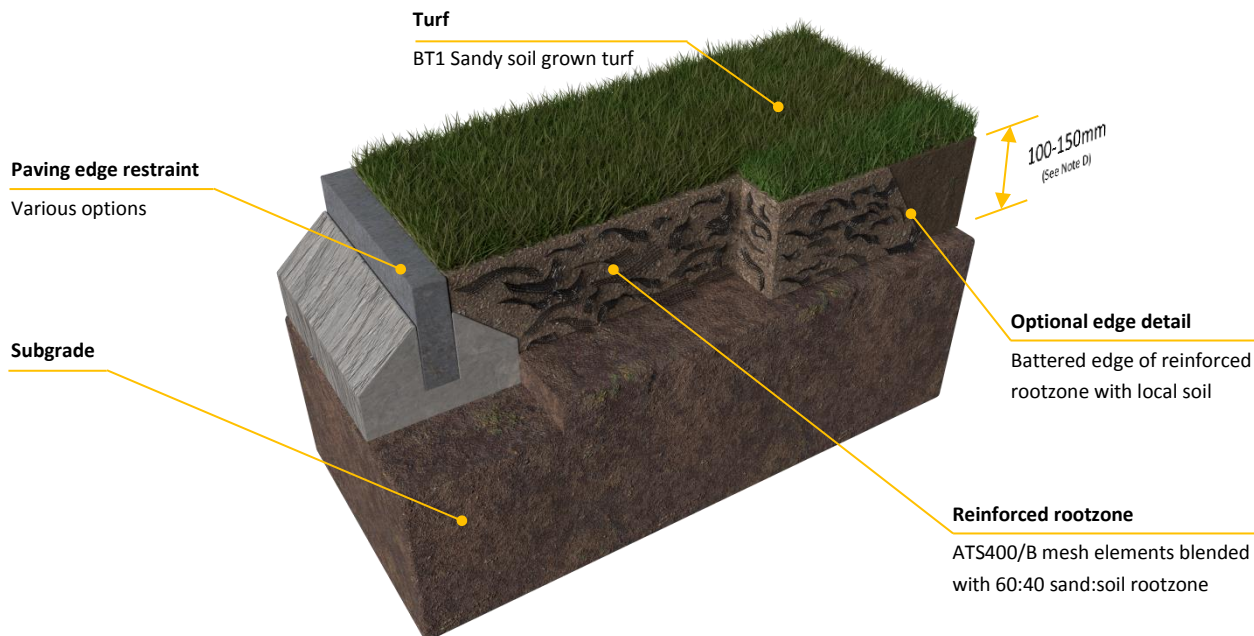


Advanced Turf® System (ATS)

Structural design guidance for walkway access

The Advanced Turf System (ATS) is suitable for a wide range of applications where a reinforced grass surface is required. Typical applications for walkway access include pedestrian event areas, disabled access, light vehicle access, verges, roof gardens, and sculptured slopes. This document is intended to be a summary presenting typical solutions. Contact ABG for detailed site specific advice.

Typical construction detail



Technical Note

Technical Specification

System	Advanced Turf® System (ATS)
Colour	Brown
Mesh material	Polypropylene Homopolymer
Mesh density	905 – 908 kg/m ³
Mesh element dimensions	100mm x 50mm
Mesh aperture pitch	10mm + 2mm - 1mm
Mesh tensile strength	3.3kN/m (longitudinal and transverse)
Mesh junction strength	≥ 50% of the strand strength
Mesh flexural recovery	High flexural recovery ≥ 95%
Mesh/rootzone blend ratio	5.4kg mesh elements / 1m ³ of rootzone
Permissible load	Cars & Light Vans < 3.5 tonne gross vehicle weight
Chemical resistance	Excellent
UV stability	High resistance to colour & strength degradation
Infiltration capacity	High infiltration rate up to 150mm/hr

All information is supplied in good faith and without charge to enable reasonable assessment of the practical performance of ABG products. Final determination of the suitability of information or material for the use contemplated and the manner of the use is the sole responsibility of the user. As design and installation is beyond the control of ABG (unless specifically requested) no warranty is given or implied and the information does not form part of any contract. ABG reserve the right to update the information within at any time without prior notice. ©²⁰¹⁴ ABG Ltd

ATS Walkway Access Design Summary TECH NOTE - Rev1.04

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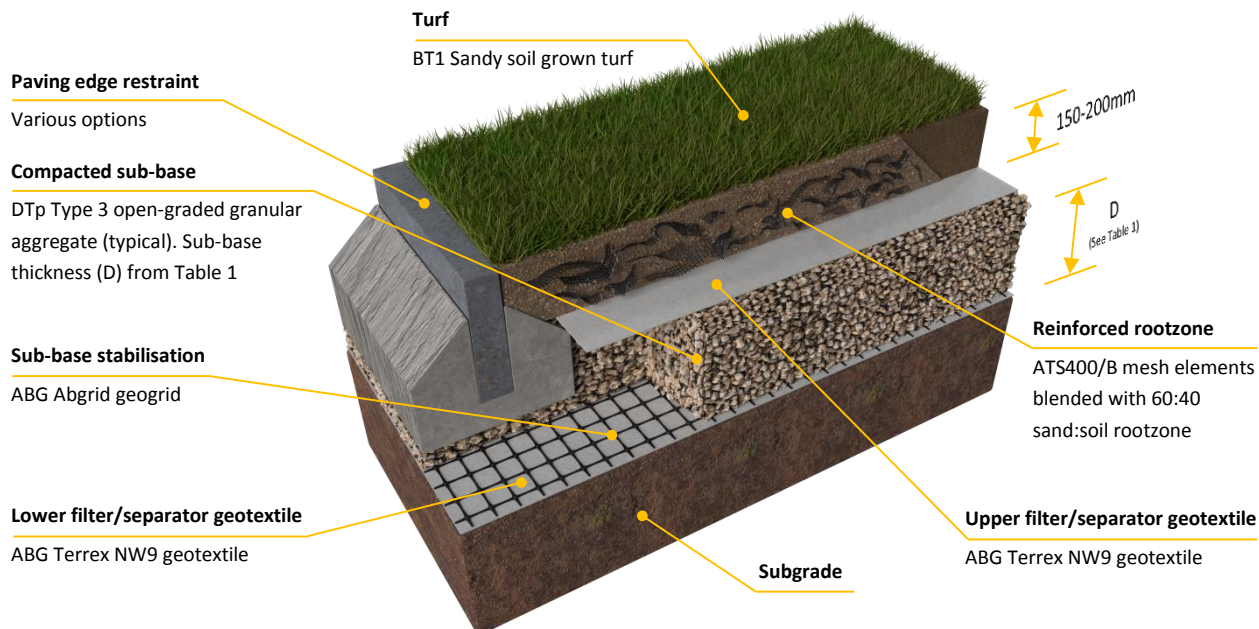
- A. For advice on the installation and maintenance of ATS, please refer to the ABG Advanced Turf® Installation Guide.
- B. Advice on subgrade CBR% strengths, ground conditions, and construction over weak ground is available from ABG. On very weak ground a sub-base may be required and specific advice is available from ABG.
- C. Typical paving edge restraint solutions include concrete, timber, railway sleepers, steel, heavy-duty plastic, or by simply leaving a 45° battered edge to the compacted ATS rootzone layer where it will abut an adjacent grassed area.
- D. Reinforced rootzone thickness of 100mm is suitable for most walkway locations, whilst 150mm provides improved structural strength, drainage and grass quality for areas subjected to intensive use, high rainfall, or where subgrade soil is poor quality.
- E. For applications where Advanced Turf® is providing surface water source control for SuDS (Sustainable Drainage System) via infiltration, drainage may be modified or omitted as determined by subgrade soil & site criteria. Where infiltration into the subgrade is not possible, typical drainage details are 100mm diameter perforated pipe drain laid at minimum gradient 1:100, J. bedded on gravel in trench backfilled with DTp Type A drainage stone covered or wrapped with a geotextile fabric (ABG Terrex NW9), and leading to a suitable outfall or soakaway. Drains placed down centres or one edge of access routes up to 5m wide. Wider areas may require additional drains at 5m-10m centres. Fildrain drainage geocomposite may be considered as a means of providing linear drainage channels. Contact ABG Ltd. to discuss further.
- F. Fertiliser will help to establish and maintain a healthy grass sward which is capable of sustaining walkway access traffic. Local and seasonal weather conditions will determine the degree of irrigation required. Inadequate irrigation during the grass establishment period may result in drought conditions and a failure to establish uniform quality grass cover.
- G. The maximum advised gradient for vehicle and disabled access is 8% (1:12) 5°.
- H. When designed in accordance with the recommendations, Advanced Turf complies with BS8300:2009 : “Design of buildings and their approaches to meet the needs of disabled people” – Code of Practice (ISBN 9780 580 57419) & Building Regulations Document ‘M’ Section 6.
- I. All stated dimensions & weights are nominal and in accordance with manufacturing +/- tolerances.
- J. The recommendations in this document are only suitable for use with ABG products.
- K. Advanced Turf® is a registered trademark of Schweitzer-Mauduit International (SWM).

Advanced Turf® System (ATS)

Structural design guidance for vehicular access

The Advanced Turf System (ATS) is suitable for a wide range of trafficked applications where a free-draining, compaction resistant and high load bearing, discreetly reinforced natural grass surface is required. Typical applications include fire & emergency access lanes, HGV maintenance & MEWP routes, overflow parking, event areas, helipads & airfield aprons, pedestrian & disabled access, and sculptured slopes. This document is intended to be a summary presenting typical solutions. Contact ABG for detailed site specific advice.

Typical construction detail



Technical Specification

System	Advanced Turf® System (ATS)
Colour	Brown
Mesh material	Polypropylene Homopolymer
Mesh density	905 – 908 kg/m ³
Mesh element dimensions	100mm x 50mm
Mesh aperture pitch	10mm + 2mm - 1mm
Mesh tensile strength	3.3kN/m (longitudinal and transverse)
Mesh junction strength	≥ 50% of the strand strength
Mesh flexural recovery	High flexural recovery ≥ 95%
Mesh/rootzone blend ratio	5.4kg mesh elements per m ³ of rootzone
Permissible axle load	Standard HGV loadings up to 10 tonnes per axle ≅ 100kN
Chemical resistance	Excellent
UV stability	High resistance to colour & strength degradation
Infiltration capacity	High infiltration rate up to 150mm/hr
Upper filter/separator geotextile	ABG Terrex NW9 non-woven geotextile 1.1mm thick, 120g/m ² , zero breakthrough head
Sub-base material	DTp Type 3 or a drained Type 1, or BS 7533-13 4/20 or 4/40 (Ref. Note D)
Sub-base layer thickness	Refer to Table 1 for thickness 'D' in millimetres (mm)
Sub-base stabilisation	Typically Abgrid 20/20 or 30/30 geogrid (see Table 1). Alternative options may be suitable (Ref. Note C)
Lower filter/separator geotextile	ABG Terrex NW9 non-woven geotextile 1.1mm thick, 120g/m ² , zero breakthrough head

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ATS Vehicular Access Design Summary TECH NOTE - Rev1.03

NOTES

- A. For advice on the installation and maintenance of ATS, please refer to the ABG Advanced Turf® Installation Guide.
- B. Advice on subgrade CBR% strengths, ground conditions, and construction over weak ground is available from ABG.
- C. Alternative ABG stabilisation geosynthetics may be used in lieu of ABG Abgrid geogrid. These include ABG Gridtex Type 2 high-strength woven geotextile or ABG Abweb geocells. If the sub-base stabilisation is omitted, the total sub-base layer thickness ('D' on Table 1) is typically increased by a minimum of 50%.
- D. Sub-base design options:
 - D1. Where a **porous sub-base** is required for SuDS applications a permeable open-graded (reduced-fines) aggregate is recommended, such as DTp Type 3 low-fines roading aggregate, or BS 7533-13:2009 SuDS aggregate (4/20 or 4/40).
 - D2. Where a **non-porous sub-base** is required a conventional DTp Type 1 sub-base is recommended. It is essential that a drainage system such as ABG Fildrain is incorporated. Specific advice is available from ABG.
 - D3. Where **no sub-base layer** is required (such as on subgrade soils with a CBR > 6%), the geotextiles and sub-base stabilisation can be omitted.
- E. Maximum sub-base particle size should match minimum sub-base thickness but must not exceed 75mm diameter. For sub-base thicknesses of around 100mm, a minimum 37.5mm particle size should be adopted to allow effective installation of the Abgrid.
- F. The sub-base must be overlaid by a Terrex NW9 geotextile to provide separation, enhanced water treatment function and prevent migration of the bedding layer.
- G. Typical paving edge restraint solutions include concrete, timber, railway sleepers, steel, heavy-duty plastic, or by simply leaving a 45° battered edge to the compacted ATS rootzone layer where it will abut an adjacent grassed area.
- H. Advanced Turf Access Routes can be delineated using kerbs, bollards, marker posts, trees or planted areas as required.
- I. Fertiliser will help to establish and maintain a healthy grass sward which is capable of sustaining traffic. Local and seasonal weather conditions will determine the degree of irrigation required. Inadequate irrigation during the grass establishment period may result in drought conditions and a failure to establish uniform quality grass cover.
- J. The maximum advised gradient for fire access, disabled access, and other vehicular applications is 8% (1:12) 5°.
- K. When designed in accordance with the recommendations, Advanced Turf complies with BS8300:2009 : "Design of buildings and their approaches to meet the needs of disabled people" – Code of Practice (ISBN 9780 580 57419) & Building Regulations Document 'M' Section 6.
- L. All stated dimensions & weights are nominal and in accordance with manufacturing +/- tolerances.
- M. The recommendations in this document are only suitable for use with ABG products.
- N. Advanced Turf® is a registered trademark of Schweitzer-Mauduit International (SWM)

Table 1: Advanced Turf® System (ATS) typical DTp Type 3 sub-base thickness (D) requirements – refer to specific construction drawing

CBR strength of subgrade soil (%) (see Table 2)	ATS reinforced rootzone layer thickness (mm)	DTp Type 3 sub-base thickness (D, mm)		
		Light vehicles only with emergency HGV access	Light vehicles with one HGV per week	ABG Abgrid geogrid
>6	150 or 200	No sub-base	No sub-base	Abgrid 20/20
4 – 6	200	100 (no geogrid required)	100	Abgrid 20/20
2 – 4	200	100	150	Abgrid 30/30
1 - 2	200	150	250	Abgrid 30/30

Table 2: Field guidance for estimating sub-grade shear strengths

CBR (%)	DCP Result ¹ (Sandy Soils)	HSV Result ¹ (Clayey Soils)	Tactile (Clayey Soils)	Visual (Clayey or Sandy Soils)
<1	<1	<30kPa	Easily indented by fingers	Adult standing will sink >30mm
1 - 2	<1	30-60kPa	Indented by strong finger/thumb pressure	Adult walking sinks 10-30mm
2 - 4	1 - 2	60-120kPa	Cannot be indented by thumb pressure	Utility truck ruts 10-25mm
5 – 7	2 - 3	120-200kPa	Can be indented by thumb nail	Loaded construction vehicle ruts by 25mm
>8	>3	>200kPa	Difficult to indent by thumb nail	Loaded construction vehicle ruts by <10mm

Note: 1. DCP results are expressed as blows per 100mm penetration. HSV results are expressed as "undrained shear strength" or C_u