



# Valley Engineer Newsletter

NOVEMBER, 2017

## UPCOMING PROGRAMS

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- December 14, 2017 at 6:00 PM – Holiday Party at Morgan’s, Cedar Crest Boulevard, Allentown
- February 23, 2018 - Engineers Week – ArtsQuest at SteelStacks
- March, 2018 – Atlas Cement Museum Tour



**PENNSYLVANIA SOCIETY  
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**LEHIGH VALLEY CHAPTER  
 (ORGANIZED 1935)**

CARBON, LEHIGH, MONROE, & NORTHAMPTON COUNTIES

## PRESIDENT’S MESSAGE

Brian Kutz, PE  
 November 2017

Dear Members,

The Lehigh Valley Chapter is currently organizing MATHCOUNTS® and Scholarship fundraising activities. I encourage everyone to volunteer or contribute to these programs, it is a great opportunity to support and give back to the local community. Al Gruenke is well underway with soliciting for contributions. Some previously generous past contributors have reduced their commitment, so I beseech all members to help out. Talk to your organization, dig deep into your own pockets.

Please remember MATHCOUNTS and our Scholarship Fund contributions reflect on your good fortune this past year. Neither of these great programs would be possible without your continued support. Contributions are tax deductible if made out to: **PA Engineering Foundation**, please send your contribution to:

**LVPSPE  
 P.O. 3441  
 Allentown, PA 18106**

The Lehigh Valley Chapter endeavors to provide tours of local facilities that would be of interest to the engineering community. So far this year, we have had tours of Fresh Pet and Pratt Industries. Al Duzubay is doing a fantastic job of finding exciting places to visit. If anyone has an idea for an interesting tour, please reach out to a Chapter Board member. As always, the tours will be memorialized in the Chapter newsletter by our in-house journalist, Al Gruenke.

Continued on page 2

The Holiday season is here. Our annual HOLIDAY PARTY will be on Thursday, December 14<sup>th</sup> at Morgan's. A representative from the Pennsylvania Department of Transportation will give a presentation on local highway projects. Please join your fellow members and enjoy a libation from the open bar to get the evening started.

Due to the busy holiday season, we will not hold our regularly scheduled December Lehigh Valley Chapter Board meeting. However, I encourage everyone to stop by one of the Chapter Board meetings next year get a feel for the "inner workings" of your Chapter. We are always looking for good people to become actively involved.

Happy Holidays! I look forward to seeing you at Morgan's on December 14<sup>th</sup>.

Thank you.

-----  
**Freshpet - Good Food for Our Pets**

"Freshpet is real, all-natural pet food made from scratch with the freshest ingredients in our kitchen. Our meals are created using real meat and veggies you can see. We never have any preservatives - that's why you'll find us in the fridge on the pet food aisle."

A dozen members and guests of the Lehigh Valley Chapter, PSPE, gathered on a pleasant Thursday morning to tour Freshpet, a pet food processor. Situated in the industrial park east of the Beth-Bath highway, the Freshpet building looks more like a mechanical facility, not an upscale processor of meals for dogs and cats.

This facility processes all-natural pet food made from scratch with the freshest local ingredients. Meals are crafted using meat and vegetables with no preservatives. In grocery and pet food stores it is located in the pet food aisle in a refrigerator.

Freshpets' Mission Statement says it all: "To improve the lives of dogs and cats everywhere through the power of fresh, natural food."

"All natural, refrigerated meals made with fresh ingredients. Never any rendered meals or artificial preservatives."

Slabs of meat, poultry, and vegetables are delivered from local farms. There is no slaughtering at this facility. The ingredients are prepared in small batches at lower temperatures to preserve key nutrients. Steam is used to gently cook the food. Freshpet foods are refrigerated and kept cool from the moment they are made until they arrive in markets. Each container has an expiration date. Store displays are enclosed, refrigerated display cases.

Our tour guide was Tom Haelle, Operations and Technical Specialist. Pride in the facility, and the process, was immediately apparent. Tom explained that they are one-of-a-kind and a small piece of the billion-dollar pet food industry. This Freshpet location, at 176 N. Commerce Way, is five years old. The company went public two years ago and is traded on the NASDAQ stock exchange, abbreviation FRPT. At present it ships, on average, 5.8 million pounds of pet food every month. Freshpet is in operation 24/7, with 170 employees. Their output has increased over 20% the past year; presently there are four production lines, with plans already in place to increase productivity by 2020.



Tom Haelle

Continued on page 3

To stop bacteria and mold, cleanliness is of the utmost priority. An on-site biology lab staffed by micro biologists continually check for bacteria, mold, or other contaminants. An inkling of things to come was the sign in the men's room: "Employees must wash hands before leaving", signs more commonly seen in restaurants, not a pet food processor! Following all "GMP" practices we had to don hairnets, beard nets, smocks, and shoe coverings, and wash our hands before the tour. All employees in the production area are similarly dressed and fully aware of expectations.

group and gave us that fact, plus a myriad of other technical details.

Tom explained that Freshpet is regulated by the Food and Drug Administration, but holds its standards to USDA regulations, the same as food processing for humans. The production area is kept at <math>46^{\circ}</math> F, quite chilly if not properly dressed. Meat and vegetables are ground up, blended, and packaged. All piping, and all surfaces that touch the food, are stainless steel.

Freshpet sells their products in sealed bags, plastic containers, and "Chubs", which have a striking resemblance to sausage. Chubs can be up to six pounds! In retail stores they are in enclosed display cases, because they must be held a maximum of 42° F.



Engineering Manager Sam Torres

Photographs in the production area were not permitted.

Processing chillers do not use ethylene glycol as heat exchangers. Instead, water is used. The cooling water is recycled. All drives are variable frequency. There is considerable automation throughout, especially in the packaging area. Engineering Manager Sam Torres addressed the



Freshpet display case in lobby



Continued on page 4



### The Panama Canal

Alfred Gruenke, PE

One of the greatest engineering achievements of the 20<sup>th</sup> Century was the Panama Canal. This humongous project has been described endlessly in books and other literature, but until it is actually seen it's difficult to visualize the size and scope of such a project.

The canal runs north-west to south east. Traversing it from the Pacific side to the Atlantic side one actually travels north-west, different than what one would expect, to the bane of trivia players everywhere! A couple of years ago at a PSPE conference our esteemed Chapter Trivia Team merely tied for first place because we did not know this fact!



Freshpet display case at PETCO Tilghman Square Shopping Center

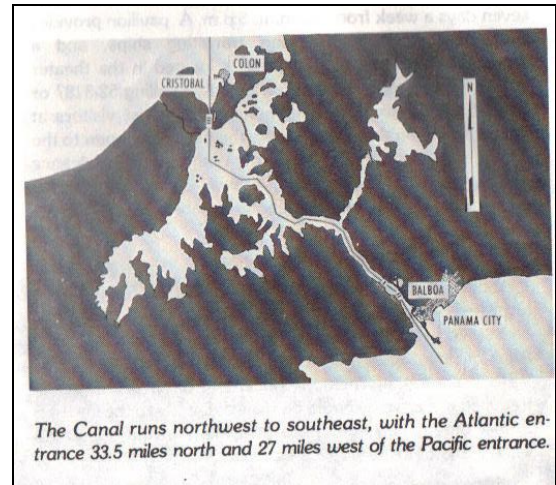
We were given a complimentary bag of pet food as we left. I don't have any pets anymore, so I gave it to my daughter. She said that her dog loved it! The only discord occurred when their cat discovered the treat and sparred with the dog for a seat at the table. A true testimonial, unso-icited.

The tour was enlightening for many us. Pet food, processed at the same standards as food for human consumption! We thank Tom Haelle, Sam Torres, and the Freshpet organization for this tour.

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We are all born ignorant, but one must work hard to remain stupid.  
-Benjamin Franklin  
-----

I love better to count time from spring to spring; it seems to me far more cheerful to reckon the year by blossoms than by blight.  
-Donald G. Mitchell  
-----

Nothing in the world is more dangerous than sincere ignorance and conscientious stupidity"  
-Dr. Martin Luther King, Jr.  
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The Canal runs northwest to southeast, with the Atlantic entrance 33.5 miles north and 27 miles west of the Pacific entrance.

The French envisioned a sea-level canal, but the geography and the prevalence of tropical diseases, primarily malaria and yellow fever, ended the venture. After spending around \$250 million and the death of 22,000 workers, the French pretty much gave up. There was also considerable mismanagement and financial finagling, resulting in jail sentences for several people.

In 1904 the United States bought the French interests for \$40 million. An engineering survey decided on a sea level canal but were over-ruled in favor of three locks. The total price was \$375 million.

Continued on page 17

## **SCHOLARSHIP SPONSORS**

A great way to be involved in the LVPSPE Chapter is to contribute to the **LVPSPE SCHOLARSHIP FUND**. Please Contact the Valley Engineer Editor to sponsor scholarships for the remainder of the calendar year.

If you would like to contribute in any amount – please send your TAX DEDUCTIBLE donation to PA ENGINEERING FUND. Donations should be mailed to:

LVPSPE  
P.O. Box 3441  
Allentown, PA 18106

Please note “LVPSPE Scholarship Fund” on the comment line.

Or, you may also contribute via the LVPSPE website <http://www.lvpspe.org/Donations>.

Scholarship application is at <http://www.lvpspe.org/Scholarships>. Any questions regarding scholarships can be directed to

Alex Dezubay, PE  
610-597-2007  
[Scholarship@LVPSPE.org](mailto:Scholarship@LVPSPE.org)

## **PSPE SCHOLARSHIPS**

The Pennsylvania Engineering Foundation currently administers the following scholarships for engineering students:

### **Undergraduate**

- \$1,000 PEF Grant: (Two awards)

### **Upperclassman**

- \$2,000 Pennsylvania Engineering Foundation Grant

Applications and guidelines are on-line now at <http://www.pspe.org/scholarships>

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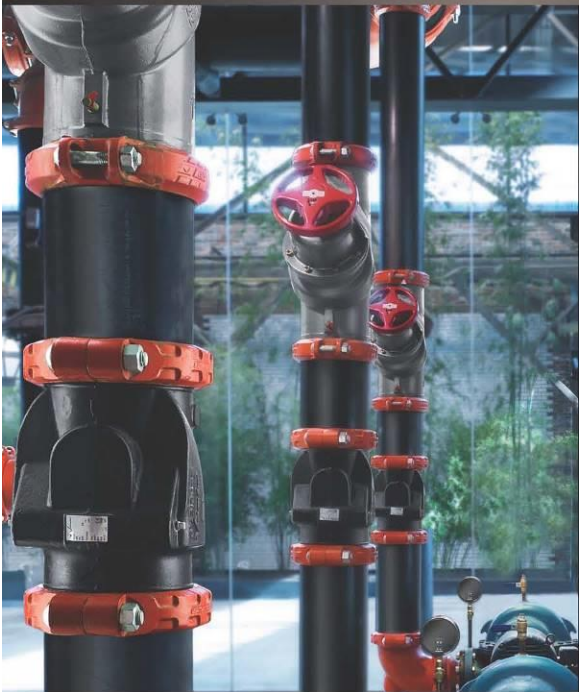
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### VP Northeast:

Michael F. Basta, PE

[StateVP@LVPSPE.org](mailto:StateVP@LVPSPE.org) 610-767-1617

## Board of Direction Meetings

The monthly Board of Direction meetings are 6:00 PM on the second (2<sup>nd</sup>) Monday of each month. Open to all members; they are held at the office of Liberty Property Trust, 74 W. Broad Street, Suite 240, Bethlehem, PA.

## 2017 – 2018 Chapter Officers

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Brian Kutz, PE

[President@LVPSPE.org](mailto:President@LVPSPE.org) 610-997-6659

### Vice President:

Alex Dezubay, PE

[VicePresident@LVPSPE.org](mailto:VicePresident@LVPSPE.org) 610-597-2007

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Alfred Gruenke, PE

610-395-6561

[PastPresident@LVPSPE.org](mailto:PastPresident@LVPSPE.org)

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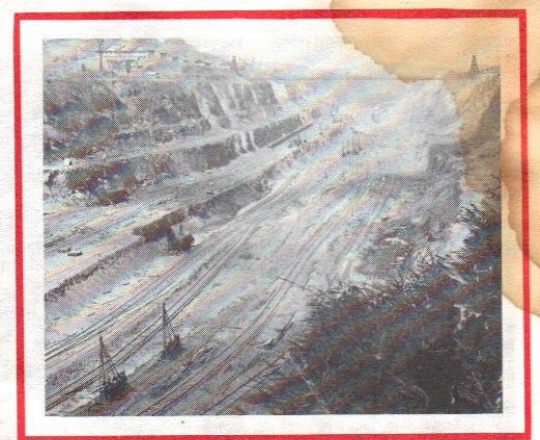
million, which included the payments to France and \$10 million to Panama. Construction started almost immediately. Lt. Col. George Washington Goethals was the Chief Engineer. The canal was officially opened to traffic on August 15, 1914.

Supervisory and clerical jobs were primarily Americans, but most of the labor was by blacks from the Caribbean.

The miracle of the canal was not just the construction, but also the eradication of yellow fever. Dr. William Gorgas, a US Army doctor, had identified the mosquito as the carrier and proceeded to eradicate the disease by improving living conditions and sanitation for the workers

The canal is 50 miles long. Three locks raise and lower ships 85 feet. The locks are 110 feet wide, limiting the size of ships

A couple of years ago I was on an interesting assignment in Panama, evaluating a cement plant for a potential buyer. Having completed that, we naturally toured the Canal and its environs. Unfortunately, I did not have the foresight to take any photos, but I did bring back a couple of informational fliers. They're a bit raggedy looking, having been stored on a shelf in my garage for over twenty years. Also, the internet has lots of photos

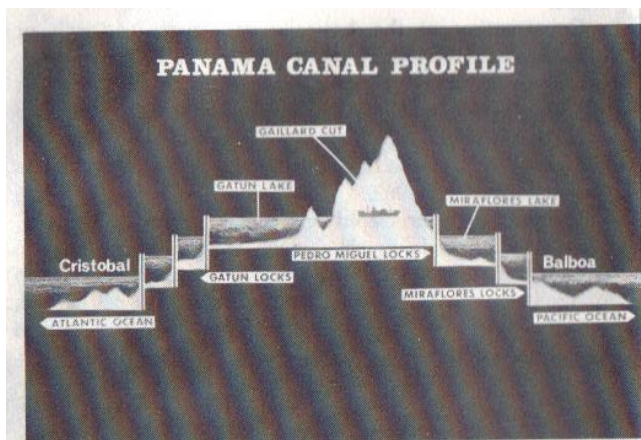


*This historical photograph, taken on January 12, 1913, shows excavation at Culebra Cut. This area, where the Canal passes through the Continental Divide, was later renamed Gaillard Cut to honor Col. David DuBose Gaillard, the engineer who was in charge of this phase of the work.*

We were based in Panama City, near the Pacific. The customers took us to the nearest locks, Miraflores, and watched a boat go through. These locks raise or lower boats 54 feet in two stages. It was fascinating! In a flash I understood the whole concept of locks! The concept is quite simple. To raise a ship, it moves into a chamber, with gates on both ends. Close the gates, fill the chamber with water, and the boat rises. When the water level is to the level of the upper level that gate opens and the ship proceeds. The secret is a free-flowing source of water. The Panama Canal uses a lake with an elevation higher than the locks. Water flows downhill, so pumps are not needed, only piping and valves. When a ship is going down in elevation it enters the chamber, the gates close, and the water drains out.

When viewing the locks, I noted the concrete, which had been installed around 1910, over eighty years before. It looked just fine; no cracks, no crumbling. I knew where the cement for that concrete had come from; Atlas Portland Cement, Northampton, Lehigh Valley, Pennsylvania.

I talked to Curator Edward Pany and Larry Oberly of the Atlas Cement Museum



*Ships transiting the Canal are raised and lowered 85 feet, from sea level to sea level, by a system of three sets of locks.*

Continued on page 18



Atlas Portland Company (later Universal Atlas) in Northampton in the early 1900s was the largest cement plant in the world. In 1908 it received the contract for 8,000,000 barrels of cement, the largest contract in its history, 1,500,000 tons.

The cement was shipped in cloth bags, 94 pounds per bag. Due to the tropical climate, the cement was double bagged to prevent it from absorbing moisture

Atlas placed a 5¢ deposit on each bag.

There used to be a Historical Marker on Rt. 329 a bit east of the Universal Atlas plant in Northampton. It stated that all the cement for the Panama Canal came from the quarry along the highway, and, at over 300 feet deep, was the deepest cement quarry in the world. It was damaged a few years ago but due to bureaucratic bumbling by PennDOT it has not been replaced.

There has been a US Military presence in the Canal Zone since the beginning, to protect the Canal and US interests. The ability to quickly send ships through the Panama Canal was a prime consideration in military planning. A little known fact is that the US Navy for many years stipulated that that all its ships had to meet two criteria: all ships had to be able to pass through the Panama Canal, and pass under the Brooklyn Bridge! The Brooklyn Naval Yard was one of the largest naval bases at the time and was also one of the largest naval repair facilities. The Navy needed all ships to be able to travel to that yard and the Brooklyn Bridge was the biggest obstacle along the way.

One of the largest ships ever to pass through the Canal was the battleship USS Missouri, with a beam of 108 2". That left a little less than 12 inches clearance each side. The Mighty Mo passed through the locks in November, 1944, sailing from Brooklyn Navy Yard to the Pacific Theatre and her rendezvous with destiny in Tokyo Harbor on September 2, 1945.

Being present at a historically significant site is always a thrill. Having a technological epiphany with a hometown connection makes it so much better.

The following pictures were from the internet.



USS Missouri passing through the Miraflores Locks, Panama Canal, 13 October 1945, while en route from the Pacific to New York City after VJ Day.



Gatun Lake provides the water to raise and lower vessels in the Canal, gravity fed into each set of locks

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 I used to go away for weeks in a state of confusion.

- Albert Einstein

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 For those who do not think, it is best at least to rearrange their prejudices once in a while.

- Luther Burbank



**Lehigh Valley Chapter**  
**Pennsylvania Society of Professional Engineers**  
*Lehigh, Northampton, Monroe and Carbon Counties*



Minutes for the November 13, 2017 Board of Directors Meeting

6:00 pm at the office of Liberty Property Trust, 74 West Broad Street, Suite 240, Bethlehem, PA 18018

Attendees: Al Gruenke, Brian Kutz, Al Dezubay, Angelika Forndran, Bob Peruzzi, Chris Williams, Mary Rooney, Frank Walsh (phone) and Mike Basta (phone)

- A. Call to Order – Brian Kutz called the meeting to order at 6:00 pm.
  - Introduced Bob Peruzzi. He’s a member of National Academy of Forensic Engineers. They asked him to be a liaison between their organization and PSPE.
- B. New Business
  - Mary attended last LVEC meeting and is willing to represent LVPSPE at LVEC meetings going forward.
  - We’d like to coordinate our meetings with LVEC going forward, Mary to assist with that.
  - Heard from a couple people who hadn’t received PDH certificates. Al to check on status with Tracy.
  - No December meeting, just Holiday Party.
  - PJAS looking for judges for competition in February
  - Mary mentioned that ‘Dream Big’ will be shown to middle school students again this year.
  - Thursday May 21<sup>st</sup> LCA running Hydromania
- C. Programs – Al Dezubay
  - November - Tour 3:00 pm Thursday 11/16 at Pratt Industries in Macungie. May need eye/ear protection, Brian to confirm.
  - December - Holiday Party starting at 6pm on 12/14/17. Speaker from PennDOT to discuss local projects. Morgan’s provides a screen but we’ll need to bring a projector. Chris to provide projector. Brian to send Al the invoice from last year.
  - February - Engineers Week – ArtsQuest Friday February 23<sup>rd</sup>
  - March - Al made connection with Atlas Cement
  - January 24<sup>th</sup> - Johann Szautner’s safari guide?
  - April - Possibly Dave Edwards at UL (United Lab)
  - May - Banquet tentatively scheduled for 5/8/2017. All agreed to change policy to invite two representatives to Banquet from any firm contributing \$1,000 or more.
- D. Newsletter – Brian Kutz
  - Wrapping up November newsletter shortly.
  - Frank provided article to be used in November or December.
  - Would be good to check in with prior scholarship recipients.

- E. Fundraising – Al Gruenke
  - Received a total of \$3,900 so far.
  - Received \$1,000 from FL Smidth and commitment from Lutron for \$2,000.
  - Kevin solicits donations from several companies.
  - Ocean Spray may be able to donate juice
  
- F. Treasurer – Ray Szczucki (not present)
  - Checking balance: \$5,586.20
  - Savings balance: \$14,000.46
  - Paid LVEC 2016/2017 dues: \$100
  - Paid LVEC 2017/2018 dues: \$100
  - Paid 2017 Engineers Week dinner: \$1,330
  - Deposited PSPE dues Aug/Sep 2017: \$180
  - Harry Garman to have audit finished later this month.
  
- G. Scholarships – Al Dezubay
  - Received two scholarship applications already.
  - Would like some administrative help. Brian to check on status of last year’s assistant.
  - Al Dezubay, Angelika Forndran, Brian Kutz and Chris Williams to review applications.
  
- H. State Director – Kevin Campbell (none)
  
- I. Past President – Al Gruenke (none)
  
- J. Mike Basta
  - September 13/14 PSPE Conference at Johnstown.
  - Northeast Region responsible for annual conference. Possibly at Bear Creek, September 2019.
  
- K. Adjournment at 7:10.