

NAYLOR
ENVIRONMENTAL

TechTurf Systems



For
natural look
grass
reinforcement

- Emergency Access Routes
- Showgrounds
- Overspill Car Parks
- Equestrian use
- Sports surfacing
- Airports and Grass Runways

email: sales@naylor.co.uk web: www.naylor.co.uk



Naylor TechTurf

100mm deep - Heavy Pedestrian

150mm deep - Car Parking

200mm deep - Emergency Access & HGVs

The TechTurf rootzone reinforcement system was originally developed in the UK following extensive research carried out by the Civil Engineering Department at Strathclyde University and the Turf Grass Science Department at Texas A&M University, USA.

Subsequent research by Strathclyde Uni showed that the use of mesh elements provided up to a 35% improvement in reinforcing effect when compared to all fibre alternatives. The TechTurf system provides a solution to load bearing; trafficked or high wear grassed areas and is SuDs compliant. The system consists of 3 elements:

- a) The reinforced rootzone material
- b) Specialised fertiliser
- c) Specially grown turf to complement the rootzone

The TechTurf rootzone is reinforced with an exact percentage of randomly oriented polypropylene mesh elements. The grass roots penetrate and entwine with the mesh elements, stabilising the system and providing

positive anchorage for the grass plants. The result is an engineered natural grass surface with high load bearing characteristics, improved damage resistance and a unique cultivation property which overcomes the problem of soil compaction. It is an ideal solution for a natural, environment-ally attractive area where excessive traffic loadings are anticipated but a natural grass finish is desired.

The system is therefore ideal for:

Walkways, Emergency access routes, Sport Surfaces, Aviation Areas, Equestrian, Landscaping, Housing Projects & Public Areas

Benefits of Naylor TechTurf:

- a) SUDS compliant - Excellent drainage properties.
- b) Invisible once installed but still performs.
- c) Improved root growth - reinforcement maintains hydration and prevents compaction.
- d) Natural Alternative - maintains the natural environment.
- e) No grid reinforcement visible.
- f) Versatile - Excellent in 'high traffic' areas giving a natural appearance but supplying a hard wearing surface.
- g) Ease of Maintenance - No special measures required.
- h) Cost Effective - a viable alternative to grid reinforcement.



Naylor TechTurf for Fire Access Routes:

TechTurf has been in use for many years for emergency access routes because of its ability to take fire tenders during extreme weather conditions without them getting bogged down or causing excessive rutting.

Recent testing in conjunction with the Fire & Rescue Fighting Unit School in Warsaw saw a series of tests in both dry and saturated conditions involving the repeated manoeuvring and shunting of a fully laden fire tenders and specialist extra heavy ladder units.

Conclusion:

TechTurf met all the requirements of load capacity and deformation of the surface (rutting > 2 cm in all weathers). This confirmed TechTurf can be used for fire access routes without restriction.



Naylor TechTurf for Multi-use areas:

When historic Chiswick house in West London was looking for additional parking for various major events, they selected Naylor TechTurf as the ideal solution, creating a 3,000m² multi use car park suitable for both cars and HGV's.

The result is a free-draining, completely natural grass surface with high load-bearing capabilities, resisting rutting and compaction.

Naylor TechTurf Commercial Use:

The carefully manicured lawns at this Swindon Distribution Centre have a hidden strength that enables their use as a service and emergency access route. The area was created using Naylor TechTurf, allowing multi-use functionality without compromising the aesthetics.

The area provides a sympathetic outlook to the distribution hub whilst also allowing emergency access using a natural structure that resists rutting and compaction, suitable for all types of traffic up to HGV use.



TechTurf

for Sports Use

Sports Pitches - The unique properties of TechTurf with its rot proof mesh reinforcement encourages grass growth by drawing air and water through the soil to promote vigorous root development to the turf above. For Sports pitch use, the TechTurf construction has a 50mm layer of specially selected local sand added above and below the rootzone layer.

So for professional or school/college football or rugby pitches TechTurf provides a hardwearing

TechTurf has been used for many sports applications

lasting solution ensuring down time is kept to a minimum. It resists compaction and protects the surface from excessive studded footwear damage even during wet conditions.

TechTurf provides all the aesthetics of natural grass, providing a flat, consistent playing surface that helps reduce injuries and needs less maintenance.



TechTurf for Golf - Traditional problems such as poor soil drainage and increasingly heavy downpours create problems of soft ground on the green approaches. With TechTurf installed you will get the maximum use of the course with the highest quality of playing surface to meet golfers' expectations.

Par 3 Holes - TechTurf is used to improve the playability of par 3 holes by reducing divots and providing a stable free draining surface to play off.

Driving Ranges - There are an increasing number of specialist standalone ranges as well as course facilities to practice chip shots and bunker shots alongside the driving practice. However, in bad weather, ball retrieval carts can get bogged down and have difficulty in the "pickup" of the used balls.

A TechTurf layer 100mm deep will be immediately firmer underfoot and its free draining characteristics will ensure fast recovery after heavy rainfall. This ensures good ball pickup and areas are ready for use in record time.



Equally important is the availability of additional parking, the TechTurf system is widely used where SuDs compliant structures are needed to provide temporary parking whilst maintaining a natural look to the surrounding landscape.



TechTurf

for Aviation Use

Naylor TechTurf is produced under stringent quality procedures ensuring a consistent high quality reinforced rootzone mixture. The resultant system provides a very cost effective solution for use on and around aviation related sites.

The TechTurf's hard wearing and well drained natural surface is ideal for light aircraft runways and taxiways; standard runway shoulders safety strips and aprons; overspill car parks and HGV access routes. It is particularly suited for Runway End Safety Areas (RESA) because of its high load bearing characteristics.

The TechTurf is ideal for:

Grass Runways for light aircraft - The unique abilities of TechTurf to withstand the regular impacts of light aircraft without excessive rutting make it an ideal choice for grass runways.



Taxiways - Regular use by light and heavier aircraft off the runway, combining a natural look but with the additional strength to take the loads without excessive rutting.

HGV Emergency access - TechTurf provides reinforced HGV routes allowing access to all areas of an airport. When used throughout, emergency vehicles are able to take the most direct route, saving crucial response time.



Overspill Car Parks - The use of TechTurf allows these areas to be both environmentally friendly and SuDs compliant.

Helicopter landing areas - military and domestic landing areas can be created requiring little maintenance.

Hangers - Areas around hangers typically require a SuDs

compliant surface TechTurf copes with imposed loads from aircraft wheels as they are maneuvered into position.



Runway End Safety Areas (RESA)

The following is given as general guidance, the designer should refer to current regulations such as the Manual of Aerodrome Design & Safeguarding.

The prime intention of the Runway End Safety Area (RESA) is to reduce the risk of damage to airplanes in the event of undershooting, overrunning, or veering off the runway, it should also provide access for emergency vehicles during such incidents.

International standards (ICAO) require a minimum of 90m (up to 240m for Code 3 or greater) of RESA from the end of the runway strip. There is also a requirement for a runway strip extending 150m from the runway centreline, extending 60m past the thresholds.

Naylor TechTurf provides an environmentally friendly, cost effective natural grassed surface solution, capable of taking these extreme loads. Operations and airport disruption are kept to a minimum by the simple fast installation with normal ongoing grass maintenance operations.

TechTurf is ideal for grass aprons that soften during winter months due to rainfall combined with the weight of standing aircraft, bogging down the aircraft wheels creating deep ruts in the surface.

Installation of TechTurf in airports use is very similar to that for other heavy duty uses and only differs in the depth of construction and the type of turf used. Drainage is via a free draining sub base or alternatively a standard DoT Type 1 sub base with Naylor Enviroflow inserted at 5m centres to assist drainage (see Enviroflow brochure).

The special **RTT Turf** is recommended for all aviation locations because of its very deep rooting capabilities (up to 1.5m) and its tolerance of both drought & flood. **RTT Turf** is ideally maintained at 25 - 80mm height making it perfect for airport use.





TechTurf for Equestrian use:

Naylor **TechTurf** is the ideal surfacing for equestrian facilities such as racetracks, gallops, paddocks and polo grounds to enable them to be used year round, providing a stable high quality surface for both horse and rider. Installed onto a well-drained base material the use of the polymer reinforcing mesh within the root zone mix ensures improved drainage and a riding surface availability for longer periods than traditional turf.

Used for take-off and landing areas in National Hunt races and three day eventing, it dramatically reduces kickback and acts as a shock absorber whilst maintaining a flat even surface even under the most arduous conditions.

TechTurf is ideal for ambulances and camera cars following the action without destroying the natural appearance of the course and complying with SuDs requirements.



TechTurf is mixed under stringent quality procedures, this ensures a consistent high quality reinforced rootzone mixture. The resultant system provides a very cost effective solution for use, reducing the traditional divot stomping in Polo fields whilst maintaining a good playing surface.



TechTurf

for General Use



TechTurf can benefit the overall aesthetics of a scheme whilst providing a hard wearing natural grass surface able to take excessive loads:

TechTurf for Schools:

Apart from the obvious playing field and overflow car park use, TechTurf can be used to provide Emergency Access whilst keeping a natural look to the area.
Driffield School, (Capital Construction)

TechTurf for Hospitals:

The Alder Hey Children's Hospital had to allow ambulance access to the helicopter pad but also be in keeping with the "Alder Hey in The Park" message.
(Ground Control Ltd)

TechTurf for Car Parks:

The increased demand for visitor parking at the Newbold Revel Prison College extends to 6,000m². The TechTurf finish is SuDs compliant and provides a load bearing grass finish.
(Ambion Contractors)



TechTurf for Embankments:

Steep embankments can be stabilised with the use of TechTurf, using the deep rooting RTT turf, it provides a hard wearing surface that is stable in all weathers.

TechTurf for Showgrounds:

Agricultural shows are a regular event throughout the UK, the showgrounds cater for multiple events throughout the year. It is therefore essential to maintain the prestigious look of the car parks and exhibition areas, whatever the weather - TechTurf is the answer.

TechTurf for Coastal Paths:

TechTurf using the deep rooting, salt tolerant RTT turf, provides a hard wearing finish for coastal paths. It reduces erosion by foot traffic dramatically, can tolerate the harshest of weathers and is quick to recover if damaged.

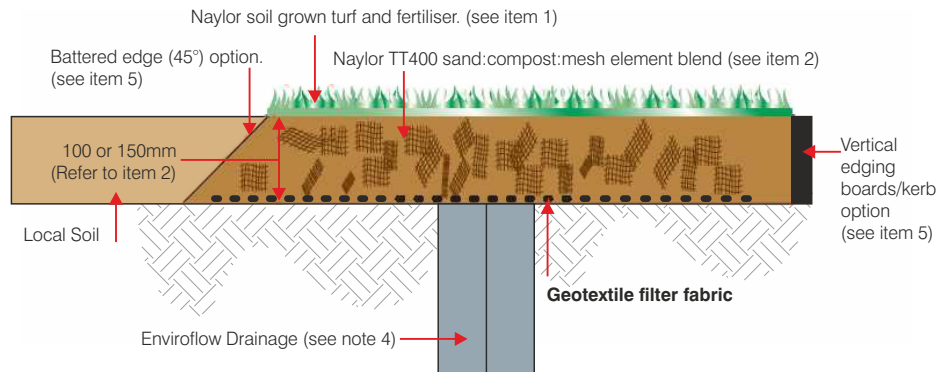


TechTurf

Typical Installation Details

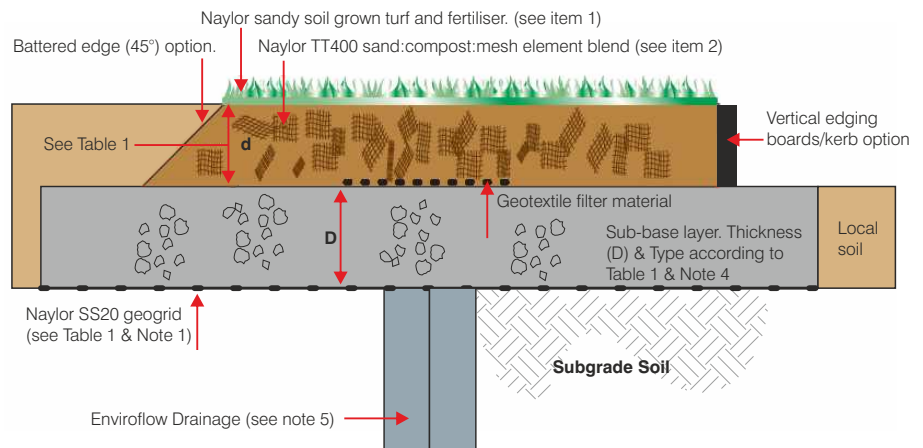
For heavy pedestrian use (walkways, tourist attractions, stately homes etc.):

1. Naylor Classic or RTT turf (see note below) onto an applied fertiliser (40g/m²).
2. 100mm depth of TechTurf TT400 rootzone. If sub-grade is poor quality replace with 50-100mm of good quality sandy loam, with a Naylor 20/20 geogrid.
3. Where a sub-base is not required: Lightly cultivate and re-consolidate the sub-grade layer.
4. For poor drainage areas - Insert a single or double row of Naylor Enviroflow into subgrade below the geogrid at 5m centres to drain the area.
5. Edges retained with kerbs/edging or by a 45° battered edge.



For car parking, emergency access (HGV) routes and event areas etc.:

1. Naylor Classic or RTT turf (see note below) onto an applied fertiliser (40g/m²)
2. 150 - 200mm thick layer of TechTurf TT400 rootzone. Refer to Naylor for advice on layer thickness.
3. Where a sub-base **is not** required: Lightly cultivate and re-consolidate the sub-grade layer.
4. Where a sub-base **is** required: A layer of DoT Type 1 sub-base (for SuDs complaint areas, a reduced fines, permeable DoT Type 3 sub-base) should be installed.
5. For poor drainage areas – Insert a single or double row of Naylor Enviroflow into subgrade below the geogrid at 5m centres to drain the area.
6. Edges retained with kerbs/edging or by a 45° battered edge.



Note:

If Naylor geogrid is omitted, then the total Sub-base layer thickness must be increased by a minimum 50%. For SUDS schemes using a permeable sub-base, this must be covered with a geotextile to retain the fines & prevent migration into the sub base.

Table 1

Sub-grade Soil Strength CBR%* (see Chart 1)	Required layer thickness in millimetres			Naylor Geogrid Type
	Naylor Rootzone 'TT400' (d)	DoT sub-base layer (D)		
		For Light vehicles	For HGV's	
> 12% (light vehicles)	150mm	No sub-base	N/A	None
> 12% (HGV's)	200mm	N/A	No sub-base	None
6 - 12%	200mm	No sub-base	No sub-base	None
4 - 6%	200mm	100mm	150mm	SS20
2 - 4%	200mm	150mm	200mm	SS30
1 - 2%	200mm	250mm	350mm	SS30

* CBR% = California Bearing Ratio. (see Chart 1)

Naylor Turf - We use two specially grown turf types with TechTurf:

Classic Turf is an extremely fine leaved but durable blend ideal for most applications including commercial landscapes, golf courses & show gardens. It gives superb sward density, fast establishment with superior tensile strength combined with high drought and wear tolerance.

RTT Turf is a very deep rooting turf (up to 1.5m) developed to be both drought & flood tolerant. Used where quick establishment is needed and little irrigation is possible. RTT is ideal for areas prone to occasional flooding, coastal paths or roadside verges where salt tolerance is needed. The hard leaf of RTT is ideal for golf fairways and semi-roughs because it encourages the ball to sit up.

Installation - Walkways and Pedestrian Areas

1. Excavate to required depth, remove all debris, leaving a clean formation.
2. Cultivate sub-grade to 150mm and compact using a light roller (no vibration) to simulate heeling. For poor sub-grades a layer of sand may need to be installed.
3. Install the drainage/irrigation systems as specified and re-cultivate between the drain lines to alleviate compaction,

4. Install the TechTurf as described below.

For TT rootzone layers up to 150mm consolidate in one layer with an adequately sized roller.



Installation Method - Access Routes and Parking Areas:

1. Excavate as described above.
2. Prepare and roll the sub-grade formation to a tolerance of 20mm.
3. Depths over 200mm and **no** sub-base requirement: Cultivate the sub-grade to 150mm depth as described above and compact (0.5-1 tonne roller, no vibration), to simulate heeling.



Or:

4. For 200mm TechTurf depth and a sub-base **is** required: Consolidate the sub-grade layer with several passes of a 1.5-2 tonne roller.
5. Install & compact the required depth of a free draining, permeable sub-base and compact (DoT Specifications for Highway Works), blind off with 25mm layer of 5-14mm gravel or crushed aggregate.
6. Install the drainage/irrigation systems as specified and re-cultivate between the drain lines to alleviate compaction.
7. For up to a 150mm TechTurf rootzone can be installed and graded with an excavator bucket.
8. Use a vibrating roller to compact (4 passes of 1.5t roller), the initial pass of a roller should be done without vibration to complete the initial layer and install the second layer (if required) as described.
- 9 Apply fertiliser (40g/m²) and apply the specified turf to the surface within 1-2 days. Turf should be laid with tightly butted edges and firmed onto the surface. A fine sand top dressing will assist knitting in of the turf.
10. Irrigate all grass surfaces immediately and repeat daily irrigation until established.
11. TechTurf areas can normally be trafficked after 2-4 weeks when the roots have penetrated into the rootzone. Additional fertiliser treatment will encourage strong healthy grass growth.

Installation on Slopes:

The design of each slope is project specific (refer to designer for sub grade details), TechTurf installation is as previously described but for steep sloped areas where consolidation by roller is not possible, this can be achieved by the use of a digger bucket followed by hand tools to achieve an even finish. Naylor RTT turf with its deep roots is ideal for steep slopes and may require pegging until the roots have established.

TechTurf

Installation & Maintenance

Installation - General Guidance Notes:

TechTurf consists of three components – Rootzone, Fertiliser & Turf:

TechTurf Reinforced rootzone is delivered in 30 tonne loads (20t tipper option) and is typically installed in 2 layers - if stockpiling, it should be sheeted to avoid contamination. If minor mesh separation occurs during transportation or stockpiling, the installation process will correct this.

TechTurf rootzone **must not** be hand raked, or bladed out with a toothed excavator bucket – use shovels or the back of a rake etc.

The rootzone **must not** be installed in wet weather, nor contaminated with mud or site debris. Adequate drainage is essential to the performance of TechTurf.

Small bundles of mesh after installation can be picked off or burnt off with a flame gun if site conditions permit. TechTurf should be installed to a tolerance of 15mm.

Keep the rootzone damp but not saturated during installation, then water prior to installing the fertiliser & turf.

Turf delivery should be delayed until most of the TechTurf rootzone has been installed (critical in both hot and dry weather) and turf should be irrigated during establishment. The turf must be firmed closely onto the surface to promote rapid rooting. Top dressing the turf with a sand/soil blend after installation will aid establishment.

It is the responsibility of the specifier/engineer and contractor to ensure that the site sub-grade, sub-base and drainage specifications are suitable for purpose prior to the installation of the TechTurf.



TechTurf

Properties & Performance

TechTurf is a rootzone reinforcement system developed in the UK, bringing unrivalled resilience, durability and health to natural grass surfaces.

Description:

TechTurf is a three part system consisting of reinforced rootzone, fertiliser and specially grown turf., providing an engineered natural grass surface with high load bearing and drainage characteristics.

TECHTURF ROOTZONE:

Content - Typically 4 parts sand: 1 part organic compost

Typical pH - 6.5 - 7.5

Moisture - Typically 10% by weight

Bulk Density - 1.6 tonnes/m³

Load Bearing - Typically up to 25 tonnes with 5 CBR sub-base

MESH:

Description - Colourless Polymer mesh (BOP100)

Properties - UV stabilised resistant to water, rot proof, inert, high chemical resistance. 3.1kN/m (tensile strength)

Dimensions - 10 cm x 4.5cm mesh (Roll 0.5m dia x 1m)

Supply - 90m rolls, prepared on film to be rolled onto rootzone to give correct mix

Weight/Roll - 23kg (8 per pallet & 25 pallets per load)

FERTILISER:

Description - Controlled release general purpose fertiliser

Packaging - 20kg bags (500m² @ 40g/m²)

TURF OPTIONS:

We offer two types of specially selected turf.

Classic Turf

A good general purpose turf suitable for commercial, landscapes, golf courses and show gardens. Maintained at 6-50mm height, it requires 150kg (max) of nitrogen per Ha – achieved by applying a slow release organic fertiliser in April & September.

RTT Turf

A deep rooting turf (up to 1.5m), developed to be drought, flood and salt tolerant, ideal where quick establishment & little irrigation is possible. Maintained at 20-80mm, it requires 125kg (max) of nitrogen per Ha – achieved by applying a slow release organic fertiliser in April & September.

Turf must be installed within 24-48 hours of arrival for best results.

Specification

Standard Specification Clause:

1.1 Manufacturer - Naylor Environmental, Clough Green, Cawthorne, Barnsley S75 4AD. Tel: 01226 794135
E: sales@naylor.co.uk

1.2 Naylor TechTurf - A high-performance root zone reinforcing system, allowing the formation of natural grassed surfaces with the strength and durability to carry frequent foot and vehicular traffic up to occasional HGVs.

1.3 TechTurf system includes:

a) 100mm, 150mm or 200mm compacted depth of reinforced rootzone c/w mesh element reinforcement distributed throughout.

b) Controlled release organic fertiliser (40g/m²)

c) Specially Grown Turf (Classic or RTT as appropriate)

Where no sub-base is required (CBR of 5+):

If sub grade is stable and free draining sub grade should be lightly cultivated and re-consolidated. If sub-grade is a poor quality sub-soil or clay, this should be replaced with 50-100mm of good quality sandy loam, with a Naylor 20/20 geogrid for stabilisation.

Where a free draining SuDs sub-base is required:

A layer of DoT Type 1x, DoT Type 3 or similar free-draining, open-graded sub-base is installed, together with optional Geogrid is placed onto the sub grade, according to specification.

Where a non SuDs sub-base is required: (DoT Type 1):

A layer of DoT Type 1 sub-base, compacted in accordance with DoT specification for Highway works is installed and provided with a drainage system such as Naylor Enviroflow at 5m centres to drain the area.

TechTurf - Blending and quantities:

Blending is carried out under strict quality controlled conditions (not during wet weather or high winds), so typically allow for a 2 week availability.

To calculate the volume of Naylor TechTurf rootzone: Multiply the area by the depth, then multiply this by 1.6 to give the total tonnage (e.g. 1,200m² x 0.15m deep x 1.6 = 288 tonnes of rootzone required).

The mesh elements are supplied in 20kg bails and require mixing at 3 bails per 18 tonnes to give the exact mix. The sandy loam rootzone material should be moist to promote cohesion and mixing.

18 tonnes of pre-prepared rootzone is spread out evenly on a flat surface to a depth of 300mm and a single mesh reinforcement bail is unwound onto the top surface. A wheeled loader then blends the mix by lifting and tipping. This is repeated for all three bales to create the

correct mix density. It is important not to "push" the layers into a pile as this will cause the mesh elements to bunch, in which case the mixer should distribute these by hand and resume mixing.

For quality control a 20kg sample of rootzone should contain around 60g of reinforcement.

During delivery and site use it may be possible to see occasional "bunches" of reinforcement - these should be pulled apart by hand and redistributed during the installation process.



Product manufactured in the EU
Information contained herein is subject to change without notice. Customers should check with Naylor Environmental to ensure that they have the latest details. Liability in respect of any statements, conditions, warranties and representations made on behalf of Naylor Environmental is limited in accordance with the terms set out in the Standard Conditions of Sale.



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