there are any projects let Brian know

Research Promotion (Andy Manos) [min-800/par-1050] Total Points (510)
- Vendor Book
- 50/50
- Goal 30 was reached by March, $1,000. Full circle is complete.
- Full circle is due the end of the month. Scholarships have already been taken care of.

Refrigeration (Michael Razzano)
- Updates: Mike is planning one Refrigeration Tour.
- Barclay Center**.**

Membership Promotion (Bill Artis) [min-500/par-800] Total Points (200)
- Membership Upgrades: Have not looked at
- Delinquency reporting: Currently have 1
- New members: Started at 289 – right now we are at 291
- Planned events – membership promotion next month SMACNA
- Events budgets – CRC - haven't spent any money yet
- No new member pins

Student Activities (Frank Paradiso Chair, James Hanna) [min-300/par-500] Total Points (100)
- Scholarships
- Student membership update.
- Stony Brook: Trying to get a meeting with two Professors. Possibly inviting to SMACNA Meeting
- Suffolk Community College presentation next year.
- Hofstra
- NYIT: Speaking with Bill about getting a few people into ASHRAE
- Other: There is a master's Energy management course available to take
- Rich and Mike will visit SCCC. Meeting in March 28th.

BOG Meeting Minutes

YEA (Elizabeth Jedrlinic)

- 2018 Plan Similar events will be organized
- Budget?
- Racecar Event: February 5th $60 per person, participants will pay $40, $20 is from YEA budget. 7 people participated.
- Goal: Brief presentation with a student activity committee and speak about HVAC careers
- Other: Frank is scheduled for the 2.0 Event. Which is in Liz budget for reimbursement and approved.
- YEA will participate at student activity in Feb.
- Planning a YEA history event in March. Looking for funding opportunities. Career development about Public Speaking. Dale Carnegie is expensive. Hotel conference rooms can be checked .
- Planning an educational event in May
- Early April, skeet shooting event in either Brookhaven or Poughkeepsie joint event with Central NY Chapter will be considered .

Reception & Attendance (Matt Catan)

- Crushing it: A cool signing sheet was designed. Works well.

Electronic Communications [min-250/par-600](50)

- Temp address Society is taking over website
- New site active! www.ashraeli.com
- Recovery of old address (Ongoing)
- Approved the preliminary budgets at CRC which included the upgrade of the website to a new site.
- Motion: Bill: Motion to release Web page funds; after vote motion approved.

Golf (Peter Gerazounis/Tom Fields)

- May 6th: Cherry Valley Golf Event

New Business…

- **By Richard Halley:** June meeting will be held in Centerport CC.
- **By Andy Manos:** EJCLI Seminar presentation Feb 13th
- **Frank Paradiso:** YEA leadership event transportation cost 50/50 shar is on RP.

Motion to adjourn by Richard Halley at 5:58 PM
Seconded by Bill Artis

Next BOG Meeting
Location: Westbury Manor
Date: 4/9/2019
Time: 5:00PM

Join ASHRAE on Social Media!

ASHRAE Social Media

Follow **ASHRAE on Twitter @ashraenews** for up-to-date news, events, and articles about HVAC&R. Search **#MyASHRAE** on Twitter to see member photos from around the world.

Follow us on Twitter

Most Popular Tweets

Does It Cost More To Build Green? Benefits include reduced operating costs & construction waste.

Online Thermal Comfort Compliance Tool Included In New ASHRAE User's Manual.

87% of households in the US have #AC, 5% do in India. India's tough choice on air-conditioning and climate.

The November issue of the Journal is tested for binding strength to see how many times a page can be turned before the binding would fail.

Harvard & SUNY Upstate Medical University find that workers are healthier and happier in certified green buildings.

ASHRAE Standard 90.1 has been redefining energy savings since 1975. A new version is available now.

Adapting historical buildings for sustainable reuse.

Get To Know ASHRAE

ASHRAE CERTIFICATIONS

Certification

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ASHRAE, accredited by ANSI under ISO/IEC 17024 for the High-Performance Building Design Professional (HBDP) program, has certified more than 2,000 Built Environmental Professionals.

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- Commissioning
- Healthcare Facility Design
- High-Performance Building Design
- Building Operations

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- Assure employers and clients of subject mastery
- Serve as a springboard for continued professional development
- Offer an easy-to-apply process

FOR MORE INFORMATION GO TO - https://www.ashrae.org/education--certification/certification

ASHRAE Golf Outing - Monday, May 6, 2019

20th Annual LI ASHRAE GOLF OUTING

Monday – May 6, 2019

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 8, 2019 (No Exceptions)

Fax, Email or Mail entire sheet or cut this half and return

Name: _____ Company: _____

Address: _____ Phone: _____

City, State, Zip: _____ Fax: _____

I have read and understand the Cherry Valley Rules and Regulations (Signature): _____

Guest 1: _____ Company: _____

Guest 2: _____ Company: _____

Guest 3: _____ Company: _____

Fund raising is primarily through the contributions of our sponsors.

Please consider our sponsorship opportunities listed below.

Golf & Meals:	**$ 375 pp x ____**		**= $_____**
Reception & Dinner:	**$ 150 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**	**= $_____**

Please make check payable to:

ASHRAE – Long Island Chapter

Mail Checks To:

MG Engineering D.P.C.
Attn: Peter Gerazounis, P.E. LEED AP
116 West 32nd Street
New York, NY 10001
Fax No.: (212) 643-0503
Email: peter.gerazounis@mgedpc.net

ASHRAE Golf Outing - Monday, May 6, 2019

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 sundried 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 - Monday, May 6, 2019

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.

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