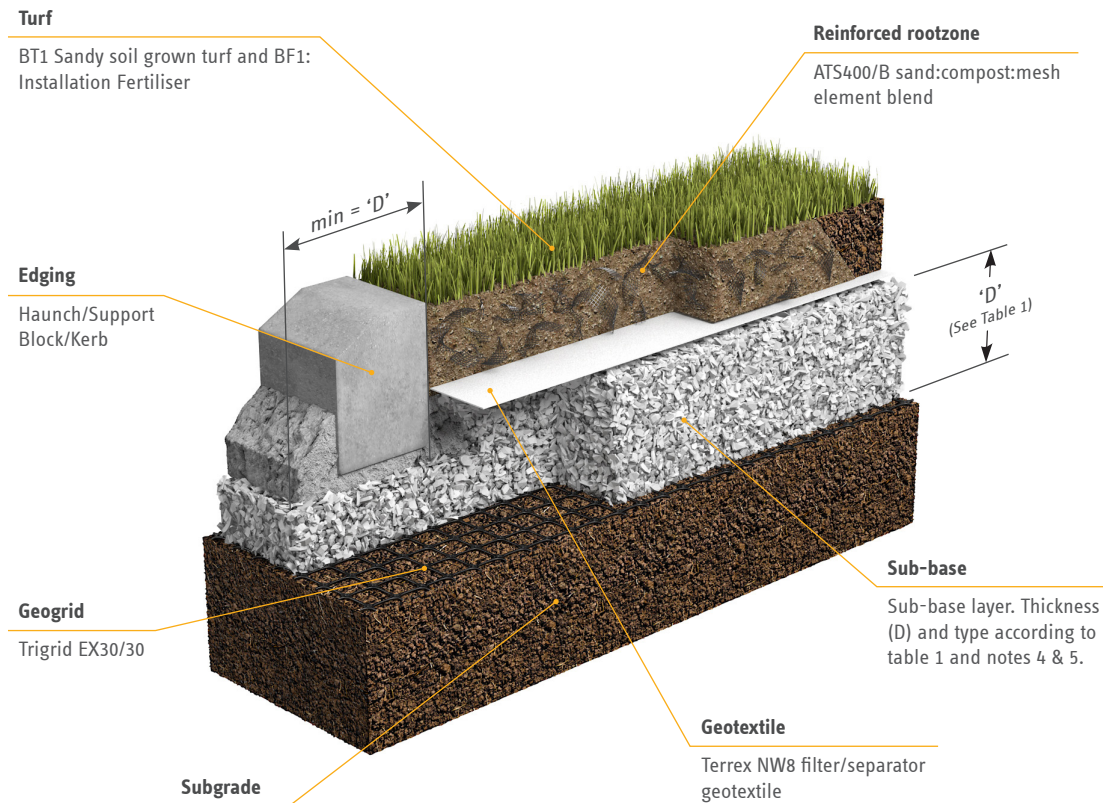


Design guidance for vehicle access routes.



All ATS Access Route applications will consist of a combination of the following component layers.

Items 1 and 2 will be supplied by ABG Ltd as part of the Advanced Turf System (ATS):

1. A layer of ABG BT1 sandy loam grown turf and ABG BF1 Installation Fertiliser (35G/m²).
2. A 150mm or 200mm thick layer of Advanced Turf ATS400/B Netlon Mesh Element reinforced rootzone.

Plus

3. **Where no sub-base layer is required: (Refer to Table 1)**

- 3a ABG Terrex NW8 Geotextile, placed over the open-tops of any aggregate filled drainage trenches installed within the existing formation/subgrade soil.
- 3b The structurally sound, free-draining or pipe-drained, lightly cultivated and re-consolidated sub-grade soil formation layer.

Or

4. **Where a porous sub-base is required for SuDS applications (Ref: Table 1 for sub-base layer thickness).**

- 4a. ABG Terrex NW8 Geotextile, placed on top of the entire sub-base profile.
- 4b. A layer of free-draining, open-graded sub-base such as DoT Type 1x, DoT Type 3, or a reduced-fines Type 4/40 stone or similar approved 'reduced-fines' sub-base material.
- 4c. Optional layers of Geogrid, Geotextile or Geomembrane placed on top of the subgrade formation, according to the specification requirements.

Or

5. **Where a non SuDS (DoT Type 1) sub-base construction is employed (Ref: Table 1 for sub-base layer thickness)**

- 5a. ABG Terrex NW8 Geotextile, placed over the open tops of aggregate filled drainage trenches installed within the sub-base layer.
- 5b. A layer of DoT Type 1 sub-base, provided with a drainage system.
- 5c. Optional Geogrid and Geotextile placed on top of the subgrade formation, according to the specification requirements.
6. The edges of the reinforced Advanced Turf layer can be retained with concrete kerbs or timber edging, or by simply leaving a 45° battered edge to the compacted ATS rootzone layer where it will abutt an adjacent grassed area.
7. Advanced Turf Access Routes can be delineated using kerbs, bollards, marker posts, trees or shrubs.

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Notes

For detailed ATS Installation advice, refer to the 'ATS Installation Guidance' document in conjunction with this 'Design Guidance'

- Note 1. Turf and Installation fertiliser are supplied by ABG Ltd. Turf is grown on sandy loam and will be free from stones. Grass varieties are named cultivars complying with Turf Growers Association (TGA) Standards and BS3969 and will be free from weed and not affected by visible pests and diseases. Typical seed mixture: 25% dwarf perennial ryegrass, 35% slender creeping red fescue, 20% smooth stalked meadow grass, 20% chewings fescue. Turf will be 15mm – 20mm thick and can be supplied in either Standard 1m² rolls or Large rolls: 0.75m or 1.1m x 28m (21m² or 30.8m²). Installation fertiliser will be supplied in accordance with the seasonal requirements of the application.
- Note 2. Advanced Turf ATS400/B is supplied by ABG Ltd and comprises of specific high grade sand:soil/organic materials pre-blended with Netlon Mesh Elements to form a reinforced rootzone. Installed in accordance with ABG recommendations (Refer to ATS Installation Guidance Literature).

Netlon Mesh Element Specification:

Colour	Brown
Mesh Material	Polypropylene Homopolymer
Mesh Density	0.905 - 0.908g/cm ³
Mesh Element dimension	100mm x 50mm
Mesh aperture pitch	10mm + 2mm - 1mm
Tensile strength	3.3kN/m (longitudinal and transverse)
Junction strength	≥ 50% of the strand strength
Flexural recovery	High flexural recovery ≥ 95%
Mesh/Rootzone blend ratio	5.4kg mesh elements / 1m ³ rootzone

- Note 3. In SuDS applications, an ABG NW8 Geotextile layer will be required to cover the open-graded sub-base layer to prevent particle migration from the overlying ATS layer. In applications where open-topped, aggregate-filled drainage trenches interface with the base of the ATS layer, these must be covered with a layer of ABG Terrex NW8 Geotextile.
- Note 4. Refer to Table 1 to determine sub-base requirement. Specific advice on ground conditions, CBR% and construction on weak ground (<1%) is available from ABG Ltd.
- Note 5. If a low permeability 'DoT Type 1' sub-base layer is specified, then a drainage system must be installed within the sub-base layer to prevent waterlogging at the sub-base/ATS interface. All sub-base layers must be installed and compacted in accordance with standard DoT recommendations.
- Note 6. If the ABG Trigris is omitted, the total sub-base layer thickness ('D', see table 1) is typically increased by a minimum of 50%. Further layers of Geotextile or Geomembrane may be included within a SuDS design where additional subgrade/sub-base separation is required or where surface water attenuation and/or filtration is required.
- Note 7. All ATS profiles must be provided with some form of underlying positive drainage to avoid the ATS surface layer becoming saturated. This may be via infiltration into the sub-base and/or subgrade (SuDS), or via traditional trench/pipe drains where a low permeability or DoT Type 1 sub-base is specified. ABG Fildrain may be specified as an economical alternative to traditional drainage. A typical conventional piped drainage system may consist: 100mm diameter perforated pipes at minimum 1:100 gradient, bedded on gravel in 300mm wide trenches, backfilled with 'DoT Type A' drainage stone, covered or wrapped with a geotextile fabric and leading to a suitable outfall or soakaway. Drains placed down centres or one edge of access routes up to 5m wide. Large areas may require lateral drains at 5m - 10m centres.

Specific advice on all the specified criteria is available from ABG Ltd.

Table 1: Design Layer thickness and Geogrid selection guidance

Subgrade Soil Strength (Ref: Table 2) CBR%	Specified layer thicknesses in millimetres			Geogrid Layer ABG Trigris
	Reinforced Rootzone ATS400/B Layer	DoT Sub-base layer (D) thickness		
		Light commercial vehicles, Vans & Cars	HGV's, Fire Access and Cherry Pickers	
≥ 12%	150mm or 200mm	No sub-base, contact ABG	No sub-base, Contact ABG	Not required
= 6 < 12%	200mm	No sub-base	No sub-base	Not required
= 4 < 6%	200mm	100mm	100mm	EX30/30
= 2 < 4%	200mm	100mm	150mm	EX30/30
= 1 < 2%	200mm	200mm	300mm	EX30/30

Table 2: Field guidance for estimating sub-grade strengths

Consistency	Tactile	Visual	Mechanical (SPT)	CBR (%)	CU (kN/m ²)
Very soft	Hand sample squeezes through fingers	Man standing will sink >75mm	<2	<1	<25
Soft	Easily moulded by finger pressure	Man walking sinks 50 - 70mm	2 - 4	Around 1	Around 25
Medium	Moulded by moderate finger pressure	Man walking sinks 25mm	4 - 8	1 - 2	25 - 40
Firm	Moulded by strong finger pressure	Utility truck ruts 10 - 25mm	8 - 15	2 - 4	40 - 75
Stiff	Cannot be moulded, can be indented by thumb	Loaded construction vehicle ruts by 25mm	15 - 30	4 - 6	75 - 100