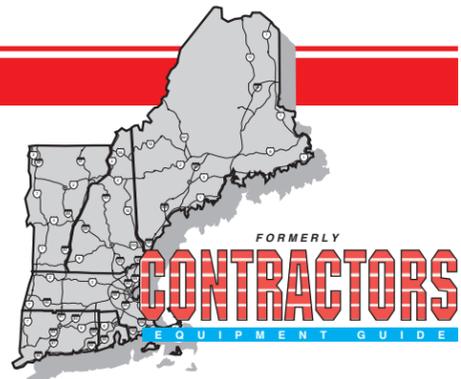


# Construction Equipment Guide®

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"The Nation's Best Read Construction Newspaper... Founded in 1957."

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## Husband, Wife Team Find Solutions to Unusual Problems in Tough Spaces

By Jay Adams  
CEG CORRESPONDENT

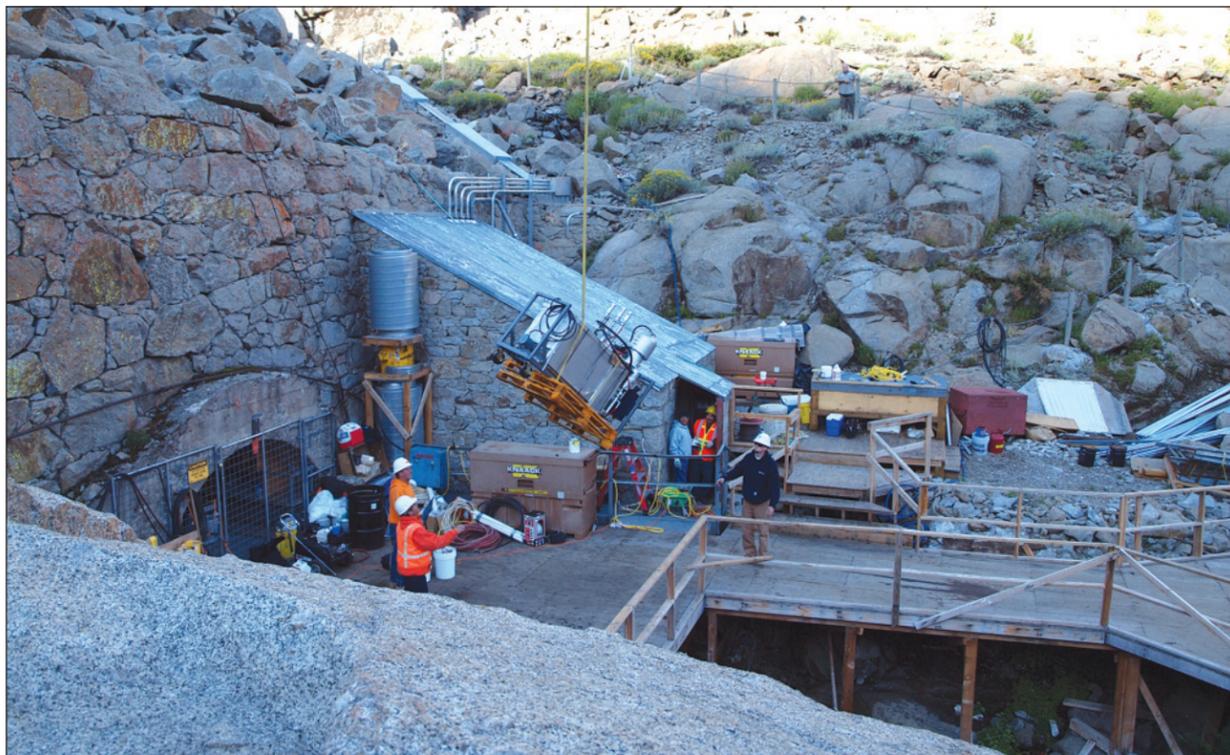
An unusual husband and wife team — Dan and Jane Warren — are the minds and elbows behind two internationally-proven companies — A & W Maintenance Inc. and Warren Environmental, whose industrial coatings have sealed dams, tunnels, walls, roads and even nuclear facilities, when men and heavy iron machines alone cannot fix the cracks.

Several decades ago, Dan Warren came to Massachusetts from Illinois as a young teenager in need of experimental eye surgery at Massachusetts Eye & Ear.

He worked on a number of large industrial painting projects for various companies during and after high school.

After working for several years as a supervisor for a very large industrial contractor, he began his own company on a shoestring, doing local work. The company was successful and began to expand in the mid-80s after having been awarded a large number of contracts for Anheuser Busch and several other larger New England firms.

While researching the best type of coating to use on a large tunnel project in Philadelphia, Warren decided that a certain type of epoxy would be the best solution. The only problem was that the epoxy was not user friendly for large applications and could not be spray-applied.



*The recent project for Pacific Gas and Electric in the Sierra Madre mountains was unique, because this very old natural rock dam structure was in need of rehabilitation and was located in a remote area accessible only by helicopter and pack animals.*



*The Warren Companies' facility, located in Middleboro Mass.*

Warren designed and patented the first solvent-free plural component spray equipment for use with the two-component epoxy. According to the couple, the solvent-free aspect was the crucial part, as solvents will allow an epoxy to be sprayed, but also will serve to break down the integrity of the coating and cause dangerous combustible fumes in confined spaces such as tunnels, a hazard to the person applying it as well as to construction crews.

With this breakthrough, Warren began getting calls for all sorts of epoxy solutions within construction tunnels and other facilities throughout New England. He founded A & W Maintenance Inc. in the early 1980s and incorporated in 1984, started as an industrial painting company applying all kinds of coatings in the industrial arena.

In 1996, Dan's wife Jane founded Warren Environmental Inc. to produce the patented crack-sealing epoxy they were applying on each job.

"Finding epoxy products that were consistently of high quality with the characteristics that we wanted to incorporate into a coating had become difficult," said Jane Warren, who brought her B.S. degree in science, her knowledge of chemistry, management and quality control to the manufacturing process. "Working with consulting chemists, a formulation was designed that incorporated the safety, corrosion resistance, strength and single-coat high-build qualities that are characteristic of the Warren coating system today. Our system is used by A & W Maintenance and by a network of approved applicators throughout the world."

Both A & W Maintenance and Warren Environmental are located in



*Repairing a 100-year-old brick tunnel in Boston.*

Middleboro Mass., at 137 Pine St. The company's approved applicators have locations across the United States and Europe.

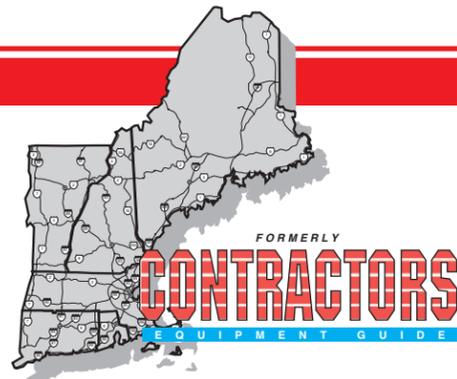
### How It Works

While Warren Environmental produces its solvent system, A & W Maintenance works on large industrial projects including deep underground tunnels, sewer systems, manholes, water treatment facility structures and pipes. A & W crews also train and work with Warren's approved applicators.

Jane Warren is the, well, glue of her company. She broke down her company's

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## Developing Safe, Single-Coat Epoxy Made Co. Take Off

patented system as follows:

"Our solvent-free epoxy application system is safe in confined spaces as it uses no thinners. Our zero VOC (solvent-free) epoxy products are mixed and applied using no thinner, are structural, can be applied in a single high build coat and stick to damp surfaces," she said. "We have formulations tested by the National Science Foundation for use in potable water structures, flexible epoxy systems for crack and joint repair, structural epoxies to add strength to and repair crumbling concrete and brick structures, corrosion and chemically resistant epoxies, and an epoxy used for nuclear containment to reduce emitted radiation from 'hot' structures. In 2009, our product was qualified by NAVSEA for Navy use as one of only two products approved for single-coat ballast, fuel and boiler feed tank lining," said Jane Warren. "This will expand our services to include all Navy ships at ports across the world.

"We have recently expanded our product line to include flexible joint seals for large pipes and a coating that can be used to control nuclear emissions from radiation contaminated equipment. Our company has achieved ISO 9001 certification for quality control and is a certified production facility for our Navy qualified products," she added.

Beyond sealing tanks and ships, holes under highways and the like, Warren and A & W have traveled around the world to complete some of the most exotic projects on record.

"The recent project for Pacific Gas and Electric in the Sierra Madre mountains was unique, because this very old natural rock dam structure was in need of rehabilitation and was located in a remote area accessible only by helicopter and pack animals," added Jane Warren. "The area was a pristine environmentally sensitive area, and the product had to be safe for the environment and be able to be flown in and applied with portable spray equipment, to the dam site. Our product was chosen because of its safety, and its ability to be sprayed without any dangerous solvents.

"The Washington, D.C. subway rehabilitation consisted of the lining of a huge leaking access shaft that was very wet all the time, and needed structural enhancement," said Warren. "Our product was chosen because of safety in the confined space area of the subway, its ability to be applied to a wet surface with excellent adhesion, its structural properties and its low odor. The successful lining of the shaft led to a number of projects for the subway system at a number of their stations as well as the lining of their deteriorated fire mains."

### From Tunnels to Mountains

"The Liawenee Flume located in Tasmania, was in need of structural rehabilitation with a material approved for drinking water use. It is located high in the mountains of Tasmania," continued Jane Warren. "Our single-coat, high-build properties, structural values and zero volatile organic compound formulation was perfect for the project."

Recently, one of Warren's formulations was used to coat equipment and materials used in a "hot cell" at a nuclear facility, which had been contaminated and needed to be removed. "It was found that after our material was remotely spray applied, the radiation emitted was greatly reduced, facilitating the safe removal of these contaminated items," said the couple, justly proud of their safety achievement, beyond a mere job.

They should be. The January 2012 issue of "The Nuclear Decommissioning Report" called Warren Environmental's help in successfully transporting this cell, "Moving the Impossible."

Other projects over the years have included the restoration of 1,000 ft. (305 m) of 14-ft. (4.3 m) diameter tunnel in New York; epoxy repair and application in the Los Angeles subway system in depths that exceeded 1,000 ft.; repairing a 100-year-old, one-million gal. water tank; complete repair of a wastewater treatment plant in Newport, R.I.; repair of a 100-year-old brick tunnel in Boston and a sewer tunnel in Miami.

Working with numerous general contractors and engineering firms around the world, both Warren companies employ about 25 very well-trained people. Jane's A & W employees have been with the company 15-plus years and are expert applicators.

The more their products become known, the more they expand their services.

"We have a great reputation for service and quality," said Warren. "There is an increasing demand for products that are non-hazardous, and are safe to use in confined spaces.

"Warren has trained applicators in Europe who perform most international bids,



The Liawenee Flume located in Tasmania, was in need of structural rehabilitation with a material approved for drinking water use, after it was treated with Warrens' single-coat, high-build properties, structural values and zero volatile organic compound formulation.



A man working in a pipe, one of the many jobs for which Warrens' products that are non-hazardous, and are safe to use in confined space are in such great demand.

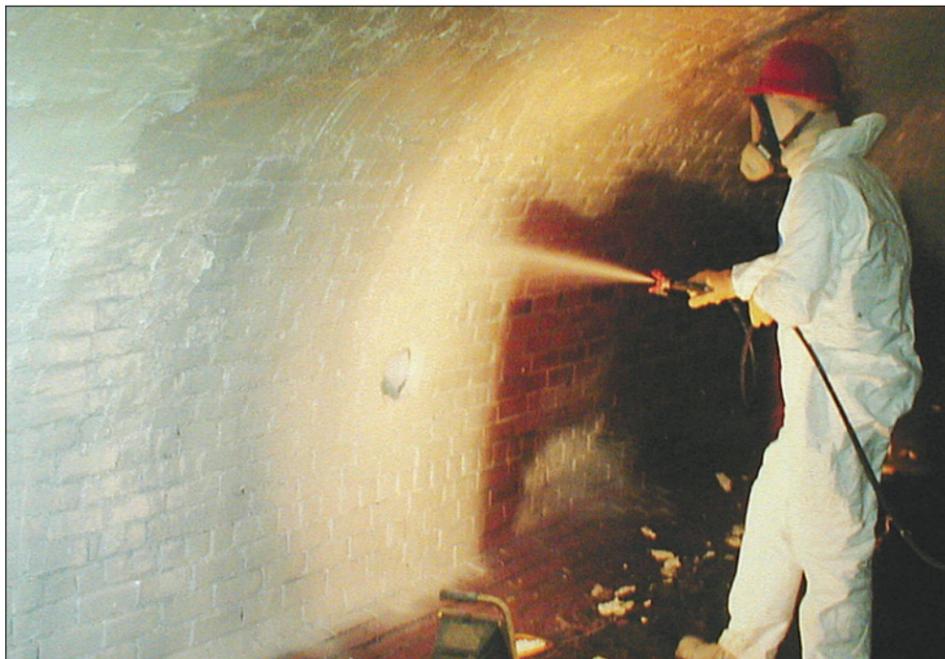
although we will travel if needed. Engineering firms call us through word of mouth. These large firms specify our coating for use on most projects," said Dan Warren.

Not only will they fix things that are cracking; they also will take a crack at things others won't fix.

"Dan Warren has the expertise and the creative ability to find a way to perform projects that others say are impossible to do, or have walked away from. He loves the challenge," said his proud wife.

"We currently have this project in Rochester, New York, that was attempted three times. It was a difficult pipe lining project that incorporated transitions from different-sized pipes into each other," continued Jane Warren. "The owners had spoken to Mr. Warren about this project, and had decided to go with a less expensive competitor. The competitor failed to perform on the project and walked away from it, saying it was impossible to do. There was a deadline for performance and the General Contractor was desperate to find a solution," she added. "Our company was called in by the engineering firm, whom we had done a lot of work with previously, and completed half the job in two weeks, putting the project ahead of schedule. The owner and the engineer are extremely pleased. The second half will begin in another week's time."

For more information, call 508-947-8539 or visit [www.warrenenviro.com](http://www.warrenenviro.com). (This story also can be found on Construction Equipment Guide's Web site at [www.constructionequipmentguide.com](http://www.constructionequipmentguide.com).) CEG



Boston tunnel spray application.