



# The Mulvaney Pipeline

## GRAVITY, only takes it so far...

Once we deliver fresh, clean, safe water to the taps in our homes and businesses, most tend to be satisfied with that accomplishment. We tend to forget that it is only half the problem. Far less attention is paid to the waste drainage side of the system. Common plumbing drainage systems are all designed based on the hydraulic performance of gravity, a system which has remained fundamentally unchanged since the 19th century. The word drainage itself means "The process of removing liquids from something by use of gravity". However, as global water and plumbing industries are discovering, there is clear evidence that drainage systems are now showing signs of stress, due in part to big reductions in drainage flow.

Global warming concerns and water shortages create problems of their own. These problems are compounded by government water-saving strategies and mandates. Add to this the outreach to the public has been quite successful as they fully embrace water conservation as a necessity. The focus continues to remain on reducing the water consumption of various fixtures (toilets, faucets, showers, etc), with insufficient consideration given to the effect on the overall system. A timely example of the importance of matched plumbing fixture design to drainage design is the Hong Kong SARS epidemic. The 2003 report by the World Health Organization (WHO) found inadequate plumbing to be the most likely contributor to the spread of SARS. Not only the delivery of potable water was examined, but also the adequacy of drainage systems as well.

The effective removal of wastes and wastewater is provided by the flushing action created by the liquid portion of the waste stream. As we reduce water usage, we increase the solids to liquid ratio. We have always depended on gravity to supply the movement force, and water to provide the "vehicle" to move the wastes. As we reduce the water ratio, we sometimes overtax the capability of gravity to move things along. A perfect example of "Green design" causing possible downstream problems is the new waterless urinals. Studies underway at the University of Washington indicate that after just 6 months of use, waterless urinal drainage pipes became one third to two thirds clogged with sludge. Although inconclusive, the results thus far indicate that, as we adopt new water saving methods, we must also pay close attention to waste systems.



The present 6 liter maximum flush limitation on toilets in the U.S. appear to be sufficient in clearing the bowl, and also carry the waste through our gravity sewer systems. Current testing of a new generation of water saver toilets using only 3 and 4 liter per flush is underway. The ability to provide an effective bowl clearing flush is no longer enough. Three liter flush fixtures will render our presently configured drainage systems insufficient to carry wastes to disposal. This new effort to further reduce water consumption will require creatively designed wastewater systems to transport the wastes.

The driving need to conserve water will most assuredly challenge the long held belief that gravity will continue to be the answer. We have come to the fundamental conclusion that using water to transport wastes by gravity is a design principal that we are rapidly outgrowing.

## FALLS are number ONE!

Falls are the leading cause of fatalities in the construction industry. An average of 450 fatal falls occurred each year, with the trend on the increase. It is important that safety and health programs for all construction related projects contain provisions to protect workers from falls on the job.



These conditions caused the most fall-related injuries on job sites:

1. Working with heavy equipment and building materials on the limited space of a scaffold is difficult. Without fall protection or safe access, it becomes hazardous. Falls from such improperly constructed scaffolds can result in injuries ranging from sprains to death.
2. Almost all sites have unprotected sides and edges, wall openings, or floor holes at some point during construction. If these sides and openings are not protected at your site, injuries from falls or falling objects may result, ranging from sprains and concussions to death.
3. Unguarded protruding steel reinforcing bars are hazardous. Even if you just stumble onto an unguarded rebar you can impale yourself, resulting in serious internal injuries or death.
4. You risk falling if portable ladders are not safely positioned each time they are used. While you are on a ladder, it may move and slip from its supports. You can also lose your balance while getting on or off an unsteady ladder. Falls from ladders can cause injuries ranging from sprains to death.

## What you can do to STAY SAFE.

- Construction workers have fallen off edges of every description. The most common are floors, roofs, and openings in floors and roofs. When an unprotected edge makes you worry about falling, take action. Set up guardrails, install opening covers, or use a fall-arrest system securely tied off.
  - A number of fatal falls have occurred among small crews doing jobs of low cost and short duration. Contractors evidently thought the jobs were small and quick enough not to warrant fall protection. That was their fatal mistake.
  - Construction workers have been killed when they removed the plywood cover from a roof or floor opening to use the material elsewhere and inadvertently stepped into the opening. Covers should be clearly identified in bright paint: OPENING COVER! DO NOT REMOVE!
  - Your chances of falling from a ladder are significantly reduced if you maintain three-point contact when climbing up and down the ladder or working from it. Three-point contact means one hand and two feet or two hands and one foot on the ladder at all times.
  - Construction workers have been killed when they fell from ladders that slid or slipped because the ladders weren't secured at top and bottom. In addition, use a mudsill to support ladder feet on soft, un-compacted, or rough soil.
  - On scaffolds and other work platforms where personnel can fall 2.4 meters (8 feet) or more, guardrails *must* be installed or a fall-arrest system *must* be worn.
  - Construction workers have been killed by falls as low as two feet. Where practical, install guardrails even on low work platforms. When working from any raised surface, remember where you are. Don't step backward. Don't shift footing without looking down first.
- Remember you are in as much danger working at 8 feet as you are working at 1,000 feet and more.



Photo by Vincent Laforet / The New York Times

## SOLAR ENERGY

The state of Hawaii recently signed a bill into law that requires the installation of solar water heating systems in new homes starting in 2010. Hawaii relies on imported fossil fuels more than any other state. About 90 percent of its energy sources come from foreign countries, according to state data. The new law prohibits issuing building permits for single-family homes that do not have solar water heaters. Some exceptions are allowed, such as forested areas where there are low amounts of sunshine.

The use of solar water heating panels on commercial and residential sites became increasingly more popular during the late 1970's and 1980's. Many of those installations are no longer in service due to faulty design or misapplication, however with energy costs tripling over the past 6 years, a rebirth may be in the making.

Hawaii hopes their initiative on solar water heating will become a trend setter nationwide. Closer to home, Connecticut has had much controversy over the effective, efficient use of solar water heating systems. Some major commercial installations in the area were consistently held out to criticism as folly. However these installations embraced ideas whose time has finally come. The advent of highly capable microprocessors for better operational control, and the alternative being very costly energy supplies, has resulted in a solar energy rebirth. Truth be known, these older solar systems did in fact valiantly deliver energy as advertised, but fell into disrepair as operational costs outpaced energy savings.

We do not anticipate solar energy becoming a Connecticut state mandate as in Hawaii. However, there are many New England applications where solar installations will deliver a dependable and sustainable source of energy well into the future..

**What could it be?**  
Name the item pictured in the Photo and you could **WIN DINNER FOR TWO!**



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 answer to the WORD Puzzle from last time was:  
"There never was a good war, or a bad peace". Benjamin Franklin  
Sorry...No one provided the correct answer.

## It's hard to believe... but TRUE!

- Cotton swabs cause 2.5 times more injuries than razor blades.
- In Finland, speeding ticket fines are based on income.
- Annually, 2,000 people are injured from trying to pry frozen foods apart.
- Until the 19th century, an "accident" referred to anything that happened, whether it was something good or bad.
- Apollo 11 had only 30 seconds of fuel left when it finally landed.
- Nature requires over 5 years to get rid of a cigarette butt.
- 41% of annual traffic fatalities in the US, are alcohol related.
- 61% of Americans wear corrective lenses to improve their vision.
- One-third of the world's population is infected with Tuberculosis.
- Humans have 100 billion brain cells and lose 85,000 of these every day!
- A person will die from lack of sleep sooner than from a lack of food.
- One ragweed plant can release as many as one billion grains of pollen!
- Average number of people airborne over the US any given hour: 61,000.
- Cost of raising a medium-size dog to the age of eleven: \$6,400.
- Rats destroy an estimated 1/3 of the world's food supply each year.
- Grapes explode when you put them in the microwave.
- Toxic house plants poison more children than household chemicals.
- 1 out of 4 Americans will require a blood transfusion during their life.

**WHAT'S GOIN' ON?**

Oct 12,-14, 2008	<b>CMAA Conference &amp; Tradeshow</b> San Francisco, CA
Oct 15-17, 2008	<b>IFMA World Workplace</b> Dallas, TX
Oct 21-22, 2008	<b>Engineering Green Buildings Conf.</b> Las Vegas, NV
Oct 31-Nov 2, 2008	<b>Connecticut Home Show</b> Hartford, CT
Nov 19-21, 2008	<b>GreenBuilding Expo</b> Boston, MA
Jan 26-28, 2009	<b>AHR Conference and Expo</b> Chicago, IL