

# Rippers and Hydro-Hammers Make Light of Rocky Site of New High School

by Brenda Lange

Warrington, PA — Donald Durkin Contracting, Inc. of Southampton, PA is responsible for Phase I work on the newest high school in Central Bucks County, PA. Central Bucks South, Phase I includes construction of three detention basins, two parking lots, interior roadways and the school's building pad. Durkin has specialized in heavy earthmoving work throughout its 50-year history and takes this assignment in stride.

The new 2000-student high school, scheduled to open in September 2004, will be situated on a 79-acre site. Preliminary site work began in June. Phase II is scheduled to go out for bid in early August.

"We had some problems stripping the topsoil in the beginning because of heavy rains," says Don Durkin, Jr. But his array of equipment and nearly two dozen workers have made light work of the topsoil and the layers of shale and argillite below.

"We thought all the rock was going to create a problem for us at first," says construction coordinator for the school district John Giannini, P.E., "There is shale to a point, but then it gets to be hard black rock — argillite. Durkin's rippers cut right through the shale, and are making their way through the argillite."

Hopefully, Giannini says, they won't have to resort to blasting because of all the permits required for that

procedure, which could threaten their schedule.

A possible problem presented itself early on in the process: the appearance of ground water in the test pits. Architect George J. Donovan and Associates, Doylestown, PA adjusted its plans to accommodate the addition of underdrains in the lower areas of the building. Durkin needed to dig down about an additional foot for those plan changes. Also, a waterproofing membrane will be installed under the floor of the gym and within the walls during Phase II to protect those lower areas.

Durkin moved in big equipment to tackle the CB South site work. Several Caterpillar 773 50-ton earthmoving trucks, 375 hydraulic excavators, and D9 dozers with Kelly rippers and hydro-hammers dot the landscape, along with Terex TS 24 twin engine scraper wagons.

The Kelly ripper has enabled Durkin to meet the tight schedule without resorting to blasting. The single tooth or shank extending out of the back of the dozer tears into the rock, pushes into it hydraulically and slices through it with the weight and power of the D9. After a slice is made, the machine moves over five or six feet and makes another slice. Sometimes, cross-hatches will be ripped into the rock to loosen it further. The dozer blade pushes the sliced rock into a pile to be moved out by the excavators.

The rippers work well to a point on the harder rock below. "After the rippers, the hydro-hammer should do the trick on the argillite," says Durkin. "Since we only have to dig down to 10 or 12 feet, we shouldn't have to use dynamite."

The laminated shale lies in large sections across the site. With its many seams, it is more practical to try to rip it out. "If we didn't have the big hammer, we'd have to blast," adds Durkin. "The hydro hammer is the next step. It's slow, but since we're at a shallower depth and there's not an enormous amount of rock, we can use it. It's not practical to blast if shallow."

Before the Kelly ripper came along more than 20 years ago, Durkin says, they had to rely on blasting, no matter the density of the rock or depth of the excavation.

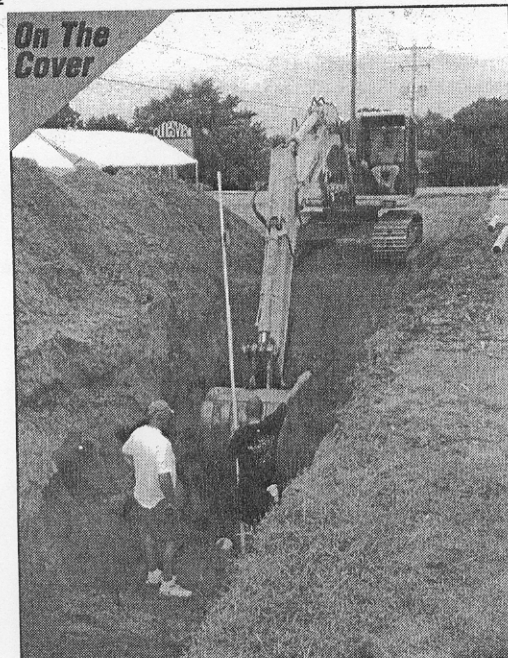
In order to open in time for the first students, the Class of 2007, the deadline for each part of the project must be met. For Durkin, that only intensifies the process. he says the site is unusual for them "in that we're doing a lot of construction in a short period of time."

The school district has had to work closely with Warrington Township supervisors and even had to change a major part of their initial plan. The site is located between two narrow strips of wetlands which feed Mill Creek which, in turn, separates the new high school from the existing Mill Creek Elementary School. In the initial plan, the high school building would have extended over the southern strip, creating a nightmare of bureaucratic red tape with the Department of Environmental Protection (DEP).

"It was just easier to plan around those wetlands," explains Giannini. "We thought of piping (water from the wetlands) underground to Mill Creek, but it was

too long a process to meet the DEP requirements. So we actually changed the footprint of the building and narrowed it enough to fit it between the two wetland areas, keeping everything on schedule."

Durkin also is responsible for all utility preparation work: laying electrical conduit for site lighting; putting in several fire hydrants, a public water line along the roadway fronting the school and the water line that loops around the school; and installing sewer lines along school property leaving easements for future public connections.



Reaching the proper depth for a sewer trenching project in Saugatuck Township, Michigan, is a snap for Bill Giles, operating his Komatsu PC150 LC with some help from Jack Dickinson (blue cap) and Paul Sellman of CSL Construction of Grand Rapids. The project is part of an area-wide, \$1.2 million sewer and water construction effort that is expected to be completed in 2003.

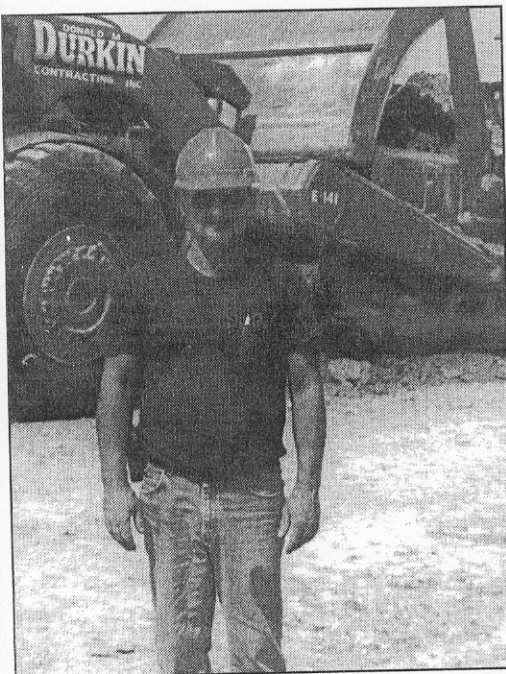
photo by Mike Gallagher

The township supervisors also asked that Durkin use environmentally sensitive practices around the detention basins. They will plant wetland vegetation around the basins to "polish" the water to ensure the storm water is free of pollutants before it is routed to the creek.

The school will also house a state-of-the-art gymnasium, swimming pool, stadium with seating for 3,000, and various playing fields. the building itself measures about 384,000 square feet. Phase I carries a \$2.6 million price tag, with an additional \$65 million budgeted for Phase II work.



A worker measures the depth of the excavation at the site of the future Central Bucks South high school. A Cat 375 excavator, 773 dump truck, and D9 dozer are part of the heavy equipment brought in by Donald Durkin Contracting, Inc. of Southampton, Pennsylvania, to clear the 79-acre site quickly.



Gene Hamburg, foreman for Donald Durkin Contracting, Inc., stands beside a Terex TS-24 at the site of the future Central Bucks South High School in Warrington, Pennsylvania.

photos by Brenda Lange



Donald Durkin Contracting, Inc. brought in the heavy earthmoving equipment to break through layers of shale and argillite and clear a site totaling 79 acres for a third high school in the Central Bucks, Pennsylvania school district. The new school is scheduled to open in September, 2004.