

إيلاف
ALYAF

ALYAF INDUSTRIAL CO. LTD.



GEO SYNTHETIC SOLUTIONS
PROTECTING THE ENVIRONMENT

ALYAF PRODUCT RANGE:

ALYAF GEOTEXTILES:

Wide range of nonwoven geotextiles in both polypropylene and polyester produced through needle punched and needlepunched thermally bonding.

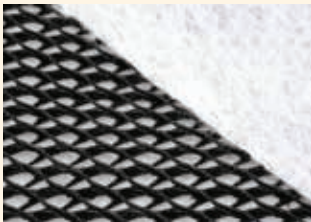
ALYAFGEO COMPOSITES:

ALFDRAIN S Range : Wide range of high flow drainage composites with an HDPE stud core laminated to an engineered ALYAF geotextile filter on one or both sides of the core.



ALFDRAIN C Range : Wide range of composites with an HDPE cusped core laminated to a purpose designed ALYAF geotextile filter on one or both sides of the core.

ALFDRAIN B Range : Bespoke range of composites with an HDPE biplanar net core laminated to a designed ALYAF geotextile filter on one or both sides of the core.



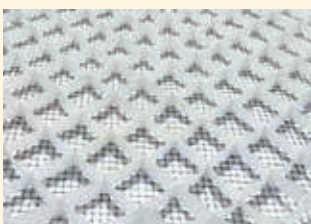
ALFDRAIN T Range : Bespoke range of composites with high compressive strength with an HDPE triplanar net core laminated to a designed ALYAF geotextile filters on one or both sides of the core.

ALFDRAIN Salt Barrier : An engineered Geocomposite capillary break layer.



ALFDRAIN PD Range : Superior multifunctional alternative to protection boards in water proofing systems.

ALYAF BI AXIAL GEOGRIDS : Range of extruded, punched and stretched PP geogrids designed for soil stabilization applications.



ALFWEB CELLULAR CONFINEMENT SYSTEM: The innovative ALFWEB 3-dimensional cellular confinement system engineered to provide erosion protection on slopes.

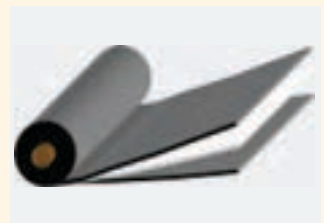
ALFGUARD Root Barrier: A range of both permeable and impermeable membranes engineered to prevent undesirable root growth.



ALFMESH: A diamond shape extruded net designed for use as crack relief reinforcement in concrete slabs on grade/ground supported, walkways/sidewalks, canal lining, etc.

INDUSTRIAL PRODUCTS - MEMBRANE REINFORCEMENT :

A wide range of nonwoven polyester reinforcement mats engineered specifically for the production of bituminous waterproofing membranes.



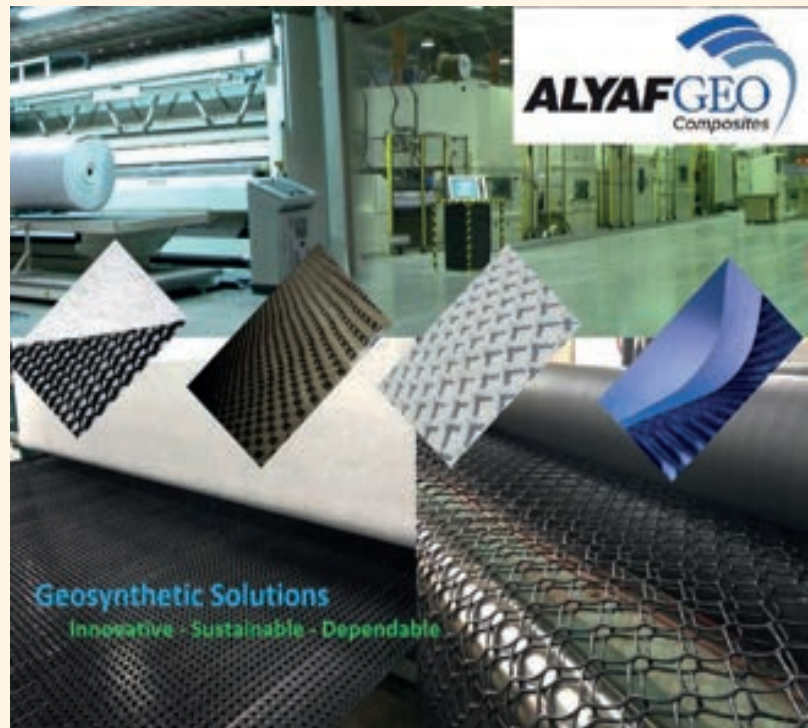
COMPANY PROFILE:

ALYAF is a Saudi Arabian company, established in 1992, specialized in the design and manufacture of a wide range of geosynthetics products for civil and environmental engineering applications.

Today, ALYAF is the largest geosynthetics manufacturer in the Middle East having supplied over a billion square meters of geosynthetic solutions.

To reinforce its position as a leading Geosynthetic solutions provider, ALYAF in association with UK based GEOfabrics has established a manufacturing facility at Saudi Arabia to produce ALFDRAIN Geocomposite range which provides design engineers with a unique alternative using high performance and cost effective Geocomposite drainage solution to replace traditional gravel drainage systems. ALYAF geosynthetics are used in wide range of applications including:

Soil Stabilization, Paved and Unpaved Road Construction, Landfills, Filters for Shore Protection & Drainage Systems, Landscaping, Geomembrane Protection in Roofing System, Salt Barriers/ Capillary Breaker, Cellular Confinement Systems for Slope Protection, Paving composites, Vertical and horizontal drainage composites, Tunnel liners, Green roof systems, cavity drainage layers, leachate and gas collection systems, Root barriers, etc.



ACKNOWLEDGED QUALITY

ALYAF applies an Integrated Management System complying with ISO 9001 (Quality Management) ISO 14001 (Environment Management) and ISO 45001 (Occupational health and safety). ALYAF has a full-fledged laboratory for testing geosynthetics to ASTM, EN and ISO standards.

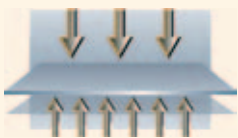
DEDICATED SERVICE

ALYAF has a team of dedicated engineers to provide efficient response to queries, assist in the design and selection of the most appropriate geosynthetics as well as on site installation support.

APPLICATION AREA	FUNCTION	PRODUCT (typical*)
Road Stabilization	Reinforcement, Separation & Filtration	ALFGRID G30-301
Pavement over saturated soils	Capillary Break Layers	Salt Barrier SB6-D305
Marine Construction	Separation & Filtration	A701 XL or AX11 XL Geotextiles
Road Maintenance	Sealing, Reinforcement & Crack Relief	ALFGRID G20-231
Lowering Of Ground Water	Separation, Filtration	XL and XP Geotextiles
Landfills: Leachate Collection Gas Venting	Separation, Filtration & Drainage Separation, Filtration & Drainage	ALFDRAIN T8-D355 ALFDRAIN S6-225
Landscaping	Capillary Break Layers	Salt Barrier SB4-D285
Structural Drainage	Separation, Filtration & Drainage	ALFDRAIN S10-255
Roofing	Separation, protection	A241 polyester geotextiles
Liquid Applied waterproofing	Carrier & reinforcement	ALYAF A163
Substructures	Protection & drainage	ALFDRAIN PD6
Roof Gardens	water retention and drainage	ALFDRAIN C series
Roof gardens	Moisture management	ALFMAT 601M
Slope Protection	erosion protection	ALFWEB 10/300
Concrete Reinforcement (ground supported slab)	reinforcement, crack relief	ALFMESH 500
Root barriers	Impermeable barriers Permeable root guard	ALFGUARD HD100 ALFGUARD AG36 PLUS
Sand Fence	Arresting drifting sand	ALFMEASH SF65

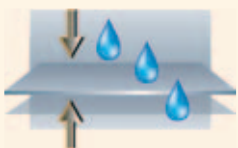
Above table suggests typical grades used. For site-specific recommendation please contact ALYAF.

ALYAF GEOSYNTHETICS FUNCTIONS:



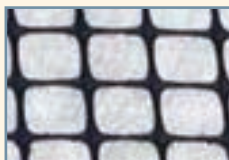
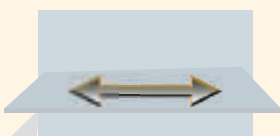
SEPARATION

Tough and durable ALYAF geotextiles serve the separation function by preventing soil migration between aggregate layers thereby the integrity and functioning of both materials can remain intact or be improved



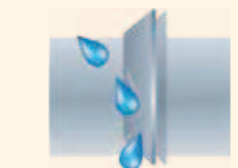
FILTRATION

ALYAF provides the filtration function by permitting excellent water flow across the geotextile while restraining the migration of soil fines.



REINFORCEMENT

ALFGRID Geocomposites reinforce aggregate layers through lateral restraint and membrane effect



DRAINAGE

ALFDRAIN Geocomposites provide an avenue for the drainage of water and gasses along the plane of the composite.



PROTECTION

The excellent dynamic and static puncture resistance of Alyaf geotextiles makes them ideal protection layers that dramatically increase the puncture resistance of geomembranes

ROAD CONSTRUCTION



ALYAF SALT BARRIER being installed at the Orbital Highway Project at Qatar



ALFGRID for soil stabilization

ALYAF Geosynthetics play a major role in the construction of pavements towards

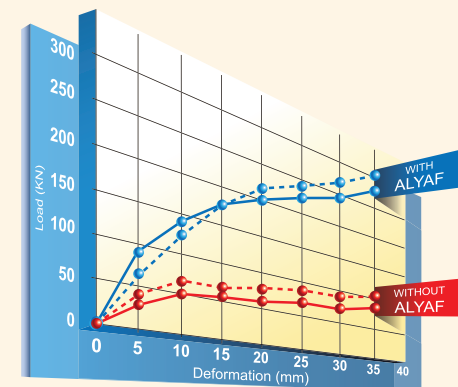
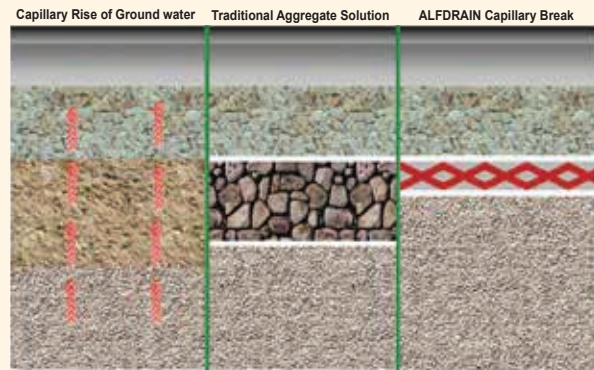
- Increase in pavement life especially over weak subgrades
- As capillary break layers over saturated subgrades
- For ground improvement over swampy areas like “sabkha” type of soils

Construction over Weak Subgrades:

The principal application of geotextiles in road pavements has been as a separator between the base course or subbase and subgrade. Intermixing and contamination of the base course aggregate under the influence of traffic loading and the pumping of fines from the subgrade, results in reduction of the effective base course thickness. With ALYAF geotextile acting as a separation layer at the interface of the subgrade and the base course, the designed base course thickness with its properties are maintained throughout the life of the project by pavement?

Construction over Saturated Subgrades:

Higher evaporation rates and a shallow ground water in hot and arid climates lead to capillary rise of ground water into the base course of pavements. The presence of moisture in base courses is detrimental to its performance and causes rapid pavement damage. To break the capillary rise and redirect water to the edge drains ALYAF has launched a new generation of geocomposite capillary break layers that replace the traditional open graded aggregate layers and the geotextile filters.



Load deformation curves for soaked sabkha soil with and without ALYAF

Source: Dr. Saad Aibaan et al, Reinforcement of Saudi Sabkha Soil, KFUPM

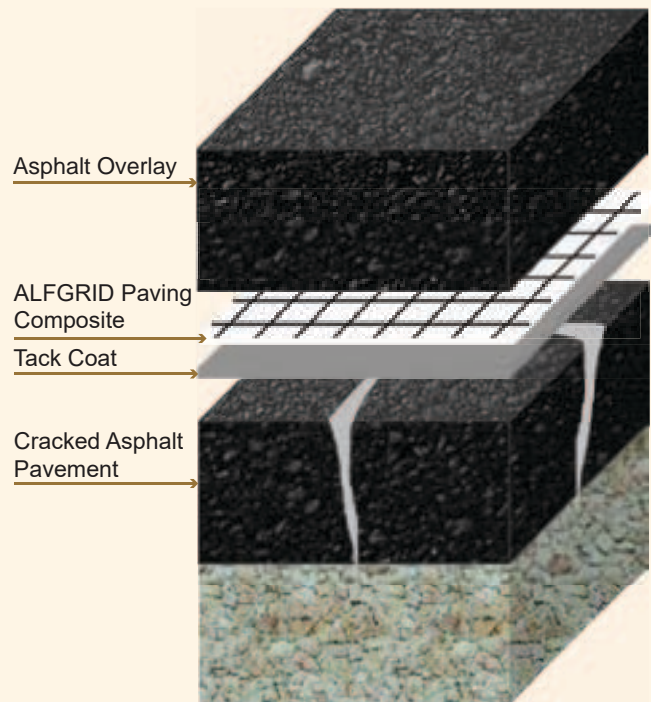
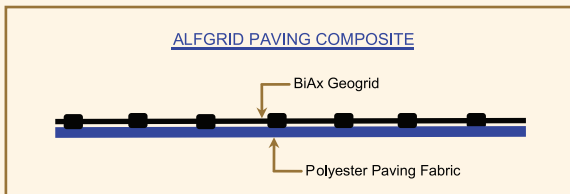
ALYAF also offers cost effective design solution for construction of access road and paved road over weak soils, like sabkha soils

Ground Improvement over Sabkha Soils:

Embankments constructed over Sabkha terrains suffer different classes of deterioration due to their low load-bearing capacity and a highly saline shallow ground water. ALYAF has pioneered techno-commercially viable geosynthetics solutions for stabilizing sabkha soil. A typical solution includes the following component:

- ALFGRID geocomposite: A single product to provide the critical multifunction of separation, filtration and reinforcement.
- Well graded aggregate layer of designed thickness as working platform.
- SALT BARRIER: Geocomposite capillary break layer to prevent the rise of the saline ground water into the structural layers.

ASPHALT OVERLAYS



ALFGRID PAVING COMPOSITE ADD YEARS OF LIFE TO PAVEMENTS

ADVANTAGES

Retards Reflective Cracking

ALFGRID Paving Composite overlay fabrics act as stress absorbing membrane interlayer (SAMI) that prevent/ retard the crack propagation from the old asphalt layer into the new asphalt overlay

Provide Moisture Barrier

Asphalt impregnated ALFGRID Paving Composite ensure pavement stability by preventing the surface water intrusion into the subgrade.

Increase Pavement Life

ALFGRID Paving Composite increase the fatigue life of the pavement

Reinforcement

The BiAx Geogrid provides reinforcement through mechanical interlock of the asphalt concrete overlay.

Moisture, expansion and contraction due to temperature changes and traffic loads, all contribute to the vertical and horizontal movements of the pavement causing cracking. When new overlays are applied to such surfaces, the cracks soon resurface in the new overlay, known as reflective cracking.

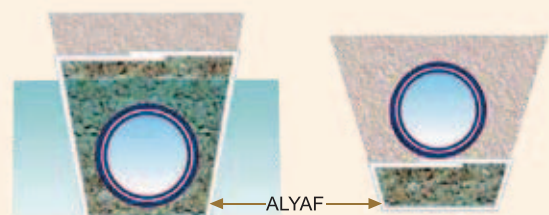
ALFGRID Paving Composite offer a cost-effective and proven method of retarding the reflective cracking. It also acts as a moisture barrier that prevents the ingress of moisture into the subgrade and increases the fatigue resistance of the pavement structure.

ALFGRID Paving Composite is made through thermal lamination of a reinforcing BiAx geogrid with a polyester paving fabric. The polyester paving fabric field saturated with asphalt provides the functions of stress absorption and sealing and also facilitates installation. The BiAx reinforcement geogrid with its 3-D rib geometry and stiff intergral junctions provides mechanical interlock of the overlying material to provide added strength to the overlay.

Pipeline Stabilization and buoyancy Protection

Solid pipelines when laid over areas having a shallow ground water table; need stabilization from the buoyancy forces of the water table especially when the pipelines are empty. Stabilization of such pipelines is effectively performed by placing the pipelines inside a bed of uniform size gravel and then wrapping the gravel with appropriate Alyaf geotextiles.

Further a very cost effective and proven solution to provide stable foundation and gradient to pipelines passing over weak areas is by enclosing the foundation aggregates by a layer of ALYaf geotextiles

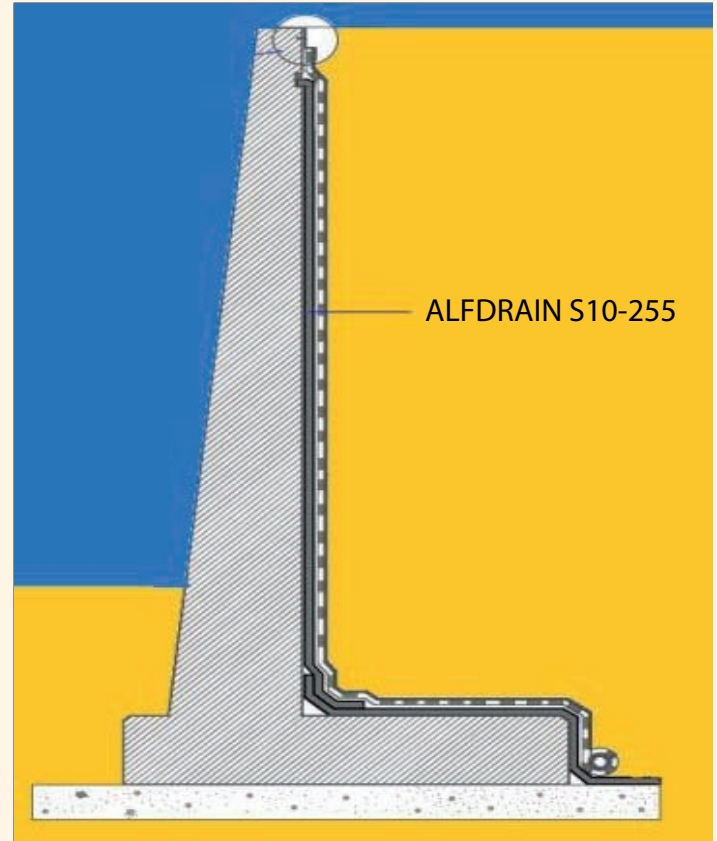


DRAINAGE SOLUTIONS:

Control of water infiltration and providing adequate drainage are critical to the performance of retaining walls and abutment walls. Current practice specifies the use of a 300-600 mm thick porous backfill with geotextile filter. ALFDRAIN geocomposites are more cost- and time-effective, durable, and at the same time, have comparable or superior drainage capability compared to aggregate drainage layers.

COMPARATIVE PERFORMANCE BENEFITS:

ALFDRAIN	Aggregate Drainage
Provides superior or equal avenue for drainage of water at different gradients	Drainage capacity dependent upon thickness and gradation of rock fill
Provides additional protection to the waterproof membrane	Crushed rock is very aggressive and results high probability of damage to waterproof membrane
Quick and easy to install for all kind of gradients and conditions	Time consuming installation, difficult to install in vertical drainage
Acts as additional moisture barrier	no additional benefits
Acts as a barrier against gasses like radon & methane	no additional benefits
Low logistic cost and footprint on infrastructure	High logistic cost and footprint on infrastructure
Very high flow to thickness ratio	Low flow to thickness ratio



ALFDRAIN is a wide range of high performance geocomposite specifically developed to provide high water drainage capacity.. **ALFDRAIN** composites possess excellent compressive strength and resistance to creep which ensures that it maintains its drainage capability under a wide range of compressive loads.

APPLICATION AREAS:

1. Retaining Walls,
2. Bridge /wall Abutments,
3. Underground reservoirs,
4. Tunnels, etc.

EROSION CONTROL IN WATERWAYS:



SHORE PROTECTION



**LAND RECLAMATION
& BREAK WATERS**



MARINAS



Flowing water can cause severe erosion and instability of soil structures. ALYAF geotextiles play a key role as excellent filter materials to prevent erosion and ensure stability of soil structures in applications like;

- Quay walls
- Seashore erosion protection
- Steram bank protection
- Ditch, channel and canal slope protection
- Cut and fill slope
- Scour protection around bridge piers

They may be used in combination with riprap or armour stone, concrete blocks, articulated concrete as well as gabion mattresses.

ADVANTAGES OF ALYAF

ALYAF geotextiles are an excellent choice for your erosion control applications because of their:

Excellent hydraulic properties

- Fine Pore Size
- High permeability
- Low potential for clogging

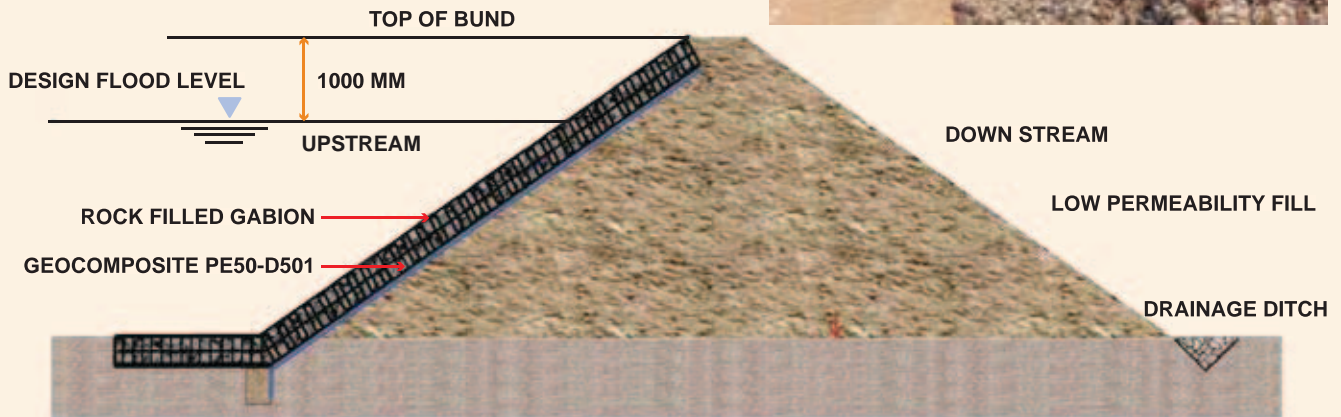
Superior Mechanical Properties

- High tensile strength with good elongation
- Excellent dynamic and static puncture strength



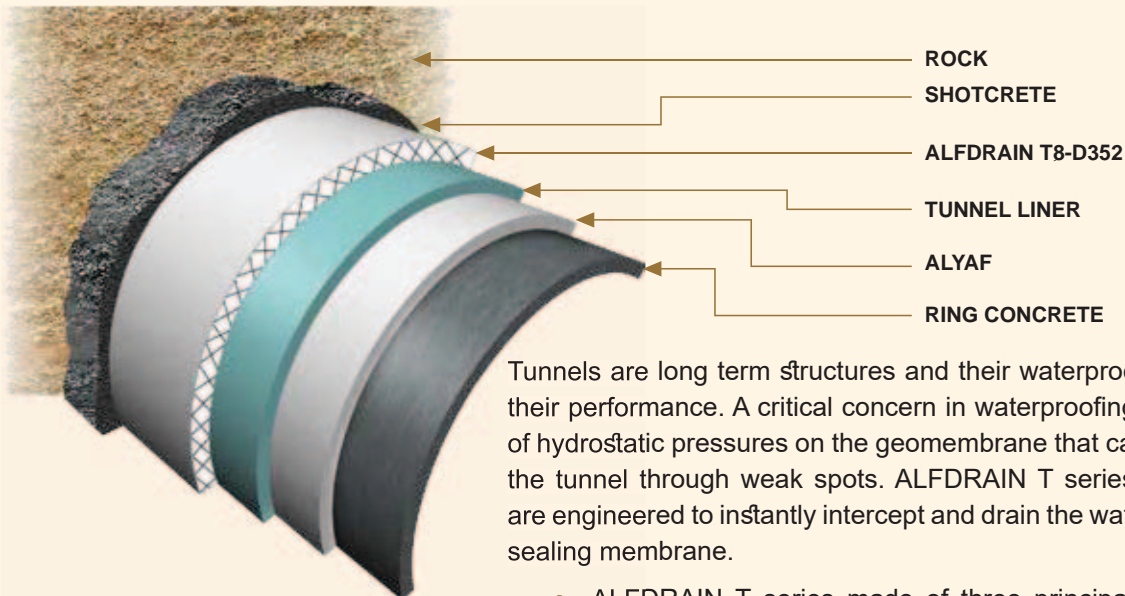
POLYMER GABIONS

ALYAF polymer gabions offer economic and technical benefits, particularly in river, lake, coastal as well as flood control applications where corrosion can be a problem with steel gabions. **ADVANTAGES:** Noncorrosive, meets durability requirements for minimum 50 years design life



APPLICATION AREAS : Tunnels, Ponds, Landfills, Roofing Systems, Etc...

TUNNELS



Tunnels are long term structures and their waterproofing is critical to their performance. A critical concern in waterproofing is development of hydrostatic pressures on the geomembrane that can overtime enter the tunnel through weak spots. ALFDRAIN T series geocomposites are engineered to instantly intercept and drain the water away from the sealing membrane.

- ALFDRAIN T series made of three principal components to perform three distinct functions:
- An engineered Triplanar net core made from HDPE to provide an effective drainage of water in its plane even under high compression loads.
- A robust layer of polyester geotextile laminated to one side of the Triplanar net core. The function of this layer is to prevent point loads on the geomembrane.
- A high strength engineered low elongation polypropylene nonwoven to act as a filter in allowing only the water to flow into the drainage core while restraining the soil fines.

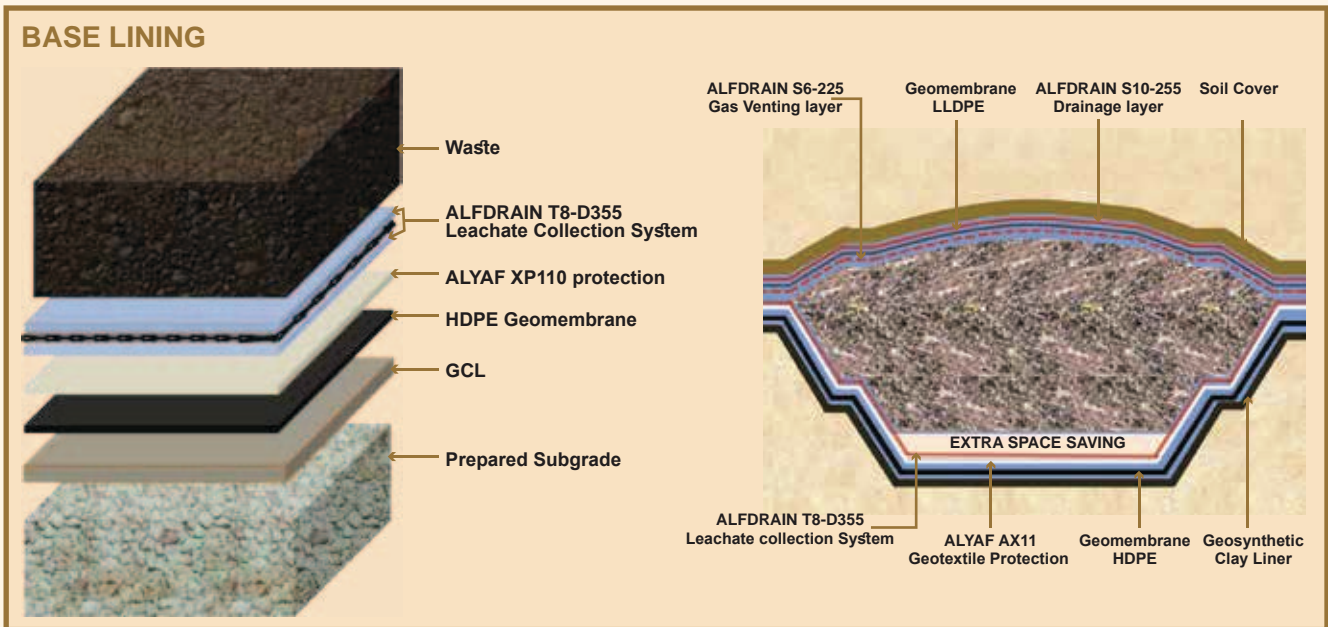


LANDFILLS :

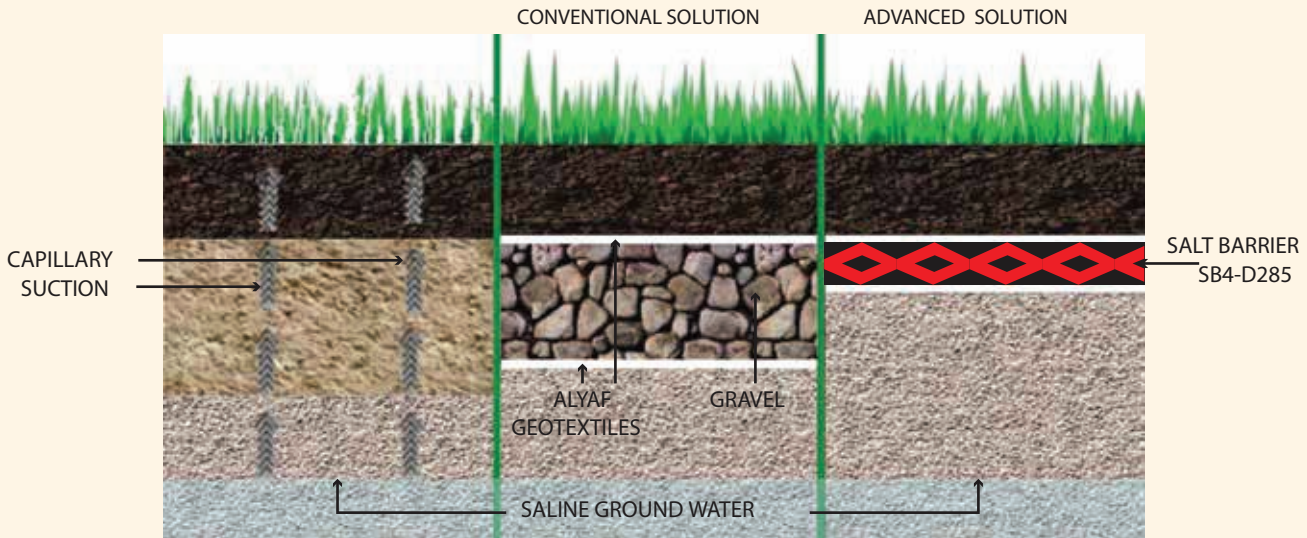
Modern day landfill requires construction of a fully encapsulated cell for waste containment with a sound leachate collection system in the base lining and gas extraction as part of the capping.

ALYAF offers wide range of specialist products in compliance to the GRI Standards for this application that include:

- **Nonwoven Geotextiles:** Both as protection as well as filter layers
- **ALFDRAIN** biplanar and triplanar geocomposites engineered for use as leachate collection and drainage layers.
- **ALFDRAIN S6-225** gas venting layer for use as an effective gas collection and venting system
- **ALFDRAIN S10-255** which is specifically designed to control rainfall run off of the capping soil?



LANDSCAPING & HARDSCAPING



Terrains across the middle East are exposed to extremely hot and arid climates that result in greater evaporation than precipitation. Evaporation draws saline water to the surface from the water table below in a continually rising process generally referred to as 'Capillary Suction'. At the surface, the water evaporates leaving behind the saline content in the soils which hampers healthy vegetative growth. Traditionally, a capillary break consisting of a coarse granular layer with a layer of ALYAF geotextile was installed between the subgrade and the top soil to arrest the rise of the saline groundwater.

ALYAF introduces **ALFDRAIN SB4-D285**, a novel salt barrier system that uses a high density drainage core with two specialized thermally bonded nonwoven polypropylene geotextile filters bonded to both sides. It prevents the salty ground water migrating to the imported top soil layer in landscaped areas and in base course on the hardscaped surfaces.

For more information about the product, refer to the **ALYAFGEO** composites brochure.



HARDSCAPING

Interlocking blocks provide an aesthetic and practical mode for surfacing walkways and their use has been growing rapidly throughout the world demonstrating their usefulness.

SALT BARRIER SB4-285 provides mutiple benefits:

- Drains surface water run of
- Breaks capillary rise of saline ground water
- Separation/Filtration prevents sand migration thereby long term structure stability is maintained.

SLOPE PROTECTION:

ALFWEB is an engineered cellular confinement system made from alternate linking of semi-rigid panels of purpose designed nonwoven fabric or high density polyethylene membrane.

The system is utilized in the areas of slope protection, channel protection, load support and earth retention structures. The ALFWEB system dramatically improves the performance of infill materials in these applications

SLOPE PROTECTION SOLUTIONS :

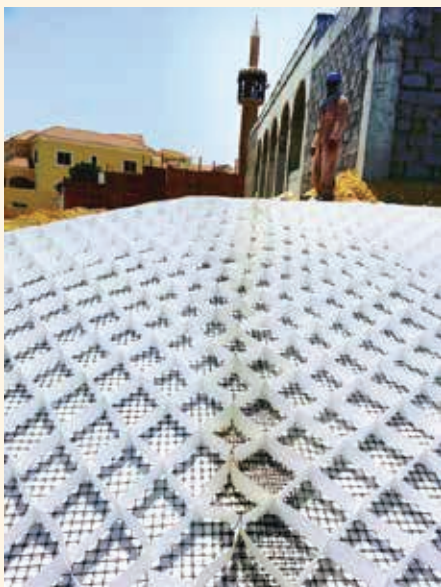
The ALFWEB system can be used in many slope protection applications meeting a wide range of performances and aesthetic requirements. The three dimensional system confines the determined infill material to resist anticipated hydraulic stresses, inhibits erosion and prevents downward migration of embankment materials.

A Variety of infill material can be used with the ALFWEB system. The choice of infill materials is based upon the demands of the specific projects.

INFILL MATERIALS INCLUDE :

- Topsoil with various selected vegetation
- Aggregate from sand and gravel to larger rock or stone
- Concrete of various strengths and surface finishes.
- Combination of above to meet special conditions.

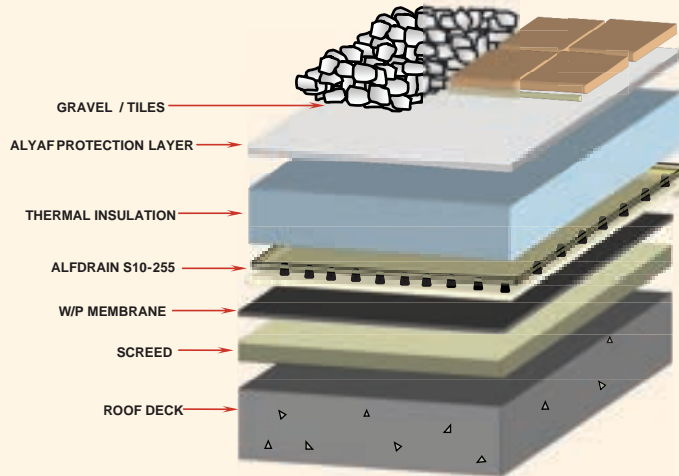
In Slope protection application, the ALFWEB system prevents the downward migration of embankment materials by functioning as check-dam in the upper soil layer. On vegetated slopes, it increases erosion resistance by encapsulating and protecting the vegetative root zone, It helps prevent forming of ridges and gullies in areas of concentrated flow over erosive soils.



The ALFWEB cellular confinement system offers a broad range of surface protection treatment for all slopes. The system is engineered for flexibility and can be combined with simple but effective anchoring techniques to allow the application of both vegetated and hard surfacing materials on steep slopes.

ROOFING SYSTEMS

ALYAF geotextile placed on top of the thermal insulation protects it from puncture damage by the subsequent gravel/tiles layer, prevents the migration of fines into the thermal joints and allows moisture / gasses entrapped underneath to vent out.



ALFDRAIN B4-D225 placed between the waterproofing membrane and thermal insulation provides the critical function of drainage and ensures that the insulation is kept dry and free from contact with moisture

ALYAF geotextile placed on top of the thermal insulation protects it from puncture damage by the subsequent gravel/tiles layer, prevents the migration of fines into the thermal joints and allows moisture / gasses entrapped underneath to vent out.

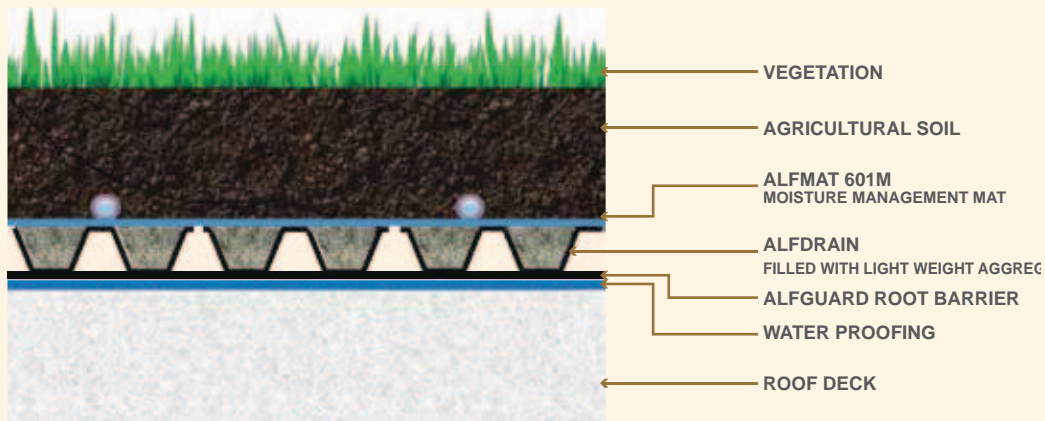
ROOF GARDENS:

Replacing the hard concrete surface of the conventional roof with a vegetated roof significantly mitigates the “Heat Island Effect.” Further the absorption, retention and controlled outflow of rain water substantially reduces surface water runoffs. ALYAF & GEO fabrics UK working closely with irrigation Engineers and architects have successfully implemented a comprehensive system to address the challenges in constructing a viable green roof assembly engineered for the tough desert environment.



ADVANTAGES OF GREEN ROOFS:

- Mitigates Urban Heat Island Effect
- Reduces, filters and slows down storm water run offs
- Vegetation helps reduce smog and dust levels.
- Recreates habitat, reduces carbon & increases oxygen in the environment
- Improves aesthetics
- Increases the lifetime of the roofing system



COMPONENTS:

- ALFGUARD HD100** : An impermeable, structured membrane made from HDPE that stops penetration of root growth.
- ALFDRAIN CP20** : It is a cusped HDPE sheet that is designed for storing water and allowing for quick drainage of excess water.
- ALFMAT 601M** : Moisture management mat made from extra hydrophilic polymeric fibres to collect water from ALFDRAIN and provide slow release to the root zone. ALFMAT 601M is further integrated with the irrigation pipes to ensure release of water into the root zone where it is required and not the top surface where it may rapidly evaporate.

GEOSYNTHETIC SOLUTIONS :

To serve the industry with comprehensive geosynthetic solutions, ALYAF has partnered with leading international manufacturers to provide a wide spectrum of quality Geosynthetics.

ALFGUARD Root Barrier

ALYAF manufacture impermeable and permeable root barriers to prevent uncontrolled root growth into pavement, utilities and waterproofing.

For aggressive roots, ALYAF has developed a tough structured HDPE based root barrier with specially engineered grooves which guides the roots back into nutrient zone thereby retaining the root growth within the intended area. ALFGUARD HD is a superior root barrier due to its engineered structure and is available in different thickness and easily manageable widths.

GEOGRIDS

BiAx Geogrids help to reduce lateral movement of interlocked, overlying aggregates that are subjected to dynamic loads, such as vehicular traffic, Through lateral confinement provided by the geogrid, the aggregate's apparent shear strength and load distribution characteristics improve, yielding in many instances, lower cost better performing structures.

Alyaf offers a range of BiAx Geogrids produced at a world class manufacturing facility certified in accordance to ISO 9001. Manufactured through a process of extrusion, punching and stretching of polypropylene sheets, ALYAF BiAx Geogrids provide an optimum aperture geometry and stiffness which are the two basic characteristics required for maximum interlock

ALFMESH

ALYAF manufactures diamond shaped geonet extruded from HDPE specially used for concrete reinforcement in ground supported concrete slabs, walkways, canal lining and slab on grade. ALFMESH is a cost effective replacement of steel reinforcement in ground supported concrete slabs due to its excellent resistance to rusting and soil borne salts, a particular concern with steel reinforcement in this region.

ALYAF POLYESTER REINFORCEMENT MATS:

Nonwoven polyester reinforcement is considered as the best reinforcement for bituminous waterproofing membranes. Since 1992 ALYAF has been supplying polyester reinforcement mat to the bituminous membrane manufacturers. Working in close co-ordination with some of the leading manufacturer's of bituminous membrane ALYAF has engineered a range of polyester reinforcements to match the demanding needs of this industry, namely

- The unique processing requirements of the bituminous membrane manufacturing facilities, and
- The performance requirements of the end product when used in varying climates over roofs, basements, bridge decks, etc.

ADVANTAGES

The proprietary process of manufacturing ALYAF polyester reinforcement fabrics ensures:

• Higher Tensile Strength In The Machine Direction:

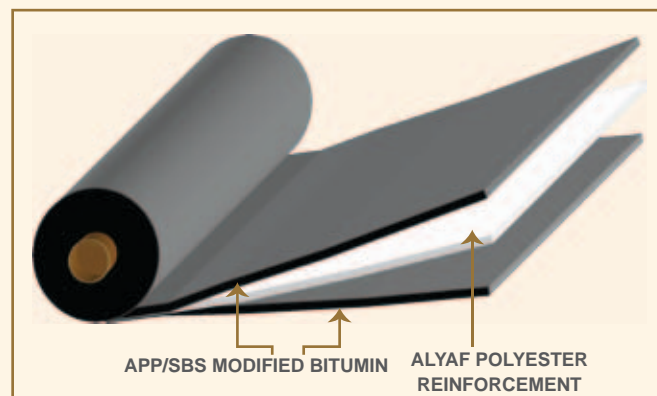
Thus offering greater resistance to the longitudinal tensions encountered in the membrane production lines and reduced shrinkage/latent stresses in the finished product.

• Higher Elongation In The Cross Machine Direction:

This enables the bituminous membranes to accommodate the stress-strain cycles it is subjected to, which is one of the main causes of seam failures in membranes.

• **Lower Moisture Absorbtion:** The lower moisture regain of ALYAF polyester reinforcement ensures that the membranes are free from moisture that could cause bubble formation.

• **Durable:** ALYAF polyester reinforcement mats are resistant to common chemicals and they are not affected by rot or mildew.



BRIEF PROJECT REFERENCE LIST

GEOCOMPOSITES
Maritime Yard Project, King Salman Complex, KSA
Khurasaniya Roads, ARAMCO, KSA
Jubail Sanitary Landfill, Royal Commission, KSA
Phospho Gypsum Stack System, MAA DEN, KSA
National Guard family Compound, KSA
Shuqaiq Power Plant Fly Ash Pit (Class 1 Landfill), KSA
Haramain Gate Twin Residential Towers, KSA
Ghabawi Landfill, Jordan
Arab Center For Research & Policy Studies, Qatar
New Orbital Highway, Qatar
College Of Media & Communication, Qatar
Porto Sharm Lagoon Project, Egypt
Princess Noura Palace Jeddah, KSA
ARAMCO Jazan Economic City And Refinery Landfill, KSA
Haramain Railway Station Makkah, KSA
Jaber Al Ahmad Al Jaber Al Sabah Hospital, Kuwait
Landfill For Hydrocarbon Contaminated Soil, KOC, Kuwait
Sheraton Car Park Project, Qatar
Riyadh Metro, KSA
GEOTEXTILES
New Suez Canal Project, Egypt
Abu Dhabi Company for Onshore Petroleum Operations Ltd. (ADCO)
KNPC New Refinery Project, Kuwait
Zakum Island, ADNOC, Abu Dhabi
Khalifa Port, Abu Dhabi
Ras Al Khair Port, KSA
Al Ruwais Port, Qatar
Salalah Port, Oman
Gorgon Port, Australia
Durrat Al Bahrain
Dubai Maritime City Port Rashid, Dubai
Kheiran Pearl City, Kuwait
Homs Landfill, Syria

GEOTEXTILES
Jeddah Landfill, Saudi Arabia
Sulaibiya Waste Water Scheme, Kuwait
ACP/GRP Landfill Project, Yanbu, Saudi Arabia
Ghabawi Landfill, Jordan
Sanitary Landfill, Jubail, Saudi Arabia
Storm Water Drain & sewer lines, ASHGHAL, Qatar
Roads & Infrastructure in Mesaied, QP, Qatar
Burg Dubai Development, The Lake, UAE
Bahrain Financial Harbour
King Abdullah Road, KSA
Hamad International Airport Landscaping, Qatar
Yas Island Landscaping, Abu Dhabi
Al Kharj Airbase, KSA
Sharjah Airport, UAE
Storm water & sewer pipelines, Abu Dhabi
Interceptor Guard Dam, Oman
East West pipeline washout protection, ARAMCO, KSA
Palm Jumeirah Underpass Tunnel, Dubai
ALFWEB
Dirab Airbase Project, KSA
Jebel Ali Port Terminal, UAE
College of Media and Communications (sloping roof garden), Qatar
Ammunition supply points, weapon storage, associated facilities, KSA
ALFMESH
Ras Alkhair Open Channel/Storm water, KSA
Flood Bund Protection (gabions) ARAMCO, KSA
Concrete Side Walks, Royal Commission
GEOGRIDS
ROP Projects, Oman
King Abdul Aziz Road Project-Thuwal /Jeddah, KSA
Al Qassim CR. Additional Phase / Qatif Bulk Plant, KSA
C-road between Riyadh and Dammam, KSA
King Abdul Aziz Economic City



Further literature, in the form of case studies, design guides, installation procedures, product data sheets and model specifications can be downloaded from www.alyaf.com