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

Paving edge restraint

A concrete, timber, plastic or steel edging detail.

Compacted sub-base

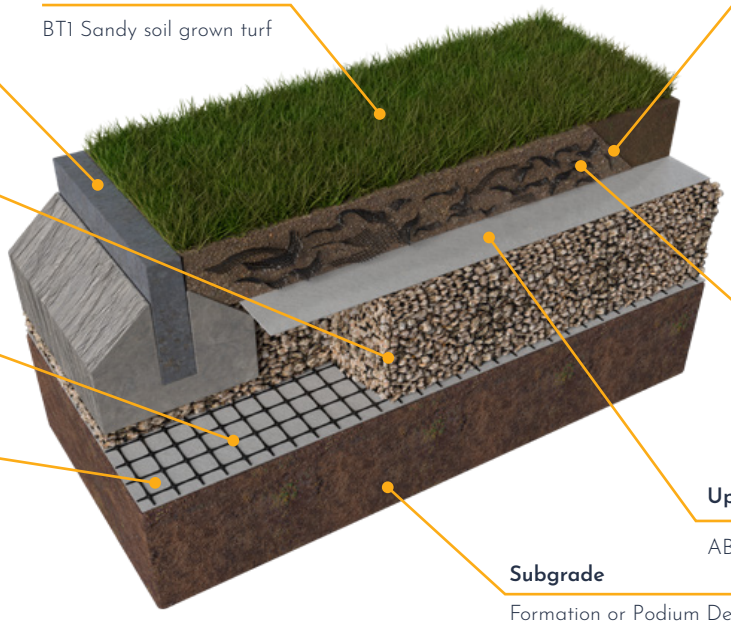
MCHW Series 800 Type 3 open-graded granular aggregate (typical). Sub-base thickness (D) from Table 1

Sub-base stabilisation

ABG Abgrid geogrid

Lower filter / separator geotextile

ABG Terrex NW9 geotextile



Technical Specification

System	Advanced Turf® System (ATS)
Colour	Brown
Mesh material	Polypropylene Homopolymer
Mesh density	905 - 908 kg/m³
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 m³ of rootzone (3kg mesh / tonne)
Permissible axle load	Standard UK Fire Vehicles and HGVs up to 12 Tonnes per axle ≅ 120kN
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/m² zero breakthrough head
Sub-base material	MCHW Series 800 Type 3 or a slotted pipe / fin drained Type 1, or BS 7533-13 4/20 or 4/40 (Ref. Note C)
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/m², zero breakthrough head

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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. To achieve the required performance, compact the sub-base in accordance with the site-specific advice from the ABG Design Department.

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 subbase 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 MCHW Series 800 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 MCHW Series 800 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. Type 1 or Type 3 aggregates should be clean, angular and hard enough to withstand traffic loads without crushing under maximum loading conditions.

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 Mativ.

O. ABG Ltd shall not be held liable for any warranties or collateral warranties arising from construction undertaken in accordance with this guide.

Table 1: Advanced Turf® System (ATS) typical MCHW Series 800 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)	MCHW Series 800 Type 3 sub-base thickness (D, mm)		ABG geogrid
		Light vehicles only with emergency HGV access	Light vehicles with one HGV per week	
>6	150 or 200	No sub-base	No sub-base	No geogrid required
4 - 6	200	150 (no geogrid required)	150	Abgrid 20/20
2 - 4	200	150	200	Abgrid 30/30
1 - 2	200	Contact ABG	Contact ABG	Contact ABG

Note: Sub-base thicknesses in Table 1 are indicative and for reference only. Customers must provide project-specific details to ABG Ltd, including subgrade soil condition, traffic loading and axle loads, to request an assessment.

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 thumbnail	Loaded construction vehicle ruts by 25mm
>8	>3	>200kPa	Difficult to indent by thumbnail	Loaded construction vehicle ruts by <10mm

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

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