



GreenBlue URBAN Successful Tree Pit

Design: Avoiding Pitfalls
Establishing the future
urban landscape

- September 2019 -

OUR MISSION:

To enable sustainable cities
through green and blue
infrastructure

DESIGN & CONTEXT

Right tree, right place.

- Heritage & Conservation
- Commercial, Retail
- Schools



- Shared Space Schemes
- New Development
- Social Space



LEADING RESEARCH

Our extensive research
is helping us to develop
the UK's next generation
of tree pit designs.





BENEFITS OF URBAN TREES

What they provide:

- ☐ REDUCE STORM WATER RUN OFF
- ☐ SHADE
- ☐ SIGNIFICANT COOLING EFFECT
- ☐ INCREASE REAL ESTATE VALUE
- ☐ REDUCE WINDSPEED
- ☐ CREATE BIODIVERSITY
- ☐ INCREASE RETAIL SALES



THE CRITICAL ELEMENTS

- ☐ UNCOMPACTED SOIL
- ☐ WATER
- ☐ AIR
- ☐ SUPPORT
- ☐ PROTECTION
- ☐ MAINTENANCE



ROOTS NEED SPACE

- Successful vigorous canopy needs soil volume below ground....



RESEARCH ON NEW TREES

Bartlett tree Labs, USA - Tom Smiley



Gravel Based SS



Sand Based SS



StrataCell



Hadlow Tree Trials – Year 4

Unlocking the Green Potential
of Trees in Urban Space



Control



Structural soil

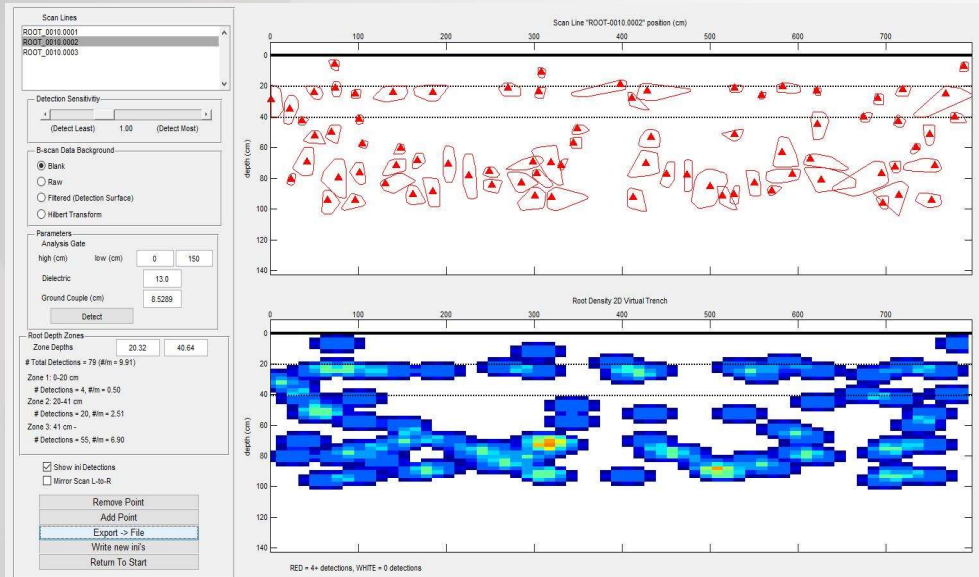


Stratacell suspended
pavement

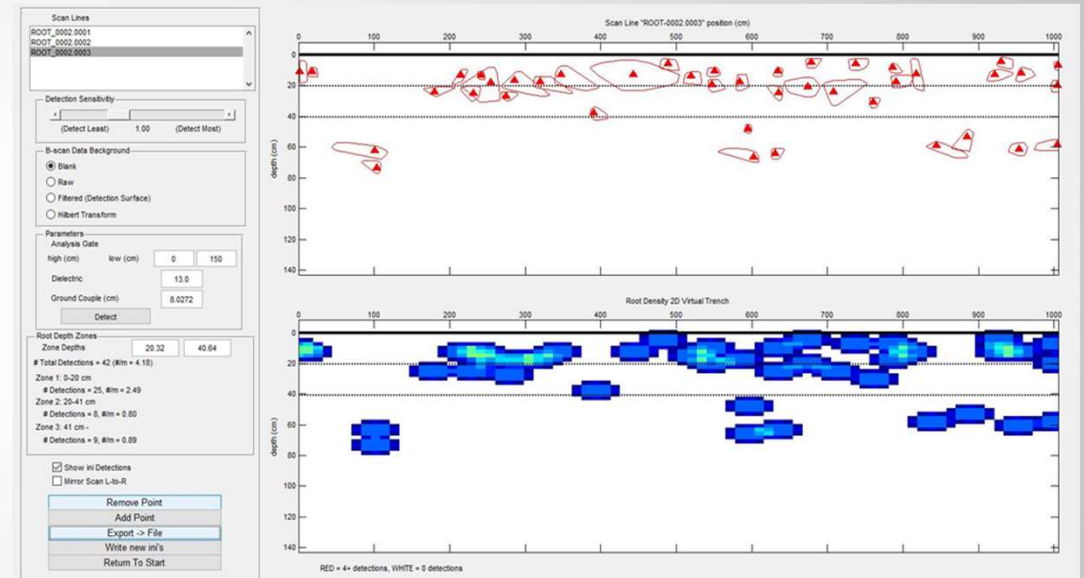


Radar Comparison

- Sand based structural soil vs Stratacell/RootSpace after 4 years.



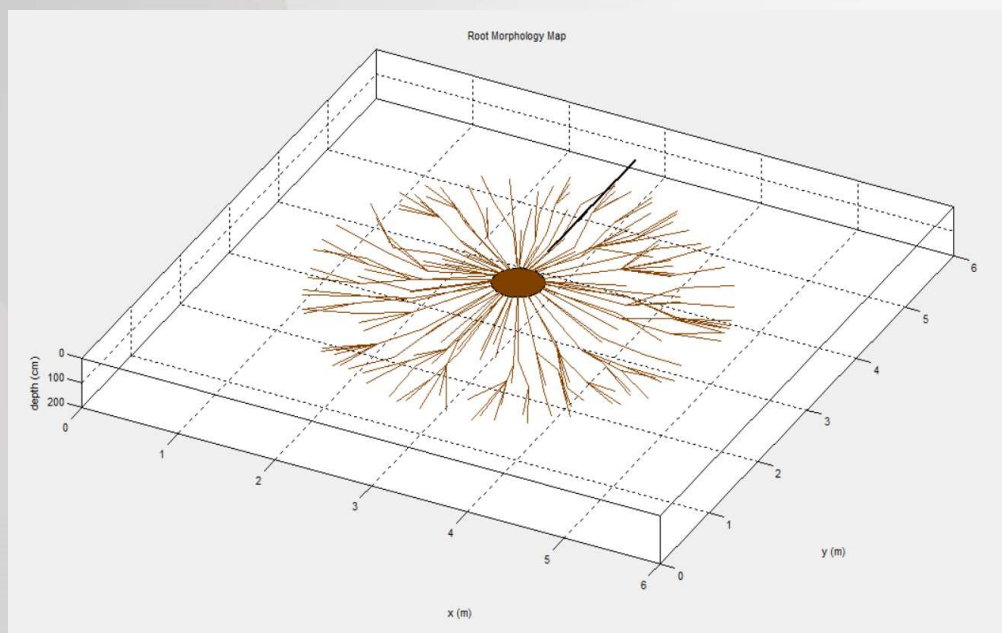
StrataCell/RootSpace



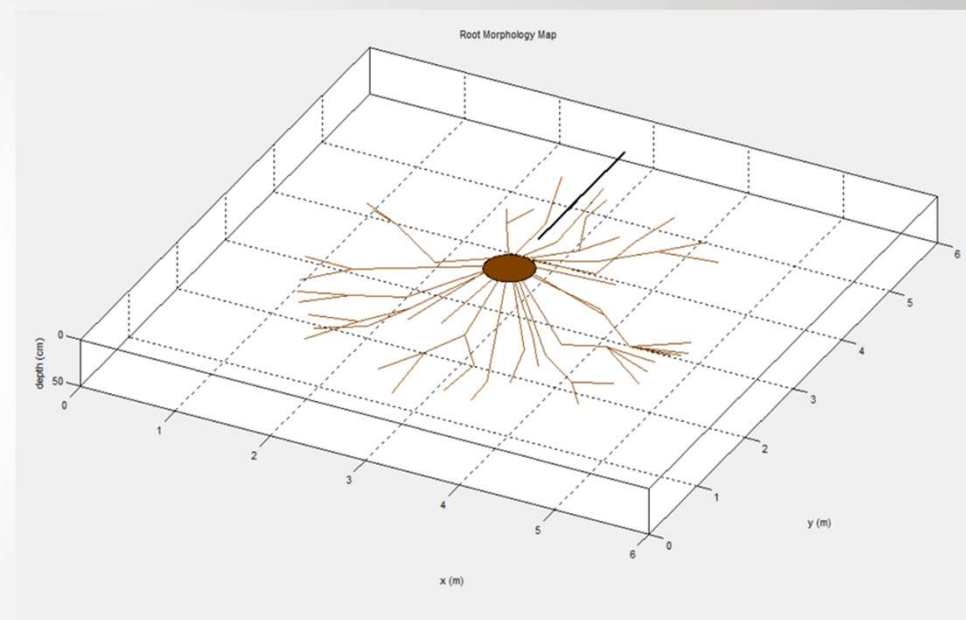
Structural Soil

Root Mapping

Unlocking the Green Potential
of Trees in Urban Space



StrataCell/RootSpace

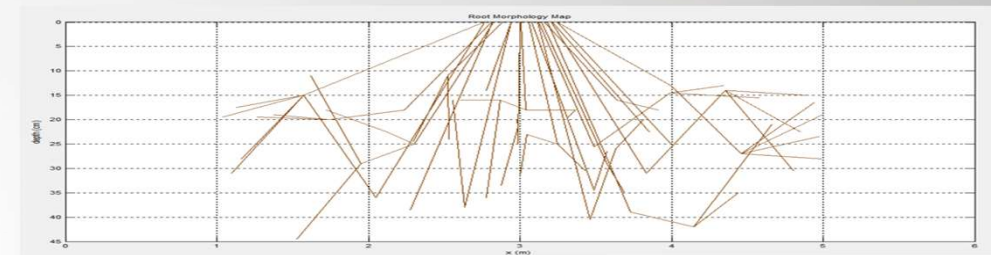
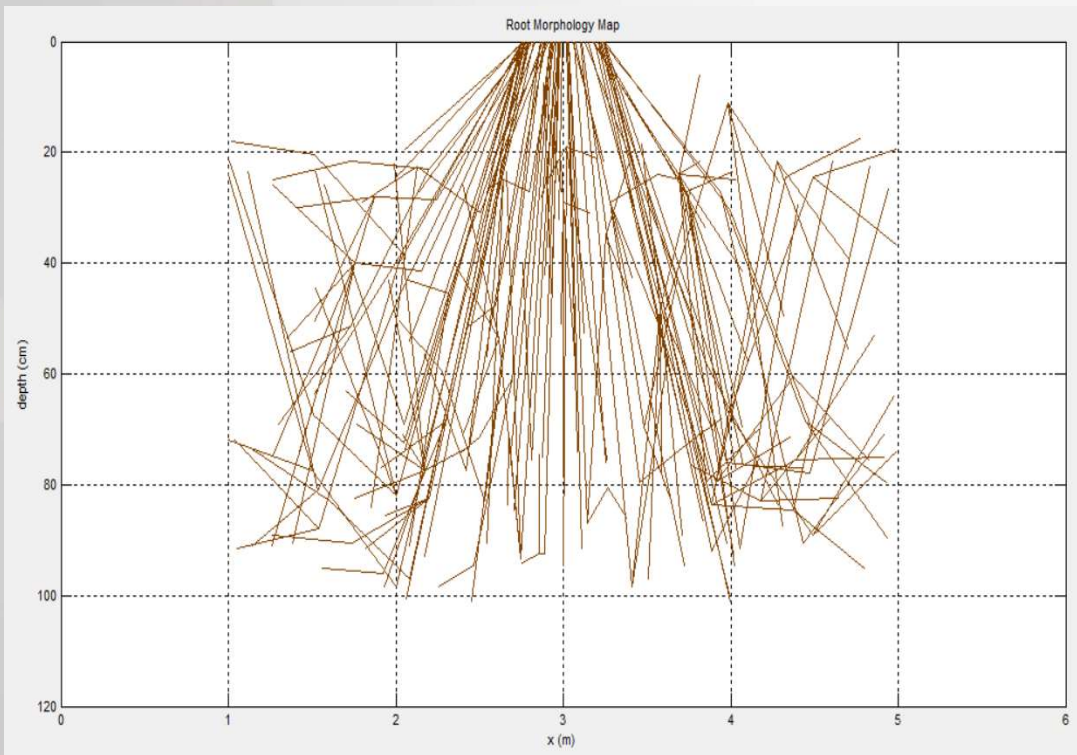


Control Tree



Virtual Trench Scan

■ StrataCell/RootSpace vs. Control Tree



Key Note: Control chart horizontal axis lines are at 2" depth increments, Stratacell / RootSpace at 8" increments.



UNCOMPACTED QUALITY SOIL CONTAINS

- ☐ Structure
- ☐ Aeration
- ☐ Humus
- ☐ Nutrient
- ☐ Macro & Micro Pores
- ☐ Organic Matter
- ☐ Moisture



RootSpace & Strata Cells

- ❑ Far more flexible to integrate into the highway and urban realm.
- ❑ Space saving SUDS tree pit design
- ❑ Tree buildouts



ROOTSPACE®

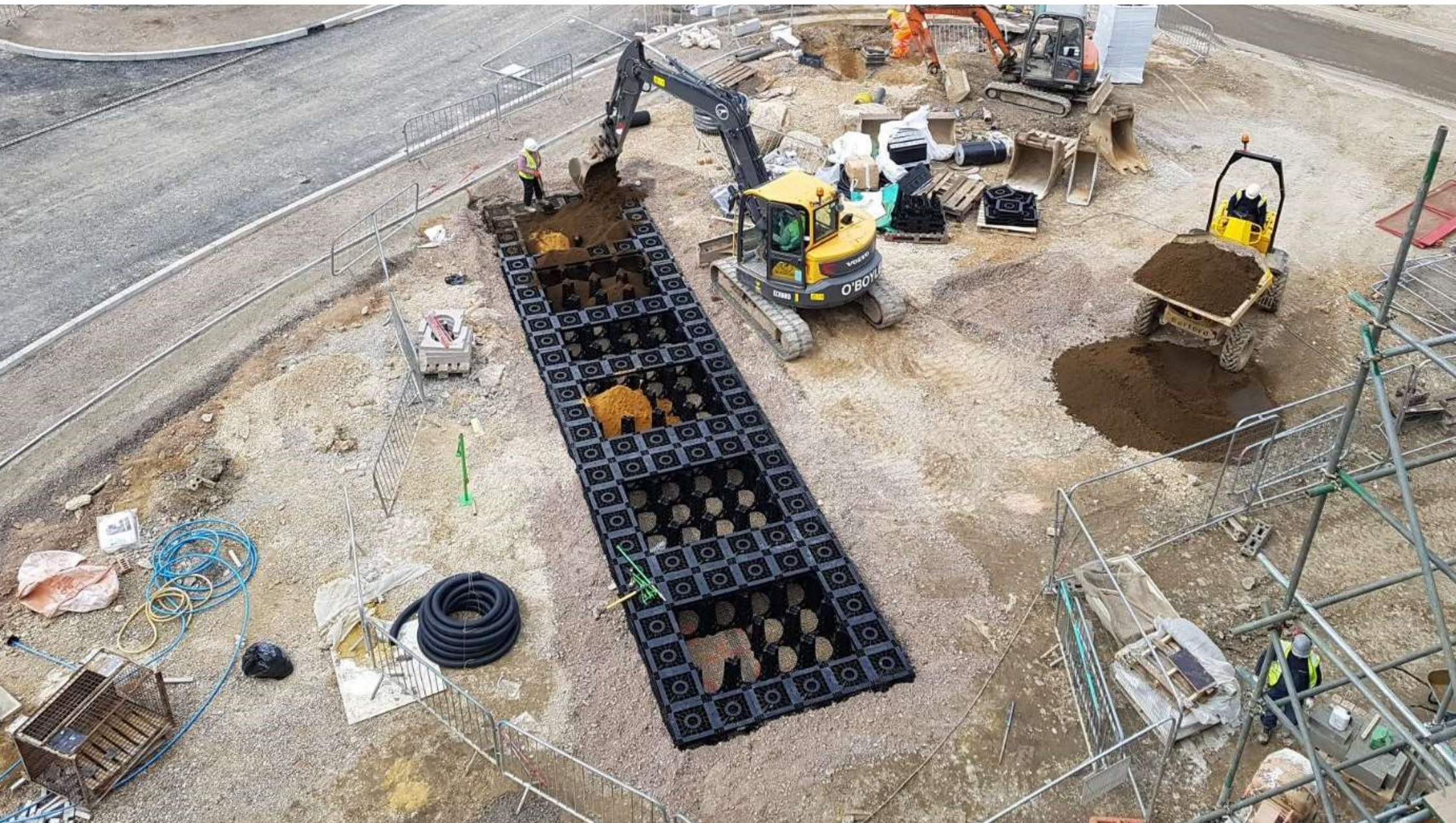
Completely new soil
panel system.

- ☐ Water attenuation layer
- ☐ Easy soil fill
- ☐ Designed for optimal aeration
- ☐ Recycled material
- ☐ Designed for utility access



ROOTSPACE **600**







HOWEVER –
THIS IS NORMAL

Do not despair.





ROOT MANAGEMENT

- ☐ Ribbed RootBarrier
- ☐ Flat RootBarrier
- ☐ RootDirector
- ☐ RootForm



Successful Urban Trees:

TREE IRRIGATION & AERATION

- ☐ RootRain Metro
- ☐ RootRain Urban
- ☐ RootRain Civic
- ☐ RootRain Hydrogrille
- ☐ RootRain ArborVent





Stormwater Management

ArborFlow

GreenBlue
URBAN

Establishing the future urban landscape



WATER RESILIENT CITIES:

Interreg 2 Seas Mers Zeeën Water Resilient Cities

European Regional Development Fund



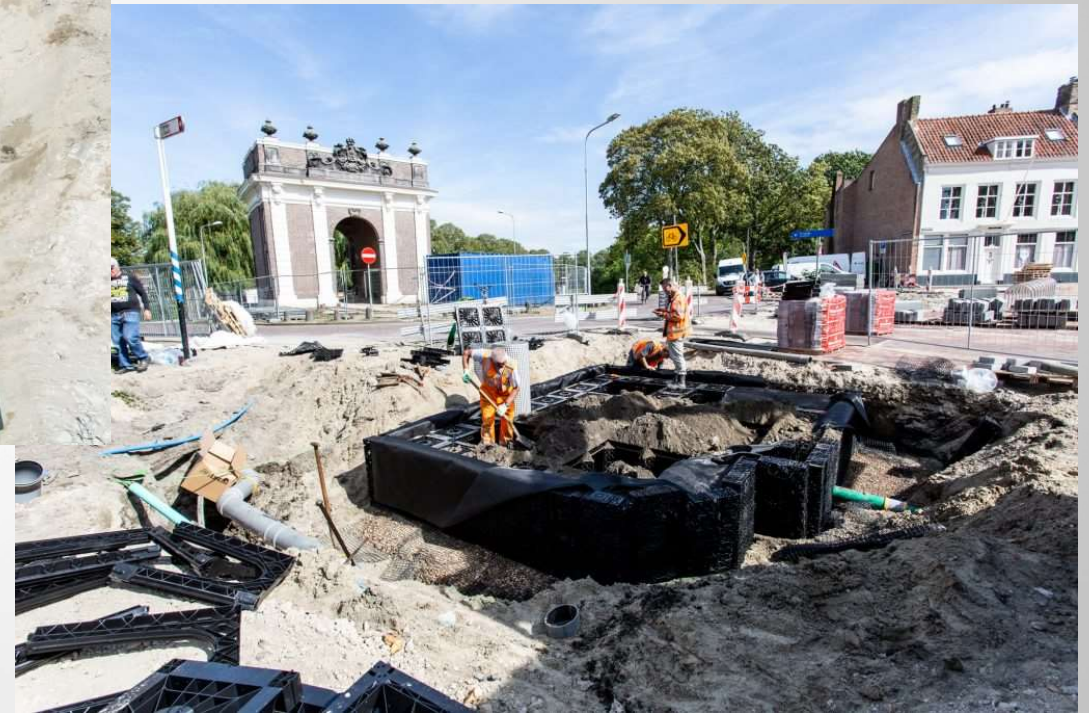
EU Interreg & WRC



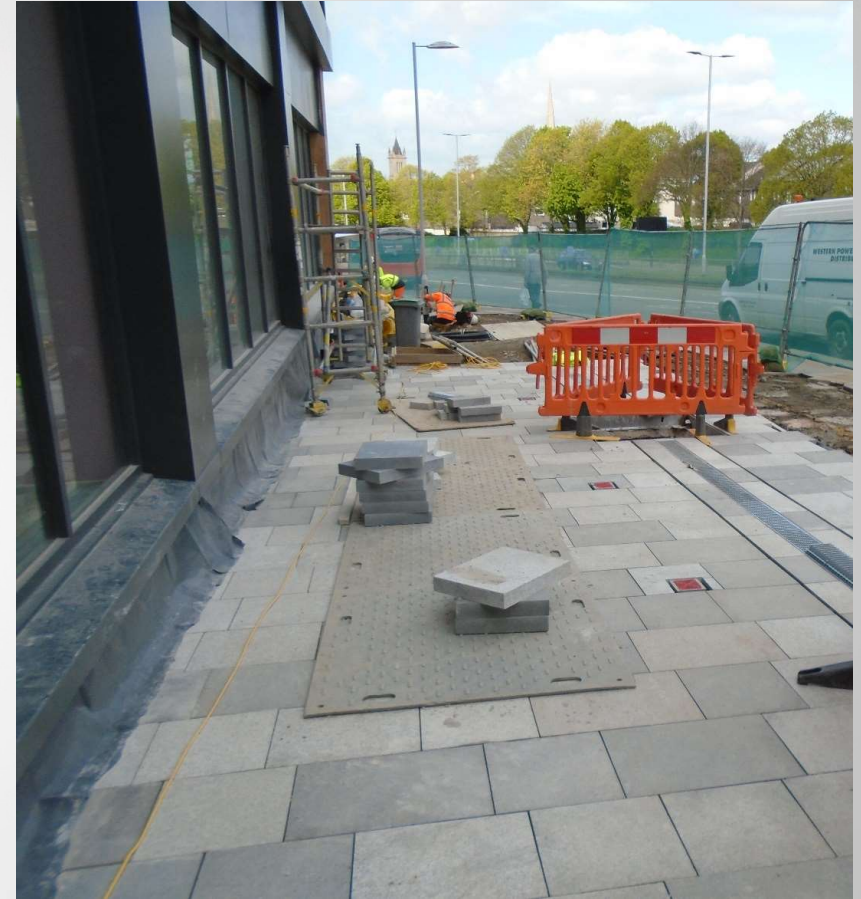
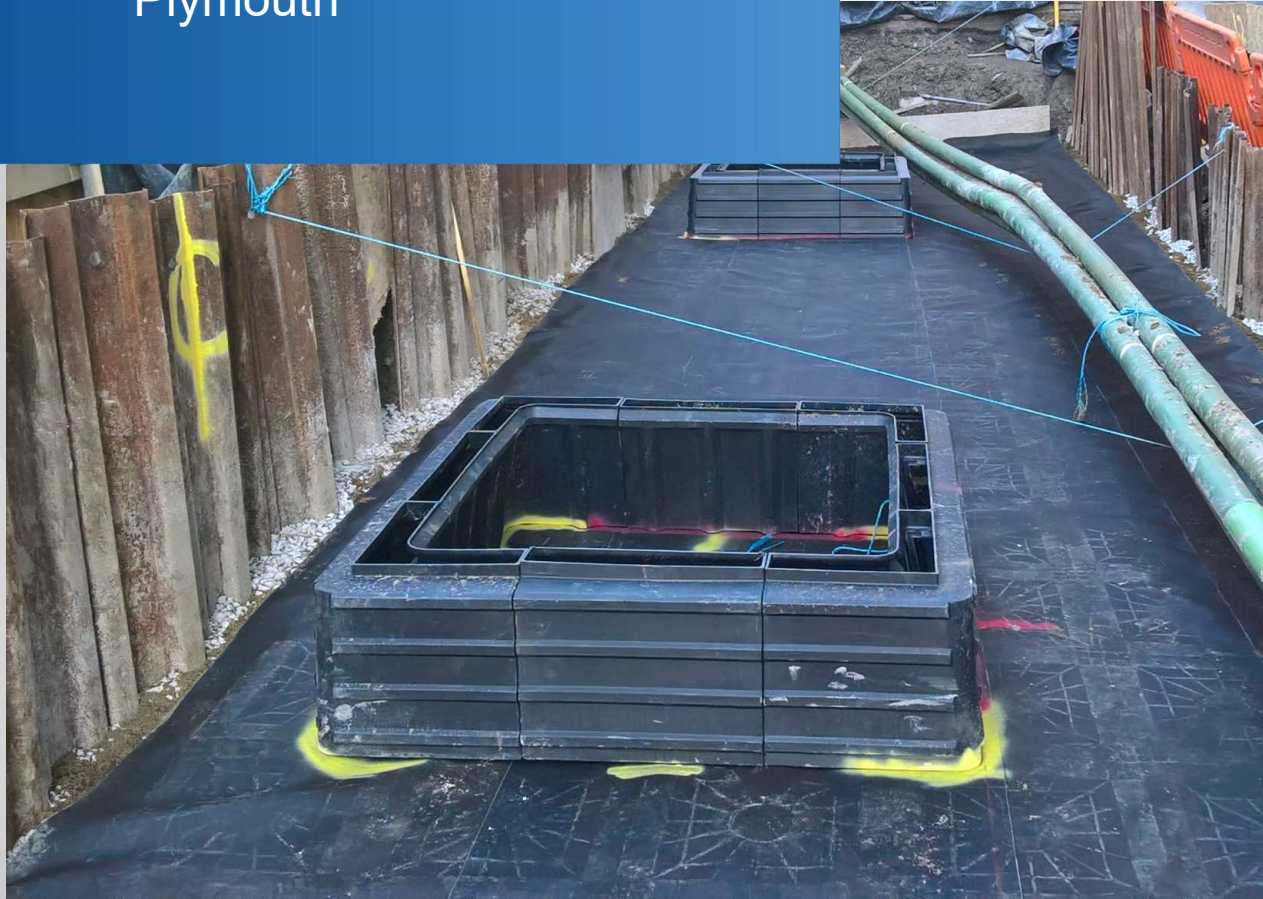
Interreg 
2 Seas Mers Zeeën
Water Resilient Cities
European Regional Development Fund



Water Resilient Cities: Middleburg Test Site



Trialing The Benefits In Plymouth



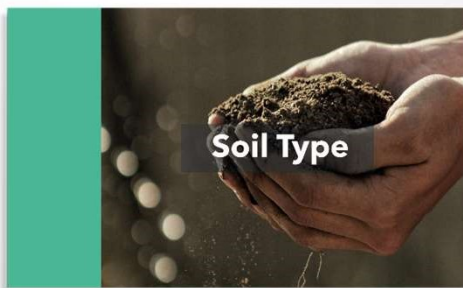
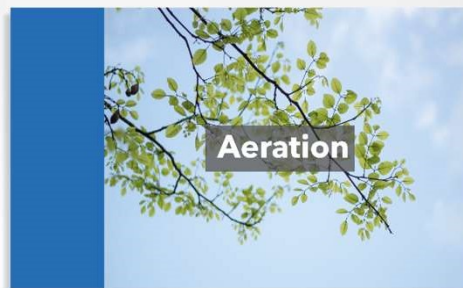
CANOPY INTERCEPTION

And other benefits.



KEY ELEMENTS

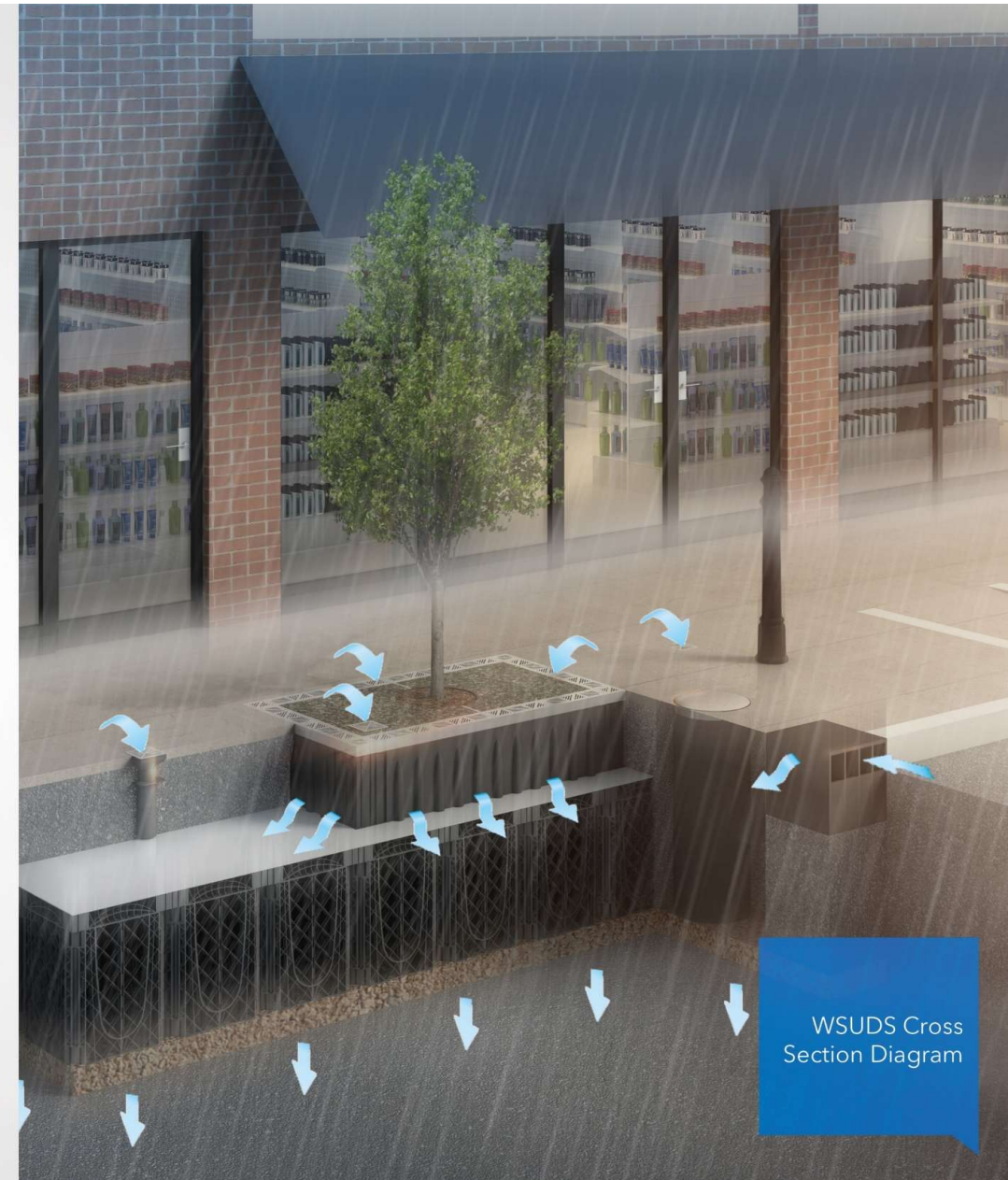
Unlocking the Green Potential
of Trees in Urban Space



SUDS AND THE URBAN TREE

Why are trees a vital component of the wider SUDS plan?

- Far more flexible to integrate into the highway and urban realm
- Space saving SUDS tree pit design
- Tree buildouts



Unlocking the Green Potential
of Trees in Urban Space



TYPICAL SUDS TREE PIT BUILD UP





BELOW GROUND CONSTRUCTION



ARBORFLOW ASSEMBLY

GreenBlue
URBAN



PAVING BUILD UP





COMPLETED PROJECT

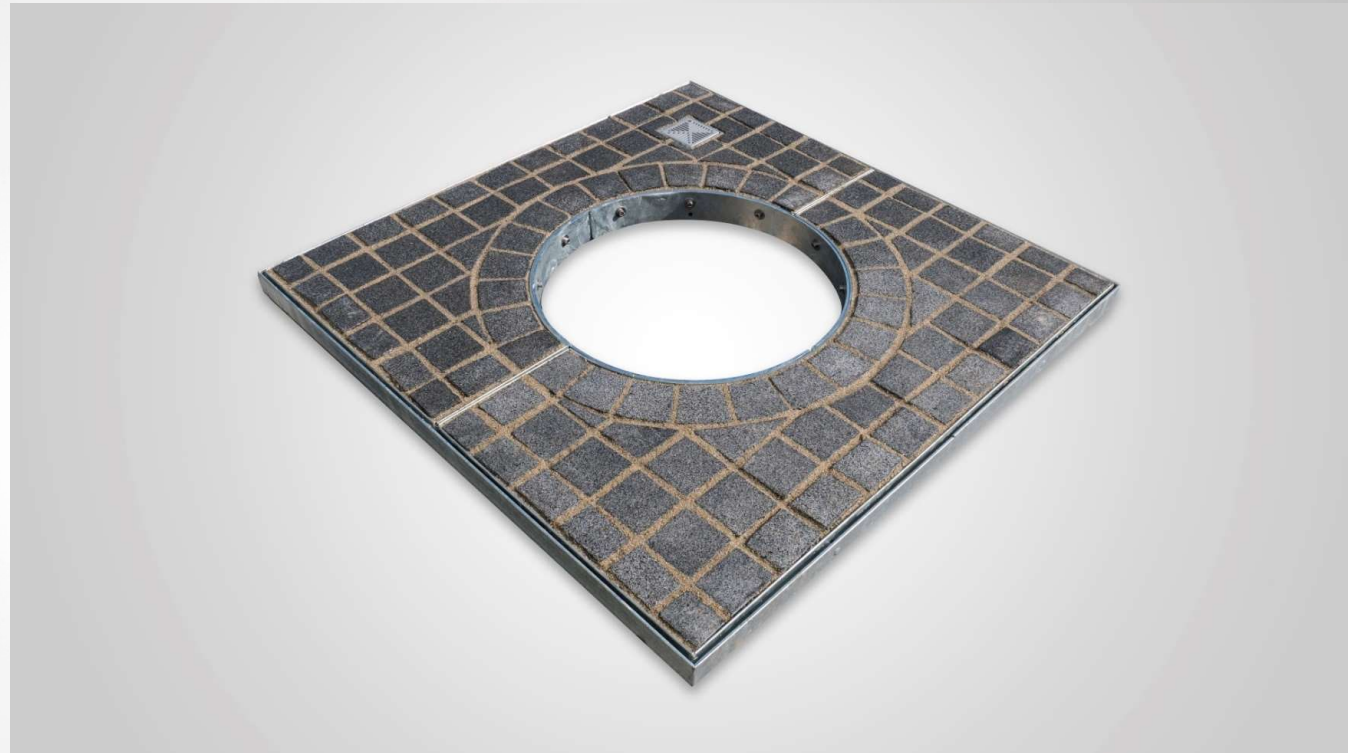
On this project
eight trees provide
a **minimum**
combined storm
water capacity of
19,600 Litres.



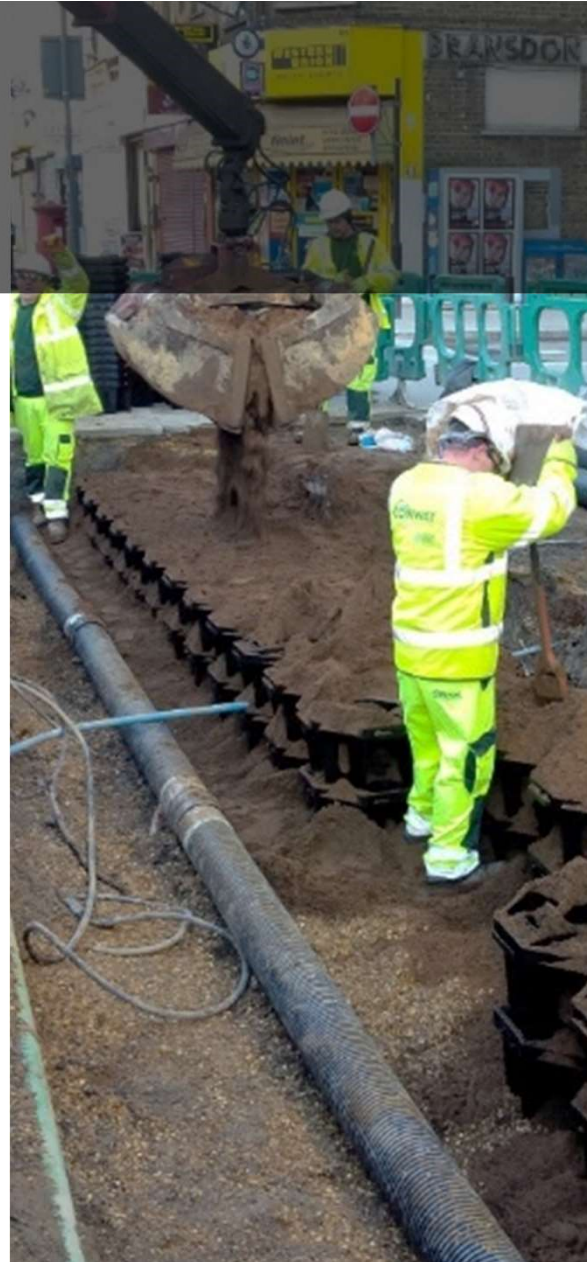
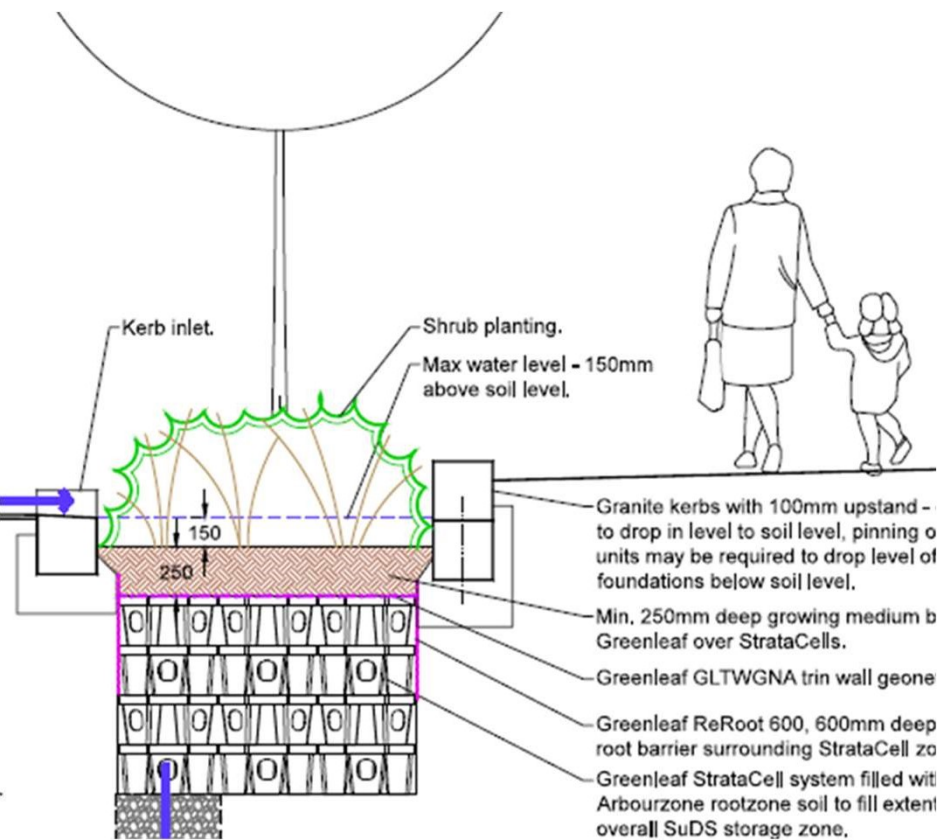
Successful Urban Trees:

SUDS TREE PIT SURFACE OPTIONS

- ☐ Permeable
- ☐ ArboResin Surfacing
- ☐ Precast ArboResin
- ☐ Heel safe
- ☐ Compatible Tree Guards



CONCEPT TO COMPLETION



Case study:
Greener Grangetown









THE PRINCIPAL COMPONENTS

- Load bearing soil cell or panel structure
- Root Management
- Control Chamber - Inlet & outlet control
- Drainage
- **ArborFlow**
 - Kerb Inlet / Curb Inlet
 - Permeable Paving
 - Traditional gutter
 - Weir Inlet



Marylebone High Street



Case study: Keighley, North Street

Stormwater runoff is diverted away from the sewer system through the tree pits, and finally drained away using ground infiltration where possible.



Case study:
Keighley, North Street



Case study:
Ocean Road



Installation with services



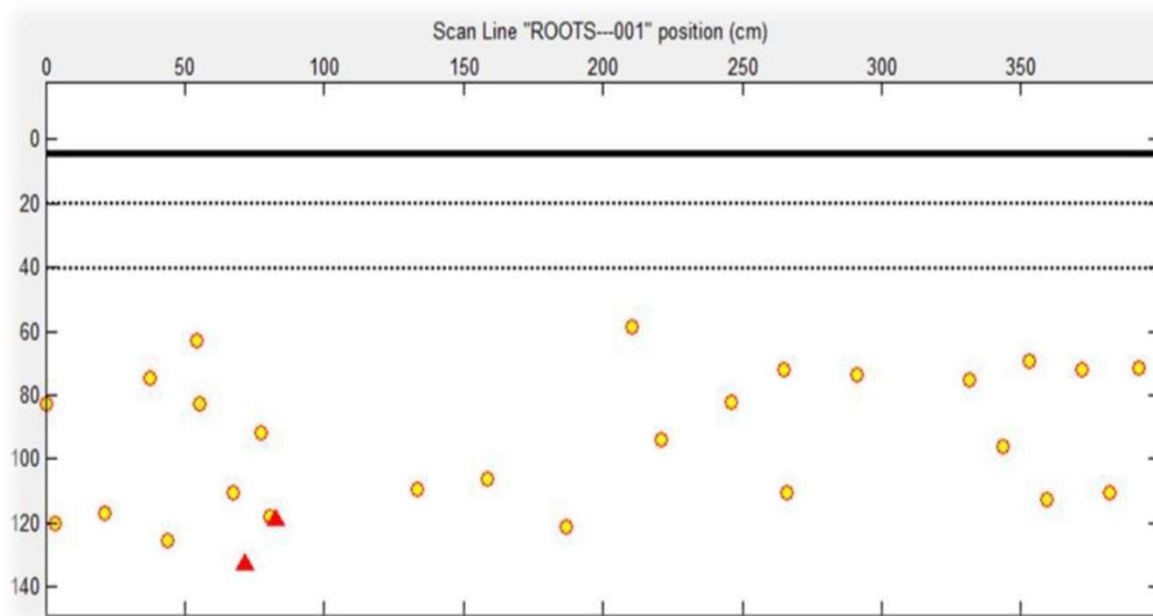
Completed successful installation

Case study:
**Blackheath,
Greenwich**



Restal Radar - 12 years on

THE RESULTS



Case study:
**Fletton Quays,
Peterborough**









WHAT DO WE OFFER?

- ☒ Technical Assistance
- ☐ Design Service
- ☐ On Site Support



WHAT DO WE OFFER?

☐ Technical Assistance

☒ Design Service

☐ On Site Support

© Copyright GreenBlue Urban

All dimensions and details are approximate and must be checked on site not scaled from the drawing.
No part of this drawing can be reproduced or transmitted by any means electronic or mechanical including photocopy without prior permission in writing from GreenBlue Urban.
Package includes the following GreenBlue Urban products per tree:

GBURAC600A RootSpace uprights - 132 No. 500mm x 500mm x 600mm per tree

GBURAC500A RootSpace Airflow deck - 56 No. 500mm x 500mm x 70mm

Rootsoil 20 to fill RootSpace and RootDirector spaces (including root ball volume) - allow 10 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 recommendations - allow 200g per tree

RRHYDR1A RootRain Hydrogrille single inlet aeration/irrigation system with cast inlet

RRARBV150A Arborvent 150 Double Inlet aeration/irrigation system with cast inlets including 2m 100mm diameter pipe

RD1000-RS RootSpace RootDirector - medium

GLTWGNA twinwall geonet - 18 sq. m

GRN20 plastic open reinforcing mesh, 20mm aperture - 38 sq. m

SASLCB Arborguy strapped anchor system - large

ULLSSP6A Ullswater vertical steel tree guard with round angle-section rings, 16mm round bars topped with 50mm diameter ball finials, finished in black

ADUR12B Adur 1200mm x 1200mm tree grille, finished in black, with galvanised steel support frame

Note:
Special drive rod kit required for SASLCB installation

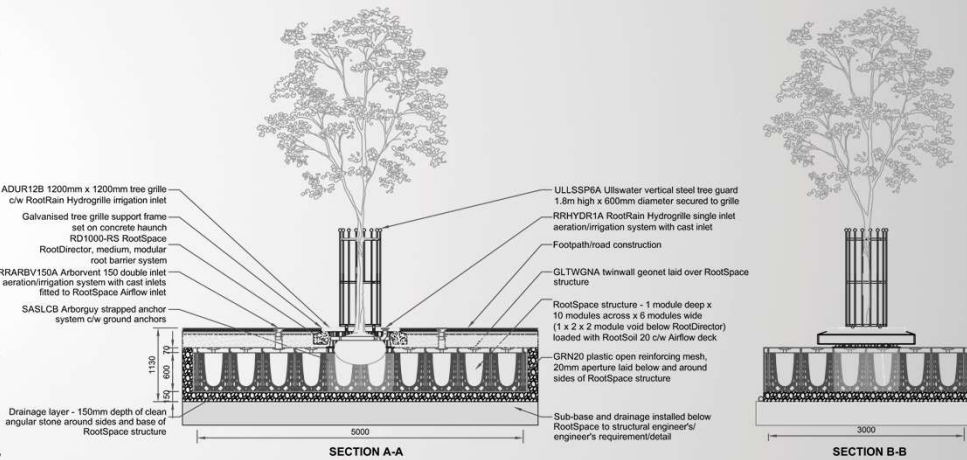
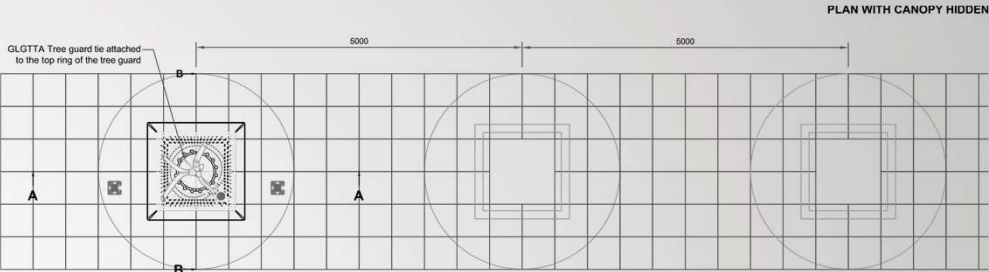
20% additional for with the Geotextile and Reinforcing Mesh to allow for overlap and cutting requirements

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

PROJECT
TREE PRODUCT PACKAGES

DRAWING TITLE
TREE PIT SYSTEM INSTALLATION
CONTINUOUS TREE TRENCH -
ROOTSPACE & 5m TREE SPACING



CLIENT

DRAWING NUMBER
GBU 2006

REV NO
A

DATE
FEB '17

SCALE
1:50 @ A3

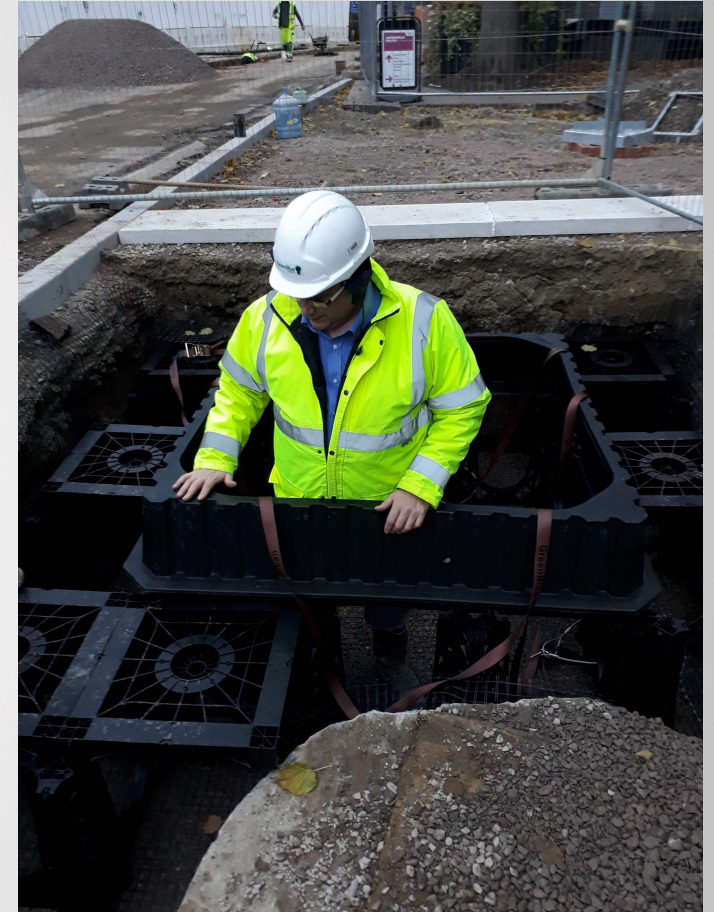
DRAWN BY
TES



Northpoint, Compass Park, Bodiam,
East Sussex, TN32 5BS
Sales and Service: +44 (0)1580 830800
Website: www.greenblueurban.com

WHAT DO WE OFFER?

- ☐ Technical Assistance
- ☐ Design Service
- ☒ On Site Support



CONDITIONS

How can we use smart, enforceable conditions to ensure that urban trees thrive and survive?



Size, volume of tree pit



Protection above ground



Support and infrastructure below ground



WSUDS Cross
Section Diagram



GreenBlue[®]
URBAN

GreenBlue[®]
URBAN



Establishing the future
THANK YOU
urban landscape