

THE NEXT GENERATION OF “GREEN” CAR WASHES

Options & applications for an environmentally-friendly & profitable wash

by Aaron Voorhees

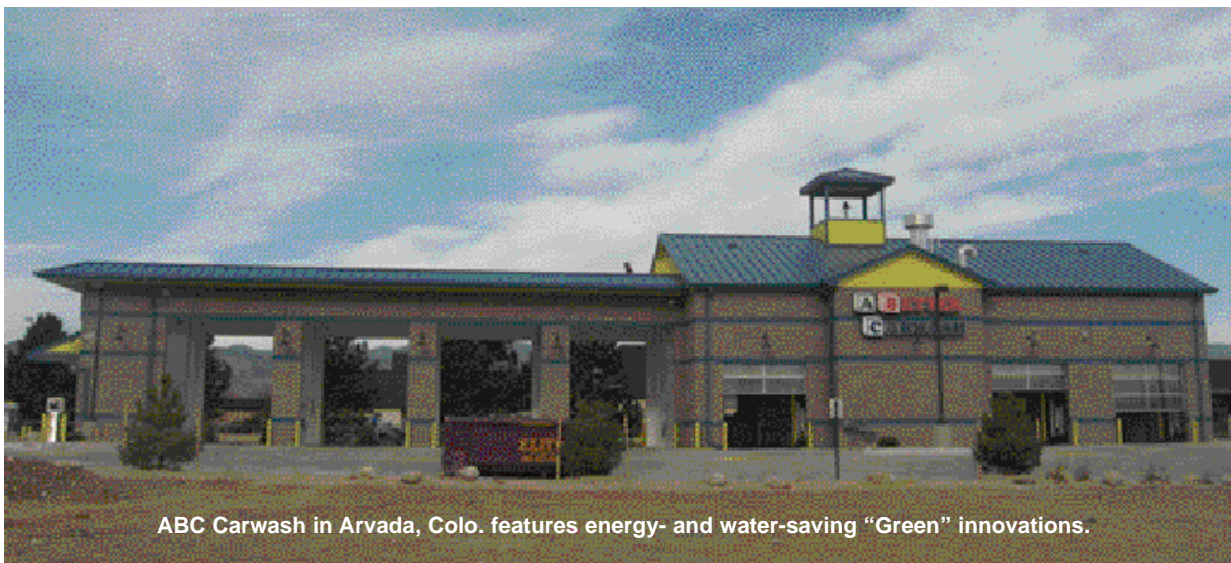
We all must do our part. As a commercial contractor and car wash owner/operator, I know that as natural resources become scarcer and prices of such rise, I must maintain a competitive edge in the car wash industry. I must help change the consumer’s view of professional car washes—that we actually *save* resources and therefore are *better* for our environment. I must be thoughtful, not only of chemicals used, but of building materials and processes that effect our environment as well. Every little bit helps. There are some amazing products and applications available to turn any wash “Green,” even if it is an existing business. And there are great options to make the construction of a new wash scalable for future Green features, even if the initial investment funds are lacking. If we all do our part, we will have much to be thankful for ... and so will our children and grandchildren.

ABC: A Better Car Wash

When I was constructing my first personal car wash in 2004, I had the opportunity to meet Jim Beetham through mutual industry contacts in Colorado. Beetham comes from a family of teachers ... his grandmother, mother, sister, and even his wife, were all school teachers. As a

tribute to this worthy profession, Beetham built his first wash in Golden, Colo. in 2005 and named it “ABC,” an acronym for A Better Carwash. His logo features wooden alphabet blocks with the letters “A-B-C” we have all seen at school. His wash has an old-fashioned school bell tower to complete the “schoolhouse feel.” What a great way to pay tribute to the vital, yet often undervalued, member of our society—the school teacher! Beetham is fond of quoting and living Henry John Hienz’s words, “To do a common thing uncommonly well, brings success.” The first ABC Carwash has had much success and Beetham has been the recipient of many awards in the car wash industry.

As a result of forecasted market trends, Beetham decided to transfer some of his investment funds from stocks and put it into something he was passionate about—car washes. “Brick and mortar” had already proven to be a solid investment, and might be better controlled and managed than stocks. Maintaining efficiency in the car wash’s design and construction and with proper operational management, his investment would pay dividends for many years to come. Beetham decided to develop and build a second ABC wash to be located in Arvada, Colo. He secured the building site and began the development of his newest vision in 2007. He was ready to take on



ABC Carwash in Arvada, Colo. features energy- and water-saving “Green” innovations.

“TO SUCCEED IN ANY COMPETITIVE ENVIRONMENT, A BUSINESS MUST BE ... SIMPLY BETTER.”

—Jim Beetham, Owner, ABC Car Wash



In order to accommodate photovoltaic solar panels, a flat roof replaced the original design of a truss roof system over the self-serve bays.



The solar panel array is oriented due south with a 10-degree tilt and will produce approximately 12,325 kW-hrs of AC power per year, approximately 10 percent of ABC's electrical usage.

the challenge of building another wash but it had to be better than the first! The next ABC wash would be “Green”! As Beetham has rightly stated, “To succeed in any competitive environment, a business must be ... simply better.”

Energy-saving solar panels

Early in 2008, we were brought on board Beetham's project to design/manage the structural design elements with the Battista Design Group. This car wash was going to feature three automatic bays, four self-serve bays, and a vending room. Originally, the plans called for a truss roof system over the entire car wash but in an effort to go more Green, he decided to go with a flat roof instead over the self-serve bays to accommodate photovoltaic solar panels. With our construction design advisement, we were able to maintain the same look and feel of the original roof design while accommodating the solar panel system. Beetham chose Energistic Systems (a local photovoltaic integrator and solar thermal developer) to design the solar panel system. Dan Fratello, with Energistic Systems, is very familiar with car washes, having been the director of engineering with Mark VII for nine years. The solar panel system was designed to include 48, 195W Evergreen solar panels for a total array size of 9.36kW with a Delta Inverter. The array is oriented due south with a 10-degree tilt and will produce approximately 12,325 kW-hrs of AC power per year, approximately 10 percent of ABC's electrical usage. Beetham earns a rebate of \$4.50 from the electrical company for every watt he produces on his site. There is also

a 30 percent federal tax credit available, and depreciation of the solar panels and equipment to further offset the initial investment cost of the solar panel system. Using an average savings of 1.6 lbs. of CO₂ saved per kW-hr of photovoltaic's production, Beetham's system will save a total of 19,720 lbs. of CO₂ per year. In addition to the solar savings ABC used extensive compact fluorescent lighting inside and out of the wash. This type of lighting uses far less electricity than traditional bulbs.

Water-saving reclaim system

It was also decided to use a water reclamation system by Aqua Chem. This system will not only reclaim all of the automatic water but will also capture all the weep water from the self-serve bays. In colder regions, weep water can reach more than 5,000 gallons a month and is typically rejected to the sewer as waste water. ABC will



A 15,500 gallon water storage tank was installed in addition to the reclaim system.

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AS BEETHAM'S SECOND ABC WASH IS NEARING COMPLETION, WE ARE ALL EXCITED TO SEE THE GREEN INNOVATIONS PUT TO WORK. THE EFFORT AND INVESTMENT ARE WELL WORTH IT, BOTH TO THE ENVIRONMENT AND TO THE POCKETBOOK.

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reclaim and reuse all this “lost” weep water. The reclaim system features a process called Cyclonic Ozone treatment with advance oxidation pretreatment, to oxidize the surfactants in the water to best maximize the water use, with the recovery rate upwards of 70 percent. This will minimize the impact on water resources of the area, without sacrificing wash quality. In addition to the reclaim system, we installed a 15,500 gallon water storage tank. ABC will not be dependent on the pressure of the local water municipality because it features its very own pressurized system. This also produced a substantial savings in the water tap fee charged by the city. The water storage tank and reduced water use with the reclaim system allowed us to operate on only a 1-inch water tap instead of the customary and more costly 2-inch.

I am not only a contractor who designs and builds car washes, but I have also owned and operated my own. My experience, mixed with that of Beetham's and his dream of A Better Car Wash, produced a plethora of ideas on how to go beyond what we had already built and operated. As the day-to-day construction unfolded, there were a number of small changes we incorporated to go above and beyond. When we poured the concrete for the automatic bays we created a 1-inch lip at the entrance and the exit of the bays. This would cause all the water and chemicals to return to the drain in the bays' center instead of pouring out into the drive lane as we had witnessed happen at other washes. But the 1-inch lip would catch about only about 80 percent of the water and chemicals headed to the drive lane, so we installed a trench drain at the entrance and exit of each automatic bay to catch the remaining water and chemicals. To combat the same



ABC Carwash vending room and signage located at the end of the self-serve bays.

problem in the self-serve bays, we installed a trench drain that runs the entire length outside of all four self-serve bays to prevent any water from exiting those bays into the drive lane. The trench drains are located within the heated slab so the water will not freeze and cease to flow.

As Beetham's second ABC Carwash is nearing completion, we are all excited to see the Green innovations put to work. The effort and investment are well worth it, both to the environment and to the pocketbook. Beetham knows that washing vehicles at a professional car wash is far better on our environment than washing in your driveway at home. "I promote professional car wash usage to protect our environment because home washing pollutes our water ways." Washing vehicles in the driveway causes far more damage to our precious water resources. Waste water and chemicals run into storm drains that pour into our streams, lakes and reservoirs, without undergoing any waste water treatment procedures. Consumers often do not realize that the negative impact of driveway washing is far greater than using a professional facility, not to mention, washing a vehicle in your

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driveway can use up to three times the amount of water used at a professional car wash to clean the same vehicle.

Other Green Ideas

ASLAN is currently working on other Green designs that will be built over the next couple of years. These car and truck washes will feature photovoltaic systems as well as thermal solar applications, and advanced water reclaim systems. In addition, we are using an insulated wall system for the equipment rooms to reduce the cost of heating. Some projects will feature Nuform wall systems in the self-serve and automatic bays, which are maintenance free. No more unsightly peeling epoxy topcoats with costly annual reapplication or repair, not to mention its harmful effects on our environment! We are entering an age where integrating solar on the roof of your wash could be supplemented by doing the same on multiple awnings covering the stacking lanes and exits of the bays. This will not only save energy but could potentially become a revenue source during slow months, depending on what your local utility company offers to purchase superfluous energy produced.

Solar Applications 101

Solar panel systems can be used for two primary purposes: photovoltaic and thermal. Photovoltaic application produces electricity to be used on site with excess electricity purchased by local utility companies. Thermal solar applications in a car wash could use the energy produced to heat or preheat water for the actual wash or to run in the heated slab. Both of these solar applications would save money in the long run and reduce impact on our environment and natural resources.

Thermal Solar

Adding thermal solar to your car wash can provide a huge savings by reducing the amount of natural gas required to heat wash water. Reducing natural gas usage also reduces emissions on the back end. In colder regions of the United States, heated concrete slabs are used so ice will not form in the drive lanes and bays. Thermal solar panels can be used to preheat the water for the heated slab as well as forced air heaters in the equipment room. For every 1 kW-hr of production saves .5 lbs. of CO₂, therefore, each panel should save 3 lbs. of CO₂ per day. The total savings will be dependent on the number of panels that are installed. A car wash would probably want to have a large array of at least eight to 10 panels to offset a larger portion of its natural gas usage to make the investment worthwhile.

I am very aware that the initial costs of solar applications can discourage the new investor. However, in most of our designs we make the building scalable to adapt to solar in the future. This can be designing the roof to take the panels, running sleeves for the electrical and/or thermal delivery, installing a tank underground below equipment room wrapped with insulation for future solar preheated water, and leaving a place designated for the inverter right next to the electrical panels. There are many new and exciting applications coming out on the market that will offset the energy crises and allow car wash operators the opportunity to capitalize on them. I do, however, think it will be a few more years.

Wall Systems

For car washes in particular, we like using wall systems like those offered by Nuform Building Technologies, formerly Royal Building Systems. This type of wall system can also be used in commercial and agricultural buildings. Nuform wall systems are basically interlocking wall sections made from durable PVC-like plastic, that are poured solid with concrete. There are a few reasons we like this system: 1) For colder regions, they offer a foam insulated version that, once poured solid with concrete, offers a greater r-value (resistance to

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temperature variance) than just traditional block. This will help keep the equipment room temperature more stable, saving money by reducing energy costs used to heat the equipment room. 2) On the construction side, we order the building and while it is being made in a factory, crews are constructing and pouring the entire foundation along with all the underground utilities and tanks, without the interference of a standing building to work around. When the building arrives, the concrete slab is completely poured, as often is the entire lot. Onsite crews can begin erecting the walls immediately. Once the walls are erected, they are completed, as opposed to traditional block which would require sealing and top coat applications. All of these features shave a considerable amount of time off the construction process which saves a bundle of money! 3) On the maintenance side, the walls come with a smooth polymer-based surface that will hold up to weather, chemicals and extreme temperature variations. 4) Nuform systems are very time and cost efficient with so much added value.

We All Must Do Our Part

Whether you have an existing wash, are building a new wash, or are just an interested investor, going Green makes sense. With so many options and applications available, we all could do a small part. And with everyone doing a little, we can make a huge difference on our industry's impact on the environment and on our own pocketbooks. ACCB

Aaron Voorhees is an entrepreneur with 14 years of business experience. He has successfully developed, built, and currently operates Living Water Car Washes in Littleton, Colo. Voorhees also owns and operates a multifaceted design management/commercial construction company that encompasses general contracting and real estate developing. Contact Voorhees by calling 303.995.0800, e-mail aaron@ASLANcom.com or visit his company's Web site at www.ASLANcom.com.

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