



# FIRST STATE TIRE RECYCLING

Monte Niemi

Colorado's 2016 Waste Tire Market  
Development Conference

June 23<sup>rd</sup>, 2016



# FIRST STATE TIRE RECYCLING

- First State Tire Recycling, Parent Company (FSTR)
- R-T.E.A.™ Manufacturing holds patent on technology



# Isanti, MN





**First State Tire recycles 2.5 to 3 million tires annually. To date, roughly 62.5 million tires recycled by FST have been used in civil engineering projects.**



First State Tire Recycling produces 400-650 cubic yards of TDA per day.





**Founded in 1981**





**1983**



# Agenda

- Benefits of TDA
  - Stormwater Management
  - Basement Foundation & Walls
  - Slope Stabilization
- 
- Expanding Soils/Building Pads
  - Heated Floors
  - Geothermal
  - Radon Mitigation



# Benefits of TDA

- Light weight, at approximately 20lbs per cubic foot
- Interlocking properties “snowshoe effect”
- Approximately 50% void space when compacted
- High permeability
- Shear strength
- Insulating value is approximately 8 times that of soil
- Eliminates capillary action
- Lateral loading reduced by approximately 50% compared to soil
- Eliminates differential settlement
- Lower cost than most material





# Stormwater Management

# Conventional Stormwater System Issues

Concrete Chamber



- Initial cost (the pictured chamber costs approximately \$301,500.00)
- Routine maintenance

Stormwater Ponds



- Safety concerns
- Loss of real estate





# Westwood Elementary

## Prior Lake, MN

### 2005



Engineered By: Anderson-Johnson Associates, Inc



Westwood Elementary was looking for a cost-effective means of managing stormwater. Tire Derived Aggregate was installed under this parking lot to control drainage and meet stormwater requirements.





A 15" double wall perforated PVC pipe collects and diverts excess stormwater into the management system.



The type 5 geotextile fabric allows drainage but prevents sediment from entering the TDA .

# Finished Project

After completion of project



Taken in 2016, 9 years after completion



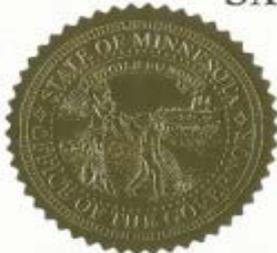
# CERTIFICATE OF



# RECOGNITION

*This certificate is presented to the Hennepin County Department of Environmental Services & Savage-Prior Lake School District 719 in recognition of your successful partnership with First State Tire Recycling. Your participation in the recycling of old, discarded tires to create useful products is greatly appreciated. Therefore, with the appreciation and respect of the people of Minnesota, this certificate is presented to:*

## HENNEPIN COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES & SAVAGE-PRIOR LAKE SCHOOL DISTRICT 719



I have hereunto set my hand and caused the Great Seal of the State of Minnesota to be affixed at the Capitol in the City of Saint Paul, January 10, 2006.

TIM PAWLENTY  
GOVERNOR

STATE OF MINNESOTA  
OFFICE OF THE GOVERNOR



FIRST STATE TIRE  
RECYCLING



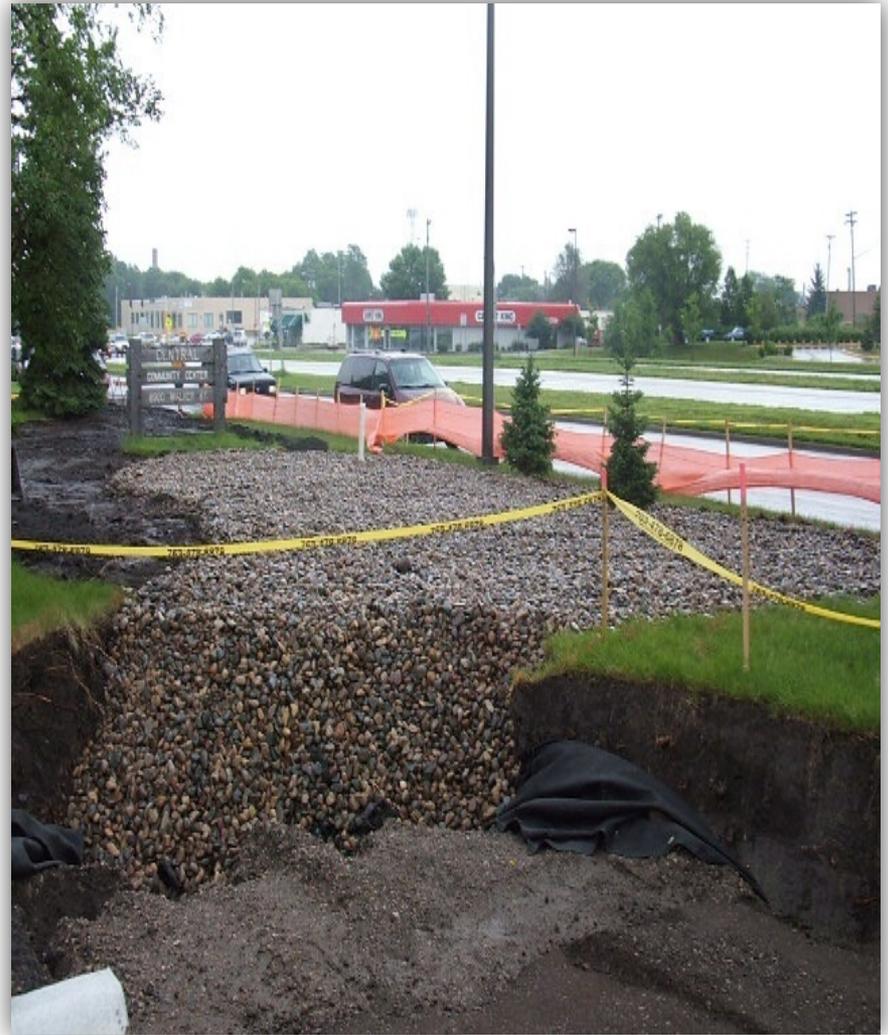
# Central Community Center Rain Garden St. Louis Park, MN 2005

Engineered By: Anderson-Johnson Associates, Inc

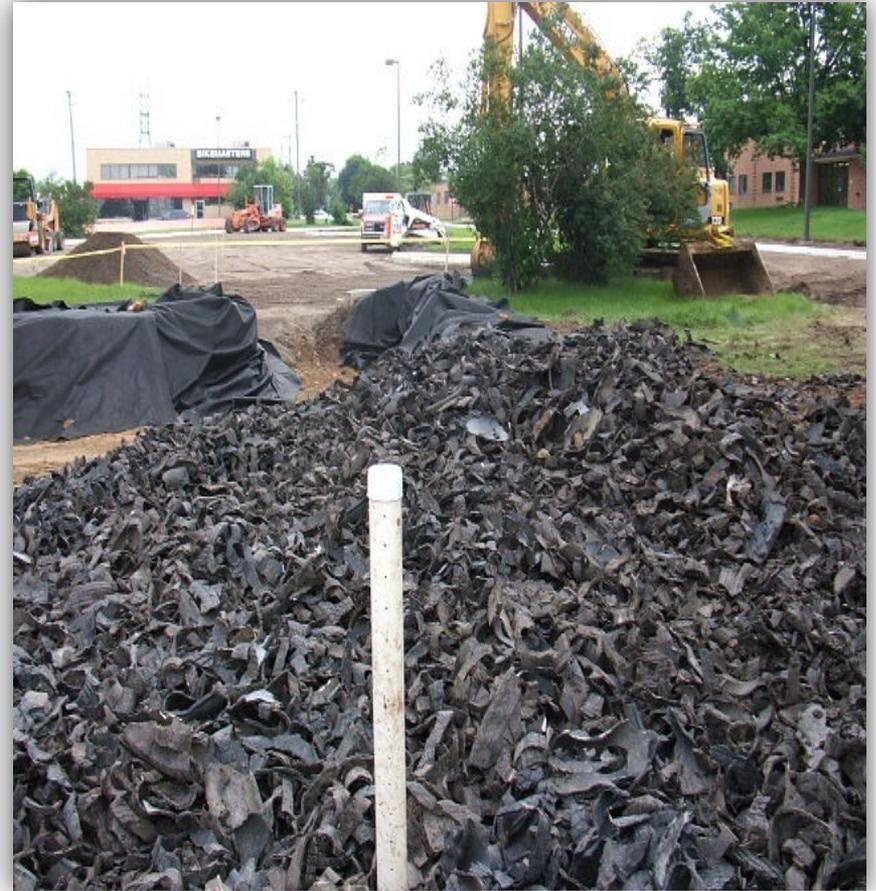


Central Community Center in St. Louis Park installed a rain garden to manage stormwater. The system was engineered to use TDA for water infiltration and retention.





Instead of stormwater running offsite and into sewer systems, water is retained, recharged and reused in surrounding soils. Installing TDA as fill allows for a greater volume of water to be stored.





# CERTIFICATE OF



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*This certificate is presented to the Hennepin County Department of Environmental Services and the City of St. Louis Park in recognition of your successful partnership with First State Tire Recycling. Your participation in the recycling of old, discarded tires to create useful products is greatly appreciated. Therefore, with the appreciation and respect of the people of Minnesota, this certificate is presented to:*

## HENNEPIN COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES AND THE CITY OF ST. LOUIS PARK



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STATE OF MINNESOTA  
OFFICE OF THE GOVERNOR





# Midway Office Complex (formerly Midway Stadium)

St. Paul, MN  
2015

Engineered by: LHB Engineering &  
the St. Paul. Port Authority



This underground stormwater treatment facility is designed to store runoff from the entire surface of the site for stormwater events up to and including a 100-year flood event.



An all-weather informational kiosk with colored graphics and written narrative will be built along a walkway to describe construction of the stormwater system, how TDA functions within the design and how it benefits our natural environment.



On top of this system will be a parking lot.



The use of the tire shreds is environmentally safe and is at a reduced cost compared to typical stone aggregate and chamber systems, commonly used in below grade stormwater storage.



From MIDS Calculator					
Volume Reduction (ft <sup>3</sup> )	Volume Reduction %	TSS Reduction (lbs)	TSS Reduction %	TP Reduction (lbs)	TP Reduction %
37746	100	3378	100	18.6	100





# Metro Metals

## St. Paul, MN

### 2008

Engineered By: Wenck Associates



# Underground Storm Water Management

Metro Metals Corporation  
St. Paul, MN



We have a new  
environmentally  
friendly ally  
in storm water  
management:

## Old Tires



Metro Metals is breaking new ground in environmental stewardship with its innovative approach to storm water management: keeping its storm water effluent clean through the creative use of recycled tire shreds in an underground storm water management system.



St. Paul, MN

The system, designed by Wenck Associates, Inc., enables this salvage business to exceed current regulatory requirements for on-site storm water storage while conserving valuable real estate for its business activities.

Wenck designed the lined system with a front-end storm water management system and a tire-shred "water safe" using R-T.E.A., a waste tire material used as aggregate. Tire shreds have 60% more void space and are 80% lighter with equivalent structural capacity.

The innovative design is the first of its kind in a fully-contained storm water management system. In addition, this environmentally conscious solution provides a tremendous savings over alternative designs and a cost-effective, beneficial reuse of waste product.



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This design allowed Metro Metals to exceed regulatory requirements for on-site stormwater storage while conserving valuable real estate for its business activities.





07/21/2008 13:37



07/30/2008 10:15



**Finalist** in *Environmental Initiative's*  
**Green Business and Environmental  
Management**





**3M St. Paul Port Authority  
Beacon Bluff  
St. Paul, MN  
2010**

Engineered By: Loucks Associates



The R-T.E.A. allows for additional water storage surrounding the pipes.



Nearly 20,000 cubic yards of TDA were used for this project.





**2011 *Environmental Initiative* Award for Sustainable  
Communities.**

***MN Society of Professional Engineers* 2011 Seven  
Wonders of Engineering Award**

***Great River Greening* 2011 Environmental Community  
Partner Award for the Stewardship of the Mississippi  
River and Groundwater**

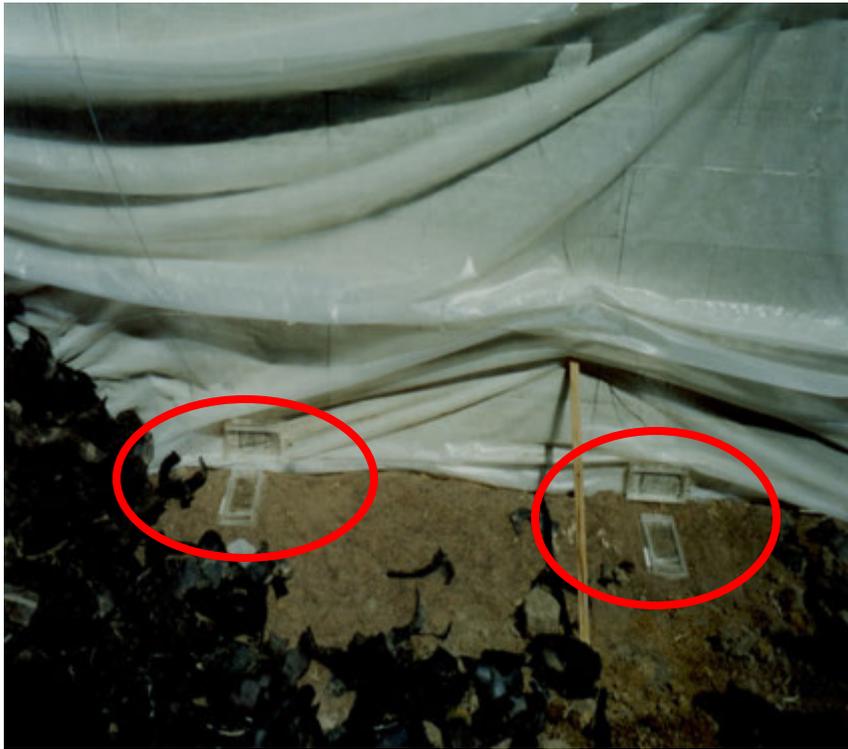


# TDA as Foundation Backfill Study 1999

Done by: University of WI – Madison

Observed by: Barr Engineering





Sensors in place to measure the lateral loading.



Lateral load testing is computer checked using a known weight of 50# sand bags. The benefit of this testing was used in at least 15 future projects.



Spoooner, WI Private Residence

SPRING

2000



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The heavy clay back fill seen here weighs approximately five times as much as TDA.



This home sustained at least three major wall cracks the first winter after it was built as a result of heavy backfill pressures.



Walls can fail  
when the  
moisture and  
heavy clay soil  
create excessive  
pressure against  
the wall...



...TDA retains no moisture!

All areas were excavated for TDA backfill.



Installation of  
TDA helped with  
the rerouting of  
moistures and  
reducing soil  
movement  
problems.



# Completion of Project



# St. Francis, MN Private Residence

JUNE  
2000



The site was too low for a conventional basement.  
Footings were placed at grade.



Handling of TDA is reduced by delivering close to work area.



Block walls and frost footings are protected by drainage qualities and R-Value TDA.





Side view of house



Back view of house

# Completion of Project

2000



2016



# What TDA provides for basement and foundation wall projects:

- Reduces lateral loading
- Increases drainage, prevents basement flooding
- Thermal insulation





# Slope Stabilization





# Highway 8

Taylors Falls, MN  
1994

Engineered by: MnDot



# Under construction in 1994



