RoaDrain™
ROADWAY DRAINAGE SYSTEM

ROADWAY
DRAINAGE SYSTEM

SYSTEM OVERVIEW

Tensar®

RoaDrain™ Roadway Drainage System: Enhance Pavement Performance with Synthetic Aggregate

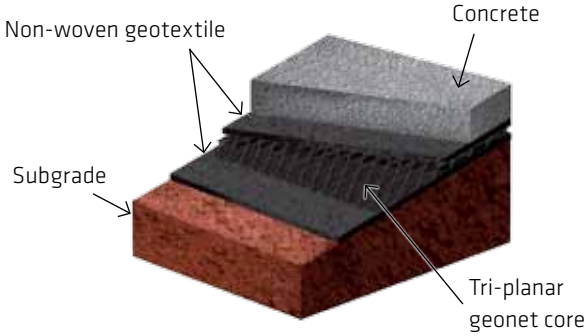
Water retention within a pavement layer is a primary cause of pavement failure. Without adequate underlying drainage, a pavement section is likely to fail prematurely. When an open-graded aggregate base layer is specified, there can be challenges with the migration of fines from the subgrade. The RoaDrain™ Roadway Drainage System from Tensar International Corporation (Tensar) is the engineered solution that consists of a synthetic subsurface drainage layer (SSDL) providing a flow rate up to five times greater than a typical open-graded base layer. The product features a tri-planar geonet core with durable, nonwoven geotextile filters laminated to the top and bottom sides. The result is a SSDL that maintains a flow void and outperforms open-graded base layers in the functions of drainage, longevity, ease of installation and cost.

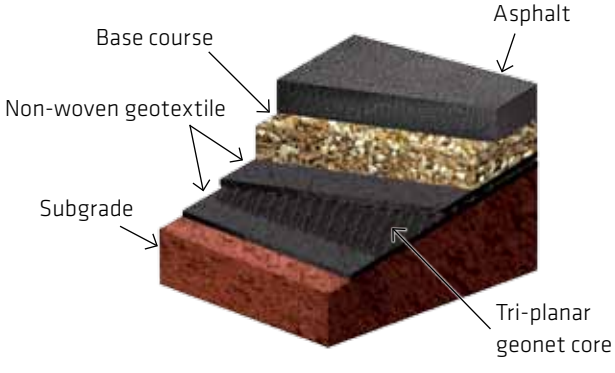
ROADRAIN IS AN INNOVATIVE SUBSURFACE DRAINAGE SYSTEM THAT IS ENGINEERED TO:

- Quickly remove subsurface water
- Provide an economic alternative to open-graded drainage aggregate
- Produce high in-plane flow rates resulting in decreased drainage time
- Successfully control moisture in a weak subgrade
- Provide a void-maintaining structure
- Provide excellent compressive stiffness that resists deformation
- Prevent migration of fines through synthetic separation
- Install quickly and easily to reduce the construction schedule
- Work with less processed structural fill for lower material cost
- Allow for roll installation parallel to center line of the road due to 45° channel orientation.
- Provide a capillary break

ROADRAIN IS AVAILABLE IN DIFFERENT GRADES SUITABLE TO FIT A VARIETY OF APPLICATIONS:

- Roadways, parking lots and paved walkways
  - Under aggregate base course
  - Directly beneath PCC
  - Capillary break (beneficial to Northern climates)
  - PCC joint repair
- Embankments and dike drainage (beneficial in areas with a high water table)
- Alternative to granular blanket drains
- Channel drains
- Detention ponds
- Under concrete slabs
- Airport runways and taxiways
- Railway facilities
- Wherever aggregate drainage material is used



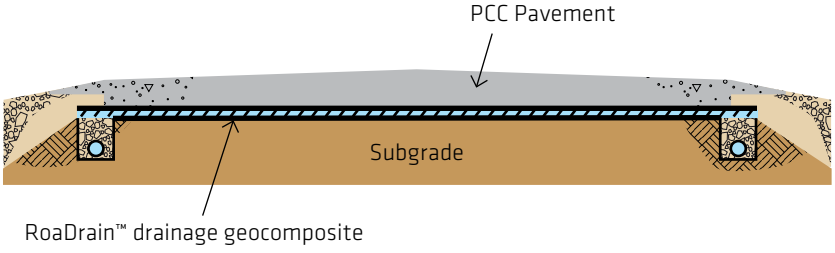


Engineered for Better Drainage

By providing excellent drainage, the RoaDrain™ System is the solution that greatly extends the life of pavements and reduces maintenance costs. Easily installed, the RoaDrain System can be placed under the base course or under Portland Cement Concrete (PCC). Below are illustrations of these various placements:

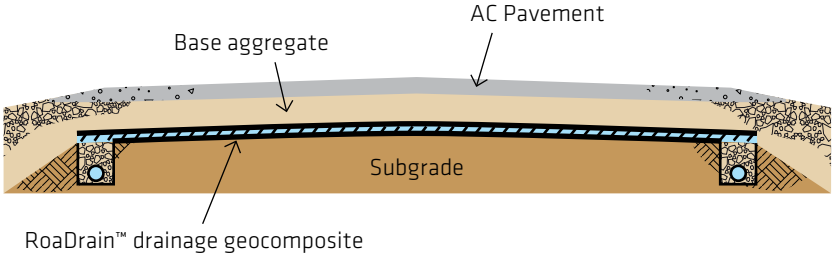
DRAINAGE BENEATH PAVEMENT SURFACE

Placed directly beneath the pavement surface, the RoaDrain System rapidly removes water from the pavement. The RoaDrain System provides excellent drainage as defined by AASHTO, (50% of the water is removed from the pavement structure within two hours.)



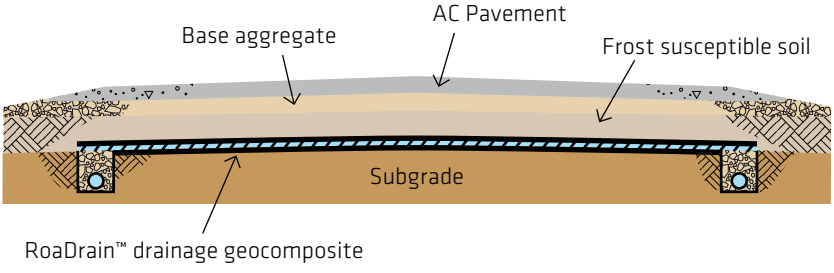
DRAINAGE BENEATH BASE COURSE

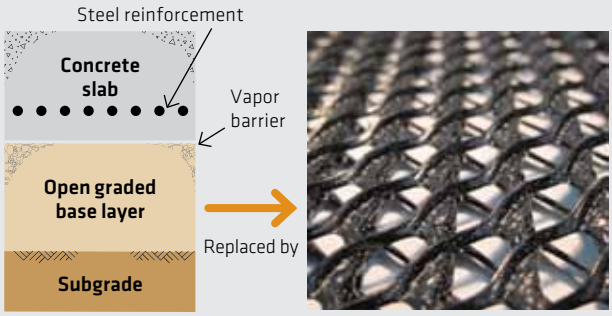
Installed under the base course, the RoaDrain System shortens the drainage path, requiring less select base material. Drainage provided by the RoaDrain System allows for an increase in the structural support design value of the pavement system through modification of the drainage coefficient or “m” values on PCC and asphalt pavement applications.



CAPILLARY BREAK BENEATH FROST-SUSCEPTIBLE SOILS

The RoaDrain Systems acts as a capillary break at lower depths under frost-susceptible soils to help eliminate frost-heave.





Drainage design featuring open graded base layer (OGBL)

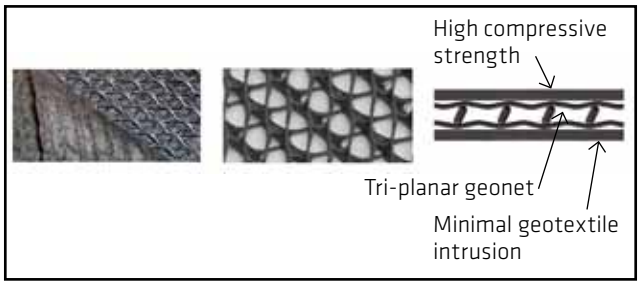
RoaDrain™ net core with tri-planer void-maintaining structure

The RoaDrain™ Roadway Drainage System can replace the open graded stone base layer (OGBL) within a drainage design.

Built for Proven Performance

The RoaDrain product is a synthetic subsurface drainage layer (SSDL) comprised of a tri-planar structure with thermally bonded nonwoven geotextile filters on both sides.

- **Nonwoven geotextile** offers separation and filtration
- **Tri-planar geonet core** ensures a void-maintaining structure with high compressive strength



Drainage Media	Permeability, k (ft/day)	Flow Rate[2] (ft^3/day/ft)
RoaDrain	56,700	30
4 in. OGBL	1,000 – 3,000	6 – 20

[1] Flow rate at 2% gradient

[2] SSDL transmissivity is tested along the primary flow direction with the boundary conditions as follows: steel plate/Ottawa sand/SSDL/ Ottawa sand/steel plate, one hour seating period @ 5,000 psf

Specifications for RoaDrain 5 (RD-5) and RoaDrain 7 (RD-7)

Property	RD-5	RD-7
Net Core Thickness, mil (mm)	280 (7.1) ±10%	300 (7.6) ±10%
Geotextile Weight*	6 oz/sy	8 oz/sy
Geotextile Strength	Exceeds Class 2	Exceeds Class 1
Geotextile AOS, US Std Sieve (mm)	70 (0.212)	80 (0.150)
Permittivity, sec^{-}	1.4	1.1
[1]Water Flow Rate, gpm/ft ($l/min/m^2$)	110 (4481)	90 (3675)
[2]Transmissivity (loading condition)	5,000 psf	15,000 psf
Pavement Fatigue (# of cycles before cracks propagate)	N/A	3000
Other Details	**RD-5**	**RD-7**
Roll Size	12.75 ft x 200 ft (3.89 m x 61 m)	
Roll Area	283.33 sy (237.29 sm)	
Approximate Roll Weight	1,000 lbs	1,200 lbs

**Typical value measured prior to bonding.*

Experience You Can Rely On

Tensar is the leader for geosynthetic products created especially for roadway improvement. We have developed products and technologies that have been at the forefront of the geotechnical industry for nearly three decades. As a result, you can rely on our systems and design expertise. Our products are backed by the most thorough quality assurance practices in the industry. And, we provide comprehensive design assistance for every Tensar system.

For more information about the RoaDrain™ System, please call **800-TENSAR-1**, visit **www.tensarcorp.com** or e-mail **info@tensarcorp.com**. We are happy to supply you with additional system information, complete installation and design guidelines, product specifications, preliminary cost estimates, summaries of completed projects, and much more.

Featured Projects

SHELL CANADA AIRPORT STRIP, ATHABASCA SANDS, CANADA

The Challenge: The airport strip was built on top of problematic silty soils. Due to the presence of a high groundwater table and low temperatures, frost heave was a significant concern.

The Solution: RoaDrain™ RD-7, a high strength drainage geocomposite with tri-planar structure, was selected for its ability to support heavy loads and its long-term high drainage capacity. The RoaDrain RD-7 benefits were immediately obvious as it removed water from the pavement structure while providing excellent compressive strength. RoaDrain RD-7 also provided a capillary break and separation between the subgrade and base course. The project was completed ahead of schedule and below budget.

HIGHWAY 35 ROAD RECONSTRUCTION, OWATONNA, MINNESOTA

The Challenge: Significant deformation and rutting of the roadway surface was observed shortly after the initial construction of this roadway section. Limited excavation revealed that underground springs and perched water within sand lenses were saturating the subgrade and road base materials, thereby compromising the structural integrity of the roadway.

The Solution: The RoaDrain product was specified due to its ability to efficiently collect water and provide total coverage of the road section. It was determined that the collection capacity and high flow rate of RoaDrain would be sufficient to keep the base aggregates dry and that the compressive strength of RoaDrain would be sufficient for long term serviceability and short-term installation stresses.

BODEGA HIGHWAY, SONOMA COUNTY, CALIFORNIA

The Challenge: Bodega Highway is located half a mile east of the Bohemian Highway in Sonoma County. The roadways in this area are prone to water intrusion. In the winter, the road tends to freeze causing a serious hazard.

The Solution: The Sonoma County Public Works Department elected to use the engineered solution of RoaDrain. The RoaDrain layer between the aggregate base and the silty subgrade soils provided an excellent drainage path. It also provided separation and strength to the pavement section. The RoaDrain product effectively removed the water from the roadway, thus creating a safer road.

SOUTHWEST PARKWAY, AUSTIN, TEXAS

The Challenge: A six lane stretch of Southwest Parkway underwent a major redesign and reconstruction. A 2,940 foot section in the middle of the problematic roadway was exposed to underground water that infiltrated its structural base course. This saturation contributed to premature failure of the pavement.

The Solution: The RoaDrain Roadway Drainage System was specified under the base course as a drainage conduit to channel the groundwater to a collection system. The RoaDrain solution has proven to deliver a valuable performance aspect to the reconstructed highway design section.

Tensar®

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