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# Highways & Climate Change SuDS in the Public Realm

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# Lambeth

*Population = 300,000 rising to 330,000+ 2025*

*Dwellings = an increase of 19% or 21,000 by 2025*

*Water demand rising to 9.8ml/day by 2025*

*98% Combined system @ 1:15 design*

*Sewage increasing by 158ml/day by 2025*

*14 Critical Drainage Areas (46,000 properties)*

*No natural watercourses*

# Opportunities?

## Land Use

Public Highway	15%
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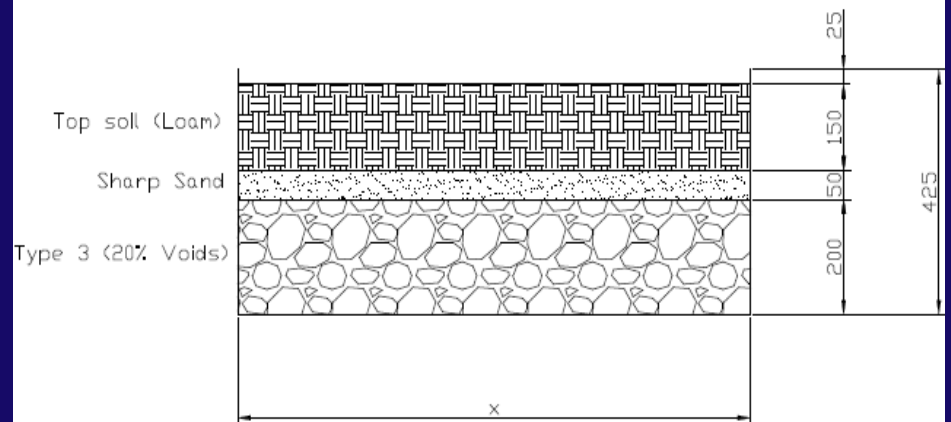
Parks & Open Space	17%
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Back gardens	28%
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# Lambeth Grass Verge

SuDS principles  
Designed for Surface Water  
Designed for amenity  
Easy re-instatement

Typical Lambeth "SuDS"  
Grass Verge X-Section



# Central Hill

Planned maintenance - The norm not the exception

Principle Road Network

Paved footway adjacent to Park

X-fall into road

Ground water

Separation of Public Realm

# Central Hill Before





# Central Hill After



# Benefits....





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# Streatham Common South

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Highway maintenance

Surface water run off issue

Inset rain garden

Extend the common

Is being modelled.

# Before







**Being tested**





# Finished Rain Garden.....





# Finished Verges.....





# Benefits...



# Modelled Outputs

## Rain Garden

1:2	100% attenuation of water entering
1:100	Delay of 110mins in a 6 hour storm

## Grass Verge

1:2	100% “soakaway” of surface water
1:100	remove 35% of surface water, 6 hour storm

# Alley Way

Identified by residents

Reinforced with a “Green Audit”

Re-surfaced

New planting areas

School and residents planting

They will maintain

New space?



# Alley Way Before





# Alley Way After



# Bird Walk – Planting Day 10-11-12



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# Costs

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Central Hill

£8m<sup>2</sup> cheaper

Streatham Common South

£7m<sup>2</sup> cheaper

Alley Way

£11m<sup>2</sup> cheaper



# Thorparch Road

Forms part of a CDA  
Historical evidence of flooding  
Forgotten/Abandoned  
Pocket Park application  
Opportunity to green  
Work with NEP scheme



# Thorparch Road





# Thorparch Road Before & After



# Crimsworth Road Before & After





# Fount Street Before & After



# Lambeth Green Streets

Ardlui Road & Chatsworth Way  
Risk from Pluvial flooding  
Historical evidence in the area  
Low maintenance/re-instatement  
DIY Streets/Green Streets  
Community/Resilience  
Door to Door – Water efficiency



# Lambeth Green Streets

Parking – Feb 2012 & 2013

Chatsworth 70% Most, 40% Lowest

Ardlui 27% Most, 10% Lowest

ATC – 20mph zone

85<sup>th</sup>ile Ardlui 28mph

85<sup>th</sup>ile Chatsworth 26mph



# Preferred “Design”

Size of two parking bays

Located near gullies for ease of design

3 options

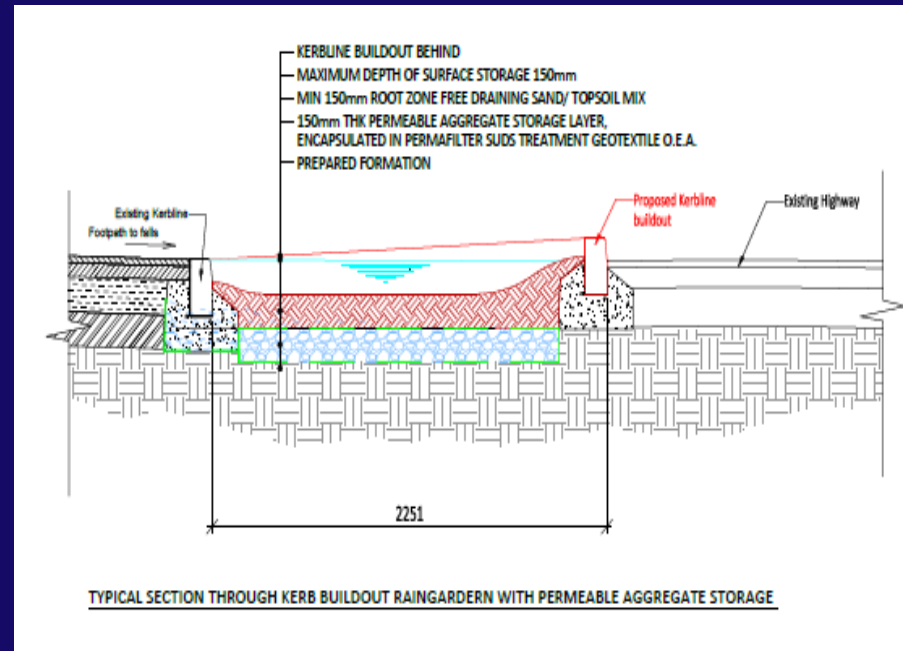
1 – Surface Storage only

2 – 20% voids storage

3 – Geo-cellular storage

Ease of re-instatement for utilities

Easy maintenance



# Modelled Outputs

## Best Case

Chatsworth 1:100 (medium infiltration)

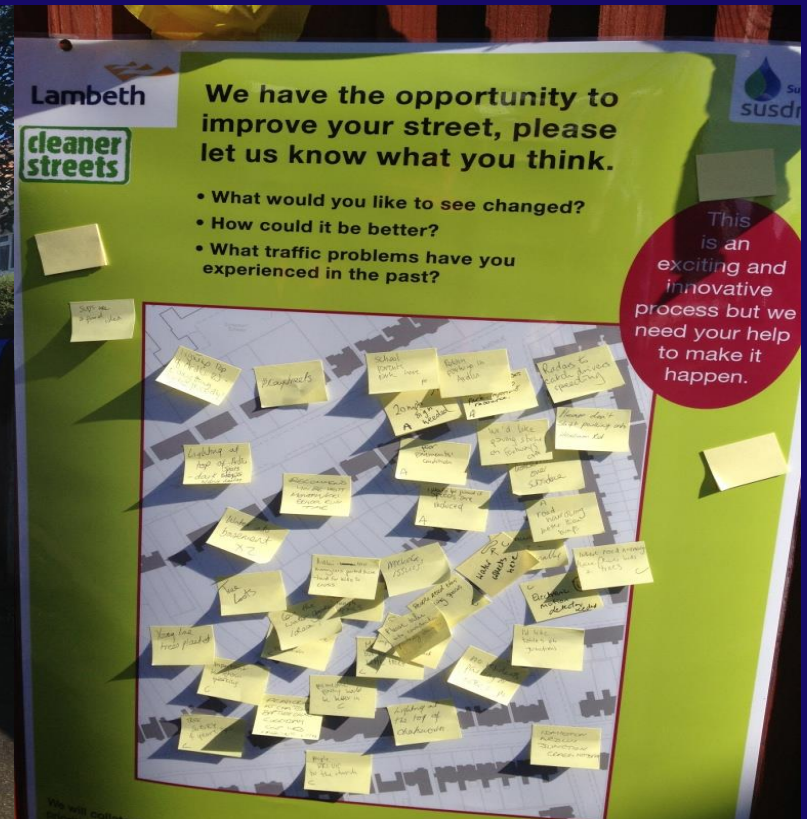
15min	16%	1440min	36%
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## Worst Case

Ardlui 1:100 (medium infiltration)

15min	4%	1440min	22%
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# Community Engagement 6-10-12





# Community Engagement 10-11-12



# Community Engagement 26-1-13





# Community Engagement 16-3-13

## THE DESIGN YOU CHOSE

On 26th January we showed you several design options asking you which one you preferred. You chose Option 3, a layout with a sinuous kerbing and large asymmetrical build outs, that achieve a strong traffic calming effect and offer space for tree planting at all junctions.

Many of you asked to avoid parking loss on Chatsworth Way. We have therefore changed the proposal to accommodate your comments. We removed all build outs and we propose to re-pave all accesses to driveways with permeable paving.

In addition, we will provide permeable paving across the pavement at the location of each tree (see drawing to the right and images below).

Permeable tree pit in Islington

Before

After

This layout will allow us to reduce the parking loss on Chatsworth Way to only 2 spaces to accommodate the build outs at the junction with Idmiston Road.

You asked us to provide a passing point on top of Ardlui Road. We reduced the width of the rain garden at that location to provide sufficient width for a car and a lorry to pass each other, whilst ensuring cars do not park blocking traffic.

You chose not to have any coloured or patterned surface on the carriageway, therefore the only change in surface will be a conventional High Friction Surface at the junctions, to highlight the new layout.

**Minimise parking loss on Chatsworth Way**

We replaced all build outs with permeable paving in front of the driveways and permeable paving around the trees. This layout will reduce the parking loss on Chatsworth Way to only 2 spaces to accommodate the build outs at the junction with Idmiston Road.

**Provide a passing point**

The build out has been narrowed and moved north to allow a sufficient road width to allow vehicles to pass each other, whilst ensuring no cars park at this location.

**parking spaces**

Chatsworth Way 52 (currently 64)

Ardlui Road 30 (currently 56)

**Before**

**After**

Top of Ardlui Road - enhancing one build out will tighten the entry radius ensuring cars do slow down. A wider planted area will also enhance the gateway effect.

**Before**

**After**

Junction between Chatsworth Way and Ardlui Road - a larger build out on the right hand side ensures vehicles do not approach the corner at high speeds, whilst improving visibility the junction for vehicles coming from Chatsworth Way.

**Before**

**After**

Junction between Chatsworth Way and Idmiston Road - extending the kerbline in front of the church will provide pleasant landscaped area for people to linger, whilst on both sides will ensure vehicles slow down on Idmiston Road.



# Community engagement 11-5-13



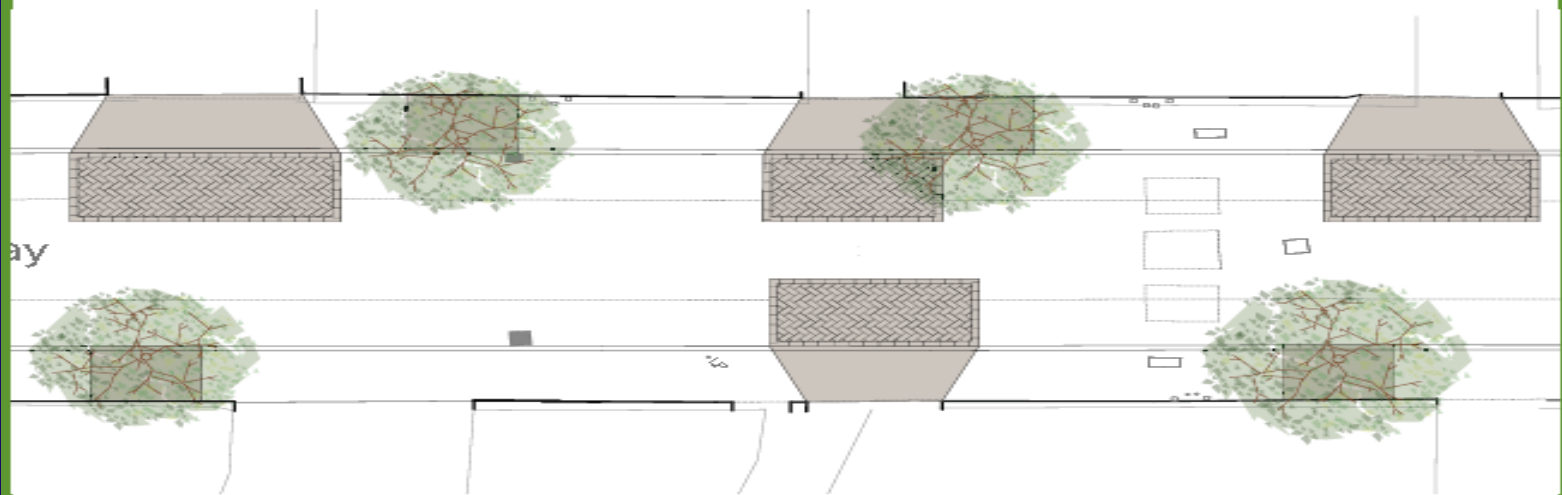
# Not all straight lines



# Not all Rain Gardens

## Minimise parking loss on Chatsworth Way

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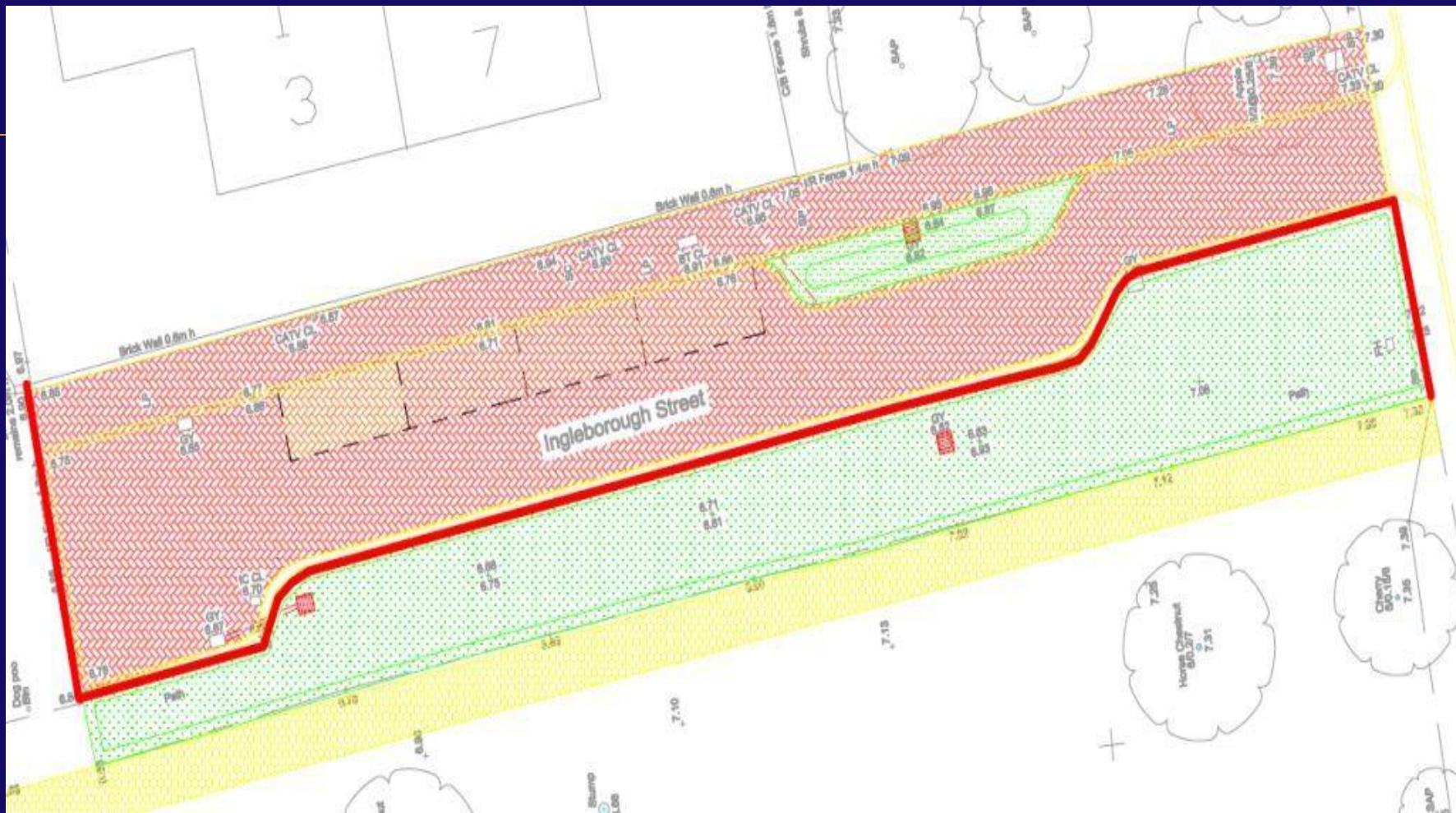


# Ingleborough Street

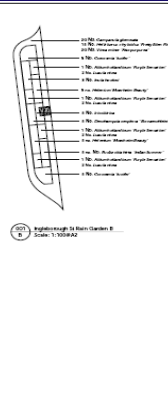
“forgotten” highway  
Serves 4 properties  
In a middle of a park  
Forrest of bollards  
Dead Space



# Ingleborough Street







001 Ingleborough Street Rain Garden A  
A Scale: 1:200 (8A2)



London 2000. *Hollabusch* = bebildeter Duden: Gross, Duden.



Type	Common Name	Scientific Name	Habit	Sunlight and Aspect	Description	Height (m)	Spread (m)	Flowering Period	Maintenance req.	Hardiness
Tree	Galley Pear	<i>Pyrus calleryana</i> 'Chanticleer'	Columnar deciduous tree	Full sun	Canonical medium-sized deciduous tree with glossy dark green ovate leaves, colouring well in autumn. White flowers followed by small brown fruits.	12+	4-8	April - May		Fully hardy
Shrubs	Black-eyed Susan	<i>Rudbeckia hirta</i> 'Indian Summer'	Herbaceous annual or biennial	Full sun or partial shade	Non-native. Spectacular yellow and black flowers.	0.5-1	0.3-0.5	June - October	Low maintenance. No pruning required	Hardy
	Dutch garlic	<i>Allium hollandicum</i> 'Purple Sensation'	Bulbous perennials	Full sun	Non-native. 145 tall, upright stem which bears a tight circular purple flower heads.	1	0.1-0.5	May - June	Low maintenance	Fully hardy
	Itala	<i>Isatis hookeri</i>	Herbaceous perennial	Partial shade	Tall clump forming with yellow flowers.	0.5-1	0.5-1	July - September	Cut back after flowering to prevent self seeding	Hardy
	Monarda	<i>Crocoma 'Jackie'</i>	Deciduous rhizomatous perennial	Partial shade	Naturalized. Red flowers. Thrives in moist conditions.	1-1.5	0.3-0.5	August - September	Low maintenance. No pruning required	Hardy
	Siberian flag	<i>Iris sibirica</i>	Rhizomatous perennial	Full sun or partial shade	Non-native. Blue flowers. Prefers moist but well drained soil.	1-1.5	0.1-0.5	June - August	Remove any dying foliage in autumn	Hardy
	Steezweed	<i>Hebe 'Monarda Beauty'</i>	Herbaceous perennial	Full sun	Non-native. Clump forming with red flowers.	1-1.2	0.1-0.6	June - August	Difficult to prolong flowering	Fully hardy
Stinking herb	Stinking herb	<i>Hebe 'Monarda Beauty'</i>	Evergreen perennial	Full sun or partial shade	Native. Winter flowers.	0.5-1	0.1-0.5	January - April	Low maintenance	Fully hardy
	Tufted hair grass	<i>Deschampsia cespitosa</i> 'Broombecker'	Evergreen grass	Full sun or partial shade	Compact evergreen grass with dark green leaves and arching panicles of light brown spikelets in summer.	0.1-0.5	0.5-1	June - August	Low maintenance. Cut back old stems to the ground in early spring before growth resumes.	Hardy
Border	Bellflower	<i>Campanula glomerata</i>	Rhizomatous perennial	Full sun or partial shade	Native. Clumps bearing vibrant blue bell-shaped flowers.	0.1-0.5	0.5-1	June - July	Low maintenance. Cut back after flowering to prevent self seeding and to encourage a second flush of flowers.	Fully hardy
Herbaceous	Elephant's ear	<i>Alcantara cordifolia</i> 'Purpurea'	Rhizomatous, evergreen perennial	Full sun or partial shade	Non-native. Large leaves and pink flowers.	0.1-0.5	0.1-0.5	March - April	Low maintenance. Remove faded flower spikes.	Fully hardy
	Leiden rose	<i>Helleborus x hybridus</i> 'Pretty Ellen Pink'	Evergreen perennial ground cover	Partial shade	Clump forming. Large, bowl-shaped flowers.	0.3	0.3	February - April	Low maintenance. Remove faded, damaged, or dead foliage when flowers appear.	Fully hardy
	Lesser periwinkle	<i>Viola minor</i> 'Atropurpurea'	Evergreen perennial ground cover	Any	Non-native. Ground cover with blue flowers.	0.2	1-1.5	April - September	Low maintenance.	Fully hardy
	Stoney woodrush	<i>Luzula nivea</i>	Evergreen perennial	Partial shade or full shade	Loose clumps topped in midsummer with tall stems carrying elegant clusters of white flowers.	0.1-0.6	0.1-0.5	June - July	Low Maintenance.	Hardy

Bordier



*Claytonia rubicunda* - *Commensals of humans*

Tree





# Brockwell Park

Loss of natural ponds (Lido)

Water tends to shed into Dulwich Road (Summer events)

Park is heavily used

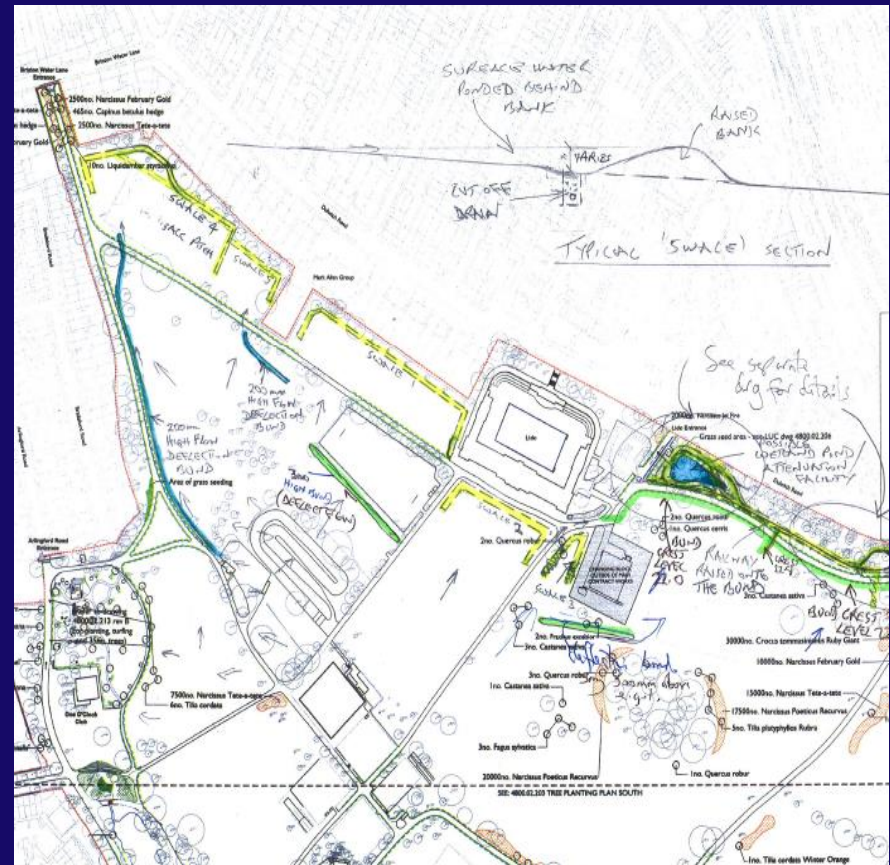
Compacted soils

Source of revenue generation -  
fire works, country show, circus,  
fun fair circa 500k people.

Protected landscape

Competing demands – Good  
drainage for revenue

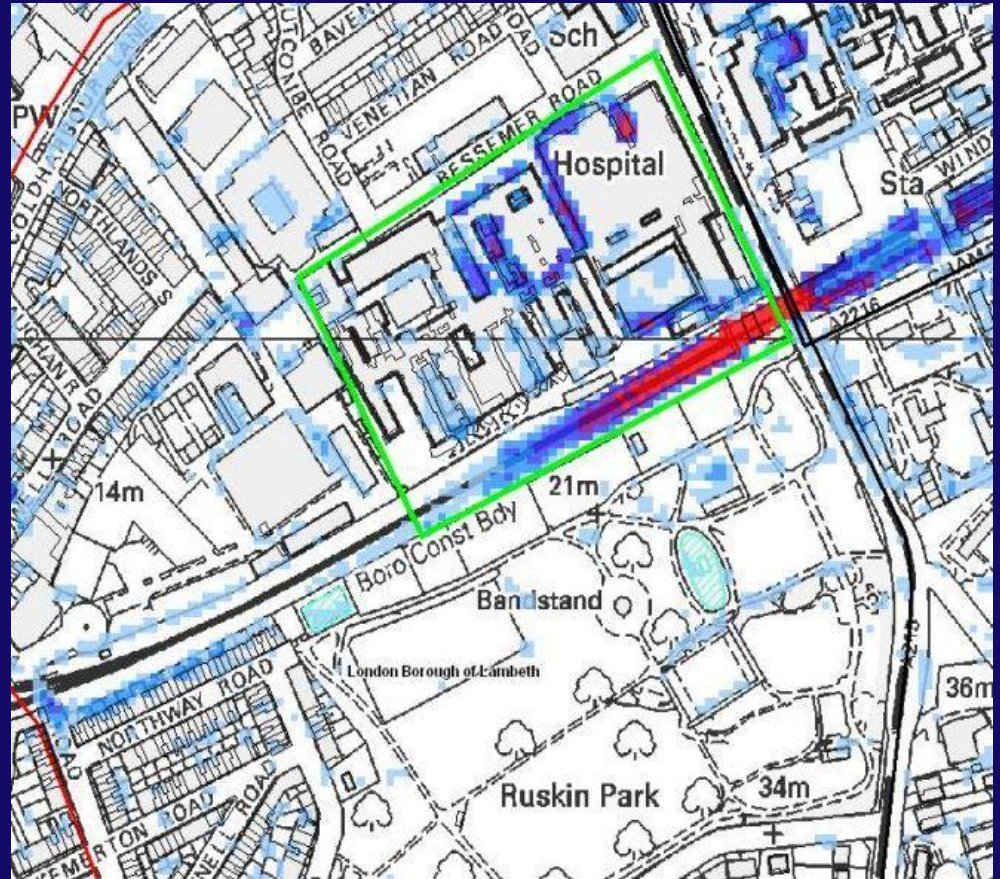
Amenity - Essential



# Ruskin Park

Kings College Hospital  
Denmark Hill Station  
Camberwell CDA  
Properties to the West

Potential to divert flows  
Amenity  
London Air Ambulance  
Therapeutic Landscape?

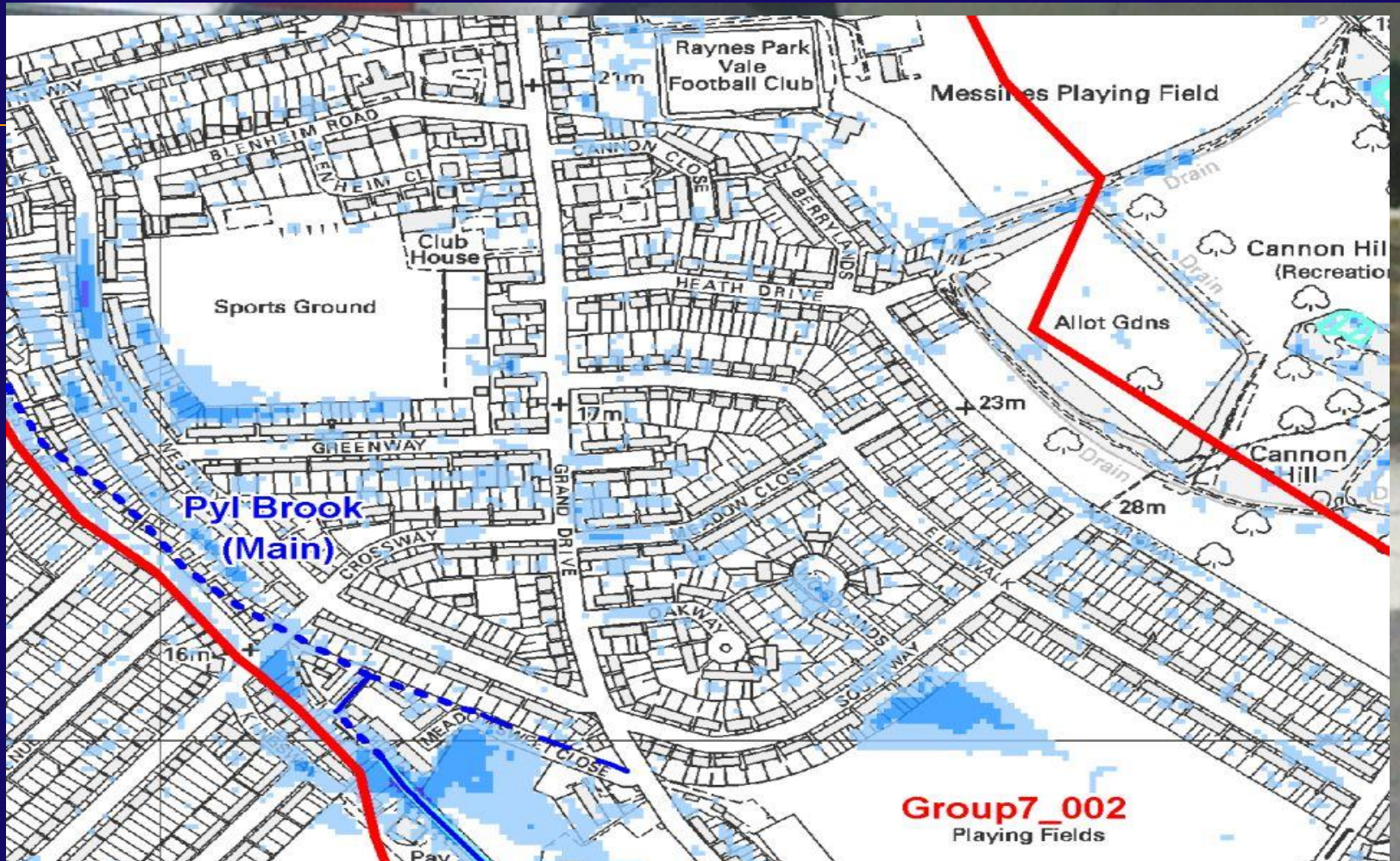


Swale to control Spring  
Overland Flow exceedance  
Properties affected  
Highway affected  
Winter Service issues  
Amenity





# Why Depave?



# Depave

Two front gardens – 22<sup>nd</sup> September 2012

Advertised on Project Dirt

We supplied

- Materials (Soil, pea shingle)

- Tools (picks, shovels)

- Gang to help and show what to look for

- Removal of spoil

Two gardens four hours – removed 40% hard surface

Enabled residents – Skills & Resources

Community Freshview/Groups of residents

# Depave







# Green Roofs

Training for 25 residents

Small scale green roofs

One of the tools for Surface  
Water Management not the  
answer

Multiple benefits

Fun day

Will be repeated, budget agreed



# Urban Wild Project

Resident led  
Businesses benefit  
Community benefits  
Bio-diversity  
Urban Heat Island  
Visual impact  
Food Production  
Resilience  
Event 9<sup>th</sup> June 2013





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# LFRMS Residents Survey

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Survey ran for 6 weeks

Help inform the development of LFRMS

Overall

96% residents support Depave

86% residents support Highway Rain Gardens

90% residents support new grass verges

96% residents support green roofs

# LFRRMS Comments

*“A step by step guide to give a hierarchy of most beneficial ways to achieve reduction , in terms of no-brainer, quick wins, weekend job, longer term ..... “*

*“Availability of general information and with encouragement and enabling of establishment of rain gardens in public and private spaces with information on site describing there function”*

*“green rooves, green car parks, front driveways made from porous materials - can we get a subsidy to convert ours?”*

**“AFTER ALL THIS IS NATURES WAY OF REDUCING FLOODING. IT SHOULD BE A LEGAL REQUIREMENT “**

# Why?

Flood risk - Surface water

Amenity - Aesthetics

Health & Wellbeing

Urban heat island

Bio-diversity

Place and space – Public realm for all to enjoy!!!

Pollution - WFD

*Highway surface water run off is the largest polluter of water bodies, Nitrates, Phosphates & Sediment*



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