

# Raingardens in Highways

## Thames Water Surface Water Management Programme

Hackney

**Kayan Cheng**

**Senior Engineer (SuDS) – Highways**

Kayan.Cheng@hackney.gov.uk

8th April 2022

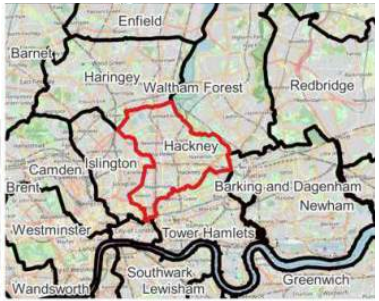
Hackney

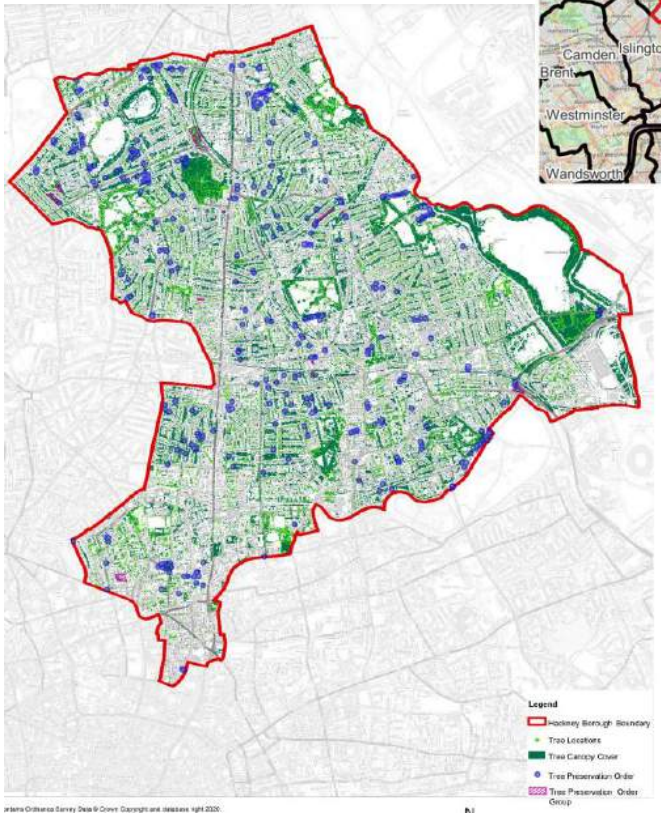

Designing Rain Gardens:
A Practical Guide

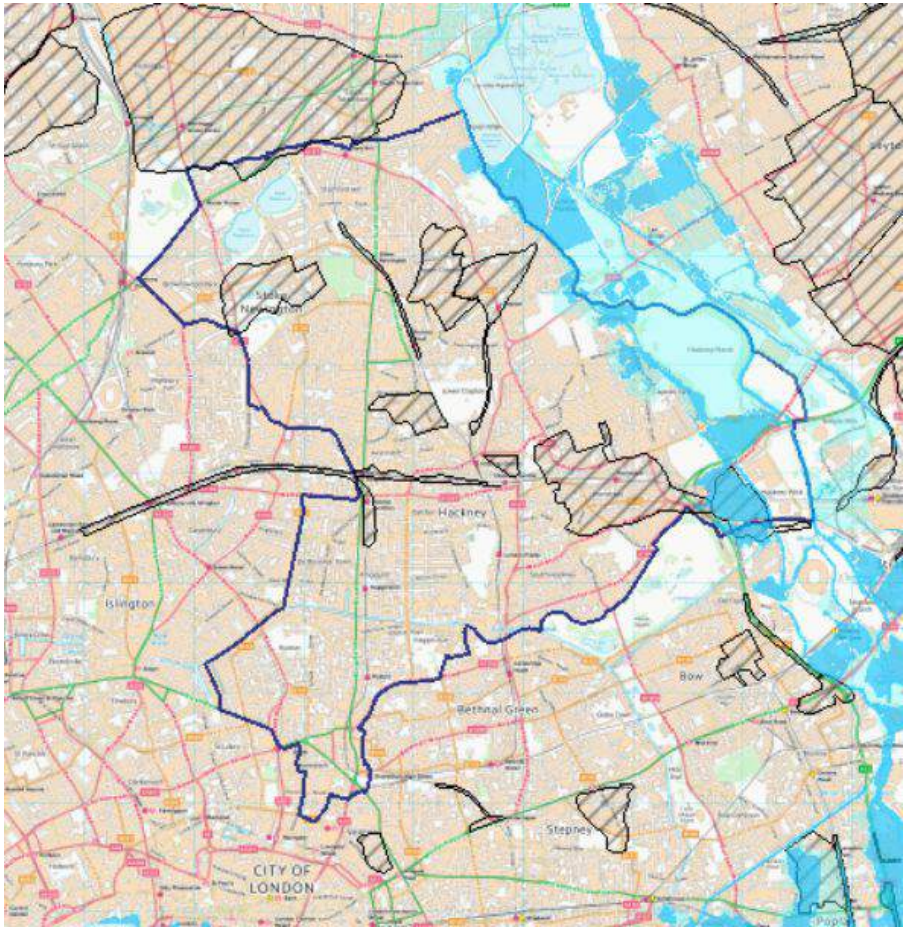
Urban Design London

Hackney

# Background



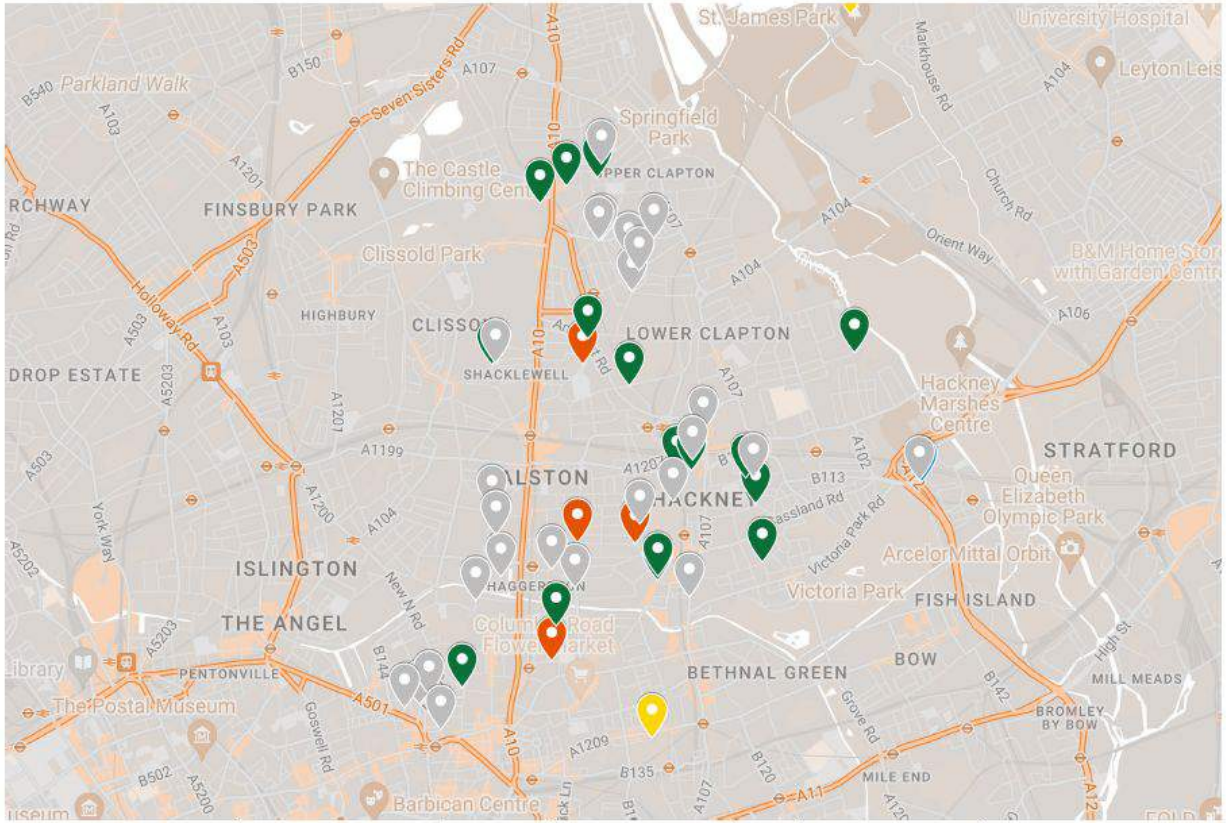



Hackney

# Site selection


Hackney

# SuDS map



Hackney

# SuDS scoring

| Criteria | 1 | 2 | 3 |
|---|---|---|---|
| CDA | No | Within 10m of CDA | Yes |
| SW flood risk | L (1 in 1000 year) | M (1 in 100 year) | H (1 in 30 year) |
| Historic flood incident | None/minor ponding | Extensive ponding | Extensive flooding |
| Buildings in vicinity (within 50m) | Office | Retails/Commercial | School/residential/Hospital |
| Carriageway or Footway | Carriageway | Mixed | Footway |

| LEGEND | |
|---|---|
| Site name | Not approved |
| Site name | Complete |
| | |
| | |
| | |

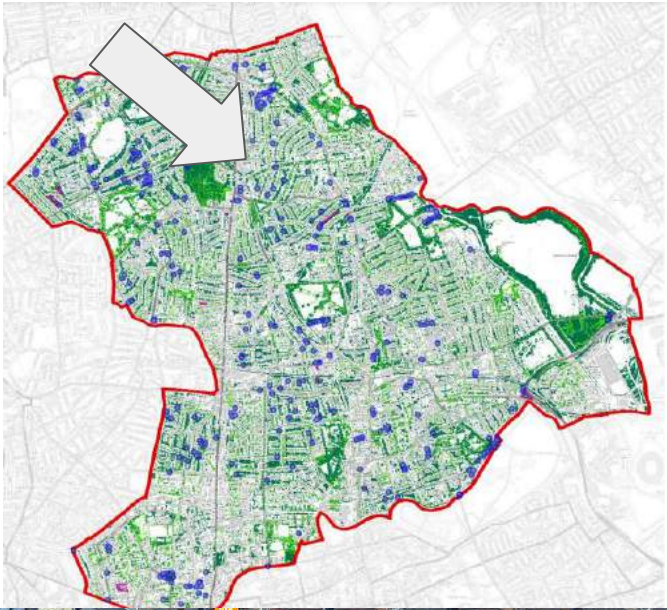
| | Last updated | 04/04/2022 16:30:48 | KC |
|---|---|---|---|

| Priority score | Score range | Programme timescale |
|---|---|---|
| 1 | 11-15 | Build this year or next |
| 2 | 6-10 | Build in next 2-3 years |
| 3 | 0-5 | Programme in long term |

| | | | | | | | | Priority check items | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ref. | Site name | Address | Ward | Work description | Status | Approved? | Last updated | CDA | SW flood risk | Previously flooded? | Use vicinity | Footway/Carriageway | Priority score |
| 1 | New North Road | Jct of Pitfields st & Fanshaw st | Hoxton West | Replace existing rose garden with 40 sqm raingarden | Complete | Yes | 20/12/2021 | 1 | 2 | 2 | 2 | 3 | 10 |
| 2 | Windus Road | O/s house no. 7-45 | Cazenove | 80sqm linear raingarden with 4no. new trees | Complete | Yes | 27/01/2022 | 1 | 2 | 2 | 3 | 3 | 11 |
| 3 | Eastway/Chapman Rd EAST | Jct of Wick Rd & Chapman Rd | Hackney Wick | 50sqm raingarden | Construction | Yes | 27/01/2022 | 3 | 2 | 3 | 2 | 3 | 13 |
| 4 | Eastway/Chapman Rd WEST | Jct of Wick Rd & Chapman Rd | Hackney Wick | 50sqm raingarden | PCI | Yes | 13/10/2021 | 3 | 2 | 3 | 2 | 3 | 13 |
| 5 | Benfleet Court | Jct of Queensbridge Rd, btn Belgrave House & Flat 1 Benfleet Court | Haggeston | 50sqm raingarden | Outline | Yes | 08/10/2021 | 1 | 2 | 1 | 3 | 2 | 6 |
| 6 | Lee Street/Haggerston Road | Corner of Lee St & Haggerston Rd, o/s 1-79 City Mill apartments | Haggeston | 50sqm raingarden | Outline | Yes | 08/10/2021 | 1 | 1 | 1 | 3 | 3 | 9 |
| 7 | Culford Road | Junction with Ardleigh road and extends northwatds to the section o/s house 116 | De Beauvoir | 60sqm raingarden | Outline | Yes | 08/10/2021 | 1 | 1 | 1 | 3 | 3 | 9 |
| 8 | Northchurch Terrace | | De Beauvoir | 160sqm raingarden | Outline | Yes | 08/10/2021 | 1 | 1 | 2 | 3 | 1 | 8 |
| 9 | Westland Place | O/s 193-195 City Rd | Hoxton West | 50sqm raingarden | Outline | Yes | 08/10/2021 | 1 | 1 | 1 | 2 | 1 | 6 |
| 10 | Appleby Road | O/s house no. xx, xx, xx & xx | London Fields | 50sqm raingarden | Outline | Yes | 08/10/2021 | 1 | 3 | 1 | 3 | 1 | 9 |
| 11 | Northwold Rd/Charnwood St | | Cazenove | 50sqm raingarden | Outline | Yes | 30/03/2022 | 3 | 3 | | 3 | 2 | 11 |
| 12 | Hertford Road | | De Beauvoir | | Outline | Yes | | 1 | 2 | 2 | 2 | 1 | 8 |
| 13 | Retreat Place Junction | Jct of Retreat Pl, Mead Pl & Rivaz Pl | Homerton | | Outline | No | | 1 | 3 | 2 | 2 | 1 | 9 |

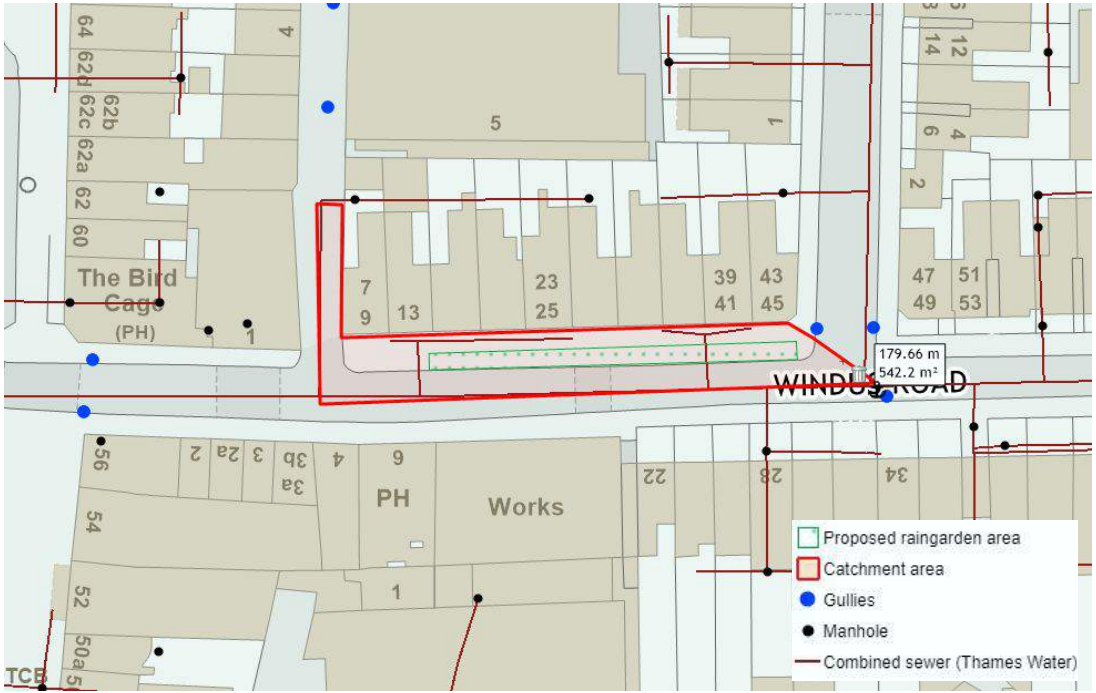
Hackney

# Windus Road





# Windus Road - initial design




Budget estimate £55k

50% funded by Thames Water

Effective contributing area (70%) = 380sqm

Cost effectiveness £72 per sqm

Raingarden specification:

80sqm raingarden surface area

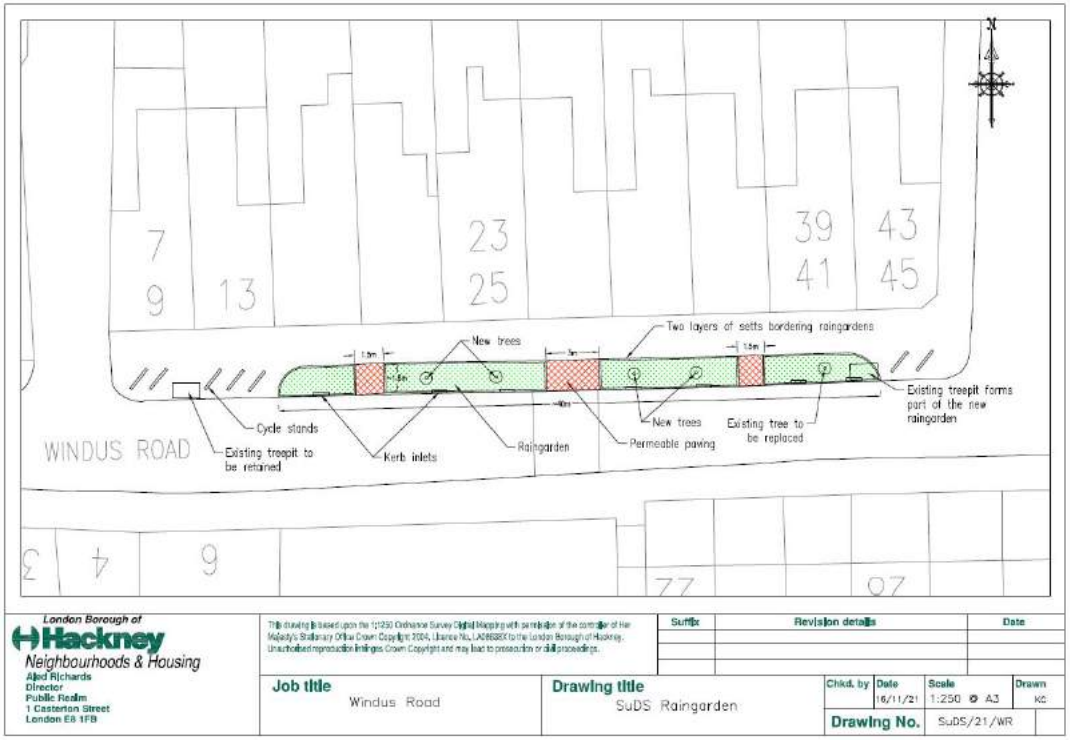
800mm total depth (50mm freeboard, 500mm topsoil and 250mm subbase)

Designing Rain Gardens: A Practical Guide

| Design standard | Depth of rainfall | Vol. of rainfall | Vol. of storage | Results |
|---|---|---|---|---|
| First flush | 5mm | 2.5 | 22 | Okay |
| 1 in 5 year | 30mm | 15 | 22 | Okay |
| 1 in 10 year | 35mm | 17.5 | 22 | Okay |
| 1 in 100 year | 50mm | 25 | 22 | Exceeded |

Rainfall design events, based on a 60 minute duration storm in the London area

# Project outcome




Budget estimate £55k vs Spent £41.5k

Include planting/ 18 months regular maintenance/ 8 no. boulders / 2no. bollards/ 7no. cycle stand

£25.6k on the construction of 65sqm of raingardens

Cost effectiveness to TW: £55 sqm

Difference:

- Reduced raingarden areas (from 80sqm to 65sqm)
- Removed permeable paving between raingardens
- Trees and some underplantings were supplied by the arboricultural team

| Design standard | Depth of rainfall | Vol. of rainfall | Vol. of storage | Results |
|---|---|---|---|---|
| First flush | 5mm | 2.5 | 17.9 | Okay |
| 1 in 5 year | 30mm | 15 | 17.9 | Okay |
| 1 in 10 year | 35mm | 17.5 | 17.9 | Okay |
| 1 in 100 year | 50mm | 25 | 17.9 | Exceeded |

Hackney

# Windus Road - before

# Windus Road - completion

Hackney

# Challenges

- Quantify benefits
- Limited overflows
- Any raingardens will be a betterment
- Construction will always be expensive in an urban setting
- Limited by the use of framework contractors
- Always help if you have the Highways engineers on your side

Hackney