



Use and installation of turf as an erosion, nutrient and sediment control measure



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 - Engineers Australia
 - Horticulture Australia
 - International Erosion Control Association
 - Soil Science Australia
 - Sports Turf Association
 - Sports Turf Research Institute
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-

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Australian Standard®

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PREFACE

This Standard was prepared by the Standards Australia Committee BD-107, Turf.

The objective of this Standard is to provide requirements for the use and installation of turf as an erosion, nutrient and sediment control measure, and guidance on selection and disposal of turf species.

The terms ‘normative’ and ‘informative’ are used in a Standard to define the application of the appendices or annexes to which they apply. A ‘normative’ appendix or annex is an integral part of a Standard, whereas an ‘informative’ appendix or annex is only for information and guidance.

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FOREWORD

Scientific research and trials have confirmed that turf is an effective erosion, nutrient and sediment control measure, [see items (1) and (2) in the Bibliography] especially in construction and building situations and in other forms of development and land use (e.g. agricultural uses, mining). Turf can provide a number of social and environmental benefits in built environments [see item (3) in the Bibliography].

NOTE: Further information on relevant research outcomes is provided in Appendix A.

Industry experience has shown there are a number of key elements that enable the successful use of turf. These key elements are addressed in this Standard and include—

- (a) planning principles that should be taken into account when deciding to use turf as an erosion, nutrient and sediment control measure;
- (b) taking into account the site and use characteristics when matching and selecting an appropriate turf species;
- (c) ordering, on-site receipt and storage of turf supplies;
- (d) appropriate practices for laying turf and its establishment;
- (e) how best to maintain turf;
- (f) ensuring that there are clear communications and contractual conditions for the installation and maintenance of turf; and
- (g) appropriate practices on the removal and disposal of turf if required.

The primary audience for this Standard includes—

- (i) infrastructure and property developers and managers;
- (ii) development and environmental consent authorities;
- (iii) public and private design and construction engineers, project managers and civil contractors;
- (iv) soil scientists;
- (v) landscape architects, professionals and contractors;
- (vi) turf suppliers; and
- (vii) turf laying contractors.

This Standard is intended to be used once a decision has already been made to use turf as the preferred method of erosion, nutrient and sediment control, and after due consideration has been given to the site and use characteristics of the specific project.

Throughout this Standard the expression ‘control of erosion’ is used, and in each instance this expression can be understood to also mean ‘control of erosion, control of pollution from excessive amounts of nutrients, and control of sediment transport’.

NOTE: This Standard provides an informative appendix for site and contract project managers and engineers for works sign-off to ensure that turf has been used and installed appropriately by contractors. See Appendix F.

STANDARDS AUSTRALIA

Australian Standard

Use and installation of turf as an erosion, nutrient and sediment control measure

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE OF STANDARD

1.1.1 General

This Australian Standard provides requirements for the use and installation of turf as an erosion, nutrient and sediment control measure, and guidance on selection and disposal of turf species.

1.1.2 Requirements

This Australian Standard specifies requirements for—

- (a) the consideration of site and use characteristics during turf selection;
- (b) turf installation, monitoring and maintenance; and
- (c) contract sign-offs related to turf installation by contractors.

1.1.3 Exclusions

This Standard does not address the growing, production or transportation of turf, biosecurity issues, or the hydraulic calculations that apply to the specification of turf for erosion, sediment and nutrient control purposes. It also does not apply to situations where seed is being sown at the specific work site, or to the use of washed turf for specialist applications (e.g. for sport fields).

1.2 OBJECTIVE

The objective of this Standard is to provide land owners, developers, project personnel and contractors with requirements on how to select, install and maintain turf in order to prevent or control erosion, nutrient loss and sedimentation. This will minimize the adverse impacts of development works and change in land use on the surrounding and downstream environments.

1.3 APPLICATION

1.3.1 Methods of erosion, nutrient and sediment control

This Standard recognizes that there are various methods for erosion, nutrient and sediment control such as turf, straw bales, jute logs or filter fences, etc. The control selected should be made after considering the relevant characteristics of the control (see Appendix A) and the specific site and use characteristics (see Section 3).

1.3.2 Use of turf

This Standard is intended for application after a decision has already been made by a competent person that the installation and use of turf is the preferred form of erosion, nutrient and sediment control for the specific project and site.

1.3.3 Specification of this Standard

This Standard is intended to be specified in contracts and consents for all types of development, building and construction and maintenance works, from single residential homes through to major public infrastructure projects (e.g. roads, bridges, ports, urban precincts, parks and recreational facilities) and natural resource developments (e.g. mining).

1.4 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

NOTE: Related documents are listed in the Bibliography.

AS

4419 Soils for landscaping and garden use

4454 Composts, soil conditioners and mulches

4921 General conditions of contract for the provision of asset maintenance and services (Short version)

AS/NZS

1547 On-site domestic wastewater management

1.5 DEFINITIONS

For the purposes of this document, the definitions in AS 4419, AS 4454 and the following apply.

1.5.1 Field capacity

Amount of water held in the soil after excess water has drained away and the rate of downward movement has decreased.

1.5.2 Frost

A low temperature incidence that creates ice on the surface of the ground or turf.

1.5.3 Hardscape

Constructed solid surface that does not have vegetation.

NOTE: Hardscape is a landscaping term.

Examples:

Concreted, sealed or stoned areas, paths and driveways.

Edges of buildings.

Roadway pavement.

Kerbing and guttering.

1.5.4 Irrigation

Application of water over a specific area at a prescribed flow rate to achieve infiltration into the soil profile and the root zone of the turf.

NOTE: Irrigation is an essential process for turf establishment.

1.5.5 Maintenance

Inputs that sustain the quality and health of turf. For example, cutting, fertilizer, labour, mowing, pesticides and water.

1.5.6 Rhizome

A vegetative runner growing below the surface of the soil.

1.5.7 Salinity

Dissolved salts in the soil matrix or irrigation water.

1.5.8 Sedimentation

The retention of sediment within the turf swath.

1.5.9 Sodicity

A soil condition in which the percentage of exchangeable sodium is high enough to cause significantly increased clay dispersivity, decreased soil structure stability and reduced soil permeability.

NOTE: Based on Clause 1.6.60, AS/NZS 1547:2000, *On-site domestic-wastewater management*.

1.5.10 Soil erosion

Change of soil and landscape surface by loss of soil profile through movement of soil particles dislodged by water or rain drop impacts.

1.5.11 Soil, for turf and lawns

A soil that is suitable for turf underlay or top dressing.

1.5.12 Soil loss

The volume of soil lost through erosion, calculated using the Revised Universal Soil Loss Equation (RUSLE) method.

1.5.13 Soil, manufactured

A soil developed from a combination of organic and mineral materials for the purpose for landscaping and garden use.

NOTE: Based on AS 4454.

1.5.14 Soil, natural

1.5.14.1 General

A soil that has been excavated from the ground. Natural soil may be excavated natural material (ENM), recovered site soil (RSS), or virgin excavated natural material (VENM) as defined in Clauses 1.5.14.2 to 1.5.14.4.

NOTE: Natural soil could include topsoil and subsoil or quarried soil-like materials. Typically it will have a bulk density of greater than 1.0 kg/L as determined in Appendix B of AS 4419.

1.5.14.2 Excavated natural material (ENM)

A natural soil or RSS that is recovered from disturbed soil or the geological environment.

NOTES:

- 1 Examples include soil excavated from a disturbed demolition site, an oval being reconstructed or a stockpile of fill stored on a site.
- 2 ENM may need processing to remove rock, stone and foreign matter and needs to be assessed for chemical contamination.
- 3 The terms VENM and ENM may have specific legislated definitions in different states. Users need to be aware of their legal responsibilities in this regard.

1.5.14.3 Recovered site soil (RSS)

Natural soil that has been stripped and recovered from the site being landscaped. It may be used to manufacture any of the soils described by this Standard. It may also be described as VENM or ENM.

1.5.14.4 Virgin excavated natural material (VENM)

A natural soil or RSS that is recovered from an intact soil or geological formation.

1.5.15 Soil profile

Soil layers that change in texture, structure and colour with depth and change in soil chemistry conditions, categorized as follows:

- (a) 'A' Horizon—topsoil.
- (b) 'B' Horizon—subsoil.

1.5.16 Soil salinity

Characteristic of soils relating to their content of water soluble salts measured by the soil's electrical conductivity at 25°C.

1.5.17 Stolon

A vegetative runner growing above the surface of the soil.

1.5.18 Subsoil

The layer of soil beneath the topsoil.

NOTE: Subsoil is the 'B' Horizon.

1.5.19 Texture

The appearance created by the leaf structure of the turf.

NOTE: A fine texture is a large number of small leaves in a small area, and a coarse texture is a small number of large leaves in a small area.

1.5.20 Topsoil

The layer of soil above the subsoil.

NOTES:

- 1 Topsoil is the 'A' Horizon.
- 2 A topsoil is subject to wetting and drying and more extreme fluctuation in moisture content than subsoil.

1.5.21 Turf establishment period

The period specified in any contractual agreements, but not less than the first two to six weeks immediately after turf has been laid.

NOTE: The turf establishment period should take into account the site and environmental characteristics and the selected species.

1.5.22 Turf, natural

Purposely grown layer of living grass specifically produced as a landscape cover and laid onto soil.

1.5.23 Turf reinforcing mat (TRM)

Non-degradable mesh for enhancing turf's solidity and cohesive strength incorporated during turf production.

1.5.24 Turf, synthetic

Artificial product laid to imitate natural turf as a soil cover.

1.5.25 Turf underlay

The turf growing medium in direct contact with the natural earth, topsoil or subsoil.

SECTION 2 PLANNING PRINCIPLES

The principles given in this section apply to the use of turf as an erosion, nutrient and sediment control measure. Principles are not requirements and are provided for guidance purposes only.

Principle 1: Use turf when appropriate to do so Use of turf is suitable in a wide range of climatic, topographical or other conditions. However, it is recognized that in some situations turf could be difficult to establish or maintain and alternative erosion and sediment control measures may be considered.

Principle 2: Achievement of environmental outcomes When appropriately selected and maintained, turf is an effective method to control erosion, nutrient loss and sediment deposition. Turf assists in preserving and enhancing soil retention, water retention, landscape quality, biodiversity, micro-climatic conditions and aesthetic experience. Turf is a living product that requires ongoing maintenance.

Principle 3: Select the correct turf for the project Different types of turf have varying performance characteristics (e.g. water requirements, shade tolerance, etc.). Turf should be selected on the basis of the best fit between the characteristics of the site and use, and the characteristics of the chosen turf.

Principle 4: Maintenance The long term effectiveness of turf as an erosion control measure and as a method to achieve environmental outcomes requires maintenance that is consistent with the erosion control performance objectives of the development.

Principle 5: Disposal When turf is no longer desired or its condition has deteriorated to a point where it is no longer an effective erosion, nutrient or sediment control measure, it has to be disposed of in an appropriate legal manner. Unwanted turf has to be disposed of in a way that does not result in adverse environmental impact.

Principle 6: Communication Successful selection and installation of turf requires clear identification and communication of customer requirements to industry participants, and adequate communication and understanding of the actions and resources needed to maintain turf once established.

Principle 7: Competent and impartial advice While turf can be used successfully as an erosion control measure in a wide variety of situations, the following is needed:

- (a) Localized advice on turf selection, installation and ongoing maintenance.
- (b) Site specific knowledge on topography, access, soil types, drainage and likely weather events.

This advice should be competent, impartial and provided without a commercial or proprietary bias that can result in detrimental outcomes to the customer's project or to the environment.

SECTION 3 TURF SELECTION

3.1 GENERAL

3.1.1 Introduction

The selection of turf requires evaluation of the characteristics of the specific site and the use that the turf will experience.

3.1.2 Content of this section

This section includes provisions for—

- (a) the competency that is expected to be demonstrated by persons that select turf;
- (b) site assessment;
- (c) use characteristics; and
- (d) characteristics of different turf species to aid selection.

3.1.3 Characteristics

While the site and turf use characteristics listed in this section are oriented towards turf selection, these same characteristics are considerations when making a preliminary comparison and decision on the different erosion, nutrient and sediment control measures that could be applied.

3.2 COMPETENCE OF PERSONS THAT SELECT TURF

3.2.1 Competence

Turf selection for control of soil erosion should be undertaken by persons that demonstrate the competencies identified in Appendix B or their equivalent.

3.2.2 Consultation

Turf selection should be undertaken in consultation with local turf suppliers.

3.3 SITE ASSESSMENT

Consideration shall be given to the following site characteristics:

- (a) Site soil, including—
 - (i) soil type, including natural or manufactured soils and the extent to which the soil is able to retain water and be conducive to turf establishment and growth;
 - (ii) soil texture and physical attributes;
 - (iii) soil chemistry, including pH, extent of salinity and sodicity; and
 - (iv) fertility, including the extent to which the soil has a naturally high or low availability of nitrogen and other nutrients.
- (b) Climate, including averages, maximums and minimums and extent of variance in—
 - (i) temperature;
 - (ii) rainfall;
 - (iii) evaporation rates throughout the year; and
 - (iv) frost, ice or snow.