

The Hills B Horizon Mix

The Hills B Horizon Mix performs well as a lower profile substrate in contained environments, below the Lightweight Planter Box Mix. It has been developed to work as the stable drainage media layer of an engineered profile. It provides enough nutrition for continued root growth while creating a stable substrate for long term volume.

The Hills B Horizon Mix is tested to the Australian Standard 3743 Potting Mix non specialist (Regular Grade). We test the Bulk Density to the Australian Standard 4419: 2003 Soils for Landscaping and Garden Use – Organic Soil Analysis. It is also tested with the 6 Point Hydraulic Conductivity Test. As the B Horizon Mix is a lower profile substrate, it doesn't fit into any one Australian Standard's requirements. We use the standards as a tool only.



TEST RESULTS:

APRIL 2019

Physical Properties	Unit	Target Range	Results	Comments
Texture	-	Loamy sand - sandy loam	Loamy Sand	Acceptable
Air-filled Porosity	%	≥ 10	13	Acceptable
Water Holding Capacity	%	≥ 40	49.1	Acceptable
Permeability (@ 16 drops)	mm/hr	> 100	1209	Acceptable
Organic Matter	% w/w	< 5	20.9	High (due to ash content)
Wettability (AS4419)	min	≤ 5	0.32	Acceptable
Dispersibility	Category	1 or 2	2	Acceptable
Large Particles				
< 2 mm	% w/w	30 - 70	52.1	Acceptable
2 - 10 mm	% w/w	10 - 20	41.3	High
10 - 20 mm	% w/w	5 - 10	6.61	Acceptable
20 - 50 mm	% w/w	< 5	0	Acceptable
> 50 mm	% w/w	0	0	Acceptable
Saturated Density	kg/L	< 2.4	1.16	Acceptable
Chemical Properties	Unit	Target Range	Results	Comments
pH in water (1:1:5)	pH Units	5.4 - 6.8	7.61	High
Electrical Conductivity	dS/m	<2.2	2.1	Acceptable
Chloride	mg/L	≤ 200	238	High
Ammonium-N (NH4)	mg/L	≤ 100	79	Acceptable
Ammonium-N + Nitrate-N (NH4 + NO3)	mg/L	≥ 50	80.5	Acceptable
Nitrogen Draw-Down Index	-	≥ 0.7	0.42	Low
Toxicity Index	mg/L	≥ 70	92	Acceptable
Phosphorus	mg/L	8 - 40	4.4	Low
Low Phosphorus - P-Sensitive plant	mg/L	< 3	4.4	High
Potassium	mg/L	50 - 250	163	Acceptable
Sulphate (SO4)	mg/L	> 40	130	Acceptable
Calcium (Ca)	mg/L	≥ 80	80	Acceptable
Magnesium (Mg)	mg/L	≥ 15	24	Acceptable
Ca : Mg Ratio	Ratio	1.5 - 10	3.3	Acceptable
K : Mg Ratio	Ratio	1 - 7	6.8	Acceptable
Sodium (Na)	mg/L	≤ 130	105	Acceptable
Iron (Fe)	mg/L	≥ 35	36.1	Acceptable
Copper (Cu)	mg/L	0.4 - 15	0.398	Acceptable - within margin of error
Zinc (Zn)	mg/L	0.3 - 10	2.7	Acceptable
Manganese (Mn)	mg/L	1 - 15	5.36	Acceptable
Boron (B)	mg/L	0.02 - 0.65	0.222	Acceptable

Hydraulic Conductivity – 32 drops (heavy compaction) – 948mm/hr
Saturated bulk density = 1.16kg/L. Dry bulk density = 0.53kg/L.



Laboratory recommendations are implemented when the B Horizon is the predominant growing media in the podium and where corrections need to be made. The Hills Bark Blower® staff add important nitrogen sources, plenty of calcium, micro and macro nutrients and pH adjusters if needed.

The Hills Green Roof Mix*

The Hills Green Roof Mix has been developed to provide a stable substrate that can sustain plant life while maintaining volume over time. The Hills Bark Blower® has installed large trial plots and monitored them over a 6 year period to ensure the green roof media used is the best available. It is also tested independently. Not only that, but The Hills Bark Blower® Green Roof mix has been given a certificate of compliance with the requirements in the soil publication by Leake and Haege, no easy feat. Available upon request.

Tested for:

As there is no appropriate Australian Standard for Green roof media yet, The Hills Green Roof Mix is tested to the Australian Standard 3743 Potting Mix non specialist (Regular Grade). We also test the Bulk Density to the Australian Standard 4419: 2003 Soils for Landscaping and Garden Use – Organic Soil Analysis. It is also tested with the 6 Point Hydraulic Conductivity Test. We use the standards as a tool only. The mix is also tested against Specification E3 Low Density Container and Green Roof from the text Soil for Landscape Development by Leake and Haege. The Hills Bark Blower® staff add important nitrogen sources, plenty of calcium, micro and macro nutrients and pH adjusters if needed.

TEST RESULTS:

APRIL 2019

Physical Properties	Unit	Target Range	Results	Comments
Texture	n/a	Gravelly loamy sand to organic sandy loam	Loamy Sand	Acceptable
Air-filled Porosity	%	≥ 5	21	Acceptable
Water Holding Capacity	%	≥ 45	42.2	Low
Saturated repacked Density	kg/L	< 2	1.12	Acceptable
Large Particles	< 2 mm	% ww	51.1	High – Acceptable
	2 - 10 mm	% ww	43.5	High
	10 - 20 mm	% ww	5.47	Acceptable
	20 - 50 mm	% ww	0	Acceptable
	> 50 mm	% ww	0	Acceptable
Organic matter content	% w/w	< 25	23.8	Acceptable
Permeability	mm/h	> 100	4741	Acceptable
Wettability (AS4419)	mins	≤ 2	0.64	Acceptable
Dispersibility in water	Category	1 or 2 (AS 4419) category	1	Acceptable
Chemical Properties	Unit	Target Range	Results	Comments
pH in water (1:5)	pH units	5.4 - 6.8	7.06	High
Electrical conductivity (1:5)	dS/m	< 2.2	1.66	Acceptable
Chloride	mg/L	< 200	197	Acceptable
Ammonium-N	mg/L	< 100	46	Acceptable
Ammonium-N + Nitrate-N	mg/L	> 50	47.2	Low
Nitrogen draw-down index	-	> 0.7	0.11	Acceptable
Toxicity Index	mm	> 70	80	Acceptable
Phosphorus	mg/L	< 3 / 8 - 40	3.2	Acceptable for Natives
Potassium	mg/L	50 - 250	111	Acceptable
Sulphate	mg/L	> 40	170	Acceptable
Calcium	mg/L	> 80	122	Acceptable
Magnesium	mg/L	> 15	44	Acceptable
Ca:Mg Ratio	Ratio	1.5 - 10	2.8	Acceptable
K:Mg Ratio	Ratio	1 - 7	2.5	Acceptable
Sodium	mg/L	< 130	92	Acceptable
Iron	mg/L	>35	38.3	Acceptable
Copper	mg/L	0.4 - 15	1.9	Acceptable
Zinc	mg/L	0.3 - 10	4.2	Acceptable
Manganese	mg/L	1 - 15	6.85	Acceptable
Boron	mg/L	0.02 - 0.065	0.584	Acceptable

Independent laboratory certificate of compliance available with this product
Hydraulic Conductivity – 32 drops (heavy compaction) – 948mm/hr
Bulk Density = 0.49kg/L. Saturated Bulk Density = 1.12kg/L



*The Hills Bark Blower® staff add micro nutrients and ameliorants to provide those nutrients that test as mildly low. The Hills Bark Blower® mixes can have additions such as wetting agent and other fertilisers upon request.

All actions recommended by the independent laboratory are carried out before installation.

The Hills Lightweight Planter Box Mix



The Hills Lightweight Planter Box Mix is excellent for installation into the top 300 – 400 mm of a contained environment such as planter boxes and podiums. It has been developed in conjunction with the Hills B Horizon mix to work as the nutrient rich growing media layer of an engineered profile.

The Hills Lightweight Planter Box Mix is tested to the **Australian Standard 3743 Potting Mix** non specialist (Regular Grade). We test the Bulk Density to the **Australian Standard 4419: 2003 Soils for Landscaping and Garden Use – Organic Soil Analysis**. It is also tested with the **6 Point Hydraulic Conductivity Test**. The mix requirements are specific and don't fit into any one Australian Standard. We use the standards as a tool only.

TEST RESULTS:

APRIL 2019

Physical Properties	Unit	Target Range	Results	Comments
Texture	n/a	Gravelly loamy sand to organic sandy loam	Loamy Sand	Acceptable
Air-Filled porosity	%	≥ 5	11	Acceptable
Water-holding capacity	%	≥ 45	55.2	Acceptable
Saturated repacked Density	kg/L	< 2	1.16	Acceptable
Large Particles	<2mm	% ww	40.6	Acceptable
	2 - 10mm	% ww	46.2	High
	10 - 20mm	% ww	13.2	High
	20 - 50mm	% ww	0	Acceptable
	>50mm	% ww	0	Acceptable
Organic matter content	% w/w	< 25	28.6	High (due to ash content)
Permeability	mm/h	> 100	721	Acceptable
Wettability (AS4419)	mins	≤ 2	1.72	Acceptable
Dispersibility in water	Category	1 or 2 (AS 4419) category	3	High
Chemical Properties	Unit	Target Range	Results	Comments
pH in water (1:5)	pH units	5.4 - 6.8	7.38	High
Electrical conductivity (1:5)	dS/m	< 2.2	2.16	Acceptable
Chloride	mg/L	< 200	358	High
Ammonium-N	mg/L	< 100	48.3	Acceptable
Ammonium-N + Nitrate-N	mg/L	> 50	50.7	Acceptable
Nitrogen draw-down index	-	> 0.7	0.27	Acceptable
Toxicity Index	mm	> 70	70	Acceptable
Phosphorus	mg/L	< 3 / 8 - 40	11	Acceptable
Potassium	mg/L	50 - 250	257	Acceptable
Sulphate	mg/L	> 40	110	Acceptable
Calcium	mg/L	> 80	82	Acceptable
Magnesium	mg/L	> 15	25	Acceptable
Ca:Mg Ratio	Ratio	1.5 - 10	3.3	Acceptable
K:Mg Ratio	Ratio	1 - 7	10.3	High
Sodium	mg/L	< 130	137	High
Iron	mg/L	>35	25.9	Low
Copper	mg/L	0.4 - 15	0.5	Acceptable
Zinc	mg/L	0.3 - 10	4	Acceptable
Manganese	mg/L	1 - 15	8.12	Acceptable
Boron	mg/L	0.02 - 0.065	0.28	Acceptable

Hydraulic Conductivity – after 32 drops (heavy compaction) – 2308mm/hr
Bulk Density = 0.49 kg/L. Saturated Bulk Density = 1.16kg/L



The Hills Bark Blower® staff add a further Nitrogen source, Dolomite, Gypsum, and other nutrition where needed.

Further organic fertilisers and water holding products can be added upon request.

The Hills Premium A Horizon Mix

The Hills Premium A Horizon Mix has been developed to meet the most exacting specifications, from the **Australian Standard 3743** Potting Mix non specialist (Regular Grade), with items from **Australian Standard 4419**: 2003 Soils for Landscaping and Garden Use as well as the **Specification E3** Low Density Container and Green Roof requirements from the Leake and Haege publication. It has a **Declaration of Compliance** that accompanies the mix for peace of mind.

This mix is suitable as the top growing layer of any container environment, from Planter Boxes, to podium areas. It is lightweight and contains the nutrients needed to sustain plant life for an extended period. Organic slow release fertiliser can be used in the maintenance schedule; however it is not needed initially. The Hills Bark Blower® staff add important nitrogen sources, plenty of calcium, micro and macro nutrients and pH adjusters if needed.

TEST RESULTS:

JULY 2018

Physical Properties	Unit	Target Range	Results	Comments
Texture	n/a	Gravelly loamy sand to organic sandy loam	Loamy Sand	Acceptable
Air-Filled porosity	%	≥ 5	9.9	Acceptable
Water-holding capacity	%	≥ 45	42.2	Low
Saturated repacked Density	kg/L	< 2	1.11	Acceptable
Large Particles	<2mm	% ww	45.7	Acceptable
	2 - 10mm	% ww	44.2	High
	10 - 20mm	% ww	10.1	Acceptable
	20 - 50mm	% ww	0	Acceptable
	>50mm	% ww	0	Acceptable
Organic matter content	% w/w	< 25	27.8	High (due to ash content)
Permeability	mm/h	> 100	1240	Acceptable - Accelerated
Wettability (AS4419)	mins	≤ 2	2.43	High
Dispersibility in water	Category	1 or 2 (AS 4419) category	1	Acceptable
Chemical Properties	Unit	Target Range	Results	Comments
pH in water (1:5)	pH units	5.4 - 6.8	6.24	Acceptable
Electrical conductivity (1:5)	dS/m	< 2.2	0.22	Acceptable
Chloride	mg/L	< 200	13	Acceptable
Ammonium-N	mg/L	< 100	1.5	Acceptable
Ammonium-N + Nitrate-N	mg/L	> 50	12.1	Low
Nitrogen draw-down index	-	> 0.7	1.1	Acceptable
Toxicity Index	mm	> 70	62	Low
Phosphorus	mg/L	< 3 / 8 - 40	7.5	Acceptable
Potassium	mg/L	50 - 250	25	Low
Sulphate	mg/L	> 40	25	Low
Calcium	mg/L	> 80	86	Acceptable
Magnesium	mg/L	> 15	28	Acceptable
Ca:Mg Ratio	Ratio	1.5 - 10	3.1	Acceptable
K:Mg Ratio	Ratio	1 - 7	0.9	Low
Sodium	mg/L	< 130	12	Acceptable
Iron	mg/L	>35	19.9	Low
Copper	mg/L	0.4 - 15	0.7	Acceptable
Zinc	mg/L	0.3 - 10	4.4	Acceptable
Manganese	mg/L	1 - 15	1.63	Acceptable
Boron	mg/L	0.02 - 0.065	0.223	Acceptable

Bulk Density is 0.58kg/L. Saturated Bulk Density is 1.14kg/L.



*Further trace elements have been added to the mix to rectify any mild low results. The pH and WHC are within testing error range for the AS 3743 results and are fully acceptable for the Specification E3 as per the independent laboratory report.

The Hills Premium B Horizon Mix

The Hills Premium B Horizon Mix is exceptional as a lower layer growing media in urban landscaping where there are planter boxes and podiums. The Hills Premium B Horizon Mix has been specially formulated in consultation with an independent laboratory and years of on-site experience. It is tested to **Australian Standard 3743** Potting Mix non specialist (Regular Grade) as it is the most stringent and appropriate test to use. However, it is also test to **Australian Standard 4419**: 2003 Soils for Landscaping and Garden Use. Although this test is not as exacting in it's requirements, it provides the all-important Bulk Density needed to calculate the weight bearing. Weight is key to podium and planter boxes. Stability is also essential. Both these characteristics have been engineered to be the best possible in this mix.

The Hills Bark Blower® staff add important nitrogen sources, plenty of calcium, micro and macro nutrients and pH adjusters if needed. This mix is accompanied by a **Declaration of Compliance** to the **Specification E2** – On Slab soil media B Horizon outlined in the publication Soil for Landscape Development: Selection, Specification and Validation by Leake and Haege.

TEST RESULTS:

JULY 2018

Physical Properties	Unit	Target Range	Results	Comments
Texture	-	Loamy sand - sandy loam	Loamy Sand	Acceptable
Air-Filled porosity	%	≥ 10	7.9	Acceptable
Water-holding capacity	%	≥ 40	43.2	Acceptable
Permeability (@ 16 drops)	mm/hr	> 100	-	Not Tested
Organic matter	% w/w	< 5	18.2	Acceptable (due to ash content)
Wettibility (AS4419)	min	≤ 5	0.19	Low
Dispersibility	Category	1 or 2	1	Acceptable
<2mm	% w/w	30 - 70	62.8	Acceptable
2 - 10mm	% w/w	10 - 20	31.2	High
10 - 20mm	% w/w	5 - 10	6.02	Acceptable
20 - 50mm	% w/w	< 5	0	Acceptable
>50mm	% w/w	0	0	Acceptable
Saturated Density	kg/L	< 2.4	1.2	Acceptable
Chemical Properties	Unit	Target Range	Results	Comments
pH in water (1:5)	pH Units	5.4 - 6.8	6.47	Acceptable
Electrical conductivity (1:5)	dS/m	<2.2	0.22	Acceptable
Chloride	mg/L	≤ 200	6.2	Acceptable
Ammonium-N	mg/L	≤ 100	1.5	Acceptable
Ammonium-N + Nitrate-N	mg/L	≥ 50	10.6	Low
Nitrogen draw-down index	-	≥ 0.7	1.1	Acceptable
Toxicity Index	mg/L	≥ 70	62	Low
Phosphorus	mg/L	8 - 40	14	Acceptable
Low Phosphorus - P-Sensitive plant	mg/L	< 3	14	High
Potassium	mg/L	50 - 250	12.1	Low
Sulphate	mg/L	> 40	18	Low
Calcium	mg/L	≥ 80	93	Acceptable
Magnesium	mg/L	≥ 15	25	Acceptable
Ca:Mg Ratio	Ratio	1.5 - 10	3.7	Acceptable
K:Mg Ratio	Ratio	1 - 7	0.5	Low
Sodium	mg/L	≤ 130	7.6	Acceptable
Iron	mg/L	≥ 35	19	Low
Copper	mg/L	0.4 - 15	1.14	Acceptable
Zinc	mg/L	0.3 - 10	3.7	Acceptable
Manganese	mg/L	1 - 15	1.7	Acceptable
Boron	mg/L	0.02 - 0.65	0.227	Acceptable



Bulk Density is 0.61kg/L

*Further trace elements can be added to the mix to rectify any mild / low results.

The Hills Premium Garden Mix



The Hills Premium Garden Mix is a superior growing media designed to support a range of plant species from exotics to most Australian Natives. It supports young plants and has the substance to remain an excellent mix long term. The Hills Premium Garden Mix has a structure that supports stable volume and a good organic content to encourage a healthy microbial ecosystem.

The Hills Premium Garden Mix is tested to the **Australian Standard 4419: 2003** Soils for Landscaping and Garden Use – Organic Soil Analysis. It is also tested against **Specification D3** Display Bed Soil from the text Soil for Landscape Development by **Leake and Haege**.

TEST RESULTS:

APRIL 2019

Physical Properties	Unit	Target Range	Results	Comments
Texture	n/a	Sandy loam to clay loam	Loamy Sand	Acceptable
Organic Matter	% dwb	3 - 6	16.1	High (due to ash content)
Organic Matter (Organic Soil Variant)	% dwb	15 - 25	6.1	Low
Permeability (@ 16 drops)	mm/hr	> 50	3611	Acceptable
Wettability	mm/hr	> 5	76.4	Acceptable
Dispersibility in water	Category	1 or 2 (AS 4419) category	2	Acceptable
Large Particles				
2 - 20 mm	% ww	< 20		
>20mm	% ww	<10		
Visible Contaminants >2mm (Glass, Plastic and Metal)	% w/w	< 25	<0.01	Acceptable
Chemical Properties	Unit	Target Range	Results	Comments
pH in water (1:5) Standard Range	pH Units	5.4 - 6.8	6.4	Acceptable
pH in CaCl ₂ (1:5) Standard Range	pH Units	5.2 - 6.5	6.1	Acceptable
pH in water (1:5) Alkaline Range	pH Units	6.8 - 8	-	-
pH in CaCl ₂ (1:5) Alkaline Range	pH Units	6.5 - 7.5	-	-
Electrical Conductivity (1:5)	dS/m	< 0.75	0.76	Acceptable
Phosphorus - P-tolerant or standard plants acid soils method 18F1	mg/kg	<50	22.1	Low
Phosphorus - P-tolerant plants alkaline soils method 9B1 or 9C1	mg/kg	<20	22.1	Acceptable
Phosphorus - P-sensitive plants, acid soils method 18F1	mg/kg	<50	22.1	Low
Phosphorus - P-sensitive plants alkaline soils method 9B1 or 9C1	mg/kg	<20	22.1	Acceptable
Exchangeable Sodium (Na)	% ECEC	<7	10.4	High
Exchangeable Potassium (K)	% ECEC	5 - 15	7.2	Acceptable
Exchangeable Calcium (Ca) Method 18F1 or 15A1 in alkaline soils	% ECEC	60 - 80	62.1	Acceptable
Exchangeable Magnesium (Mg)	% ECEC	15 - 25	19.7	Acceptable
Exchangeable Aluminium (Al)	% ECEC	<2	-	-
Exchangeable Ca:Mg ratio	Ratio	3 - 9	3.1	Acceptable
Available Iron (Fe)	mg/kg	100 - 400	357	Acceptable
Available Manganese (Mn)	mg/kg	25 - 100	15	Low
Available Zinc (Zn)	mg/kg	5 - 30	3.6	Low
Available Copper (Cu)	mg/kg	1 - 15	2.3	Acceptable
Available Boron (B)	mg/kg	0.5 - 5	0.7	Acceptable
Available N (N as Nitrate)	mg/kg	>50	2.3	Low



The Hills Premium Garden Mix tests as Grade A soil for Unrestricted Use.

The Hills Turf Underlay

The Hills Turf Underlay is a superior mix that creates a thriving lawn environment. It is specially developed for the use in both residential and amenity turf areas. The mix contains minerals and inorganic components, as well as a percentage of organic product for better structure and nutrition. The Hills Turf Underlay has high permeability which creates a free draining environment to decrease the chance of fungal growth.

The Hills Turf Underlay is tested to **Australian Standard 3743** Potting Mix non specialist (Regular Grade) to provide enough information about the available nutrients. It is also tested to **Specification C1** – Passive Amenity Turf from the text Soil for Landscape Development by **Leake and Haege**.



TEST RESULTS:

APRIL 2019

Physical Properties	Unit	Target Range	Results		Comments
2.0 mm (fine gravel)	% retained by mass	< 10	8.45		Acceptable
1.0 mm (very coarse sand)	% retained by mass	< 10	7.71		Acceptable
0.5 mm (coarse sand)	% retained by mass	10 - 30	9.05		Low
0.25 mm (medium sand)	% retained by mass	20 - 40	54.46		High
0.1 mm (fine sand)	% retained by mass	10 - 30	14.1		Acceptable
0.05 mm (very fine sand)	% retained by mass	5 - 15 (max 25% combined of vfs, si +cl)	2.05	6.23	Low
0.002 mm (silt)	% retained by mass	5 - 10 (max 12% combined of si +cl)	2.56	4.18	Low
<0.002 mm (clay)	% retained by mass	3 - 8	1.62		Low
Large Particles	% by mass	2 - 20mm = < 10% > 20mm = 0%	8.45 <0.01		Acceptable Acceptable
Organic matter content	% w/w	2 to 8	13.3		High (due to ash content)
Permeability	mm/h	> 30 (@ 16 Drops)	2520		Acceptable – Rapid
Wettability (AS4419)	mm/min	> 5	9.8		Acceptable
Dispersibility in water	Category	1 or 2 (AS4419)	1		Acceptable
Chemical Properties	Unit	Target Range	Results		Comments
pH in water (1:5)	pH units	5.4 - 8.0	6.55		Acceptable
pH in CaCl2 (1:5)	dS/m	5.2 - 7.5	6.36		Acceptable
Electrical conductivity (1:5)	mg/L	< 0.5	0.61		High
Exchangeable Na percentage	mg/L	< 7	11.6		High
Exchangeable Ca:Mg ratio	mg/L	3 - 9	2.9		Acceptable
Available phosphorus	-	50 - 150 20 - 50	5.83	-	Low
Available nitrogen (NO ₃)	mm	20 - 60	1.3		Low



“We consider the material fit for purpose as a turf underlay in all but high grade sportsfield situations provided the turf is fertilised once established as is normal practice” **SESL Australia.**