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WPE WEST PLAINS ENGINEERING, INC.

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PLAINS TALK

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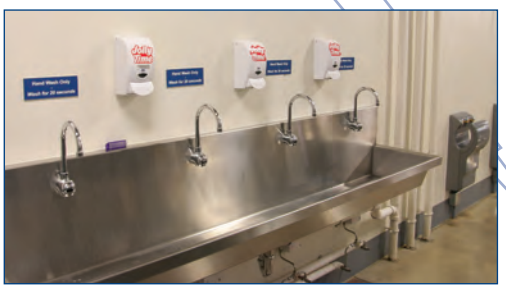
Sioux Falls WPE: One Fun Place

• The address for American Pop Corn Company is One Fun Place in Sioux City, Iowa. It is not the place but the people that make it a fun place to work.

American Pop Corn Company, makers of JOLLY TIME® Pop Corn, is one of the oldest popcorn companies in the United States. The company was founded in 1914 by Cloid H. Smith. Mr. Smith was looking for a better market for the corn grown on his property. His idea was to package a high quality product that would be easy for grocers to sell and consumers to prepare.



The Wash Room at One Fun Place

Before this time popcorn was sold primarily on the cob. It was hard to store, pop, and the quality varied drastically. In the basement of their home, Mr. Smith and his son Howard, shucked the corn from the cob, cleaned and packaged it. It was sold in bulk to vendors in 100 and 150 pound sacks and to grocers in one pound cartons.

In the 1920's American Pop Corn began marketing popcorn in airtight metal cans. With the can's ability to keep the popcorn fresh, it carried the message "*It's guaranteed to pop*." With this product the company launched its first national advertising campaign.

American Pop Corn still offers JOLLY TIME Pop Corn® in larger containers but the majority of their business has moved to popcorn packaged for use in microwave ovens. JOLLY TIME is now available in exotic flavors like The Big Cheez®, Mallow Magic® and Sassy Salsa®, as well as the more traditional Blast O Butter® and Healthy Pop® 94% Fat Free varieties.

West Plains Engineering was asked to help design a 43,000 square foot addition doubling the size of the microwave production area.

The HVAC Systems consists of two high efficiency RTU with energy recovery, continuous ventilation, heating and air conditioning; specialty exhaust for the test kitchen, quality assurance and a wash room.

The dust collection for the grain bins was purchased directly by the owner. West Plains Engineer worked with the owner, the supplier and the City of Sioux City to ensure the installation met the appropriate NFPA standards. American Pop Corn will save substantial energy cost by filtering the air used in dust collection and returning it to the plant. This required additional safeguards be installed to meet NFPA and ensure the safety of the system.

The addition was designed to minimize the energy use to heat, cool and light the facility.

The HVAC system uses high-efficiency packaged units with energy recovery. The system provides continuous ventilation with the ability to provide 100% ventilation for economizer cooling and for wash down ventilation.

HVAC for the office and lab spaces use a variable refrigerant flow system with energy recovery. The system is versatile and efficient providing individual temperature control to each space.

The lighting system uses vapor tight T-8 fixtures on the production floor and high efficient T-8 or T-5 fixtures in the office and warehouse spaces. Where appropriate, lighting is controlled with occupancy sensors to allow the lights to be used only when the space is occupied.

One Fun Place and one fun project. The other members of the design and construction team that helped make this one fun project were: KC Engineering, Structural Engineering; W.A. Klinger, General Contractor; Interstate Mechanical, HVAC Contractor; MidWestern Mechanical, Plumbing Contractor; and Thompson Electric, Electrical Contractor.

About the Author:
Mark Grebner *is the Business Services Division Manager and a Mechanical Engineer.*

Cedar Rapids WPE: AHU Replacements at University of Iowa Hospitals & Clinics

• West Plains Engineering has been working with the University of Iowa Hospitals and Clinics on the replacement of multiple air handling units which have reached the end of their serviceable lives. Each of these air handling units offers specific challenges associated with its replacement.

The existing air handling unit designated as AHU-6 had been installed outside the main building but in an undesirable location at ground floor. That location was difficult for maintenance, was too congested in the area immediately around the air handler and had its outside air intake in an unacceptable area. The solution to this was to select an alternative location for its replacement. After a site assessment conducted with the Owner's input, West Plains Engineering designed the new air handling system four floors higher up on a section of open roof. The air handling unit itself was installed at a location which would not be visible to the general public. The routes for the connecting supply and return duct work were selected outside of the building but in an inconspicuous corner of an interior areaway.

AHU-18 near Gothic Tower

Custom Dimensions of AHU-45

The replacement of existing air handling unit AHU-18 offered other unique challenges. The Owner needed minimal disruption of the occupancy served because, among other issues, the entire space which this air handler served had been remodeled two years earlier and there was now a strong desire to avoid a major disruption of that area a second time within such a short timeframe. We were able to sequence a phased replacement plan that limited the total downtime on the system to a single nine-day window. That window consisted of two weekends and a five-day workweek during which special ventilation was provided. Another challenge faced on this project was the need to improve the energy efficiency of the overall system. The air handler which was to be replaced was a forty year old multizone unit. Since construction within the occupied space was not an option, all of the retrofit work needed to be done in or near the existing mechanical equipment room. The solution to this was to install a new multizone system with discriminator controls, and variable speed drives.

For the replacement of air handling units AHU-45 and AHU-46, West Plains Engineering designed a single larger unit to handle the spaces served by the two existing units. By installing a single new unit, we were able to eliminate a significant amount of congestion within the mechanical equipment room which housed one of the existing units. The new air handler was engineered with custom dimensions in order to fit in the limited rooftop space that had housed the former AHU-45.

Our work at this medical facility has shown our ability to work with our clients in helping them upgrade their mechanical infrastructure despite the unique challenges that each situation presents.

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Rapid City WPE: 2012 Rube Goldberg Machine Competition

• Rube Goldberg, a comically involved, complicated invention, laboriously contrived to perform a simple operation – *Webster's New World Dictionary*

In 1949, during the peak of the Rube Golberg era, two engineering fraternities at Perdue University, Theta Tau and Triangle, developed their own version of a Rube Goldberg Machine Contest. The contest was part of the Engineer's Ball and was a fierce competition between the two rival fraternities. These competitions initially included acts of sabotage to the machines between the rivals which soon provoked a list of rules to disqualify teams attempting such actions. But in 1955, the Engineer's Ball and the Rube Goldberg Competition died out along with the loss of sponsorship from the two fraternities. Fast forward 28 years to 1983 and while cleaning, members of the Theta Tau's Phi Chapter found the original traveling trophy from Purdue's first Rube Goldberg Machine Contest. The members' interest in this traveling trophy along with a little research ultimately revived the competition into what we know today.

Theta Tau Fraternity Actives

Theta Tau Fraternity Pledges

Triangle Fraternity

Now the Rube Goldberg Machine Competition is a nationally recognized competition where high school students and college students construct a Rube Goldberg Machine based on a set of rules published each year so each team can compete nationally. Each year, the South Dakota School of Mines and Technology takes part of this competition and hosts a local Rube Goldberg Competition as part of engineer's week. Over the years, we have been involved with this competition as both judges and photographers on behalf of Black Hills ASHRAE.

This year, there were three teams that constructed Rube Goldberg Machines as part of the Engineer's Week activities at the South Dakota School of Mines and Technology; Theta Tau Fraternity Pledges, Triangle Fraternity, and Theta Tau Fraternity Actives. This year's objective for the Rube Goldberg Machine Contest was to "Inflate a Balloon and pop It!" under the following set of rules:

• The machine must complete the task as described in the challenge.
• The machine must be no larger than 6 ft. x 6 ft. x 6 ft.
• The machine must have a minimum of twenty (20) steps. There is no maximum number of steps.
• The machine must run for no more than two (2) minutes per run.
• Teams will have three (3) minutes before the first run to explain their machine. The machine will have a minimum twenty (20) minute reset time.
• Only two (2) team members may interact with the machine once the contest has begun. This includes resetting the machine.
• Machines may display corporate logos or names from team sponsors. No other corporate logos may be displayed without written permission from the logo owner. All responsibility for copyright permission rests with the team.
• No animals may be used in the machine.
• The machine must not imply profane, indecent or lewd expressions.
• Any loose or flying objects must remain within the set boundaries of the machine. This includes, but is not limited to, drops of water, slivers of balloon, and other "small" objects. Steam and other gasses are exempt from this rule.
• The machine may utilize one (1) air compressor hose and one (1) power cord. No other cords may be run to or from the machine; however there is no limit to the number of hoses and cords utilized within the space of the machine.
• No flames may be used on or within the machine. Electrical arcing may be used upon approval of the Contest Site Chairman.

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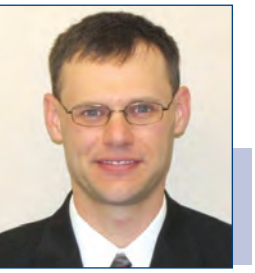
Rapid City WPE: 2012 Rube Goldberg Machine Competition

• Machines must be safe and not harm team members, judges, the audience, or equipment outside the bounds of the machines. •
• No hazardous materials, explosives, or flames may be used on or within the machine. Questions about the safety of specific steps (e.g., electrical arcing) should be directed to the contest site Chairman.
• The machine must be safe to the satisfaction of the RGMC officials. The contest Chairman must approve any questionable items prior to competition.
• Any destructive action against another machine is grounds for disqualification.

Each machine constructed utilized numerous individual pieces including but not limited to: action figures, marbles, dominos, various toy cars and trucks, lumber, and duct tape. In the nature of a Rube Goldberg Machine, and the ones constructed by the local contestants, it is rather difficult to explain or describe everything happening internally to the machine. However, each team was able to complete the task of inflating a balloon and popping it with varying degrees of success.

Prizes for the competition included a cash prize for each team along with a first place traveling trophy. The results of the competition included the Theta Tau Fraternity Pledges and Theta Tau Fraternity Actives tied for second place, and the Triangle Fraternity obtaining first place. The first place team will have the opportunity to compete nationally at Purdue University located in W. Lafayette, Indiana.

This is definitely an interesting competition and would recommend anyone to become involved as either a spectator or volunteer whenever the opportunity presents itself. For more information please visit http://www.rubegoldberg.com



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Sioux Falls WPE: Congratulations!
Sara Horner and Tom Norstrom were united in marriage on November 11, 2011.