



Maryland Green Registry MEMBER

The Maryland Green Registry promotes and recognizes sustainable practices at organizations of all types and sizes. Members agree to share at least five environmental practices and one measurable result while striving to continually improve their environmental performance.

Hillis-Carnes Engineering Associates, Inc.

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Engineering Consulting Firm

Member since April 2011

Management and Leadership



Environmentally Preferable Products and Services

As a geotechnical engineering firm, HCEA has been practicing sustainability in design since its founding over 25 years ago; we just did not call it a “sustainable” practice until the definition and practice of “sustainability” became well known.

In design it has always been a goal to “value engineer” projects to see if we could explore the subsurface conditions, test the soil and rock, and design less expensive foundations for our clients. There are many case histories in our records where we have been able to design shallow foundations rather than using deep foundations for a given structure. Shallow foundations are usually referred to as spread footings and generally consist of a small concrete pad or footing, placed 3-4 feet below ground surface, and requiring less earth disturbance and concrete to construct. These foundations would be compared to deep foundations such as caissons and drilled shafts where the foundation could consist of a 2 +/- foot to over 10 +/- foot diameter vertically drilled hole extending from as little as 10 feet to greater than 100 feet in depth, filled with concrete and steel reinforcing.

Minimizing earth disturbance and the use of construction materials made from earth materials (i.e. concrete and steel) is more important than ever. We have been incorporating these types of design evaluations on almost every foundation project.

Environmentally Preferable Purchasing

All paper products contain recycled materials ranging from 30% to 100% depending upon the use of the paper product. We are reducing copy paper usage by doing as much of our work electronically as possible. Our clients, especially our public clients have been requesting paperless reports, submittals, specifications and drawings as much as possible.

Waste

Recycling

Hillis-Carnes Engineering Associates, Inc. (HCEA) is a geotechnical, structural, environmental, and construction engineering firm with three AASHTO certified testing laboratories. We test soil, rock, aggregates and concrete. Concrete samples are created on a job site where concrete is being poured. The concrete must meet certain strength requirements and these requirements are tested in our laboratories.

Concrete samples are obtained from the concrete truck or batch plant and placed in round cylinders that are typically 6-inches in diameter and 12-inches in height or 4-inches in diameter and 8-inches in height. Approximately 90% of the cylinders are 4-inches x 8-inches in size and contains approximately 0.34 cubic feet or 0.013 cubic yards of concrete. Each sample of concrete is removed from its cylinder and placed in a machine that breaks the concrete sample to determine its compressive strength value. Once the concrete sample is broken, the concrete is discarded.

In the past these broken concrete cylinders were sent to landfills at a rate of about \$60.00/ton. For a typical dumpster load of 25 tons we were spending over \$1,500.00 per dumpster load to discard these cylinders. For a year we would typically dispose of 25 dumpster loads of broken concrete and at \$1,500.00 per load we were spending over \$37,500.00 on disposal.

We now pay \$125.00 per dumpster load for the concrete cylinders to go to a recycling facility where they are crushed and sold as recycled concrete CR-6 for use as fill material in building and highway construction projects. We only spend \$3,125.00 to dispose of these cylinders on a yearly basis. But the real environmental "savings" is in the reuse of this material. Every cubic yard of recycled concrete that is used reduces mining and earth disturbance because natural crushed rock would have to be used if recycled concrete was not available. For someone buying the recycled concrete they would expect to pay

(F.O.B.) around \$6.50 to \$7.00 per ton. The price (F.O.B.) for natural crushed rock would range between \$8.00 and \$10.00 per ton.

Bottom Line: Using recycling of concrete cylinders we save over 90% of the yearly concrete cylinder disposal fee, the user of the recycled crushed concrete can purchase the product less expensively than crushed rock and ground disturbance caused by mining natural rock is reduced.

Transportation

Efficient Business Travel

HCEA uses teleconferencing between our offices and our clients whenever possible. When multiple employees are required at out of office meetings, we combine ridership to reduce company miles. Many of our clients are also practicing these measures thus reducing overlay on site meetings.

Fleet Vehicles

HCEA provides drilling services requiring the use of company vehicles to transport both employees and drilling equipment to the work sites. We currently own 21 pieces of drilling equipment, two "low-boy" tractor trailers to transport drilling machines and over 40 various pick-up, van and stake-body service trucks. We have reduced our fuel usage by adapting our equipment to transport two drilling machines and/or one drilling machine and one service truck so that we can make multiple stops and pick-ups when moving drilling and support equipment from one jobsite to another. We also have become more efficient in reducing employee travel to our offices by picking up employees on the way to individual job sites. Savings vary depending upon the amount of projects, their locations and the type and number of drilling machines required. However, our data indicates that we are saving between 10% and 22% of our annual mileage. With over 150 total vehicles in our fleet, we estimate our mileage savings at a minimum of 125,000 miles per year.

Profile Updated July 2014



Help build a greener, more sustainable Maryland through voluntary practices that reduce environmental impacts and save money.

Learn more at www.green.maryland.gov/registry

