

ANGLE and LINE

A Quarterly Newsletter by COWAN ASSOCIATES, INC.

Engineers • Designers • Surveyors
Serving Business, Municipalities, and Industry since 1958



GEOLOGIC and ACCELERATED EROSION

by Jeffrey L. Schroy, SET, CPESC

Soil erosion is the process of detachment and transportation of soil materials by water, wind, ice and gravity. While "geologic" erosion naturally produces about 30 percent of the total sediment in the United States, "accelerated" soil erosion from man's use of land accounts for the remaining 70 percent. Surface mining, forestry, agriculture and construction are the major activities that cause accelerated erosion. Although construction by volume does not cause most sediment pollution, it is the most evident and damaging because of the rate at which it occurs. Erosion associated with construction activities can be 200 times greater than that from cropland, and 2,000 times greater than that naturally occurring in woodlands.

When natural landscape is converted to accommodate houses, subdivisions, shopping centers and roads in rural areas, or development and redevelopment within cities and towns, these land use conversions are collectively referred to as *urbanization*. Water-generated accelerated erosion is unquestionably the most severe erosion in areas undergoing urbanization.

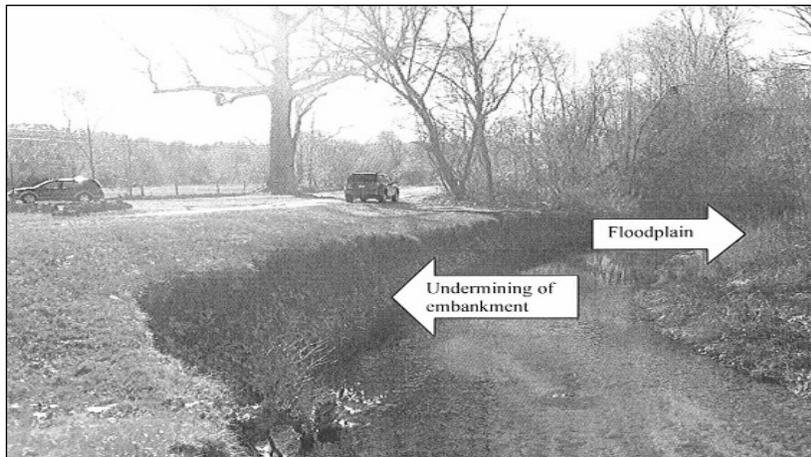
Erosion problems associated with construction activities include water pollution, flooding, stream channel damage, decreased groundwater storage, slope failures, damage to adjacent and/or downstream properties, and the time and costs associated with addressing these issues. Successful movement/loss in the first place enhance project aesthetics, reduce complaints and, most importantly, eliminate appreciable damage to off-site receiving channels, property and natural resources.

The goal is to control soil erosion, sedimentation, and nonagricultural runoff from regulated "land-disturbing activities" to prevent degradation of property and natural resources. Regulations specify "Minimum Standards" which include criteria, techniques and policies that must be followed on all reg-

ulated activities. Regulations for erosion and sedimentation control delineate the rights and responsibilities of those who administer a plan and also those of property owners who must comply.

While property owners are ultimately responsible for plan approval and implementation, responsibility for ensuring compliance extends to the developer, contractor and consultant. Successful execution affects a variety of interests, from anyone who owns, rents or develops property to those who reside or recreate on lands or waters adjacent to or downstream from land-disturbing activities.

Design of the erosion control measures for this site is to ensure fairness so fewer developers do not gain an economic advantage. It also advocates technically sound and economical control of nonpoint source pollution. Proactive implementation not only conserves and protects resources, but is also

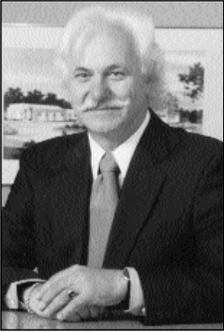


more practical and cost-effective in the long-term when compared to reactionary approaches that may lead to costly delays or expensive remediation of damages from inadequate implementation. Simply put, the standards and policies promoted include quality construction, engineering and administrative practices that endeavor to provide equal protection for all properties and resources across the Commonwealth.

A land-disturbing activity is "any land change on private or public land that may result in soil erosion from water or wind and the movement of sediments into state waters or onto lands in the Commonwealth including, but not limited to, clearing, grading, excavating, transporting, and filling of land." This definition includes land-disturbing activities equal to or exceeding 10,000 square feet in area, however, the following 13 activities are specifically exempt from the definition.

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PRESIDENT'S CORNER



With Labor Day behind us, we fondly remember summer - sunny shore trips, backyard barbecues, fire works, and fireflies. Labor Day appropriately lets us celebrate the fruits of our labor in whatever fashion we prefer, including doing some work.

As I checked e-mails on Labor Day, I found in my inbox the monthly e-news memo I receive from OSHA, the Occupational Safety and Health Administration. On this Labor Day, OSHA reminded us that we all, employers and employees, have a duty to assure a healthy and safe workplace.

Yes, OSHA is an enforcing agency as mandated by Congress some 35 years ago, but I think that we, industry and government alike, have come a long way and realize that workplace safety and health are a top priority, best fostered by a partnership approach. Therefore, I like to stress the opportunities that OSHA provides with education, outreach and training.

There are a number of OSHA resources available to assist employers and employees in identifying work place hazards and possible solutions to those hazards. Once you are on OSHA's website, www.osha.gov, you can link directly to an "on-site consultation program," which is a free and confidential service. Employers can find out about potential hazards at their work sites, improve their occupational safety and health management systems, and then qualify for a one-year exemption from routine OSHA inspections.

This service is delivered through state offices employing well-trained professional staff. Most consultations take place on-site, though limited services away from the work site are available. This service is primarily geared towards smaller businesses as an outreach effort without citations and penalties. It's entirely confidential too, and no information is shared with the routine inspection staff.

The only obligation is to commit to correcting serious job safety and health hazards - a commitment which must be made and carried out in a timely fashion prior to an actual site visit.

We also have a great resource available with our regional Allentown area office. Mr. Scott G. Shimandle, Compliance Assistant Specialist, is always ready and willing to discuss and personally assist with work place health and safety issues, and how to implement an effective program. His contact information is: USDOL/OSHA - Allentown Area Office, 850 North 5th Street, Allentown, PA 18102-1731; telephone 610-776-0592; fax 610-776-1913; email shimandle.scott@dol.gov.

Work place accidents are all too common. The Bureau of Labor statistics registered 5,488 fatalities for the year 2007. Although this is a 6% decrease from the total fatalities for 2006, it is still a staggering number, not only of lives lost but also the associated economic losses for accident victims' families as well as the employer, as work place accidents result in lawsuits, work loss, and job-site shutdowns.

As employers and employees, we must always look to improve safety at the workplace. It is the right thing to do for people and the bottom line alike.

by Johann F. Szautner

GEOLOGIC and ACCELERATED EROSION

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1. Disturbed land areas of less than 10,000 square feet in size, however, a local conservation district may reduce this exception to a smaller area of disturbed land.
2. Minor land-disturbing activities and individual home landscaping, repairs and maintenance work.
3. Individual service connections.
4. Installation, maintenance or repair of underground public utility lines when such activity is confined to an existing hard surfaced road, street or sidewalk.
5. Septic tank lines or drainage fields unless included in an overall plan for land-disturbing activity relating to construction of the building to be served by the septic tank system.
6. Surface or deep mining.
7. Exploration or drilling for oil and gas including the well site, roads, feeder lines and off-site disposal areas.
8. Tilling, planting or harvesting of agricultural, horticultural or forest crops; or livestock feedlot operations, including a specific list of engineering operations.
9. Repair or rebuilding of the tracks, right-of-way, bridges, communication facilities and other related structures, and facilities of a railroad company.
10. Agricultural engineering operations including but not limited to the construction of terraces, terrace outlets, check dams, desilting basins, dikes, ponds not required to comply with the provisions for Dam Safety Act; ditches, strip-cropping, lister furrowing, contour cultivating, contour furrowing, land drainage and land irrigation.
11. Installation of fence, sign, telephone, electric or other kinds of posts or poles.
12. Shore erosion control projects on tidal waters when the projects are approved by local wetlands boards, the Marine Resources Commission or the U.S. Army Corps of Engineers.
13. Emergency work to protect life, limb or property; and emergency repairs.

Parties uncertain as to whether or not a specific activity is regulated should consult local regulations.

It can be seen that a significant amount of soil erosion is from man's use of land. Construction activities must be planned in such a way as to greatly reduce accelerated soil erosion.

BETTER SAFE THAN SORRY

by Johann F. Szautner, P.E.

Engineers, surveyors and other technical professionals often need to work on construction sites among an army of laborers, tradesmen, suppliers and vendors who are employed by various contractors and subcontractors. All parties on a construction site have a duty to exercise reasonable care to avoid the risk of injuries to workers. Even those of us who are not responsible for the construction can, under certain circumstances, invite site safety liability exposure.

Historically, courts have not held professional service firms responsible for construction accident related injuries or deaths if the firm did not have a contractual obligation for site safety, were not involved in any construction activity, including construction management, nor assumed site safety responsibility – and there is the rub because historically courts have also found professional service providers liable if they did not act reasonably upon recognition of an unsafe condition. Even if no obligation for site safety exists contractually, our laws have been interpreted that based on specific circumstances, a professional duty may prevail over a contractual provision to the contrary.

The crux of the question is whether the professional service provider had both the opportunity and the ability to alleviate an unsafe condition. Courts look at the awareness of an unsafe condition in conveying a duty of care, and then analyze the reasonableness of the professional service provider's action or failure to act.

Courts will evaluate whether the risks of injury or death associated with an unsafe condition were foreseeable and, if the professional service provider observed it and recognized it as an unsafe condition, and had a reasonable opportunity to intervene to prevent the accident.

As ambiguous as this liability exposure by professional conduct appears to be, there are some risk management tools available. The first and most important one is to communicate the observance of an unsafe condition to a responsible person in charge, usually the superintendent or clerk of the works. Then, document in writing the perceived unsafe condition and to whom and when and under what circumstances it has been communicated.

Mail a copy of report to your client, indicating that the unsafe condition may be a breach of the construction contract and/or may be a non-compliance of state and federal OSHA regulations, and jeopardize public health and safety.

Let's not forget for one moment that construction sites inherently create the potential for accidents and need to be managed to provide a safe workplace, but also to hold paramount the health, safety and welfare of the public. Remembering this will help us, as professionals, to do the right thing when observing unsafe conditions, and that is the best risk management tool available.

ROUTE 38 PEDESTRIAN OVERPASS

by Charles R. Tomko, P.E.

Cowan Associates, Inc. is proud to have had a part in the design of precast elements for the Route 38 Pedestrian Overpass in Cherry Hill, NJ. The overpass allows pedestrians to safely travel between the Cherry Hill Mall and the complex of stores, movie theater and restaurants across Route 38, as well as an adjoining housing development. The access is fully accessible as it includes

an enclosed elevator on the Cherry Hill Mall side of the overpass and ramp on the far side, meeting ADA requirements.

The precast elements consisted of the stair tower around the elevator structure, landing at the top of the elevator, and approach stairs. But the most unique part of the precast portion of the project is the precast parapet walls around the elevator stair tower and landing, and their connection to the stair pieces.



The precast parapets were constructed with anchor ports along the base of the parapet pieces which allowed the pieces to be bolted to the Halfen adjustable anchors in the stair sections. The bolts were recessed to allow the ports to be grouted, thus concealing the bolts. The stair pieces were also designed with specially reinforced ledges to provide additional support for the parapets. The precast elevator landing pieces were also unique in their design as the landing was constructed in two inverted channel pieces and bolted together in the field. One of the sections incorporated a cantilever to create the elevator foyer area. The



same technology was used to connect the parapets to the landings as was used on the stairs. The contractor reported that the pieces all fit together smoothly in the field. Cowan Associates, Inc. also provided the design of two hammerhead pier caps used to support the stair mid landing and the upper level elevator foyer landing. The hammerhead pier caps in this case are simply rectangular concrete caps centered over the circular support columns. Bethlehem Precast, Inc. of Bethlehem, PA produced the precast concrete.

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HABITAT FOR HUMANITY BUILD DAY

by Scott P. McMackin, P.E.

On August 23, 2008, six (6) members of Cowan Associates had the fulfilling experience of spending time volunteering for a build day for Habitat for Humanity of Bucks County at their Emerald Hollow development in Trumbauersville.

The Emerald Hollow development consists of two phases, totaling 73 townhouse units, being constructed entirely by Habitat for Humanity. Habitat for Humanity notes that the development is considered to be one of the largest and most innovative projects in the northeast by providing affordable housing in a village concept with cluster housing and a large amount of open space.



The build day started at 8:30 a.m. and, after a short safety overview, we spent the day installing drywall in one townhome and constructing a CMU foundation for a second townhome. After a full day, the Cowan team and other volunteers worked so hard that we were let out a half hour early! Cowan Associates also presented a contribution to Habitat. Thanks to Angelika Forndran, Tom Wargo, Mike Smith, James Laubach Sr. and Jr., and Rick Parker for volunteering their time. This was our second year volunteering for Habitat for Humanity, and we look forward to future days.

Cowan Associates is proud to have been associated with Habitat for Humanity for many years. We thoroughly enjoyed our day and invite our readers to contact Habitat of Bucks County at 215-348-2204 or www.habitatbucks.org for information on volunteering.

HUMOR A young engineer was leaving the office at 6 p.m. when he found the CEO standing in front of a shredder with a piece of paper in his hand.
“Listen,” said the CEO, “this is important, and my secretary has left. Can you make this thing work?”
“Certainly,” said the young engineer. He turned the machine on, inserted the paper, and pressed the start button.
“Excellent, excellent!” said the CEO as his paper disappeared inside the machine. “I just need one copy.”

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