

## Over thirty years of excellence.

Safety. Integrity. Positive relationships.  
Community Involvement. Stewardship.  
Delivering the best. These core values have  
forged our reputation for excellence.

Founded in 1984, Matrix Service Company (Nasdaq:MTRX) is a top-tier engineering, construction and maintenance company that, through our subsidiaries - Matrix Service, Matrix NAC, Matrix PDM

Engineering and Matrix Applied Technologies - designs, builds and maintains infrastructure critical to North America's energy, power and industrial markets.



STRENGTH  
FLEXIBILITY  
PARTNERSHIP



## Chilled Thermal Energy Storage Reservoir Reducing Energy Cost by Optimizing Utilization

If you are looking for ways to reduce your energy cost, a Thermal Energy Storage (TES) Reservoir may be the solution. TES reservoirs exploit the natural tendency of water to reduce the energy cost during high peak demand. Matrix PDM Engineering can provide the design of a TES tank and TES diffuser for your tanks.

Matrix PDM TES diffuser designs are customized to the shape of the reservoir. Whether it is the underground basement walls of a building or the aboveground stand-alone steel tank, TES diffusers are designed as octagonal, H-Shaped or radial to minimize any disturbance to the water layers while charging or discharging.

### **If you are retrofitting or planning new construction, investing in TES can provide the following benefits:**



**Reducing Capital Expense Cost**  
Reduce the equipment cost by reducing the required number and capacity of chillers and cooling equipment



**Reducing Operation Cost**  
Reducing the demand for high capacity and high quantity chillers operation during high peak periods. Reducing the operation cost during high peak demand by discharging energy from TES reservoir. Storing energy during off peak hours based on cheaper utility rate.



**Reducing Maintenance Cost**  
Lesser number of chillers with lesser capacity would result in lesser maintenance cost. Maintenance cost of a chilled TES water tank is minimal.



**Fire Suppression and Safety**  
Chilled TES tanks can be a water reservoir source for any fire suppression system.



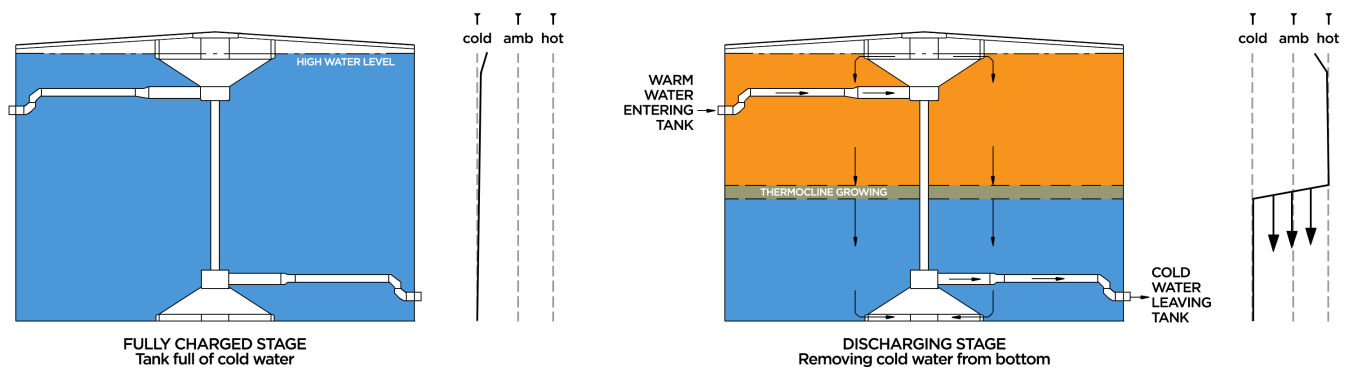
**Incentives and Faster Return in Investment**  
With many direct cash incentives and rebates offered by utility companies, the TES tank return on investment is within a few years.

**TES reservoirs offer economical advantages in large public buildings with central air conditioning or heating systems:**

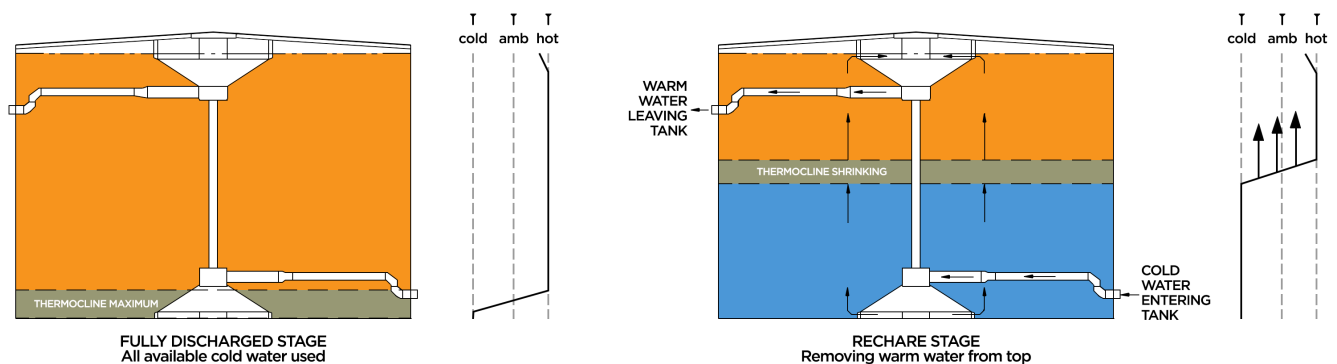
Universities, hotels, hospitals and resorts, large office buildings, exhibition centers, malls, theatres, airports, district cooling and heating areas

## How does Chilled TES work?

1. During periods of peak cooling demand, chilled water is withdrawn from the bottom of the Chilled Water TES tank and used by the air conditioning system. Warm water returning from the system is directed to the top of the TES tank.



2. During off-peak periods, when electrical rates are low, the chilled TES tank is recharged. Warm water is withdrawn from the top of the Chilled TES tank, cooled with conventional water chilling units, and returned to the bottom of the tank.



3. Hot Water TES tanks operate similarly. Properly designed diffusers distribute the flow within the tank to minimize mixing. The water naturally stratifies, with the lighter, warmer water floating on top of the colder, denser water.

Matrix PDM Engineering is ready to help you benefit from our broad engineering expertise, specialized skills, unique knowledge of construction and maintenance and deep resources. Engage us at the beginning of your project -- as early as the pre-planning stage -- and we will help you make sure it's right from the start. We invite you to contact us today to learn how we can help you meet your challenges as no other engineering firm can.

Matrix Service Company has more than 30 offices strategically located throughout the U.S. and Canada, and currently employs more than 5,000 people. With established operations, we are well positioned to serve you. Likewise, we are prepared to add operational facilities as needed.

We're committed to growth in both people and locations, making sure we're available 24/7 — when and where you need us.



For us, safety is more than a core value. It's a way of life. We are all accountable - safety is first and foremost in everything we do.



**For more information:**  
**866 367 6879**  
[matrixnpdm.com](http://matrixnpdm.com)

## KEY CONTACTS

AST AND SPECIALTY STRUCTURES  
Rama Challa, PE - 918 624 6275

LOW TEMPERATURE & CRYOGENIC  
Rick Vater - 724 934 7010

INDUSTRIAL FACILITY SOLUTIONS  
Greg DiFrank, PE - 614 797 2283

BUSINESS DEVELOPMENT  
Bevan Houston - 918 281 6036

TES RELATED INQUIRIES  
Abhi Utturkar, PE - 918 624 6262  
Golnaz Bassiri, PE - 918 624 6206