

Product Description and Delivery Advice

The **Advanced Turf System** consists of the following 3 components, each of which is supplied by ABG and will be delivered onsite on the date(s) that have previously been agreed with the customer:

1. The **Advanced Turf System (ATS400/B)** rootzone. A composite blend of sand, organic matter and mesh elements. This pre-blended rootzone will be delivered to site in 29 tonne bulk loads in articulated vehicles, unless smaller sized vehicles are requested when quotations are prepared. A 200mm thick layer of **ATS400/B** will be laid and consolidated in 2 layers, so it is recommended that consideration is given to a location for tipping / stockpiling of the material when it arrives on site, thus avoiding double handling.
2. Sandy soil grown turf as specified. Only specified sandy soil grown turf, or turf grown on a sandy rootzone should be used, since conventional turf is wholly unsuitable for use with the **Advanced Turf System**.
3. Pre-turfing fertiliser, as appropriate, if specified.

Important notes for all Advanced Turf® installations

After reading the following notes, select the most appropriate installation method for your project.

- If the **ATS400/B** rootzone is to be stockpiled for long periods on site, it is recommended that it is sheeted over, to avoid contamination or mesh dispersal. It is possible that minor mesh separation will occur during transportation, but tipping from the vehicle and the installation process will correct this. Small unblended bundles of mesh can be dispersed by hand into the mix.
- The **ATS400/B** rootzone must not be hand raked, or bladed out with an excavator bucket that has teeth, as this will separate out the mesh. Always use machines fitted with toothless buckets / blades or shovels, the back of a rake etc.
- The **ATS400/B** rootzone must not be placed, graded or consolidated in wet weather conditions during installation. Doing so may affect the soil structure and impair drainage characteristics. Allow the rootzone to drain prior to re-commencing consolidation after rain.



Fig. 1: ATS400/B rootzone / mesh blend



Fig. 2: Rootzone bulk delivery



Fig. 3: Set accurate rootzone levels



Fig. 4: Rootzone spreading over Terrex NW9

- Do not contaminate the **ATS400/B** rootzone with site debris and mud etc. when installing. Doing so may affect the structural and drainage capacity of the **ATS400/B**.
- Ensure that drainage and irrigation systems are not damaged by site traffic during installation. Avoid damage or capping of drainage channels, findrains and sub-base surface as this will affect the **ATS400/B** drainage.
- Any small quantities or bundles of mesh that remain on the surface of the **ATS400/B** after levelling and consolidation can be hand-picked or lightly brushed off. **DO NOT USE A RAKE.**
- The **ATS400/B** rootzone should be kept damp, but not saturated during installation. Irrigation may be required prior to the specified sandy soil grown turf and fertiliser being applied.
- Any fertiliser supplied by ABG has been specifically selected to ensure rapid grass establishment and it is critical that it is applied correctly prior to turfing.
- It is recommended that delivery of the turf is delayed until most of the **ATS400/B** rootzone has been installed, since the turf must be laid as soon as possible and within 1 day of delivery. This is particularly critical in hot or dry weather. Watering may be required during establishment of the turf.
- The turf must be firmed closely onto the **ATS400/B** rootzone layer surface to promote rapid rooting. Removing excessive surface mesh prior to laying the turf will assist in this. Light top dressing with a sandy rootzone is optional as specified.
- It is the responsibility of the specifier / engineer and contractor to ensure that the site sub-grade, sub-base and drainage specifications and conditions are suitable for purpose prior to the installation of the **ATS400/B** rootzone layer.



Fig. 5: Maintain accurate levels



Fig. 6: Rootzone compaction with roller



Fig. 7: Rootzone compaction on slopes



Fig. 8: Newly turfed Advanced Turf System

Installation for Walkways and Pedestrian areas

1. Survey and mark out the area of the site.
2. Excavate the area to the required **ATS400/B** rootzone depth and remove all debris from the site, leaving a clean formation level.
3. Cultivate the sub-grade to a depth of 150mm and reconsolidate using a light roller without vibration, to simulate heeling. In some cases where a poor quality sub-grade soil exists, a layer of good quality top soil may have been imported instead of cultivating the subgrade soil. Consolidate this new soil layer.
4. Install drainage and irrigation systems as specified, then carefully re-cultivate between the drain lines if any compaction has occurred, taking care not to damage or cap over the drainage / irrigation.
5. Proceed with the installation of the **ATS400/B** rootzone as described for 'Access Routes' (steps 9 to 19 below). For **ATS400/B** rootzone layers up to 150mm thick consolidation may be achievable in one layer where an adequately sized roller is selected (refer to Table 2).

Installation for Access Routes and Parking Areas

1. Survey and mark out the area of the site.
2. Excavate the area to the required depth and remove all debris from the site, leaving a clean formation level.
3. Prepare and proof roll the sub-grade formation to a tolerance of 20mm or as otherwise specified. For projects where **ATS400/B** rootzone layer is less than 200mm thick and where no sub-base is required, complete steps 4 and 5.

For projects where the **ATS400/B** rootzone layer is 200mm thick or greater, and where the subbase is required, go to step 6.

4. Place the specified DoT Type 1, Type 3 or CGA reduced fines sub-base and consolidate in accordance to DoT highways specification (see Table 1). Place a layer of ABG **Terrex NW9** geotextile over the sub-base.
5. Install drainage and irrigation systems as specified, then carefully re-cultivate and re-consolidate between the drainage lines if any heavy compaction has occurred, taking care not to damage or cap over the drainage / irrigation.

Then continue by following steps 9 to 19 to complete the installation.

6. Consolidate the sub-grade formation layer with several passes of a 1.5 to 2 tonne roller until the required sub-grade strength is achieved.
7. Cultivate the subgrade soil to 150mm depth and reconsolidate with < 1 tonne roller (without vibration). Any imported top soil must be similarly lightly consolidated.
8. Install the specified drainage and irrigation.
9. Establish levels using pegs and lines or a laser, to help maintain a uniform layer thickness of the **ATS400/B** rootzone whilst laying to maximum tolerances of 15mm in 1m, or as otherwise specified.
10. Place heaps of **ATS400/B** rootzone in the construction area using a dumper / excavator. The quantities placed will be governed by the **ATS400/B** layer thickness to be consolidated and the size of roller to be used for consolidation (refer to Table 2). Vehicles may travel slowly over the **ATS400/B** rootzone, provided that the rootzone is not wet and that it is thick enough to prevent rutting of the sub-grade / subbase.
11. Spread out the first layer of the **ATS400/B** rootzone using the bucket of an excavator and hand tools. On large areas, welding a 150mm diameter steel pipe to the bucket of the excavator will aid uniform spreading and levelling of the rootzone.
12. Make a single pass over the rootzone with a smooth drum roller (without vibration), followed by the consolidation rates as specified in Table 2, with vibration on.
13. Install the second **ATS400/B** rootzone layer using the same placement and levelling procedures and consolidation rates as for the first layer. Achieve final levels with hand tools and by placement of rootzone in localised low areas. Tolerance 15mm in 1m.
14. Apply the specified fertiliser.
15. The surface should be turfed as soon as possible after rootzone installation. Turf should be laid so that edges are tightly butted together and firmed closely onto the surface. A top dressing of unreinforced rootzone may be applied where specified.

16. Water all the surfaces immediately, or as required according to weather conditions. Turf may require frequent and daily watering until established during hot / dry weather.
17. Protect the areas from traffic and pedestrians until the grass has established and the roots have grown deeply into the rootzone. Turf will normally provide a fully traffickable surface after 2-4 weeks.
18. After the recommended time period, re-apply the appropriate fertiliser (refer to maintenance advice) and carry out normal turfgrass maintenance practices.
19. Seasonal fertiliser applications will encourage strong healthy grass growth on the Advanced Turf® surface and will ensure that its structural and agronomic properties are fully achieved.

Installation method for Steep Slopes

1. Slope design will be project specific as determined by the slope angle and subgrade materials. Consultation with ABG Technical Department is strongly recommended prior to slope construction and installation.
2. Placement and handling practices for the **ATS400/B** are the same as previously described for all other applications. However, consolidation of **ATS400/B** rootzone on slopes using a roller is generally impractical, but can be achieved by applying localised heavy pressure with an extractor bucket. Hand tools can be used to shape the formation, then reconsolidate.
3. The specified turf may require pegging onto the slope surface with biodegradable pegs until established. Ground cover plants can be used as an alternative to turf. Project specific advice can be obtained from ABG.

Terms and Conditions

Site specific engineering design should be carried out after the site investigation has provided all the necessary information.

The assessment of suitable safety factors in relation to each particular project must always remain the responsibility of the design engineer.

Sub-base and Rootzone Compaction Tables

Table 1:
Compaction requirements for granular sub-base material

Type of compaction plant	Category	Number of passes for layers not exceeding the following compacted thicknesses:		
		110mm	150mm	225mm
Smooth wheeled roller (or vibratory operating without vibration)	mass per metre width of roll:-			
	2,700kg up to 5,400kg	16	unsuitable	unsuitable
Pneumatic tyred roller	mass per wheel:			
	over 4,000kg up to 6,000kg	8	16	unsuitable
	over 6,000kg up to 8,000kg	12	unsuitable	unsuitable
	over 8,000kg up to 12,000kg	12	unsuitable	unsuitable
	over 12,000kg	10	16	unsuitable
Vibratory roller	mass per metre width of roll:			
	over 700kg up to 1,300kg	8	unsuitable	unsuitable
	over 1,300kg up to 1,800kg	6	16	unsuitable
	over 1,800kg up to 2,300kg	4	6	10
	over 2,300kg up to 2,900kg	3	5	9
	over 2,900kg up to 3,600kg	3	5	8
	over 3,600kg up to 4,300kg	2	4	7
	over 4,300kg up to 5,000kg	2	4	6
	over 5,000kg	2	3	5
Vibrating plate compactor	mass per square metre of base plate:			
	over 1,400kg up to 1,800kg/m ²	8	unsuitable	unsuitable
	over 1,800kg up to 2,100kg/m ²	5	8	unsuitable
Vibro tamper	mass:			
	over 50kg up to 65kg	3	6	10
	over 65kg up to 75kg	2	4	8
Power rammer	mass:			
	100kg up to 500kg	5	8	unsuitable
	over 500kg	5	8	12

Table 2:
Advanced Turf System rootzone consolidation

Type of compaction plant	Category	Advanced Turf Rootzone	
		Maximum compaction thickness (mm)	Number of passes required
Vibratory roller	mass per metre width of vibratory roll:-		
	over 270kg up to 450kg	75	8
	over 450kg up to 700kg	75	6
	over 700kg up to 1,300kg	125	5
	(e.g. A Bomag 80 or 120)		
	over 1,300kg up to 1,800kg	150	4
	over 1,800kg up to 2,300kg	150	2
	over 2,300kg up to 2,900kg	175	2
	over 2,900kg up to 3,600kg	200	2
Vibratory roller	mass per m² of base plate of a vibratory roll:		
	over 800kg up to 1,100kg	unsuitable	unsuitable
	over 1,100kg up to 1,200kg	75	5
	over 1,200kg up to 1,400kg	75	3
	over 1,400kg up to 1,800kg	125	3
	over 1,800kg up to 2,100kg	150	3
	over 2,100kg	200	3

***Important note:** Where the heaviest vibratory roller available is less than 2,900kg per metre width, then the rootzone must be laid and compacted in layers not exceeding 150mm.

(i.e. 200mm thickness to be laid and compacted in two layers).

Extracted from The Department of Transport Specification for Highway Works.

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Series 800 Road Pavements - unbound Materials Table 8/1.