

# Primary and Secondary Schools benefit from ice storage regardless of electrical rates

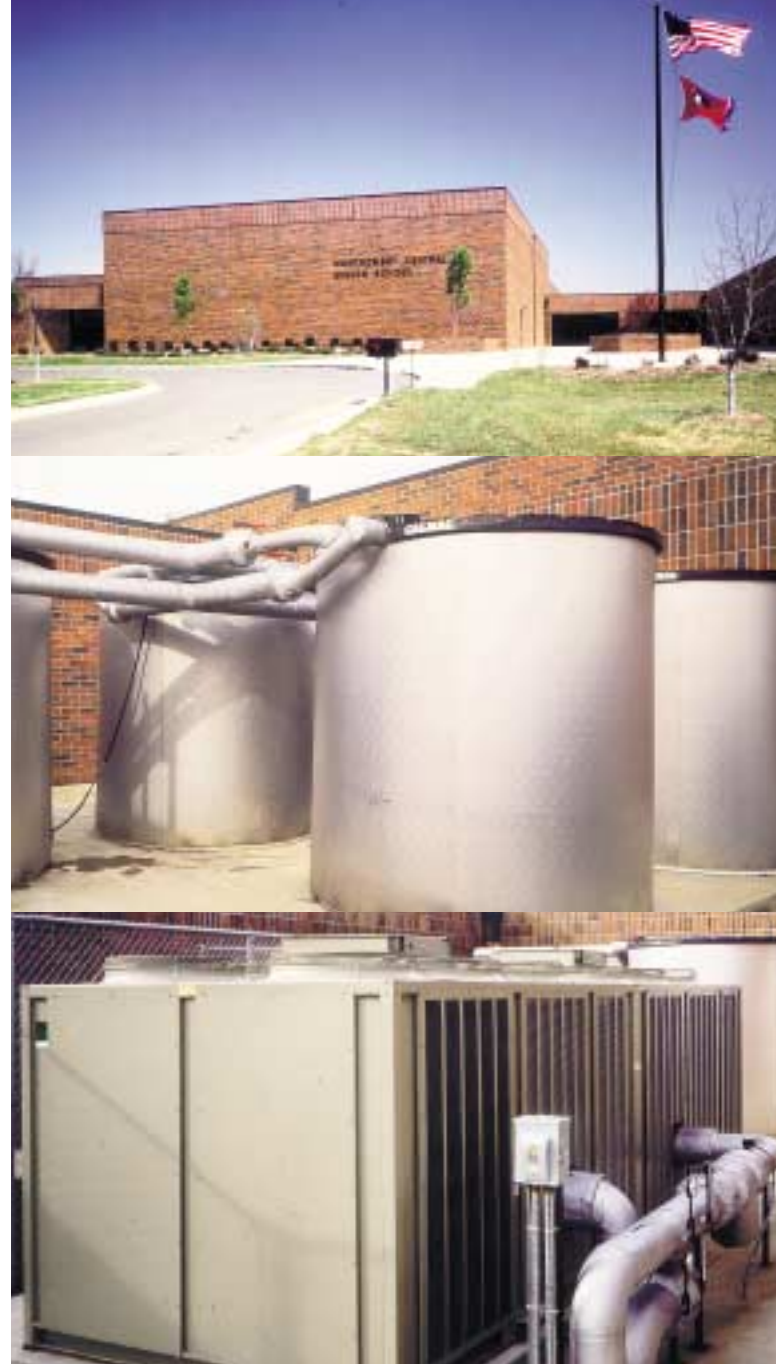
Even without utility rebate or time-of-day rates, Tennessee school expects 2-year payback from demand savings only

According to a major educational business journal, "Air conditioning has become a design factor in virtually all new educational buildings." Supporting this observation is their recent survey report stating that 73% of new elementary schools and 86% of new 4-year college facilities are air conditioned. An increasing number of business managers and physical plant directors are discovering, too, that educational buildings are ideal candidates for thermal storage in all electric utility areas.

A case in point is the new Montgomery Central Middle School in Clarksville, Tennessee. An engineering analysis of their air conditioning requirement determined that they had a design day peak cooling load of 190 tons, required air conditioning between 6:00 AM and 5:00 PM on school days, and needed provision for three hours occupancy at night for special events and meetings. The analysis further showed that all requirements could be met with thermal storage and a 100-ton chiller.

Mike Boehm, Maintenance and Operations Supervisor for the school system, stated, "We preferred a central hydronic system® rather than package heat pumps because of efficiency. We also wanted to avoid a water cooled chiller due to maintenance and water treatment requirements. And we wanted to limit the maximum demand the building could draw under design conditions. That's why I decided on thermal storage. We were approached by many ice storage vendors, but I liked the simplicity of using a standard air cooled recip chiller and the flexibility of being able to add ice tanks in the future at minimum cost and system adaptation."

The logical choice was an air cooled chiller with five modular Calmac ICE BANK® thermal storage tanks. Boehm said, "We were able to shift 120 kilowatts off peak. During the fall and spring I can usually operate the air conditioning on ice alone and never bring on the chiller during the day. With a demand rate of \$9.16 per kW, we can achieve a two-year payback over a conventional chilled water system with demand savings only. There are no utility rebates, ratchets or time-of-day rates in this area."



With thermal storage, this 100-ton chiller is able to do a 190-ton job. And, when its reduced power supply components are taken into account, the payback period drops to under two years.

# Modular ICE BANK® tanks may be located almost anywhere...

## INDOORS



Skyline Elementary School, Cape Coral, FL

## OUTDOORS



John F. Kennedy High School, Richmond, VA

## BURIED WITHIN AN ENCLOSURE



Fairfield Elementary School, Fort Wayne, IN

## A partial listing of primary and secondary schools employing Calmac ICE BANK® Systems:

### ALABAMA

Eastwood Middle School

Tuscaloosa

### ARIZONA

Challenger School  
DeNiza High School  
Landmark School  
Longview Elementary School  
Osburn Middle School  
San Manuel High School  
Skyview Elementary

Glendale  
Tempe  
Glendale  
Phoenix  
Phoenix  
San Manuel  
Peoria

### CALIFORNIA

Washington Junior High  
Anderson High School  
Canyon Lakes Elementary School  
Casa Loma Elementary School  
Centennial High School  
Copper Hills Elementary School  
Fancher Creek Elementary School  
Franklin Elementary School  
Frazier Mtn. High School  
Fremont Elementary School  
Fremont School  
Hurley Elementary School  
Jefferson Jr. High School  
Lincoln School  
Madera Jr. High School  
Madison Elementary School  
Marcus Foster Middle School  
Mountain View Elementary School  
Mt. Vernon School  
Mt. Whitney High School  
Muncie School  
Oakland High School  
Pinkham Elementary School  
Pioneer School  
Red Bank Elementary School  
Roosevelt School  
Sierra Jr. High School  
South High School  
Taft High School  
Taft High School  
Washington Jr. High School  
West Valley High School  
Westside School  
Woodward Lake School  
William Penn School

Bakersfield  
Anderson  
San Ramon  
Bakersfield  
Fresno  
Fresno  
Bakersfield  
Lebec  
Bakersfield  
Bakersfield  
Visalia  
Madera  
Madera  
Madera  
Oakland  
Fresno  
Bakersfield  
Visalia  
Bakersfield  
Oakland  
Visalia  
Bakersfield  
Fresno  
Bakersfield  
Cottonwood  
Fresno  
Fresno  
Bakersfield

### DISTRICT of COLUMBIA

St. Albans

Washington

### FLORIDA

Alta Vista Elementary  
Booker High School  
Booker High School  
Brentwood Elementary School  
Brookside Middle School  
Broward County School Board  
Charlotte Harbor School  
Florida Christian School  
Indiatlantic Elementary  
McIntosh Middle School  
Mila Elementary  
Palm Coast High School  
Pine View School  
Royal Palm Exceptional Center- Lee County Schools  
Sarasota H.S. Media Center  
Sarasota High School  
Seabreeze High School  
Skyline Elementary School  
South Fork High School  
Three Oaks Elementary School  
Tuttle Elementary School  
Venice Area Middle School  
Venice High School

Sarasota  
Sarasota  
Sarasota  
Sarasota  
Fort Lauderdale  
Port Charlotte  
Miami  
Indiatlantic  
Sarasota  
Merritt Island  
Bunnell  
Sarasota  
Fort Myers  
Sarasota  
Sarasota  
Daytona Beach  
Cape Coral  
Fort Myers  
Fort Myers  
Sarasota  
Venice  
Venice

### ILLINOIS

Clifford Pierce Middle School  
Libertyville High School  
Warren Township High School

### INDIANA

Beech Grove High School  
Beech Grove Middle School  
Central Nobel High  
Columbia City High School  
Corydon High School  
Dekalb Middle School  
Edgewood Elementary School  
Fairfield Elementary School  
Greenfield Central High School  
Hickory Elementary  
Indian Creek Elementary School  
Lawrence North High School  
Leo Elementary School  
Maplecreek Middle School  
Mary Castle Elementary School  
Mary Feeser Elementary School  
McKinney Harrison School  
Neil Armstrong Elementary School  
North Clay Middle School  
North Madison Elementary  
North Spencer Schools  
Northwood Elementary School  
Paul Hadley Middle School  
Pleasant View Elementary School  
Skiles Test Elementary  
South Wayne Elementary  
Southern Wells School  
Washington Elementary School  
West Lafayette Jr./Sr. High School

### KENTUCKY

Caldwell Co. Middle School

### MARYLAND

Ben Stoddert Middle School  
Carole Highland School  
Chesapeake Bay Middle School  
Kent Island High School  
Newport Elementary School  
Severn Elementary School

### MASSACHUSETTS

South District Elementary School

### MICHIGAN

Forest Hills Elementary School  
Perry Schools  
River Rouge School River

### NEW JERSEY

Glassboro Elementary School  
Helen Fort Middle School  
Henry C. Beck Middle School  
Atlantic City High School

### NEW YORK

Rome High School

### NORTH CAROLINA

Clayton Elementary  
Cleveland Middle School  
Cooper Elementary  
Riverwood Elementary

### OHIO

Incarnation School  
London High School  
Medina High School  
Northview / Southview High Schools  
Northwest Elementary

Chicago  
Libertyville  
Chicago

Beech Grove  
Beech Grove  
Albion  
Columbia  
Corydon  
Waterloo  
Michigan City  
Fort Wayne  
Greenfield  
Fort Wayne  
Indianapolis  
Indianapolis  
Indianapolis  
Fort Wayne  
Indianapolis  
Elkhart  
Auburn  
Mooresville  
Brazil  
Bloomington  
Bloomington  
Mooresville  
Bloomington  
Zionsville  
Indianapolis  
Fort Wayne  
Fort Wayne  
Fort Wayne  
West Lafayette

Princeton

Marlow Heights  
Takoma Park  
Severna Park  
Stevensville  
Newport  
Severn

Bellingham

Grand Rapids  
Lansing  
Rouge

Glassboro  
Pemberton  
Cherry Hill  
Atlantic City

Rome

Clayton  
Garner  
Clayton  
Clayton

Centerville  
London  
Medina  
Sylvania  
McDermott

### OHIO (continued)

Northwest Middle School

Cincinnati

### PENNSYLVANIA

Bermudian Springs Middle School  
East Stroudsburg Elementary  
Glen Mills School  
Norristown Elementary School  
Northsite Elementary School  
Northwestern Middle School  
Schnecksville Elementary  
South Columbia School

York  
Smithfield Township  
Norristown  
Bushkill  
New Tripoli  
Schnecksville  
Catawissa

### SOUTH CAROLINA

Cedar Grove Primary School

Williamston

### TENNESSEE

Brynes-Darden Elementary  
Dickson Elementary School  
Greenwood Middle School  
Hazelwood School  
Kenwood Elementary School  
Minglewood Elementary School  
Montgomery Central Middle School  
Norman Smith Elementary  
North Clarksville School  
Northeast Elementary School  
Northeast Middle High School  
Rossvie High School  
Rucker Stewart Middle School  
Sango Elementary School  
Warren County Elementary

Clarksville  
Dickson  
Clarksville  
Clarksville  
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Clarksville  
Clarksville  
Clarksville  
Clarksville  
Gallatin  
Clarksville  
McMinnville

### TEXAS

Bebenese Elementary School  
Bowman Middle School  
Bowman Middle School  
Corsicana High School  
Crowley Elementary School  
Georgia Kimbell Elementary School  
Joey Pirrung Elementary School  
Nolan High School  
North Oaks Elementary School  
Pershing Middle School  
R. S. Kimbrough Middle School  
Rio Hondo High School  
Roma Middle School  
West Oso High School  
Taylor High School

Arlington  
Dallas  
Plano  
Corsicana  
Crowley  
Mesquite  
Mesquite  
Fort Worth  
Round Rock  
Houston  
Mesquite  
Rio Hondo  
Roma  
Corpus Christi  
Taylor

### UTAH

East Layton Elementary School

Layton

### VIRGINIA

Albermarle Middle School  
Benedictine High School  
George Wythe High School  
John F. Kennedy High School  
Lakeside Elementary School  
Longdale Elementary School  
Northwest Elementary School  
Northwest Elementary School #3  
Salem Road School  
Varina Elementary School

Charlottesville  
Richmond  
Richmond  
Richmond  
Henrico County  
Glen Allen  
Glen Allen  
Richmond  
Chesterfield  
Richmond

### WISCONSIN

Depere Middle School  
Kenosha Elementary K-6  
Longfellow Elementary  
McFarland Middle School  
Milwaukee Public School- Exceptional Education  
Somers Elementary  
Stettin Elementary School  
Winneconne High School

DePere  
Kenosha  
Sheboygan  
McFarland  
Somers  
Wausau  
Winneconne



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