River Road

Bismarck, ND

2009

Engineered By: Braun Intertec Corporation

First State Tire Recycling

This road had subsided 2-3 feet in past months and had already been closed for 4 months.

First State Tire Recycling

The design called to stabilize the slope with a combination of driven piles and lightweight fill.

First State Tire Recycling

The failed slope is above the Missouri River. They were not able to excavate deep without impacting the river way.

First State Tire Recycling

First State Tire Recycling

Blue Earth County Highway 48

Mankato, MN
2010

Engineered by: Blue Earth County &
Gale-Tec Engineering

First State Tire Recycling

The slope alongside a bridge embankment failed shortly after construction, affecting service DM&E Railroad's mainline that runs under the bridge.

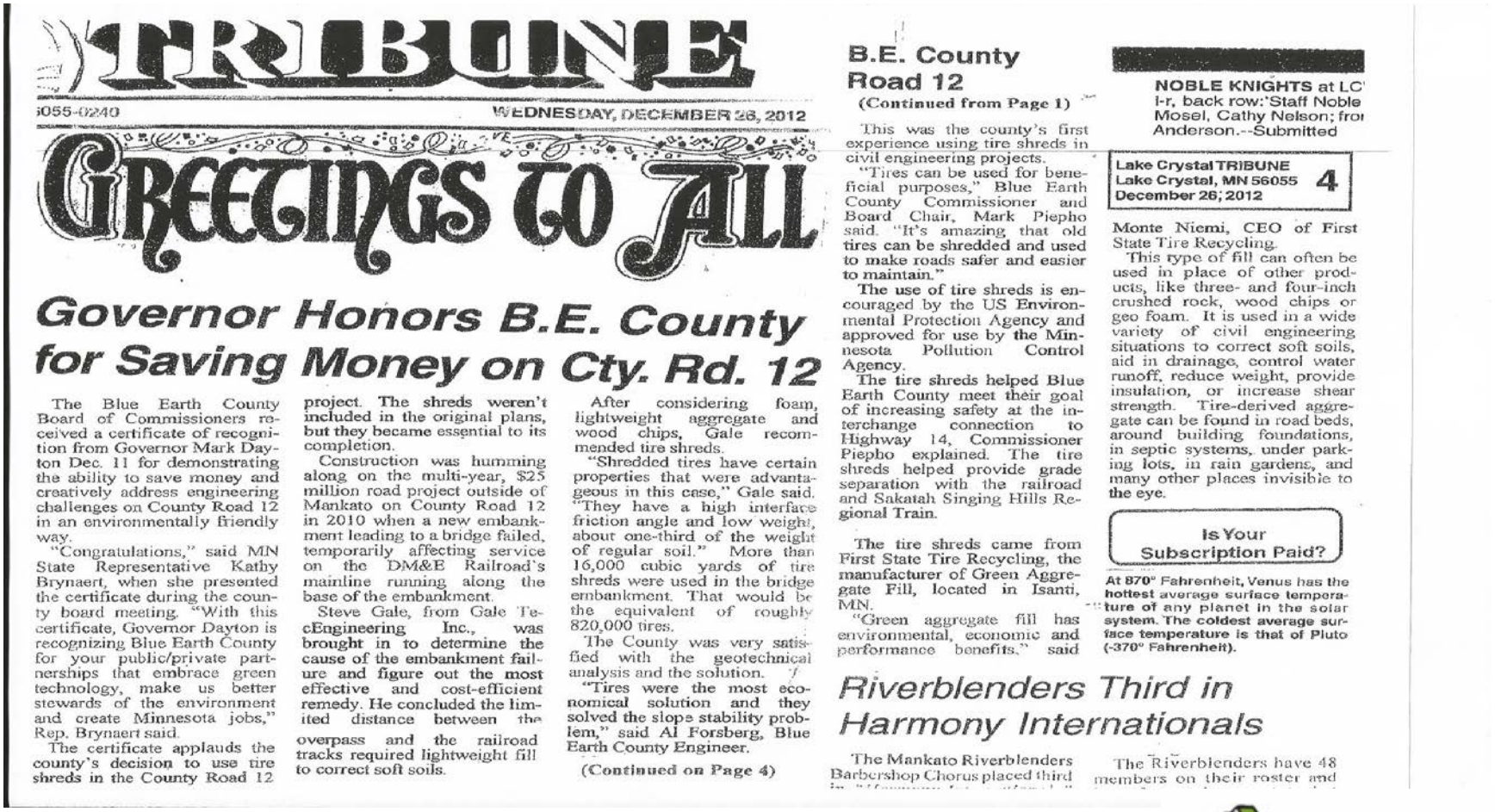
First State Tire Recycling

More than 16,000 cubic yards of tire shreds or about 820,000 tires were used in the repair project.

First State Tire Recycling

FIRST STATE TIRE
RECYCLING

Article that was written in the Star Tribune about the project.



TRIBUNE

6055-0240 WEDNESDAY, DECEMBER 26, 2012

GREETINGS TO ALL

Governor Honors B.E. County for Saving Money on Cty. Rd. 12

The Blue Earth County Board of Commissioners received a certificate of recognition from Governor Mark Dayton Dec. 11 for demonstrating the ability to save money and creatively address engineering challenges on County Road 12 in an environmentally friendly way.

"Congratulations," said MN State Representative Kathy Brynaert, when she presented the certificate during the county board meeting. "With this certificate, Governor Dayton is recognizing Blue Earth County for your public/private partnerships that embrace green technology, make us better stewards of the environment and create Minnesota jobs," Rep. Brynaert said.

The certificate applauds the county's decision to use tire shreds in the County Road 12 project. The shreds weren't included in the original plans, but they became essential to its completion.

Construction was humming along on the multi-year, $25 million road project outside of Mankato on County Road 12 in 2010 when a new embankment leading to a bridge failed, temporarily affecting service on the DM&E Railroad's mainline running along the base of the embankment.

Steve Gale, from Gale TecEngineering Inc., was brought in to determine the cause of the embankment failure and figure out the most effective and cost-efficient remedy. He concluded the limited distance between the overpass and the railroad tracks required lightweight fill to correct soft soils.

After considering foam, lightweight aggregate and wood chips, Gale recommended tire shreds.

"Shredded tires have certain properties that were advantageous in this case," Gale said. "They have a high interface friction angle and low weight, about one-third of the weight of regular soil." More than 16,000 cubic yards of tire shreds were used in the bridge embankment. That would be the equivalent of roughly 820,000 tires.

The County was very satisfied with the geotechnical analysis and the solution.

"Tires were the most economical solution and they solved the slope stability problem," said Al Forsberg, Blue Earth County Engineer.

(Continued on Page 4)

B.E. County Road 12

(Continued from Page 1)

This was the county's first experience using tire shreds in civil engineering projects.

"Tires can be used for beneficial purposes," Blue Earth County Commissioner and Board Chair, Mark Piepho said. "It's amazing that old tires can be shredded and used to make roads safer and easier to maintain."

The use of tire shreds is encouraged by the US Environmental Protection Agency and approved for use by the Minnesota Pollution Control Agency.

The tire shreds helped Blue Earth County meet their goal of increasing safety at the interchange connection to Highway 14, Commissioner Piepho explained. The tire shreds helped provide grade separation with the railroad and Sakatah Singing Hills Regional Train.

The tire shreds came from First State Tire Recycling, the manufacturer of Green Aggregate Fill, located in Isanti, MN.

"Green aggregate fill has environmental, economic and performance benefits," said Monte Niemi, CEO of First State Tire Recycling.

This type of fill can often be used in place of other products, like three- and four-inch crushed rock, wood chips or geo foam. It is used in a wide variety of civil engineering situations to correct soft soils, aid in drainage, control water runoff, reduce weight, provide insulation, or increase shear strength. Tire-derived aggregate can be found in road beds, around building foundations, in septic systems, under parking lots, in rain gardens, and many other places invisible to the eye.

NOBLE KNIGHTS at LC
l-r, back row:'Staff Noble
Mosel, Cathy Nelson; fro
Anderson.--Submitted

Lake Crystal TRIBUNE
Lake Crystal, MN 56055 4
December 26, 2012

Is Your Subscription Paid?

At 870° Fahrenheit, Venus has the hottest average surface temperature of any planet in the solar system. The coldest average surface temperature is that of Pluto (-370° Fahrenheit).

Riverblenders Third in Harmony Internationals

The Mankato Riverblenders Barbershop Chorus placed third

The Riverblenders have 48 members on their roster and

FIRST STATE TIRE RECYCLING

CERTIFICATE OF RECOGNITION

This certificate is presented to the Blue Earth County Highway Department for your Leadership in building Minnesota Green Roads. Creative engineering solutions were demonstrated using Green Aggregate Fill (TDA) on Blue Earth County 12/S.P. 07-612-13. In recognition of your successful partnership with First State Tire Recycling.
Therefore, with the appreciation and respect of the people of Minnesota, this certificate is presented to:

BLUE EARTH COUNTY BOARD OF COMMISSIONERS

Highway Department

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, OCTOBER 12, 2012.

MARK DAYTON
GOVERNOR

STATE OF MINNESOTA
OFFICE OF THE GOVERNOR

PRINTED ON RECYCLED PAPER CONTAINING 15% POST CONSUMER MATERIAL AND STATE GOVERNMENT PRINTED.

FIRST STATE TIRE RECYCLING

What TDA provides for slope stabilization projects:

- Shear strength
- Lightweight
- High permeability
- Reduced pressure
- Cost effective

First State Tire Recycling

County Road 8
Carlton County
2011

Engineered By: Carlton County Highway Department

First State Tire Recycling

A section of County Highway 8 experienced an embankment slide near Silver Creek, an area dominated by red clay soil.

First State Tire Recycling

In order to correct the slide, and prevent future sliding, Carlton County Highway staff installed TDA as part of the road bed reconstruction.

First State Tire Recycling

TDA put less weight on the road sub-grade compared to traditional soils.

First State Tire Recycling

In 2012, this section of road survived record flooding.

First State Tire Recycling

The most recent photo taken in May, 2013.

First State Tire Recycling

Expanding Soils/Building Pads

First State Tire Recycling

Beroun Liquor Store

Spring

2002

Engineered By: Robinn Company

First State Tire Recycling

This project consisted of a store and parking lot built on top of TDA.

First State Tire Recycling

Additional TDA was needed to provide another 4 ft. lift.

First State Tire Recycling

A floating slab foundation was built on top of the TDA.

The shear strength on the TDA supports the foundation.

First State Tire Recycling

The building in the final stages of construction.

First State Tire Recycling

Building and Parking Lot
right after completion

Building and Parking Lot
6 years after completion

Even after 6 years there was
still no cracking in the slab.

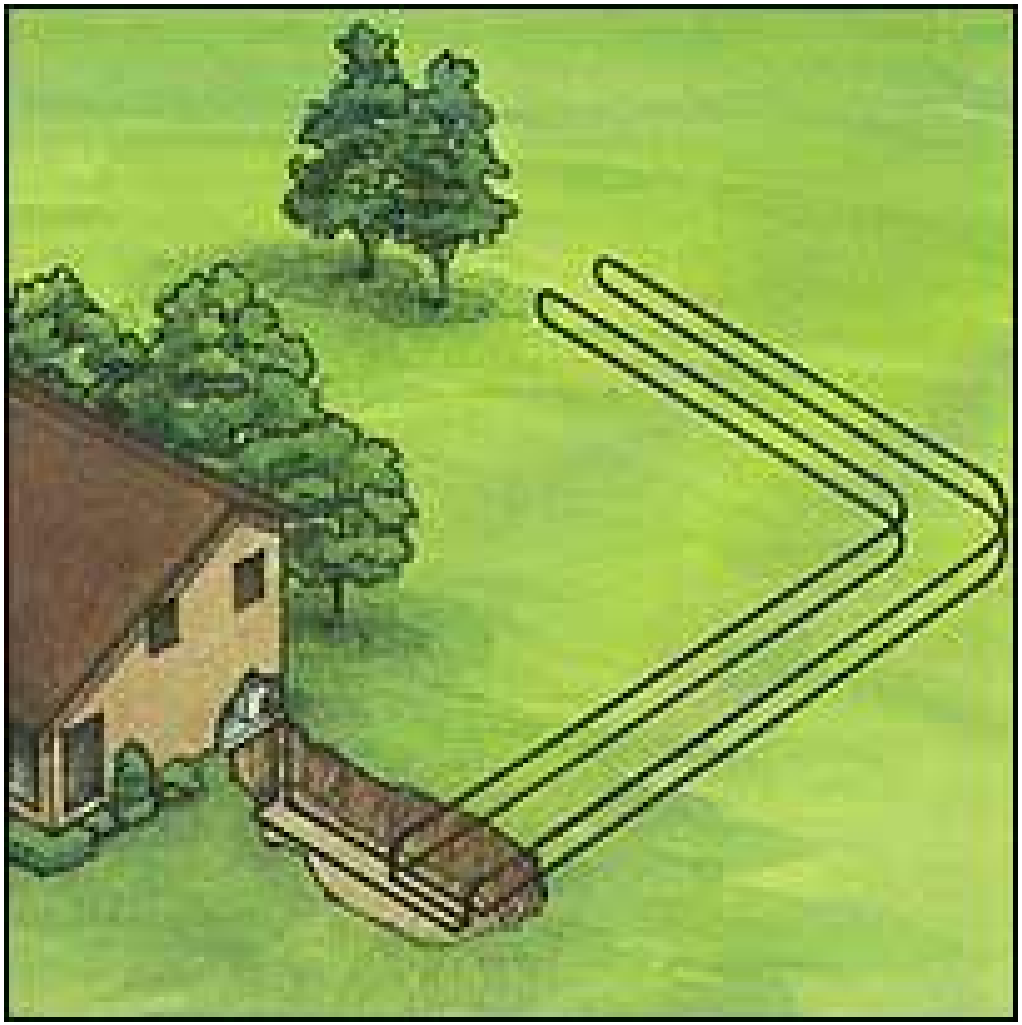
First State Tire
RECYCLING

What TDA provides for expanding soils/building pads:

- Shear strength
- Snowshoe effect
- Lightweight
- High permeability
- Reduced vertical pressure
- Cost effective

First State Tire Recycling

Geothermal Heat Pumps



First State Tire Recycling

Geothermal

- Heat from within the earth.
- Renewable energy source because the water is replenished by rainfall and the heat is continuously produced inside the earth.
- Temperatures in the upper 10 feet of the Earth's surface hold almost constantly between 50 & 60 degrees Fahrenheit.

First State Tire Recycling

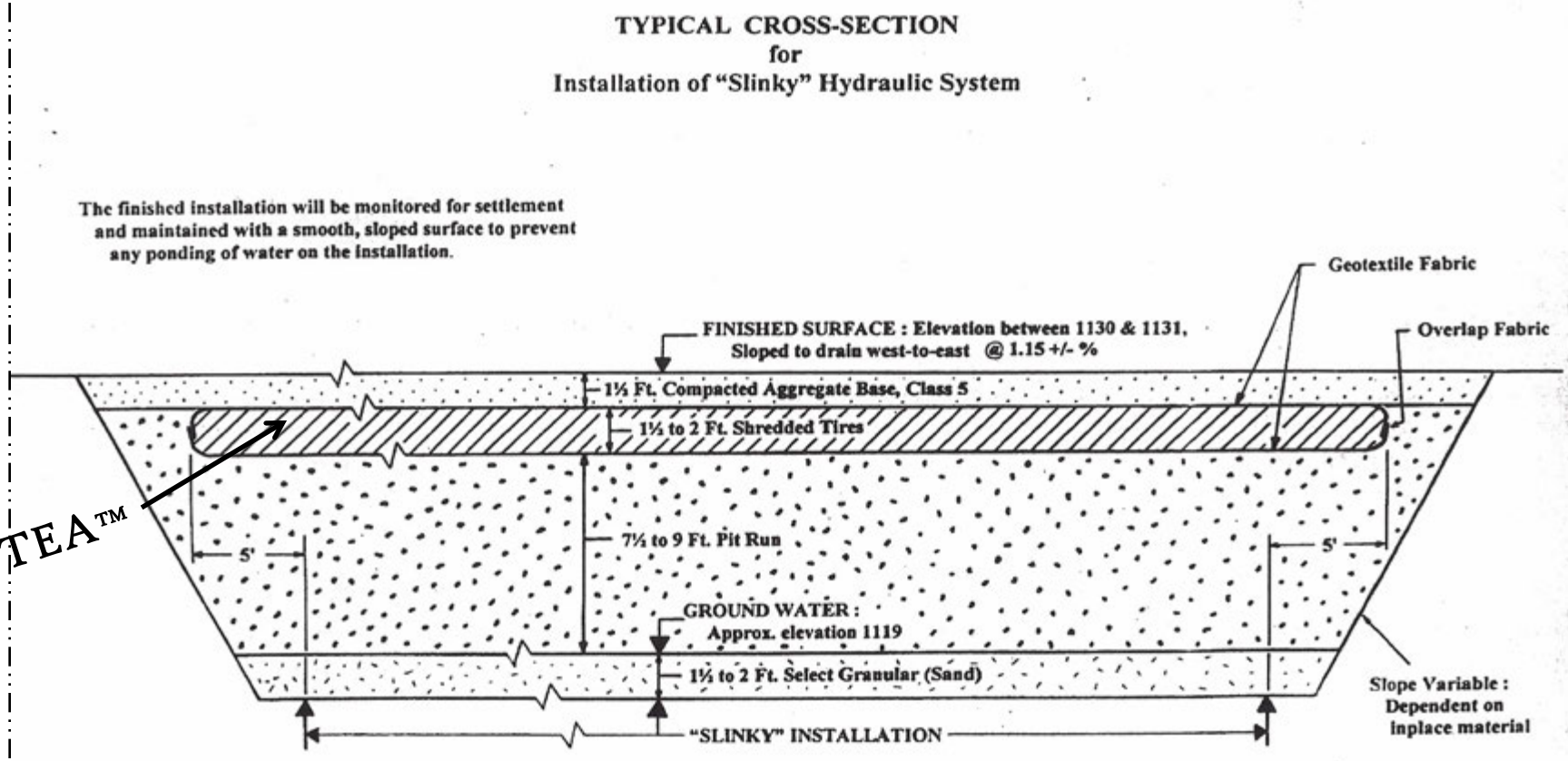
U.S. Environmental Protection Agency (EPA) states that geothermal heat pumps are:

- Energy-efficient
- Environmentally clean
- Cost effective systems for temperature control

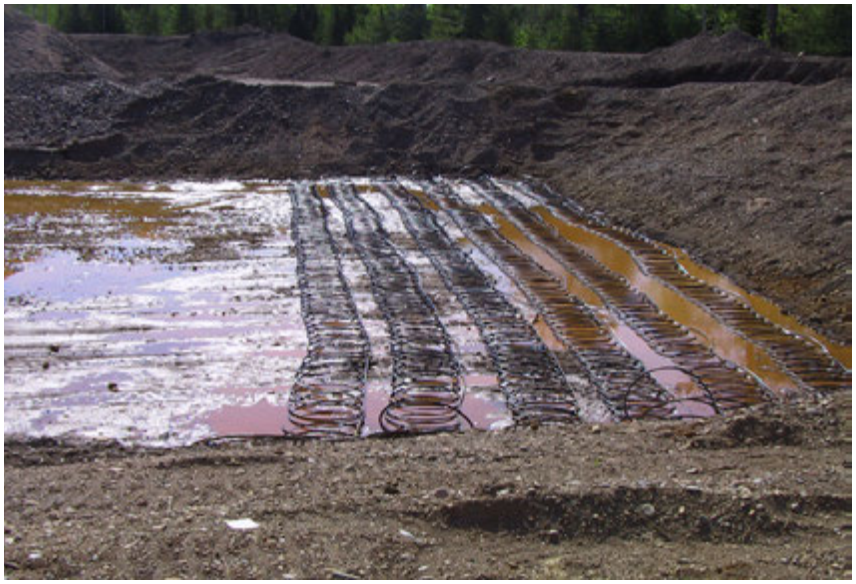
First State Tire Recycling


Carlton County Highway 61
June 2004
Engineered By: Carlton County Highway Department
First State Tire
RECYCLING

Carlton County Highway Maintenance Department
Heat-pump Cross Section Insulated By R-TEA™



First State Tire Recycling



Placing Geothermal Heat Pump Coils

First State Tire Recycling

Insulating Geothermal Heating Pump with TDA.

First State Tire Recycling

What TDA provides for geothermal projects:

- Thermal insulation
- Reduces frost heaving
- Energy efficient
- Dependable
- Cost effective

First State Tire Recycling

Radon Mitigation

Problems

- In typical backfill (such as dirt and soil) radon gases get trapped and enter into homes and buildings.
- Radon is a colorless, odorless, tasteless, and a chemically radioactive gas.
- It is formed by the natural radioactive decay of **uranium** in rock, soil, and water.
- Radon is considered cancer-causing.
- Can be found in all 50 states.

First State Tire Recycling

- The EPA generally recommends that you take action to reduce your home's indoor radon levels. For test results 4pCi/L or higher.

- The cost to have a professional assist in removal of radon gas typical costs between $800 - $2,000. Depends on the size and design of home.

First State Tire Recycling

Methods to Reduce Radon

- The void space in the TDA allows the radon gases to flow upward into the air.

- Sub-Slab Depressurization
  - Underground Pipes
  - Exhaust Fan
    - » These methods remove radon gas from below the concrete floor and the foundation before it enters the home.

- Sealing cracks and/or openings in floors and walls.

First State Tire Recycling

FIRST STATE TIRE RECYCLING

Heated Floors

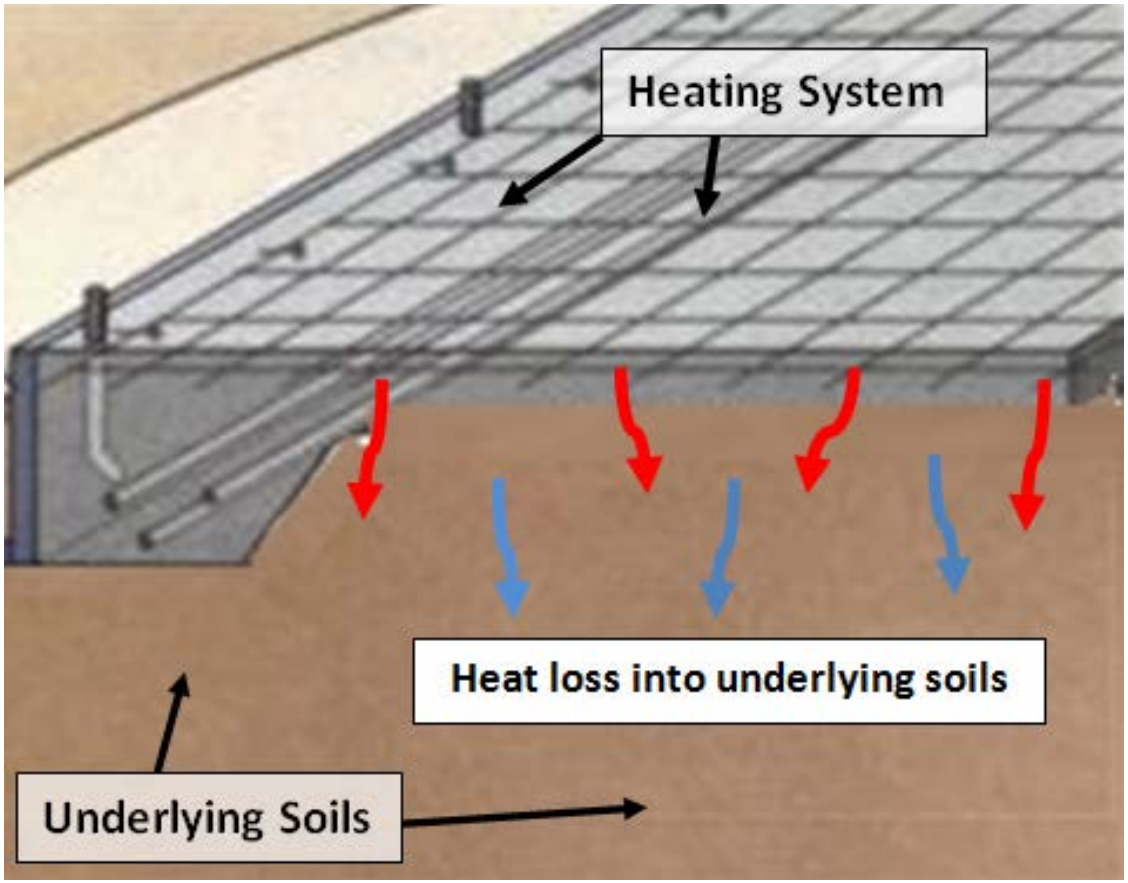
Utilizing TDA to Mitigate
Heat Loss to Underlying Soils

First State Tire Recycling

Properties of TDA:

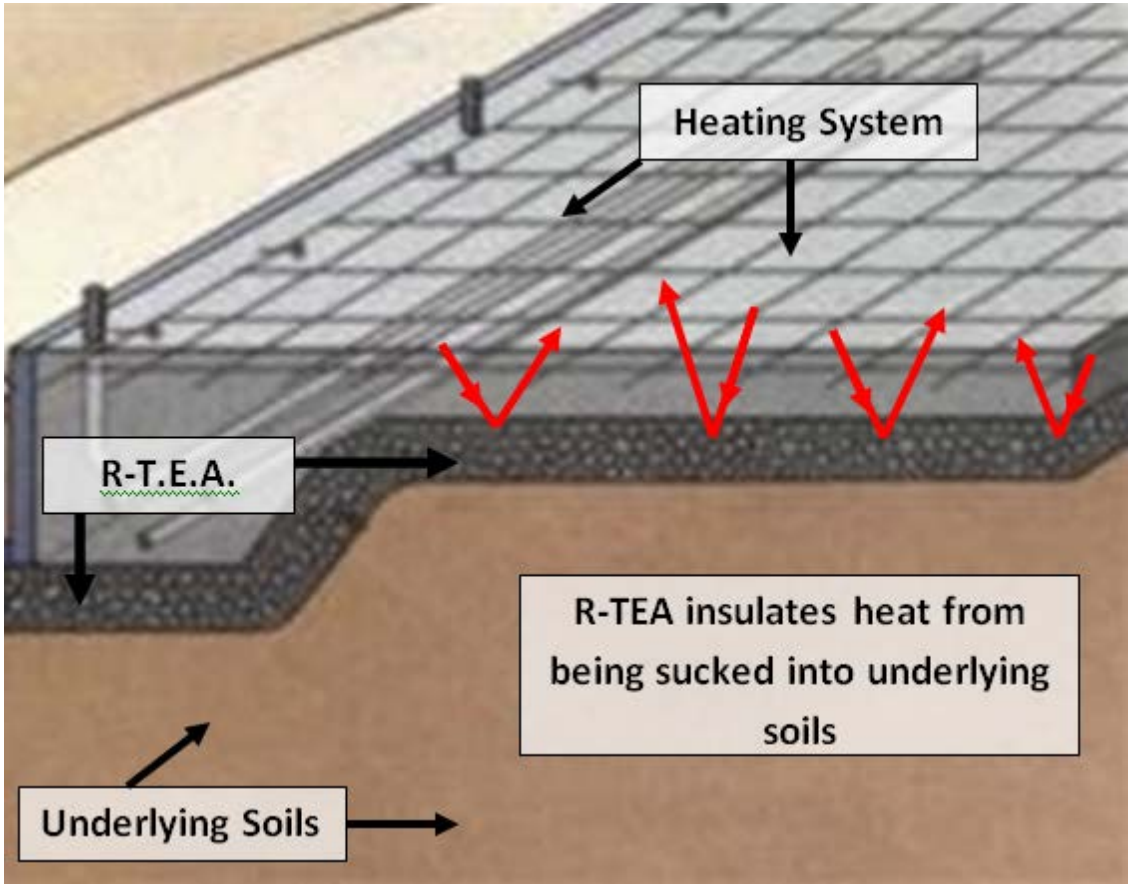
- Thermal Insulation
  - Low thermal conductivity reduces heat loss to underlying soils
- High Permeability
  - TDA is relatively free draining, and doesn't absorb water

First State Tire Recycling



Heat loss without insulation layer, or without installing TDA.

First State Tire Recycling



TDA insulation layer with low thermal conductivity

First State Tire Recycling

QUESTIONS???

FIRST STATE TIRE
RECYCLING

For More Information

- Visit
  - Booth @ Conference
  - Firststatetire.com
  - @firststatetire
- Email
  - rtea@firststatetire.com
  - MonteMKN@firststatetire.com
- Call
  - (763)434-0578 (Office)
  - (612)919-6272 (Monte)

First State Tire Recycling

Additional Applications

- Irrigation
- Nature Trails
- Underground Structures

First State Tire Recycling


Chomonix Golf Course
Lino Lakes, MN
2000
First State Tire
RECYCLING

The soil in this area was relatively hard. TDA was used to elevate the area for the parking lots and tee boxes.

First State Tire Recycling

The surface begins to crack when asphalt and/or cement is on top of less solid soils.

First State Tire Recycling

In this area sand is the main source for soil. Sand weighs 3,000 pounds per yard where as TDA weighs only 600 pounds per yard.

TDA weighs nearly 5 times less then regular sand

First State Tire Recycling

First State Tire Recycling

Anoka County Park and Recreation received a grant for using TDA in this project.

First State Tire Recycling

Finding a new use for old tires

Ham Lake company turns old tires into a new, innovative business

by Kelly Barrett
Staff writer

Looking at the mound of old tire pieces, it's hard to imagine that in a few short weeks the mounds will be transformed into a parking lot for the patrons of Chomonix Golf Course in Lino Lakes.

The tires, compliments of Recycled Tire (RT) Manufacturing, serve as aggregate for a new parking lot and tee boxes for the driving range at the golf course.

For the Anoka County Parks and Recreation Department, the decision to use Recycled Tire Engineered Aggregate (RTEA) was a relatively easy one.

"It was a way to recycle the tires," said Anoka County Parks and Recreation Landscape Engineer Nick Ecloff. "The park's department also received a grant for using this material."

The department received a grant from Anoka County to complete the project, which will be finished in mid-July, using the rubber aggregate.

"We felt that this was a good product and a good grant, so we decided to go for it," Ecloff said.

RTEA, because of its light weight, is often used in areas where the soil cannot support the weight of asphalt or cement; however the soil at Chomonix Golf Course is relatively hard, so the rubber aggregate was strictly used to elevate the area for the parking lot and tee boxes.

Although not used to reinforce the soil at Chomonix Golf Course, the rubber aggregate, which works especially well on low ground with swampy or wet soil, is traditionally used on softer soil.

Traditionally, sand, which weighs 3,000 pounds per yard, is used as aggregate beneath asphalt. In comparison, RTEA weighs 600 pounds per yard, making it a better option for less solid soils.

The problem with placing asphalt or cement on less solid soils is that the surface begins to crack because the soil sinks under the weight of the road or parking lot.

"It's lightweight, it won't wick or hold water," said marketing representative Steve O'Brien of RTEA. "That's why people like our material."

By using these tires under asphalt, the moist soil will not buckle under the weight of the parking lot. (Photos by Kelly Barrett)

In addition to being lightweight, the rubber aggregate is comparable in price to traditional sand fill.

"Most people seem to think that it's going to be more expensive," O'Brien said.

Started in 1986

RT Manufacturing, based in Ham Lake, is an part of First State Tire Disposal in East Bethel. The company began producing aggregate in 1986, after owner Monte Niemi developed this new use for recycled tires.

The birth of the rubber aggregate was a direct result of Minnesota legislation that was passed declaring it illegal to landfill whole automobile tires.

This law created a problem for companies like First State Tire Disposal because nobody knew what to do with the tires, including Niemi, who began experimenting with new ways to dispose of discarded tires.

The rubber aggregate Niemi developed consists of approximately 100,000 tires cut into eight-inch pieces and spread along the construction area.

The company receives approximately two million tires annually, accumulating enough tires to complete each job in under a month.

RT Manufacturing keeps a small stock pile of the rubber aggregate on hand to handle jobs as they come up.

This shredded tire material, or more technically, rubber aggregate derived from shredded automobile tires, is buried under sand and serves as a foundation for construction in an area with moist or soft soil.

"People aren't really aware of it, because it's not on the surface," O'Brien.

> "This is probably, in terms of sheer volume, one of the greatest recycling efforts going on in Minnesota. Taxpayers are being saved money by using this material."
>
> — **Steve O'Brein,** *RTEA*

Rubber aggregate, developed by Recycled Tire Manufacturing of Ham Lake, is covered with sand to help create a solid base for a new parking lot at Chomonix Golf Course in Lino Lakes.

According to O'Brien, RT Manufacturing, which has a patent on the product, is the only company in the area that uses this process for producing rubber aggregate.

"It's what we do full time," O'Brien said.

RT Manufacturing has used its rubber aggregate in projects in 12 different counties, including Anoka County, as well as at the Minneapolis Convention Center.

The project called for the construction of a parking lot and park on top of a parking ramp. RTEA was used as a lightweight alternative to sand when construction was done on top of the parking ramp.

Besides being used for fill in road and parking lot construction, the rubber aggregate is also starting to be used to backfill around basements.

"The aggregate has eight times the insulation value of soil," O'Brien said.

Although there are other lightweight materials used as aggregate out there, O'Brien said this rubber-based product is better than other aggregate options.

"It's solving specific engineering problems that need to be addressed," O'Brien said. "This is probably, in terms of sheer volume, one of the greatest recycling efforts going on in Minnesota. Taxpayers are being saved money by using this material."

FIRST STATE TIRE RECYCLING

Nature Trails

Ramsey, MN

First State Tire Recycling

Minneapolis Convention Center - 1991

TDA was used as fill on top of underground parking ramp to reduce load.

Cost savings of approximately $110,000

First State Tire Recycling