



# The Mulvaney Pipeline

## The Falkirk Water Wheel

**A truly amazing engineering feat.**

Two canals join to bisect Central Scotland stretching from Edinburgh in the East, to Glasgow in the West. The Canal Forth and Clyde was built in 1777 between Grangemouth and Falkirk. The Union Canal between Falkirk and Edinburgh was finished in 1822. The 79 foot difference in elevation between these two waterways was overcome utilizing manual 11 locks. Traversing the 11 locks to move from one canal to the other required a full day to accomplish.

In 1963, after 150 yrs of existence of this water way with its 11 locks the construction of a huge water carousel started. This extraordinary idea was finished in 2002 and became a symbol of Scottish engineering and national pride. This is the only rotational boat transporter in the world. It has two arms and each arm forms a kind of huge tub filled with water. Boats enter the tub, then the tub locks up and the huge arm starts rotating. The entire process from boat entry, water tight door lock, and revolution to the upper or lower level takes approximately 15 minutes. An amazing improvement over moving through the 11 old locks.

The success of the Falkirk Wheel design is based solely upon Archimedes' principle which states floating objects displace their own weight in water. So when



a boat enters, the amount of water leaving the caisson weighs exactly the same as the boat. This fundamental principle keeps the wheel balanced despite its enormous mass. Each caisson, whether empty or full, in effect weighs exactly the same. Rotating the wheel through the needed 180°, requires surprisingly little power. Just 22.5 kilowatts of power are needed for the five minute rotation, or about the amount of power needed to bake a loaf of bread in an electric oven.

The cost of the wheel construction was 34.5 million, however the entire canal renovation and improvements totaled out at 166.5 million. Even discounting the value of reopening the canals for commercial traffic, the "wheel" has doubled tourist visits to the area. It has become one of the top ten tourist attractions in Scotland. Engineering accomplishments such as this pay a double dividend both in functional need and as a tourist destination.



Provide the correct answer to the following WORD PUZZLE and you could

**WIN DINNER FOR TWO!**  
oogdhntreeaweervsoawrbradaacpeea

E-mail or FAX your answer to our office. If more than one correct answer is received, a winner will be selected at random. If you e-mail your entry, you must write "NEWSLETTER CONTEST" in the subject line to avoid our SPAM filter. Please mail to [janette@mulvaneyinc.com](mailto:janette@mulvaneyinc.com)

The correct answer to the riddle contest was  
**"Both are in the middle of water"**

The following submitted correct answers

Ken Hill	ASML
Kay Balun	Biodel
Roseanna Deacon	Biodel
Heather Piazza	Charles Beckman Swanson Assoc.
Paul Thomaz	Charles Beckman Swanson Assoc.
Beck Swanson	Charles Beckman Swanson Assoc.
Thomas DiBlasi	DiBlasi Associates
Tony Grasso	Hospital of St. Raphael
Susan Stout	Plumbers & Pipefitters Local 777
Michael Donnelly	Superior Office Furniture Inc.
Bill Sapienza	Sapienza & Associates

## Luxury goes GREEN

Increased international travel caused by a ever expanding global economy and growing purchasing power throughout Asia is leading to more leisure-related travel and rising demand for more luxurious accommodations. The worldwide supply of the top 200 hotel groups reached 43,000 establishments and 5.5 million rooms.

Hotels are big consumers of resources such as water and power. Even though there is an evident trend for ensuite bathrooms to become larger and more stylish, there is also recognition that hotel facilities must become 'greener' because of the dwindling supply and rising cost of water in many countries. Hotel customers are also becoming better informed about the importance of conserving scarce resources. Hotels that provide the full spectrum hotel services are moving to provide a much more sustainable hotel product that seeks to conserve energy and other natural resources but still provides the guest with the feeling of luxury and pampering they are looking for in a full-service hotel.



## CONNECTICUT GREEN BUILDING COUNCIL

For centuries we have built buildings that honor and work with Connecticut's environment. Just look at many of the beautiful colonial houses that dot our landscape. Many are orientated south, aggressively utilize day lighting, have large center fire place chimneys, have giant maple or oaks that shade them in the summer, they all had operable windows to let fresh air in and they were most made with local materials.

In several ways, many of the proven techniques of our forefathers are at the forefront of green buildings today in Connecticut. What we've done is simply to build upon these time honored methods adding 21st century wisdom, design knowledge and improved technology to create beautiful spaces that also honor Connecticut's climate.

While there are currently very few buildings in Connecticut that have earned a LEED™ certification or have been built with a holistic green approach, many buildings in Connecticut are beginning to exhibit green traits.

In April, the Mark Twain Museum Center became the first Connecticut LEED™ rated building. Today there are almost 2 dozen buildings carrying the LEED certification.

## Interesting TidBits

- 1 million people a year get tetanus and 270,000 die as a result.
- There are fewer deaths from skydiving than from bee stings.
- In Tokyo, a bicycle is faster than a car for most trips under 50 min..
- Over 10,000 birds a year die from smashing into windows!
- Like fingerprints, everyone's tongue print is different!
- Every 45 seconds, a house catches on fire in the United States!
- The original name for the butterfly was 'flutterby'!
- In the White House, there are 13,092 knives, forks and spoons!
- You're born with 300 bones, but as an adult, you only have 206!
- The U.S. a birth every 8 seconds and a death every 14 seconds
- For every garbage can you put out at the curb, 70 cans were filled by all the processes needed in order to make it.
- Only one in twenty calls to 911 turn out to be an emergency.
- Each year there is one ton of cement poured for each man, woman and child in the world.
- Dragonflies have 6 legs but oddly, they cannot walk.
- A single stop sign in the US causes an average of 20 tons of carbon dioxide to be added to the atmosphere yearly.
- The cruise liner, Queen Elizabeth II, moves only six inches for each gallon of diesel that it burns.

## GreenPlumbers are coming to Connecticut

Some years ago, the Master Plumbers Association set up a one year trial program to educate their members on how best to install the likes of solar hot water systems. This effort has grown into an organization called "GreenPlumbers". The group provides a 5 course, 32-hour, accreditation in environmental and technical issues. Accredited "GreenPlumbers" adopt an environmentally friendly position as they spec and install water and drainage system. Plumbers have long held their mission to be protecting the health of the country. Because of climate change and global warming, the new mission adds the protection of earth's resources by training plumbers to be advocates and educators in environmental protection and conservation."

Although the initiative began in Australia, the 2008 goal in the united states is to train at least 8,000 'green' plumbers. A GreenPlumbers accreditation license for contractors supports and protects the integrity of the initiative. "GreenPlumbers expects to train more than 40,000 plumbers, across the U.S in the next 10 years.

## iFlush - Plumbing's "digital revolution"

Given the world's pre-occupation with digital convergence, the success of the iPod and the coming age of the iPhone – is it any wonder then that advanced electronics are entering a 'new age' in the control of plumbing fixtures.

Sloan Valve Company is developing new electronic products particularly in relation to water-saving and energy-efficient products. Examples include faucets with power-generating devices such as solar cells and others with turbines that provide supplementary power to the battery.

Every conceivable control is being considered for both commercial and home applications. Faucets that are remotely programmable, those that turn on with a touch of your finger, and those that limit consumption during uses that normally require a constant flow of water. The "iFaucet" is coming to your home soon.

## What's Goin' On?

Jul 15-17, 2008	Intersolar North America 2008 San Francisco, CA
Aug 5-6, 2008	MCAA LEED AP for existing buildings Baltimore, MD
Aug 13-15, 2008	REX 2008 Radiant Panel Conference Chicago, IL
Sep 9-10, 2008	2008 Women in HVACR Conference Atlanta, GA
Oct 11-14, 2008	IFMA's Fall Symposium Dallas, TX
Jan 26-28, 2009	AHR Conference and Expo Chicago, IL



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"The superior man seeks what is right; the inferior one, what is profitable."  
— Confucius