GreenBlue URBAN

Establishing the future urban landscape

RootSpace® Pavement Support System

Product Overview

MADE FROM 100% RECYCLED MATERIAL

The Key Benefits of Soil Cells

For over a quarter of a century, GreenBlue Urban has been working to ensure that every tree, wherever planted, has the chance to achieve species potential. Now, we are closer than ever to arriving at this objective, and it is very clear that the provision of uncompacted soil volume provided for the tree is probably the most critical single element in achieving long term establishment.

Urban trees are in an environment that is endemically hostile to where they would like to be, a forest floor, away from the demands and below ground competition of the urban environment. The RootSpace soil cell system replicates the forest floor scenario as closely as possible by providing the tree with the uncompacted, aerated soil that's crucial to it's long term health, whilst working around services and below ground constraints, marrying the needs of the built environment and the arboricultural needs of the tree.

Northumberland Avenue, London (2018) - Victorian era example of a suspended pavement support system.

The Benefits of Urban Trees

Particulate levels on tree-lined streets can be up to 60% lower than those without trees.

For every 5% of tree cover, stormwater runoff is reduced by 2%.

A series of international third-party studies have shown that trees increase property prices by between 5% to 18%.

A 10% increase in urban green space can postpone the onset of health problems by up to 5 years.

A single mature tree absorbs carbon at a rate of 47.5 lbs (21.6 kg) per year.

Few things can compare with the visual impact and seasonal interest that trees bring to an urban environment.

Research has indicated that a 10% increase in tree canopy was associated with roughly a 12% decrease in crime.

Students who have a green window view recover from mental fatigue faster and thus pay attention for longer.

Features & Benefits

The GreenBlue Urban RootSpace Pavement Support System is an engineered load-bearing soil cell with over 95% open void space for maximum rooting volume as well as the ability to accommodate services.

RootSpace G2 is manufactured in the UK from 100% recycled material, designed to be economic freight and is the culmination of more than 27 years experience in helping establish trees in complex urban environments.

The new generation of RootSpace is launched with a 400mm high option to suit a greater spread of situations.

A typical RootSpace installation.

Key Benefits

- Optimum conditions for soil biology maximising root growth & tree health.
- Very fast, simple and easy to assemble reducing installation time & costs.
- Designed for easy integration, and re-excavation for maintenance, of utilities.
- Minimum carbon footprint with 100% UK manufacture
- Minimum excavation depths required.
- Can be used close to highways due to world leading lateral performance.

Product Specifications

Code	Description	Height	Width	Breadth
GBURAC600A	RootSpace 600 Upright	600mm	500mm	90mm
GBURAC500A	RootSpace Airflow Lid	75mm	500mm	500mm
GBURSP65A	RootSpace 600 Infill	527mm	334mm	40mm

Code	Description	Height	Width	Breadth
GBURAC400B	RootSpace 400 Upright	400mm	500mm	75mm
GBURAC500B	RootSpace Airflow Lid	75mm	500mm	500mm
GBURSP45PB	RootSpace 400 Infill	327mm	334mm	40mm

Material	100% recycled HDPE
Manufacture Location	Injection moulded in the UK

Load Bearing Capacity

Load bearing capacity of structural soil cells is a complex science. It is common to interpret the actual breaking point of structural products as the ultimate allowable wheel load. Engineers employed by GreenBlue allow a factor of safety by basing calculations on loadings before undue displacement occurs.

Vertical Capacity

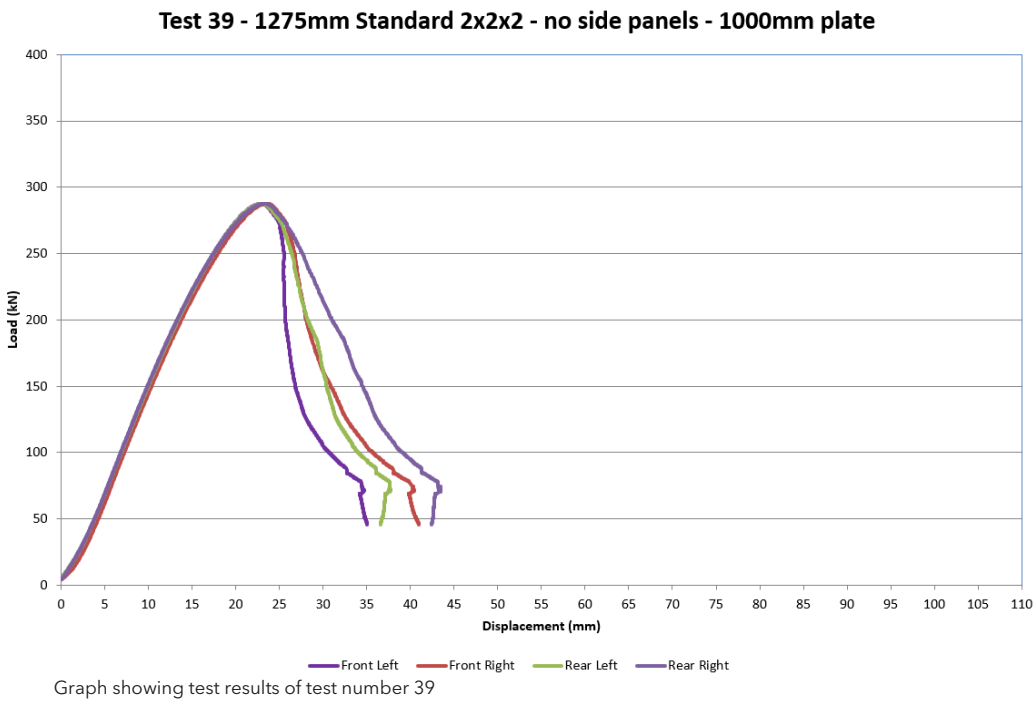
RootSpace Configuration	Vertical Crushing Load	
	kN/m2	tonne/m2
G2 400: 475mm units (single height)	434.0	44.3
G2 400: 875mm units (double height)	297.7	30.4
G2 600: 675mm units (single height)	308.0	31.4
G2 600: 1275mm units (double height)	285.7	29.1

Horizontal Capacity (with side panels)

RootSpace Configuration	Horizontal Crushing Load	
	kN/m2	tonne/m2
G2 400: 875mm units (double height) Loaded on side - with side panels	139.4	14.2
G2 600: 1275mm units (double height) Loaded on side - with side panels	56.5	5.8

Load Testing

Extensive compression testing of RootSpace units has been carried out at highly reputable independent testing laboratories. The complete test of each size and configuration is repeated several times to ensure reliability of data and confirm consistency of the unit's structural performance.



Graph showing test results of test number 39

Photograph of RootSpace 600 (double height) being tested.

Road / Pavement Build-up Design

Guidelines given in the DMRB HD24 HD26: Pavement Design and Construction, require the design of road surfacing and layer works to be based principally on a traffic assessment figures. These are expressed in terms of million standard (80kN) axle loads (msa) to be carried during the design life of the construction. This traffic loading together with the quality of the subgrade dictates the selection of the surfacing and depth of a road pavement required.

The dispersal of wheel loads carried by buried structures depends on the type and depth of road layer works selected. Subbase layers are normally made up of compacted gravel. Surfacing layers are typically bituminous macadam, reinforced concrete or block pavers. The wheel load "footprint" on the road surface may be assumed to disperse further through the materials as shown in the table:

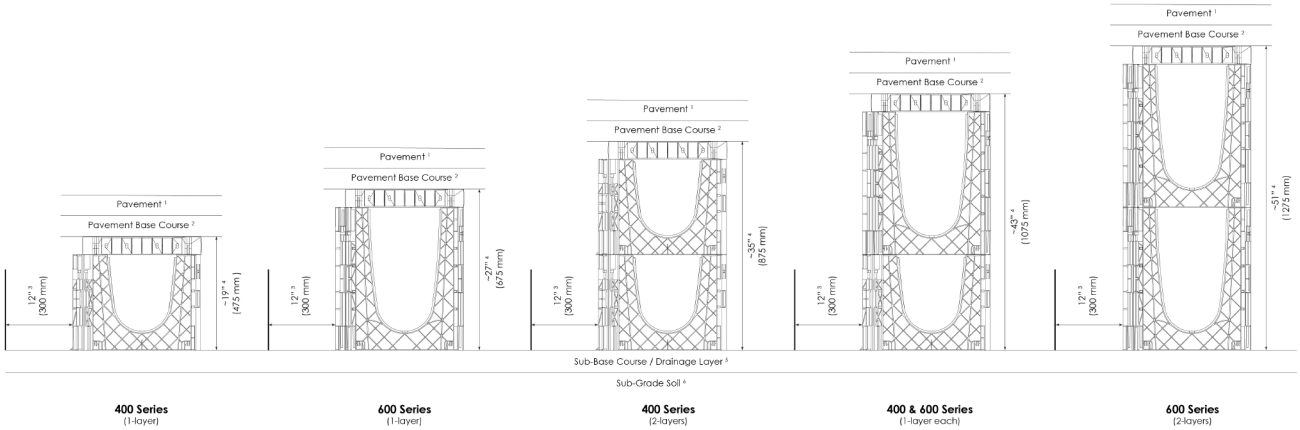
Material	Angle of load spread
Reinforced concrete	1.5 horz. to 1 vertical
Bituminous macadam	1.0 horz. to 1 vertical
Unreinforced concrete	1.0 horz. to 1 vertical
Compacted DTp Type 1 Gravel	0.5 horz. to 1 vertical
Interlocking block paving	1.0 horz. to 1 vertical

The following table gives the minimum allowable paving construction depths required to disperse a 4.5 tonne wheel load (as an example) on different RootSpace configurations (this is based on a typical macadam type road construction and the standard tree pit detail of GBU specification as shown overleaf):

RootSpace configuration	Height	Subbase DTp Type 1 depth	Macadam depth *	Total depth
400 single	475mm	150mm	150mm	300mm
600 single	675mm	300mm	150mm	450mm
400 + 400	875mm	300mm	150mm	450mm
400 + 600	1075mm	325mm	150mm	475mm
600 + 600	1275mm	325mm	150mm	475mm

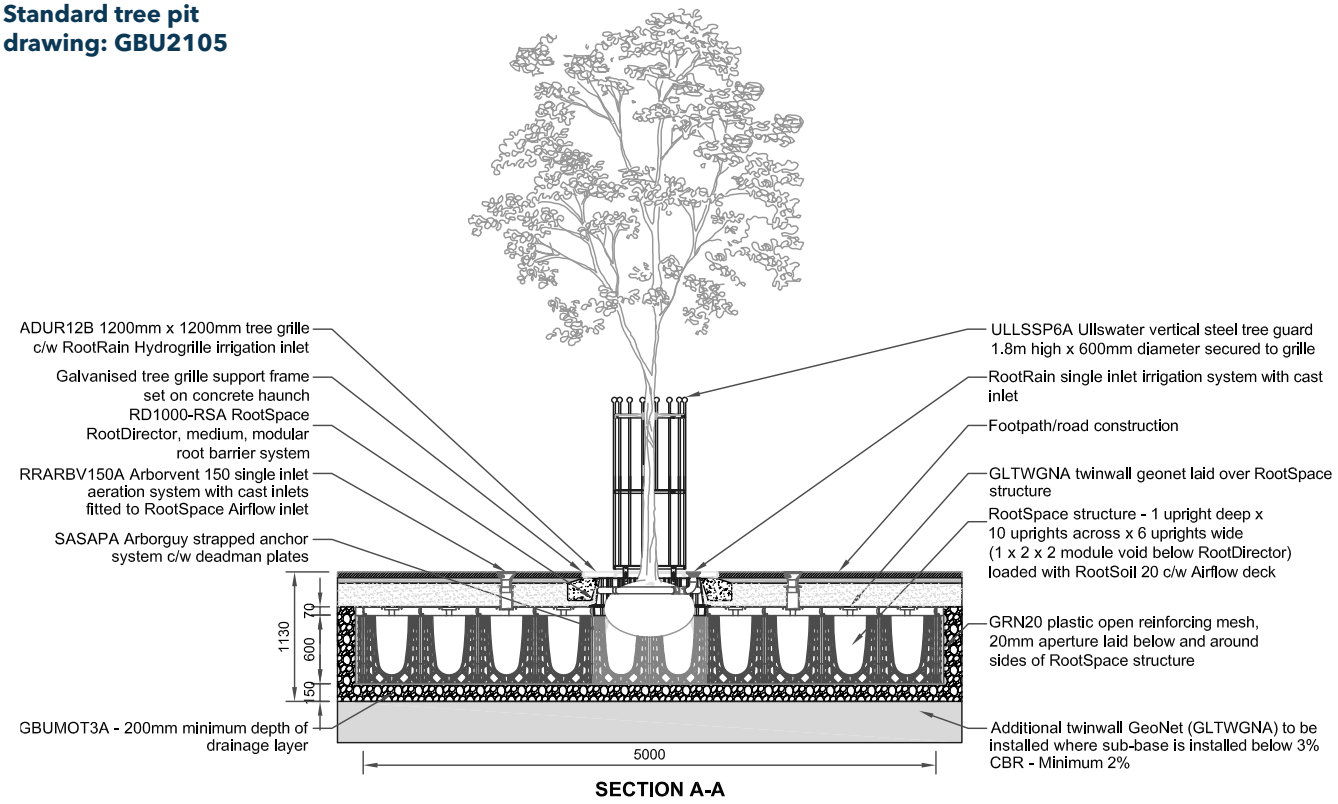
* Total depth of bound bituminous layers
(Minimum construction depths for a full range of wheel loads are available separately)

RootSpace Configurations



Typical Tree Pit & Ancillary Components

Standard tree pit drawing: GBU2105



Key RootSpace Tree Pit Products:

- GBURAC500A RootSpace Airflow deck - 56 No. 500mm x (") 500mm x 70mm
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- Rootsoil 20 to fill RootSpace and RootDirector spaces (including root ball volume) - allow 9 cu. m per tree. Additional allowance needs to be made for settlement
- RootStart Mycorrhiza - apply to tree pit at time of planting in accordance with manufacturer's rzecommendations - allow 200g per tree
- RRARBV150A Arborvent 150 single inlet aeration system with cast inlets including 0.75m 100mm diameter pipe
- RD1000-RSA RootSpace RootDirector - medium
- GL TWGNA twinwall geonet - 15 sq. m
- GRN20 plastic open reinforcing mesh, 20mm aperture - 31 sq. m
- SASAPA Arborguy strapped anchor system - large
- GBUMOT3A - Drainage layer as per installation instructions

Optional RootSpace Tree Pit Products:

- ADUR12B Adur 1200mm x 1200mm tree grille, finished in black,with galvanised steel support frame
- ULLSSP6A Ullswater vertical steel tree guard with round angle-section rings, 16mm round bars topped with 50mm diameter ball finials, finished in black

Note:
20% additional for with the Geotextile and Reinforcing Mesh to allow for overlap and cutting requirements

For heavy load applications, install RootSpace side panels to installation as directed by engineer

Structural engineer's note:
For increased strength and stability in soft ground conditions, specify RootSpace modules to incorporate side panel inserts to tree pit perimeter

Additional geonet is required where sub-base is less than 3% CBR

Supporting Documents & Resources

Design

Tree Species Soil Volume Guide

Our tree species soil volume guide can be used as a refrence point when designing tree pits with adequate soil volume prevision.

Installation

RootSpace Installation Guide

A step by step guide to installing the RootSpace system including further information on excavation depths.

Tree Pits and Services Guide

A comprehensive guide to installing RootSpace in and around services and utilities with real world case studies.

Maintenance

ArborSystem Installation & Maintenance Manual

Comprehensive, detailed instructions on how to install and maintain the complete ArborSystem® tree pit package.

DOWNLOAD

Scan the QR codes to download each resource or head to: greenblue.com/resources

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