



**ACT**  
Government

# TOPSOIL 09A

MUNICIPAL  
INFRASTRUCTURE  
TECHNICAL  
SPECIFICATION  
**09 - LANDSCAPE**

Transport Canberra and  
City Services

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# 1 TOPSOIL

## 1.1 General

General: This Specification comprises the supply of topsoil for establishment of landscape soft works.

Requirement: Provide soils that:

- > Establish areas of grassing and turfing
- > Establish tree plantings
- > Establish shrub and groundcover planting

This specification does not include Special Sportsground topsoil. *Refer MITS05 Sportsgrounds.*

This specification does not include Bioretention System, Ponds and Wetlands filter material. *Refer MITS 16A Bioretention Systems, Refer MITS 16B Ponds and Refer MITS 16C Wetlands.*

### 1.1.1 Cross references

General: The following documents are related to this specification:

#### 1.1.1.1 ACT Legislation

Environmental Protection Act

Work Health and Safety Act

Waste Minimisation Act

#### 1.1.1.2 Specifications

Requirement: Conform to the following:

MITS 00 Preliminaries

MITS 02 Earthworks

MITS05 Sportsgrounds

MITS 09B Grassing

MITS 09C Planting

#### 1.1.1.3 Design Standards

General: The following Design Standards are related to this Specification:

MIS 24 Soft Landscape Design

Attachment B Design acceptance requirements

#### 1.1.1.4 TCCS Reference Documents

General: The following TCCS reference documents are related to this Specification:

Reference document 4 Protection of public landscape assets

Reference document 7 Operational acceptance submissions

Reference document 8 Works as executed quality records

Reference document 9 Final acceptance submissions

Reference document 10 Landscape consolidation

Reference document 11 Drafting Standard for Civil and Landscape works

## 1.1.2 Referenced documents

### 1.1.2.1 Standards

General: The following documents are incorporated into this Specification by reference:

AS 4419 Soils for landscaping and garden use

AS 3743 Potting mixes

AS 4454 Composts, soil conditioners and mulches

### 1.1.2.2 Other publications

Proprietary products: To *TCCS Products previously considered for use list*

## 1.1.3 Interpretation

### 1.1.3.1 Abbreviations

General: For the purposes of this Specification the following abbreviations apply:

**TCCS:** Transport Canberra and City Services, and its successors.

### 1.1.3.2 Definitions

General: For the purposes of this Specification the definitions given below apply:

**Advanced Tree Planting:** Tree planting with pots equal or greater than 45L, and/or root ball depth equal or greater than 400mm.

**Bad ground:** Ground unsuitable for the work, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is, or becomes, soft, wet or unstable.

**Imported topsoil:** Similar to naturally occurring local topsoil, which may include manufactured topsoil, suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and of contaminants, and classified by texture to *AS 4419 Appendix I*, as follows:

- > Fine: Clay loam, fine sandy loam, sandy clay loam, fine sandy clay loam, silty loam, loam.
- > Medium: Sandy loam.
- > Coarse: Sand, loamy sand.

**Site rock:** Rocks selected for salvage.

**Site topsoil:** Topsoil excavated from the site which contains organic matter, supports plant life, conforms generally to the fine-to-medium texture classification to *AS 4419* (loam, silt, clay loam) and is free from:

- > Stones more than 20mm diameter shall be < 2% w/w
- > Clay lumps more than 20mm diameter shall be < 2% w/w.
- > Weeds and tree roots.
- > Sticks and rubbish (plastics, metals, papers etc.).
- > Material toxic to plants.

**Soil blend/mix:** A general purpose soil derived from the blending/mixing of two or more of sand, natural soil material or organic materials (which may include ameliorants) to meet site specific requirements (or Soil Types shown in **Products, Topsoil**).

**Subsoil:** Sub-surface material comprising B and C horizons of soils which may or may not have distinct profiles; may have brighter colours and textural differences often with higher clay contrasts. In soils with weak profile development, the subsoil can be defined as the soil below the topsoil.

**Top dressing:** A soil which is suitable for surface application to lawn.

**Topsoil:** A part of the soil profile; typically, the A1 horizon, containing material which is usually darker, more fertile and better structured than the underlying layers. When the A2 horizon also meets these criteria, it may be included. Topsoil is the most important part of the soil with respect to the plant growth and its loss or degradation represents the most serious aspect of soil erosion.

**1.1.4 Hold points**

**1.1.4.1 Notice**

General: Give notice so that the documented inspection and submissions may be made to the **Hold points table**.

**Table 9A-1 Hold points table**

Item	Clause title	Requirement	Notice for inspection	Release by
<b>Execution</b>				
9A.1	Stockpile locations	Submit a proposal for storage of materials onsite	A minimum of Two (2) weeks prior to commencement of works	Authorised person
9A.2	Topsoil analysis - Soil Type 1, 2, 3, 4 and 5	Topsoil Samples	A minimum of four (4) weeks prior to commencement of works	Authorised person – site superintendent
9A.3	Subsoil analysis - Soil Type 6	Prior to supplying topsoil	A minimum of four (4) weeks prior to commencement of works	Authorised person – site superintendent
9A.4	Topsoil – completion of initial compliance certification	Prior to supplying topsoil	A minimum of four (4) weeks prior to commencement	Authorised person – site superintendent
9A.5	Supply of topsoil	Notification of topsoil supply	At least 3 working days prior to supplying topsoil to site	Authorised person – site superintendent

## 1.2 Preconstruction planning

### 1.2.1 Submissions

#### 1.2.1.1 Topsoil compliance testing

Initial testing: Conduct initial testing to formulate a potentially compliant topsoil for the proposed design, prior to submission of compliance testing.

Compliance Testing: Provide topsoil samples, with associated test results confirming compliance with the specifications prior to supplying topsoil to site.

Refer to **Execution**

## 1.3 Materials

### 1.3.1 Topsoil

#### 1.3.1.1 Topsoil Types and Application

**Table 9A-2 Top Soil Types table**

Soil Type	Application	Soil Properties
<b>Type 1</b>	Topsoil for irrigated grass or passive amenity turf	See <b>Performance Criteria for Soil Type 1 – Irrigated Grass table</b>
<b>Type 2</b>	Topsoil for non-irrigated dryland grass in open space and road verges	See <b>Performance Criteria for Soil Type 2 – Topsoil for Non-irrigated Dryland Grass table</b>
<b>Type 3</b>	Topsoil for garden bed planting – exotic and native species	See <b>Performance Criteria for Soil Type 3 – Topsoil for Garden Bed Planting table</b>
<b>Type 4</b>	Topsoil backfill for advanced tree planting– native and exotic species	See <b>Performance Criteria for Soil Type 4 – Topsoil Backfill for Advanced Tree Planting table</b>
<b>Type 5</b>	Tree planting in paved areas – Structural support soil	See <b>Performance Criteria for Soil Type 5 – Filler Soil of Structural Support Soil Table</b> and <b>Performance Criteria for Soil Type 5 – Aggregates Component of Structural Support Soil table</b>
<b>Type 6</b>	Subsoil backfill for advanced tree planting – exotic and native species	See <b>Performance Criteria for Soil Type 6 (physical and chemical properties) table</b>

**Table 9A-3 Topsoil Application Depths table**

Soil Application	Minimum depth
Irrigated Grass or Turf	150mm
Dryland Grass	100mm
Planting beds	300mm
Advanced Tree Planting	To detail

Sportsground topsoil: refer to *MITS05 Sportsgrounds*.

**1.3.1.2 Topsoil Properties / Quality**

Requirement: Topsoil shall conform with the following schedules **Performance Criteria for Soil Type 1 – Irrigated Grass table** through to **Performance Criteria for Soil Type 6 (physical and chemical properties) table**.

Performance Criteria: topsoil shall conform with the following criteria for utilising site-won topsoil, or for imported topsoil.

**Table 9A-4 Performance Criteria for Soil Type 1 – Irrigated Grass**

Physical properties	Units	Target range
Texture, preferred range	n/a	Sandy loam to clay loam
Hydraulic conductivity (@16 drops by McIntyre Jakobsen)	mm / hour	> 30
Chemical properties	Units	Target Range
pH in water (1:5)	pH units	5.7 – 8.0
pH in CaCl <sub>2</sub> (1:5)	pH units	5.2 – 7.5
Electrical conductivity (1:5)	dS / m	< 0.5
Phosphorus (Mehlich 3)	mg / kg	30 – 100
Exchangeable sodium percentage	% of ECEC	< 7
Exchangeable magnesium percentage	% of ECEC	15 – 25
Exchangeable Ca/Mg ratio	Ratio	3 – 7
Available nitrogen (nitrate N + ammonium N)	mg / kg	> 25
pH in water (1:5)	pH units	5.7 – 8.0



**Table 9A-5 Performance Criteria for Soil Type 2 – Topsoil for Non-irrigated Dryland Grass**

Physical properties	Units	Target range
Texture, preferred range	n/a	Sandy loam to clay loam
Hydraulic conductivity (@16 drops by McIntyre Jakobsen)	mm / hour	> 30
Chemical properties	Units	Target Range
pH in water (1:5)	pH units	5.7 – 8.0
pH in CaCl <sub>2</sub> (1:5)	pH units	5.2 – 7.5
Electrical conductivity (1:5)	dS / m	< 0.5
Phosphorus (Mehlich 3)	mg / kg	30 – 100 (open space) 30 – 100 (road verge)
Exchangeable sodium percentage	% of ECEC	< 7
Exchangeable magnesium percentage	% of ECEC	15 – 25
Exchangeable Ca/Mg ratio	Ratio	3 – 7
Available nitrogen (nitrate N + ammonium N)	mg / kg	> 25

**Table 9A-6 Performance Criteria for Soil Type 3 – Topsoil for Garden Bed Planting**

Physical properties	Units	Target range
Texture, preferred range	n/a	Sandy loam to clay loam
Organic matter	% dry weight basis	3 – 10
Chemical properties	Units	Target Range
pH in water (1:5)	pH units	5.7 – 7.5
pH in CaCl <sub>2</sub> (1:5)	pH units	5.2 – 6.8
Electrical conductivity (1:5)	dS / m	< 0.5
Phosphorus (Mehlich 3) – Phosphorus tolerant / standard exotic species	mg / kg	30 – 100
Phosphorus (Mehlich 3) – Phosphorus sensitive native species	mg / kg	1 – 10
Exchangeable sodium percentage	% of ECEC	< 7
Exchangeable potassium percentage	% of ECEC	5 – 10
Exchangeable calcium percentage	% of ECEC	60 – 80
Exchangeable magnesium percentage	% of ECEC	15 – 25
Exchangeable Ca/Mg ratio	Ratio	3 – 7
Exchangeable aluminium percentage	% of ECEC	< 2
Available nitrogen (nitrate N + ammonium N)	mg / kg	> 50
Available manganese	mg / kg	25 – 50

**Table 9A-7 Performance Criteria for Soil Type 4 – Topsoil Backfill for Advanced Tree Planting**

Physical properties	Units	Target range
Texture, preferred range	n/a	Sandy loam to clay loam
Organic matter	% dry weight basis	2 – 10
Hydraulic conductivity (@16 drops by McIntyre Jakobsen)	mm / hour	> 30
Chemical properties	Units	Target Range
pH in water (1:5)	pH units	5.7– 7.5
pH in CaCl <sub>2</sub> (1:5)	pH units	5.2 – 6.8
Electrical conductivity (1:5)	dS / m	< 0.5
Phosphorus (Mehlich 3) – Phosphorus tolerant / standard exotic species	mg / kg	50 – 100
Phosphorus (Mehlich 3) – Phosphorus sensitive native species	mg / kg	10 – 30
Exchangeable sodium percentage	% of ECEC	< 7
Exchangeable potassium percentage	% of ECEC	3 – 10
Exchangeable calcium percentage	% of ECEC	60 – 80
Exchangeable magnesium percentage	% of ECEC	15 – 25
Exchangeable Ca/Mg ratio	Ratio	3 – 7
Exchangeable aluminium percentage	% of ECEC	< 2
Available nitrogen (nitrate N + ammonium N)	mg / kg	> 25
Available manganese	mg / kg	25 – 50

**Table 9A-8 Performance Criteria for Soil Type 5 – Filler Soil of Structural Support Soil**

Physical properties	Units	Target range
Texture, preferred range	n/a	Loam to clay loam
Organic matter	% dry weight basis	3 – 10
Chemical properties	Units	Target Range
pH in water (1:5)	pH units	5.7 – 7.5
pH in CaCl <sub>2</sub> (1:5)	pH units	5.2 – 6.8
Electrical conductivity (1:5)	dS / m	< 0.5
Phosphorus (Mehlich 3) – Phosphorus tolerant / standard exotic species	mg / kg	30 – 100
Phosphorus (Mehlich 3) – Phosphorus sensitive native species	mg / kg	10 – 30
Exchangeable sodium percentage	% of ECEC	< 7
Exchangeable potassium percentage	% of ECEC	3 – 10
Exchangeable calcium percentage	% of ECEC	60 – 80
Exchangeable magnesium percentage	% of ECEC	15 – 25
Exchangeable Ca/Mg ratio	Ratio	3 – 7
Exchangeable aluminium percentage	% of ECEC	< 2
Available nitrogen (nitrate N + ammonium N)	mg / kg	> 25
Available manganese	mg / kg	25 – 50

**Table 9A-9 Performance Criteria for Soil Type 5 – Aggregates Component of Structural Support Soil**

Test method	Physical properties	Specification
	% Passing A.S. sieve (mm)	
<b>AS1141.11</b>	63.0	100
	53	85–100
	37.5	20–65
	26.5	0–20
	19.0	0–5
	13.2	0–2
	4.75	0–1
	Aggregate to filler soil ratio	4.5 – 5.5

Typical components of aggregates for structural support soil: nominal 63 mm hard rock aggregate, such as basalt, diorite, or other suitable hard rock aggregate.

**Table 9A-10 Performance Criteria for Soil Type 6 – Subsoil Backfill for Advanced Tree Planting**

Physical properties	Units	Target range
Texture, preferred range	n/a	Loamy sand to Sandy loam to Sandy Clay
Hydraulic conductivity (@ 16 drops by McIntyre Jakobsen)	mm / hour	> 20
Chemical properties	Units	Target Range
pH in water (1:5)	pH units	5.7 – 7.5
pH in CaCl <sub>2</sub> (1:5)	pH units	5.2 – 6.8
Electrical conductivity (1:5)	dS / m	< 0.5
Phosphorus (Mehlich 3) – Phosphorus tolerant / standard exotic species	mg / kg	30 – 80
Phosphorus (Mehlich 3) – Phosphorus sensitive native species	mg / kg	10 – 30
Exchangeable sodium percentage	% of ECEC	< 7
Exchangeable potassium percentage	% of ECEC	3 – 10
Exchangeable calcium percentage	% of ECEC	60 – 80
Exchangeable magnesium percentage	% of ECEC	15 – 25
Exchangeable Ca/Mg ratio	Ratio	3 – 7
Exchangeable aluminium percentage	% of ECEC	< 2

## 1.4 Execution

### 1.4.1 Stockpile locations

Requirement: Submit proposal for location of topsoil stockpiles onsite

This is a **HOLD POINT**.

## 1.5 Completion

### 1.5.1 Submissions

Work as Executed Records: To *MITS 00B Quality Requirements*.

Requirement: Submit soil testing certifications of the relevant soil specifications to indicate conformance with this specification and MITS 00B Quality Requirements.

Non-Conforming Material: Non-conforming material (or minor non-conforming material) can be submitted for review, with recommendations provided by a Certified Professional Soil Scientist / qualified soil scientist / agronomist to determine its suitability for the proposed planting. This may include recommendations to improve the topsoil product in order to produce a compliant, or minor non-conforming product that is fit-for-purpose. The product's suitability shall be certified by a Certified Professional Soil Scientist/ agronomist as final sign off.

Requirement: Topsoil tests must be current (no older than 6 months) and be taken from the topsoil to be supplied to site.

## 2 MEASUREMENT AND PAYMENT

### 2.1 Measurement

#### 2.1.1.1 General

Payments made to the Bill of Quantities: To *MITIS 00 Preliminaries*, this Specification, the drawings and **Pay items** inclusive.

#### 2.1.1.2 Methodology

The following methodology will be applied for measurement and payment.

- > Allow for all work, materials, testing and quality assurance requirements in each Pay Item.
- > Temporary erosion and sedimentation control: to *MITIS 00C Control of erosion and sedimentation*
- > Bulk Earthworks: to *MITIS 02B Bulk earthworks*
- > Removal of unsuitable material: to *MITIS 02B Bulk earthworks*
- > Preparation including detailed excavation, filling, trimming of surfaces prior to topsoil spreading for grass and planting areas: To *MITIS 09B Grassing* and *MITIS 09C Planting*.
- > Topsoil supply and placement: to this Specification

### 2.2 Pay items

**Table 9A-11 Pay Items table**

Item No	Pay Item	Unit of measurement	Schedule rate scope
9A.1	Topsoil – grass areas	m <sup>2</sup>	All activities associated with the supply and delivery of specified topsoil to site, stockpiling, placement and spreading to the specified depth for grass areas
9A.2	Topsoil – planting areas	m <sup>2</sup>	All activities associated with the supply and delivery of specified topsoil to site, stockpiling, placement and spreading to the specified depth for grass areas
9A.3	Topsoil amelioration	m <sup>3</sup>	All activities associated with the supply, delivery and mixing of ameliorants into stockpiled soil
9A.4	Topsoil amelioration certification	m <sup>3</sup>	All activities associated with collection and testing of topsoil samples that have been ameliorated to validate the treatment



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