ANGLE and LINE

A Quarterly Newsletter by COWAN ASSOCIATES, INC.
Engineers • Designers • Surveyors
Serving Business, Municipalities, and Industry since 1958

IMPROVING WATER QUALITY - CAN YOU HELP?

by J. Cheryleen Strothers

Do you like to take a nice stroll along a meandering stream, admiring the inherent beauty of the clear running water? Are you a fisherman who enjoys catching "the big one" in the local stream? Do you like boating on a nearby lake? Or do you just like sitting and watching as other people enjoy various recreational activities? How would you feel if all these small pleasures were lost because the water quality within the stream or lake is no longer able to support these activities?

In accordance with the federal "Clean Water Act," the Pennsylvania Department of Environmental Protection is required to provide water quality assessments biennially to the Environmental Protection Agency. The "2006 Pennsylvania Integrated Water Quality Monitoring and Assessment Report" states that of 83,602 miles of streams assessed, 14,982 miles were impaired for aquatic life use, and 17,343 acres of lake area out of 56,182 were also impaired. Additionally, out of 337 miles of streams and 56,600 acres of lakes assessed for recreational use, 187 miles of streams and 1,271 acres of lakes are impaired.

For years the Federal Government, through the Clean Water Act, has been providing requirements to state and local governments on maintaining the existing water quality and guidance for improving water quality. Currently all municipalities in Pennsylvania use the National Pollution Discharge Elimination System (NPDES) permitting to regulate any construction activity on sites over one acre. Most of the municipalities in this area own and/or maintain a "municipal separate storm sewer system" (referred to as MS4) and possess an NPDES permit for their stormwater discharges. This permit requires the municipality to implement a stormwater management program consisting of:

1. A Public Education Program.

2. A Public Participation and Involvement Program to solicit volunteers to help the municipality to implement the program.

3. An Illicit Discharge Detection Program.

4. A program regulating stormwater runoff from construction sites.

5. A Post-construction Stormwater Management Program.

6. A Pollution Prevention/Good Housekeeping Plan for municipal operations maintenance.

The success or failure of any program hinges on the time, energies and, yes, the monies available to implement the program. The MS4 programs have not been supported by state or federal funding; therefore, the program is supported solely by general fund tax dollars made available by each municipality. In some cases, with general funds in short supply, municipalities are forced to do the minimum necessary to meet the requirements of the permit.

But the issue of improving water quality is not just the responsibility of governmental agencies, it is the responsibility of every one of us. So what can we all do to help? The Center for Watershed Protection, a non-profit corporation, has provided some simple guidelines that all of us can incorporate into our daily lives to help.

1. Clean up after your pets. The presence of pet waste in stormwater runoff leading to a stream produces elevated levels of fecal bacteria in the water. In fact, according to studies (Alderiso, 1996 and Trial, 1993), 95% of the fecal coliform found in urban stormwater was of non-human origin. Although the thought of picking up after your dog may sound disgusting to many, the thought of that excrement reaching the streams and lakes is equally disturbing.

2. Use proper car washing techniques. Studies show that approximately 25% of the population of the United States are chronic car washers, i.e. wash their car at least once every month. But where does the wash water containing detergents and road grime go? If it drains into the storm sewer system, the pollutants end up in the nearby streams or lakes. If you are one of these chronic car washers, consider the following:

   Use a commercial car wash. Many of the commercial car washes recycle the water. Additionally, greases and sediments from the wash water are collected and discharged into the sanitary sewers.

   If you wash your car at home, do so on gravel, grass or other permeable surface. In this way the wash water is filtered prior to getting into the storm sewer system.

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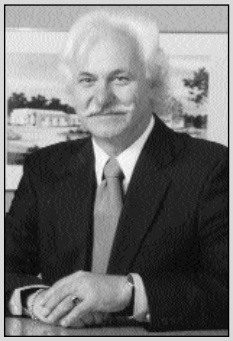
PRESIDENT'S CORNER



From February 17 to 23, 2008, we celebrated "Engineers Week" 2008. The purpose of this yearly celebration is to honor the achievements of millions of engineers who contribute daily to our quality of life and to inspire young people to explore engineering. This year's House resolution puts this celebration in context, as formulated by Rep. Lipinski who holds engineering degrees from Northwestern University and Stanford University.

"Engineers have helped us build boats to cross the seas, railroads to take us west, and the internet to communicate with the world. Today we need the innovative capabilities of engineers to confront the new challenges before us such as developing American energy independence, finding solutions to confront global climate change, and making our nation more secure. I would like to thank the engineers that have contributed so much to America, and to honor them for their commitment to continue working to better our society."

Yet, according to a recent Harris poll conducted for the American Association of Engineering Societies, 61% of Americans and 78% of women feel that they are not informed about engineering and engineers. Fewer than 3% of the respondents regarded engineers as creative, pioneering, seeking knowledge, or inventive.

A survey conducted in conjunction with the May 2000 National Academy of Engineering's Summit on Women in Engineering found that young girls are not aware of what engineers do, are not presented with information that shows engineering as a viable career for girls, and are not encouraged to take advanced math and science classes. Companies, universities, and individual engineers can take engineering into classrooms.

Obviously, we who are engineers have our work cut out and, for starters, should endeavor to take engineering into classrooms. To this end and to celebrate our firm's 50th Anniversary, Cowan Associates has initiated a scholarship program for graduating seniors of Quakertown High School. This will not only benefit a deserving future engineering student, but also showcase engineering studies and the career opportunities associated with an engineering degree.

As far as women in engineering are concerned, I can proudly report that Cowan Associates exceeds the national average statistics. Of our nine Professional Engineers, two (or 22%) are ladies. The percentage of yearly graduating female engineers is 18%. Additionally, we are thankful to have very competent female project and office managers.

We believe that we have assembled the finest team of engineers and staff available, and this is reflected in our collective attitude of responsibility and pride in quality. We know that quality of service will earn us your trust.

Johann F. Szautner, P.E.

IMPROVING WATER QUALITY - CAN YOU HELP?

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Use nozzles that shut off automatically when not in use.

Use only biodegradable soaps.

3. Use proper lawn care techniques. Do not over fertilize your lawn. Excess fertilizers that the plants cannot absorb will eventually drain to the streams or infiltrate into the groundwater.

4. Properly use and store pesticides. Use pesticides only as directed. Pesticides, by their nature, kill organisms. If used in excess or disposed of improperly, they can get into the storm sewer system and discharge to the streams. Just as the pesticides kill bugs, the chemicals can adversely affect or even kill the aquatic life in the streams.

5. Keep your automobile in good working order. Fluid spills or leaks on hard surfaces will be washed to the storm sewer system during the next rain. This runoff results in pollutants, heavy metals and toxic materials entering ground and surface water supplies, creating public health and environmental risks.

These are just a few simple ways that you can help to preserve the existing water quality in local streams and lakes. If you are interested in obtaining more information, websites such as the US Environmental Protection Agency (cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm), the PA Department of Environmental Protection (www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/stormwatermanagement), or the Stormwater Manager's Resource Center (www.stormwatercenter.net) contain educational materials for the public. If you are interested in volunteering to help improve water quality in your area through stream clean-up or assisting in education efforts, please contact your municipality for additional information.

With everyone's help, hopefully the pristine and tranquil waters in this area can be maintained for the enjoyment of all of us and also future generations.

HUMOR

Several weeks after a young man had been hired, he was called into the personnel director's office.

"What is the meaning of this?" the director asked. "When you applied for this job, you told us you had five years experience. Now we discovered this is the first job you've ever held."

"Well," the young man replied, "In your advertisement you wanted somebody with imagination."

EMPLOYEE SPOTLIGHT

Cowan Associates is proud to spotlight Marita R. Thomson for her outstanding service in this quarter. Marita is the head of our Human Resources and Accounting Department. She has been an employee of Cowan Associates for 14 years. Marita's responsibilities include billing, payroll, and general accounting, as well as dealing with medical insurance issues and personnel. She is being honored for her tireless efforts and outstanding service this past year. Marita is an important part of the success of Cowan Associates, Inc., and we all appreciate her efforts.

Todd Myers has recently completed a certification process to achieve a level of Fire Inspector 1 which is a national certification program for fire inspectors. This certification is recognized in all 50 states and in several countries across the world, and is in accordance with nationally recognized standards as specified in the National Fire Protection Association Standards 1031, Standard for Professional Qualifications for Fire Inspector and Plans Examiner. Todd also received the International Fire Service Accreditation Congress Certification and a ProBoard Accreditation as a Fire Inspector 1. Todd will use this new certification in third party plan reviews which Cowan Associates currently provides. Todd is also seeking cross-certification with the International Construction Code, as well as the Uniform Construction Code. This Fire Inspector 1 certification will greatly enhance Cowan Associates ability to perform third party reviews of plans for municipal clients as it relates to fire safety and life safety issues. We at Cowan Associates are very proud of Todd's accomplishment in obtaining this nationally recognized accreditation as a Fire Inspector 1.

HOW TO RUN SAFELY

by Johann F. Szautner, P.E.

A jogging website offers the following light-hearted four-step advice on what you need to run safely:

1. A brain.
2. A little knowledge (about jogging).
3. Common sense.
4. Running shoes (tied).

It also warns that very serious injuries can come from very small things like mis-stepping.

Last year, I was hired by a New Jersey shore community to investigate a trip and fall accident of a jogger who sued the municipality for placing a speed bump over which she tripped, fell, and as a result, sustained multiple injuries.

Case Synopsis

The middle-aged jogger was experienced, having jogged for over ten years, in good physical condition, and jogging on a sunny morning at 7:00 a.m. on a Sunday along a town road leading to the beach. As this road experiences heavy seasonal traffic with frequent speeding, the municipality installed a series of speed bumps across it, traffic calming devices.

The jogger testified that she was running along the left side of the road to face traffic, and that she was distracted by hearing a parked car being started across the street from her, and thus did not see the speed bumps. She got her toe caught between the speed bump underside and the pavement surface. A traffic sign labeled "Slow" was posted within 70 feet of the speed bump, and an additional sign, "Bump," may have been posted at the time of the accident, according to conflicting testimony.

Forensic Investigation

Plaintiff's expert determined that the speed bump cross-section geometry did not meet geometric parameters pertaining to the Americans with Disabilities Act and International Building Code for walking surfaces, and that many loading cycles over the plastic speed bump may have deformed it so as to create a space between the pavement and the bottom of the device which created a trap for anyone jogging over it. He further concluded that the position of the sun at 7:00 a.m. was such as to cast a deep shadow of a nearby tree over the speed bump, making it difficult to see. No substantiation of this hypothesis was offered.

The plastic speed bumps were fastened to the pavement by means of adhesive strips and two (2) 18" steel spikes each. After the accident, they were removed and the holes in the pavement filled with sand. As the original speed bumps were kept, it was possible to reinstall them at the exact position in which they were in place during the accident by driving the spikes into the old holes. This happened during my forensic investigation where I observed the reinstallation and made the following observations:

1. Three (3) plastic speed bumps, each measuring 2 inches in height and 9.5 inches in width, were evenly spaced across the pavement.

2. Edges of the speed bumps were beveled and the speed bumps measured 8'-9½" in length.

3. The lateral spacing of the speed bumps left a 23" wide clear pavement strip on either edge of the pavement and a 16" wide clear pavement strip between the first and second, and the second and third speed bump structures.

4. Remnants of adhesive on the speed bump structure underside mirrored remnants of adhesive on the pavement, indicating complete and good seal of any space between the pavement surface and the speed bump underside.

5. The speed bumps are colored traffic yellow and meet the requirements of AINSI Z535.1 Standard.

6. There are no sidewalks along the street, and lawn extends into the right-of-way to the edge of pavement.

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HOW TO RUN SAFELY

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7. Building Code and Americans with Disabilities requirements do not pertain to roadway surfaces.

8. At the time of the accident, specific standards for traffic calming devices were not issued either by Federal Highway Administration or by New Jersey Department of Transportation.

9. Existing literature pertaining to traffic calming devices lists speed bumps as one of the available devices.

Conclusion

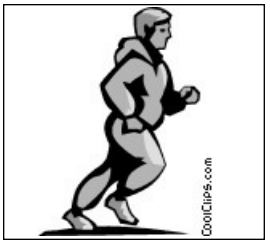
From reviewing the relevant facts, it is evident that the jogger could have run along the edge of the pavement on either side of the road. The available unobstructed width of 23" is adequate for unrestricted ambulation of a single person. Most residential walkways up to and around a dwelling measure no more than 24 to 30".

Although the jogger indicated being distracted by the noise of a car motor starting up, she should have stopped to see if the car, when moving, would have conflicted with her movement and taken any necessary avoidance maneuver.

The jogger must have been mistaken in her recollection that she caught the toe of her swing foot between the speed bump and pavement as this would be a physical impossibility. The placement of the speed bump was open and obvious, and there was no reason for the jogger not to recognize the potential danger of tripping when running over the device. She could have run along either edge, completely avoiding the speed bump.

Result

After the Plaintiff's refusal of settlement offer, the case went before a jury which decided that the municipality was 60% negligent and the jogger 40%. The jury award exceeded the original settlement offer by 15%.



**ANGLE and LINE is published quarterly by Cowan Associates, Inc. For additional information on articles contained within contact:
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