

STRUCTURAL SOIL:

- Structural soil mixture is to be uniformly blended. Segregation that occurs during delivery and handling must be thoroughly homogenised prior to placement and compaction.
- Ensure structural soil mixture remains moist at all times during mixing, handling, transport, storage and placement.
- The filler soil must be a clay loam or similar texture and be of uniform composition and free of unwanted deleterious material.
- The mixture is to be free of toxic substances that are harmful to plant health and growth.
- The contractor or soil manufacturer must submit samples of soil to a NATA accredited laboratory to verify compliance with the specification. The contractor is to supply a certificate clearly stating compliance.
- For a proprietary product line a document produced by the supplier may be acceptable as a compliance certificate under the following circumstances:
 - it is an 'off the shelf' product line and not a custom mix
 - if a representative test certificate is available and produced within the last 6 months
 - if the testing covers the criteria in the specification
 - the manufacturers quality assurance system is externally certified.
- Generally the ratio of aggregate to filler soil blend should be 5 parts aggregate by volume to 1 part filler soil and be in accordance with the properties listed below.
- Filler Soil Properties
 - Physical properties

Soil Physical Properties		
Property	Units	Target Range
Texture	na	Loam to clay loam
Organic matter	% dwb	3-8
Wettability	mm/h	>5
Dispersibility in water	Category	1 or 2 (AS 4419) category
Gravel > 4 mm	% w/w	< 2
Gravel > 8 mm	% w/w	0

8.2. Chemical properties

Soil Chemical Properties		
Property	Units	Target Range
pH in water (1:5) Standard range	pH units	5.4-6.8
pH in CaCl ₂ (1:5) Standard range	pH units	5.2-6.5
Electrical conductivity (1:5)	dS/m	< 0.5
Phosphorus (P)	mg/kg	30-80
Exchangeable sodium (Na)	% of ECEC	< 7
Exchangeable potassium (K)	% of ECEC	3-10
Exchangeable calcium (Ca)	% of ECEC	60-80
Exchangeable magnesium (Mg)	% of CEC	15-25
Exchangeable aluminium (Al)	% of CEC	< 5
Exchangeable Ca:Mg ratio	ratio	3-9
Available iron (Fe)	mg/kg	100-400
Available magnesium (Mn)	mg/kg	25-100
Available zinc (Zn)	mg/kg	5-30
Available copper (Cu)	mg/kg	1-15
Available boron (B)	mg/kg	0.5-5
Available N (nitrate)	mg/kg	> 20

9. Aggregate Properties

Aggregate Physical Properties		
Test method	Properties	Specification
AS 1141.11 (2009)	AS sieve (mm)	% passing
	63.0	100
	53.0	85-100
	37.5	20-65
	26.5	0-20
	19.0	0-5
	13.2	0-2
AS 1141.24 (1997)	Sodium sulphate soundness (total weight % loss)	Max. 9
	Aggregate to filler soil ratio	4.5-5.5

- A typical structural soil composition and amelioration is provided below that may meet the specification requirements. The specific amendments required must be verified by laboratory testing and recommendations made by an agronomist.

Example physical structural soil composition	
Property	Quantity
Nominal 63mm hard rock aggregate (usually basalt)	1 m ³
Filler soil	200 L

Example filler soil amendment to meet requirements	
Property	Quantity
Filler soil clay loam, sandy clay or clay	80-90% v/v
Composted soil conditioner conforming to AS4454	10-20% v/v
Gypsum	500 g/m ³ of filler soil
Urea	500 g/m ³ of filler soil
Iron sulphate	1.5 kg/m ³ of filler soil
Magnesium sulphate	400 g/m ³ of filler soil
Lime or dolomite	600 g/m ³ of filler soil
Potassium nitrate	500 g/m ³ of filler soil
Superphosphate	500 g/m ³ of filler soil
Trace element mix	300 g/m ³ of filler soil
8-9 month controlled release	2 kg/m ³ of filler soil

- A review of the structural soil mix and placement method must be undertaken by Council and approved during the design stage and prior to delivery of materials to site.
- The contractor must submit samples at regular intervals during construction to demonstrate compliance with the specification. Inspections of the structural soil mix and test submissions are to occur with a minimum frequency of one test per 100m³ or as otherwise agreed by the superintendent.

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Approved Project Services

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