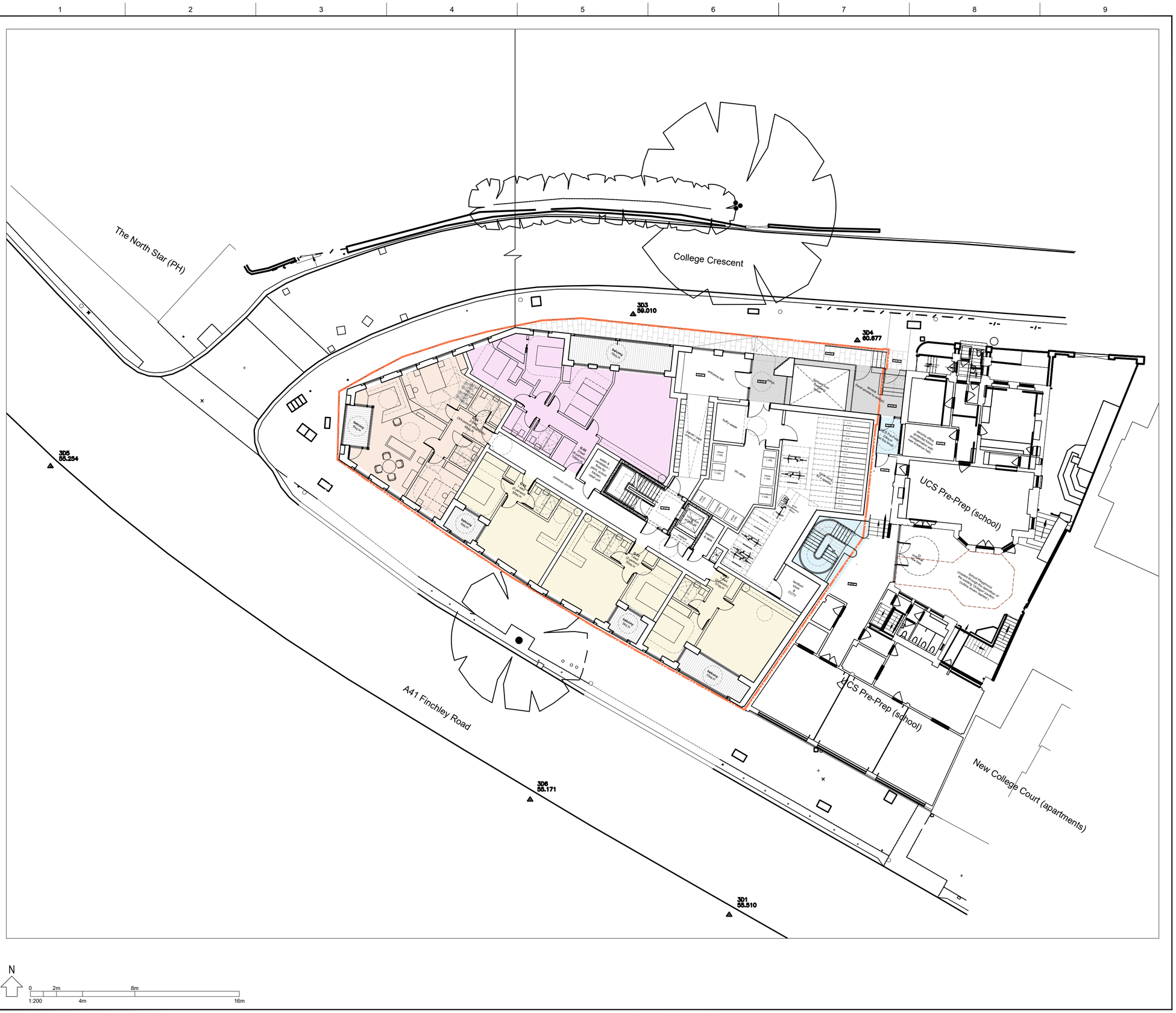

NOTES:

DO NOT SCALE. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING. CHECK DIMENSIONS ON SITE AND REPORT DISCREPANCIES TO THE ARCHITECT.

ALL AREAS HAVE BEEN MEASURED FROM CURRENT DRAWINGS. THEY MAY VARY BECAUSE OF (EG) SURVEY, DESIGN DEVELOPMENT, CONSTRUCTION TOLERANCES, STATUTORY REQUIREMENTS OR RE-DEFINITION OF THE AREAS TO BE MEASURED.

KEY PLAN:

Rev.	Date	Comment	Drawn	Checked
P3	25.04.22	Further revisions to access strategy & levels to account for steep slope of College Crescent (external hard landscape); residential stair & lift core and adjacent risers reconfigured to facilitate access to lower ground floor	REB	NH
P2	16.03.22	Revisions to access strategy & levels to account for steep slope of College Crescent (entrance hall / refuse store / cycle store / post); rationalised party wall line with UCS Pre-Prep	REB	NH
P1	06.12.21	Issued to Client for Concept Design sign-off	REB	NH

Issue Purpose

PRELIMINARY

tp bennett

One America Street London SE1 0NE | +44 (0)20 2408 2000 | www.tpbennett.com

Project

PFS Site, 104a Finchley Road
London NW3 5EY
(inc. adjacent UCS pre-prep)

Drawing Title

Upper Ground Floor Plan
Proposed

Drawn	Date	Scale @ A2	Alt. Ref.
REB	NOV' 2021	1:200	

tp bennett Project No.	Drawing Number	Rev
A12003	D 0100	P3

NOTES:

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KEY PLAN:

Rev.	Date	Comment	Drawn	Checked
P3	25.04.22	Flat roof straddling party wall boundary amended; residential stair & lift core and adjacent risers reconfigured	REB	NH
P2	16.03.22	Revisions to levels; minor window amendments; rationalised party wall line with UCS Pre-Prep; canopy removed	REB	NH
P1	06.12.21	Issued to Client for Concept Design sign-off	REB	NH

Issue Purpose

PRELIMINARY

tp bennett

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Project

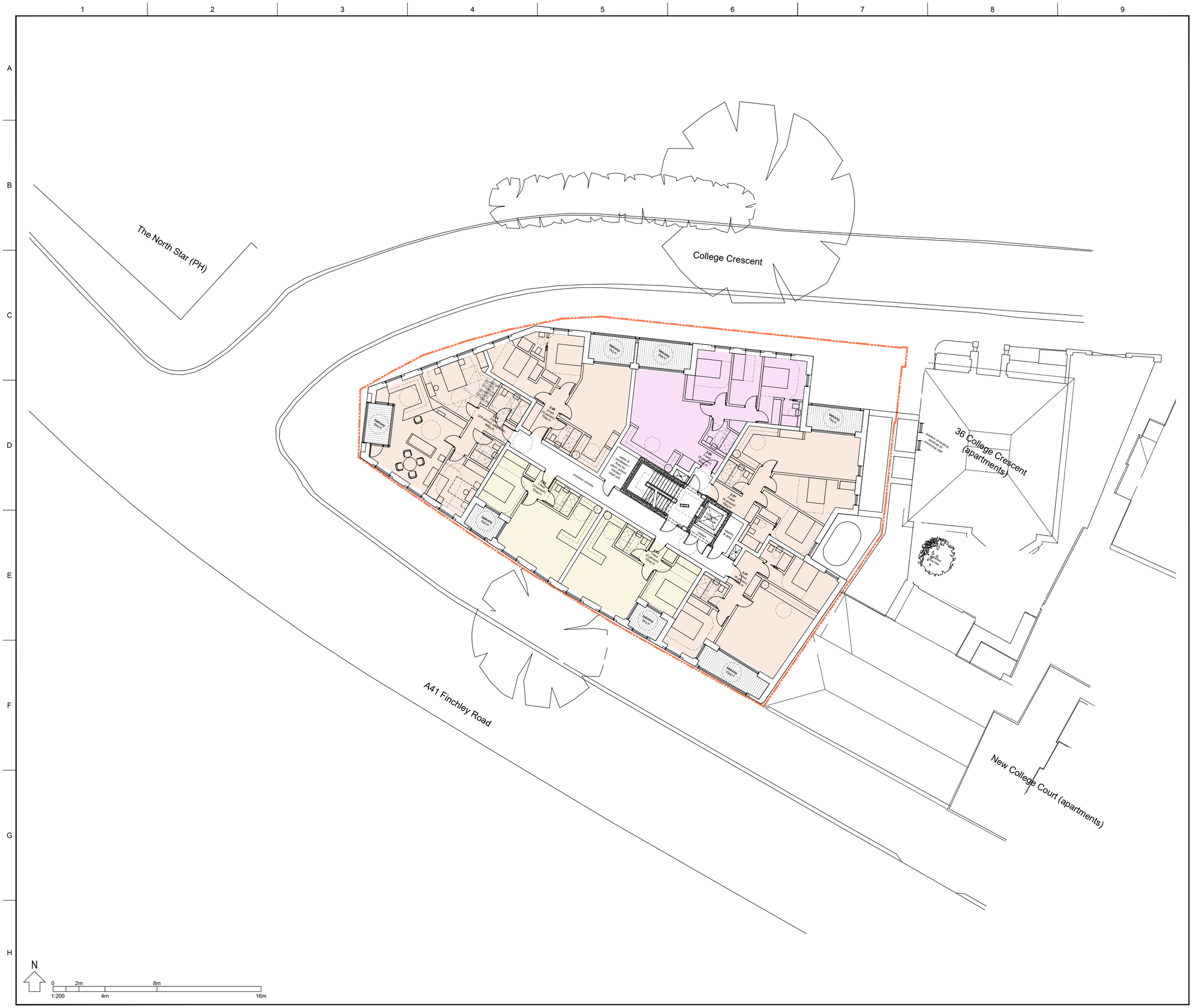
PFS Site, 104a Finchley Road
London NW3 5EY
(inc. adjacent UCS pre-prep)

Drawing Title

First Floor Plan
Proposed

Drawn	Date	Scale @ A2	Alt. Ref.
REB	NOV' 2021	1:200	

tp bennett Project No.	Drawing Number	Rev
A12003	D 0101	P3



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KEY PLAN:

Rev.	Date	Comment	Drawn	Checked
P3	25.04.22	Flat roof straddling party wall boundary amended; residential stair & lift core and adjacent risers reconfigured	REB	NH
P2	16.03.22	Revisions to levels; minor window amendments; canopy removed	REB	NH
P1	06.12.21	Issued to Client for Concept Design sign-off	REB	NH

Issue Purpose

PRELIMINARY

tp bennett

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Project

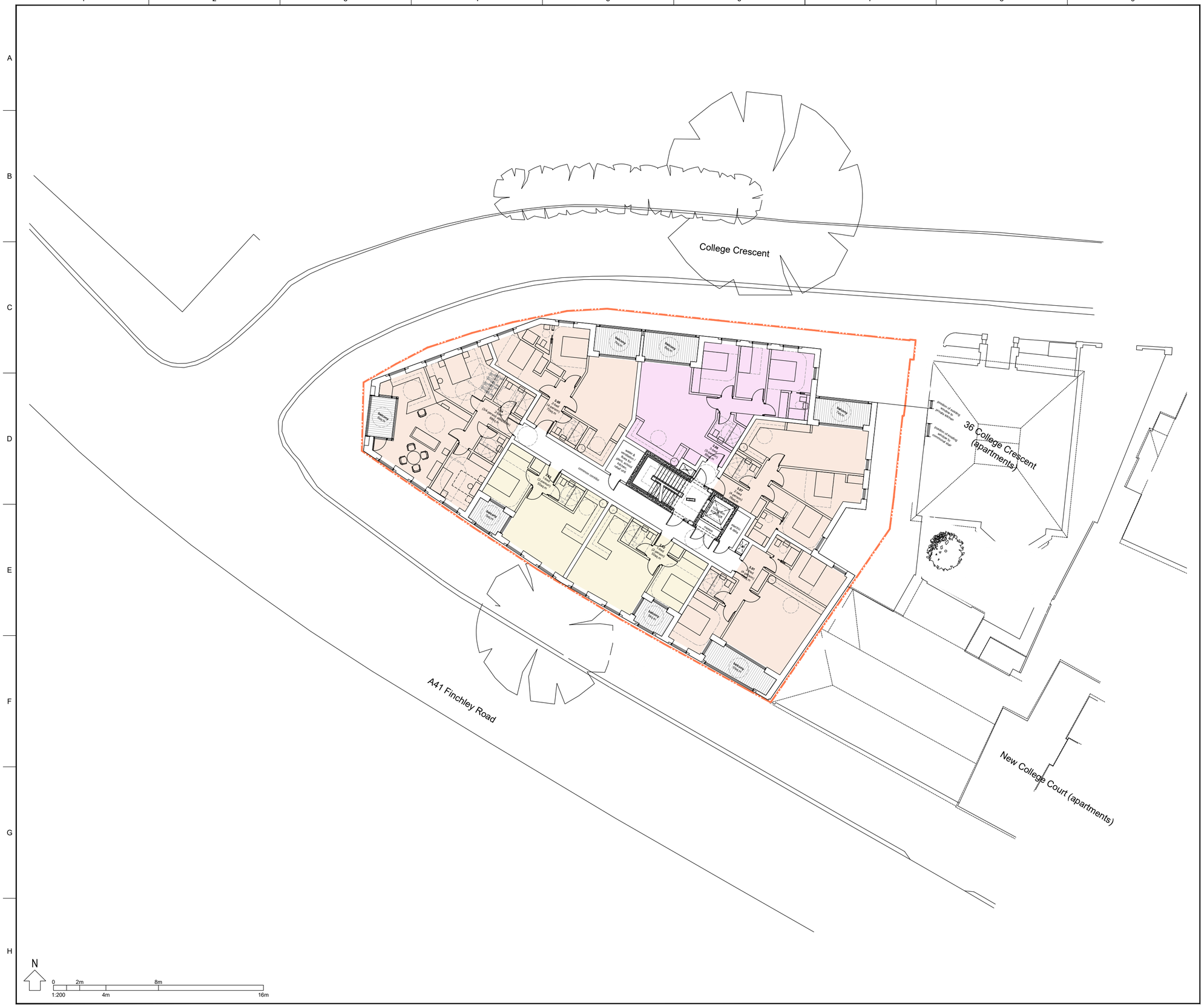
PFS Site, 104a Finchley Road
London NW3 5EY
(inc. adjacent UCS pre-prep)

Drawing Title

Second Floor Plan
Proposed

Drawn	Date	Scale @ A2	Alt. Ref.
REB	NOV' 2021	1:200	

tp bennett Project No.	Drawing Number	Rev
A12003	D 0102	P3



NOTES:

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KEY PLAN:

Rev.	Date	Comment	Drawn	Checked
P3	25.04.22	Residential stair & lift core and adjacent risers reconfigured	REB	NH
P2	16.03.22	Revisions to levels; minor window amendments; canopy removed	REB	NH
P1	06.12.21	Issued to Client for Concept Design sign-off	REB	NH

Issue Purpose

PRELIMINARY

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Project

PFS Site, 104a Finchley Road
London NW3 5EY
(inc. adjacent UCS pre-prep)

Drawing Title

Third Floor Plan
Proposed

Drawn	Date	Scale @ A2	Alt. Ref.
REB	NOV' 2021	1:200	

tp bennett Project No.	Drawing Number	Rev
A12003	D 0103	P3

College Crescent

A41 Finchley Road

New College Court (apartments)

N

0 2m 8m

1:200 4m 16m

NOTES:

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KEY PLAN:

Rev.	Date	Comment	Drawn	Checked
P3	25.04.22	Residential stair & lift core and adjacent risers reconfigured	REB	NH
P2	16.03.22	Revisions to levels; canopy removed; revisions to roof finishes	REB	NH
P1	06.12.21	Issued to Client for Concept Design sign-off	REB	NH

Issue Purpose

PRELIMINARY

tp bennett

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Project

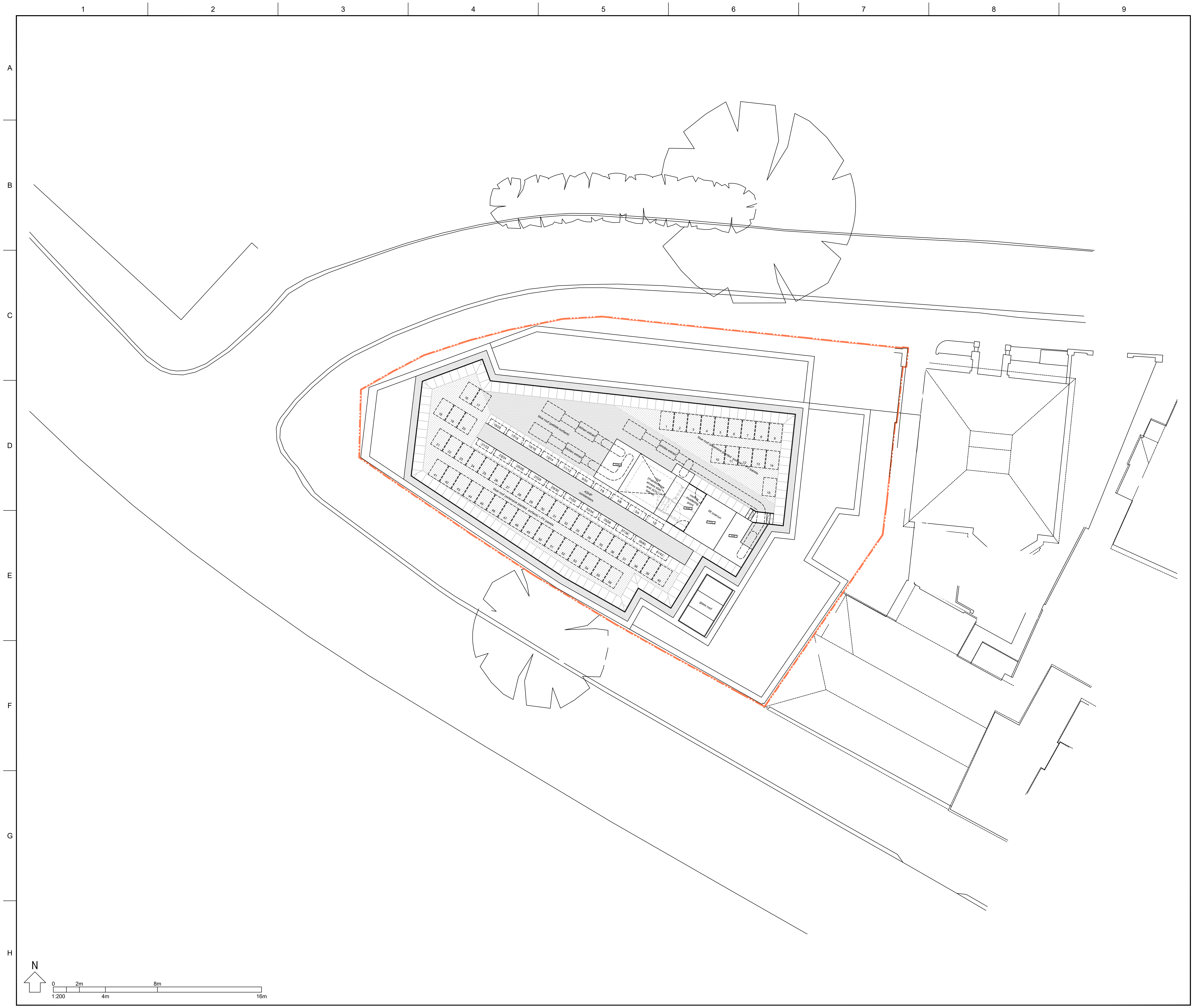
PFS Site, 104a Finchley Road
London NW3 5EY
(inc. adjacent UCS pre-prep)

Drawing Title

Fourth Floor Plan
Proposed

Drawn	Date	Scale @ A2	Alt. Ref.
REB	NOV' 2021	1:200	

tp bennett Project No.	Drawing Number	Rev
A12003	D 0104	P3



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KEY PLAN:

Rev.	Date	Comment	Drawn	Checked
P4	25.04.22	PV panels per WME spec' and angled at 35degrees to horizontal located and numbered; residential stair & lift core and adjacent risers reconfigured	REB	NH
P3	12.04.22	Lift overrun and roof to maintenance access stair added; perimeter balustrade added; roof amended at road junction; WME plant arrangement accommodated (shown dashed) and roof finishes amended to suit	REB	NH
P2	16.03.22	Revisions to levels; canopy removed	REB	NH
P1	06.12.21	Issued to Client for Concept Design sign-off	REB	NH

Issue Purpose

PRELIMINARY

tp bennett

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Project

PFS Site, 104a Finchley Road
London NW3 5EY
(inc. adjacent UCS pre-prep)

Drawing Title

Roof Plan
Proposed

Drawn	Date	Scale @ A2	Alt. Ref.
REB	NOV' 2021	1:200	

tp bennett Project No.	Drawing Number	Rev
A12003	D 0110	P4

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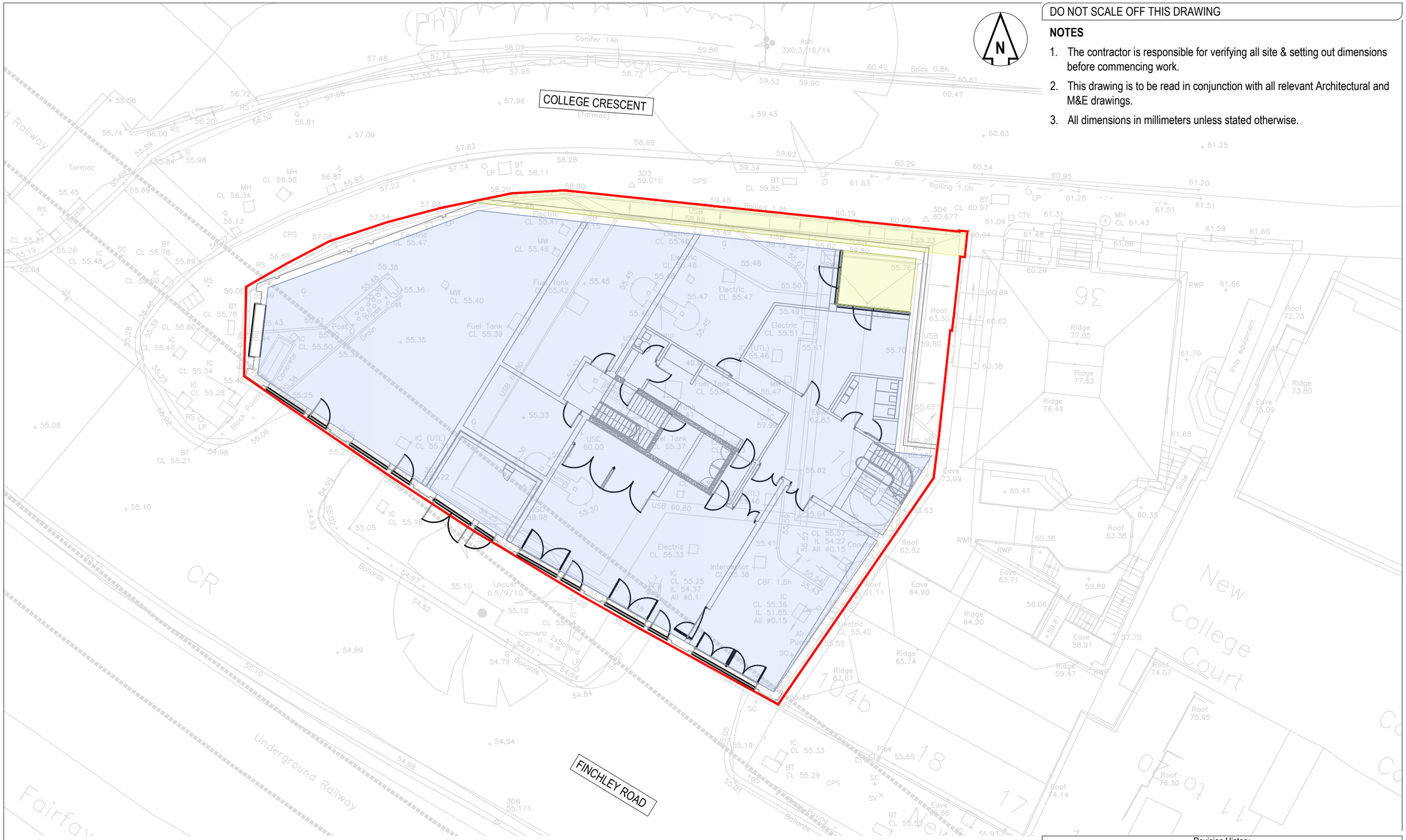
Appendix K – Impermeable Areas Plan

5719/002/002



DO NOT SCALE OFF THIS DRAWING

NOTES

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2. This drawing is to be read in conjunction with all relevant Architectural and M&E drawings.
3. All dimensions in millimeters unless stated otherwise.

INFORMATION

TREVELLYAN DEVELOPMENTS

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Project
FINCHLEY ROAD

Drawing Title
TOTAL IMPERMEABLE AREAS

1:200

RWCL Internal Register reference: 5179-002 Scales @ A3

5179-002-5010-P01

Impermeable Areas

Roof = 655m^2

Paved Area = 75m^2

Total =730m^2

Revision History

Rev	Comment	By	Chkd	Appr	Date

Current Revision

P01	ISSUED FOR INFORMATION	SK	SB	SB	05.08.2022

Robert West

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Transport & Environment

Appendix L – Bauder System Summaries

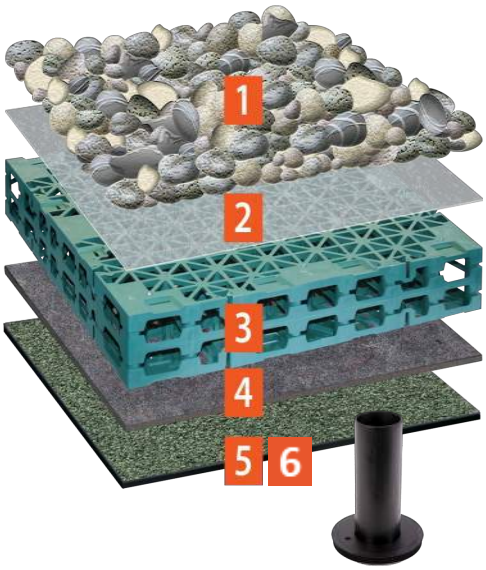
Revision: November 2020 V1

SYSTEM SUMMARY

Bauder Blue Roof—Ballasted System

Blue Ballasted Roof Solution

Best practice requires all blue roof voids to be covered. The lowest cost solution is to lay pebble ballast above the blue roof void layer (Bauder's Attenuation Cell 100). Rain water can then accumulate in the void whilst Bauder's unique flow restrictor (fitted at each outlet) allows precise control of the roofs discharge rate and enable large volumes of water to be attenuated at roof level.



Product	Description	thickness	weight
1 Rounded Pebbles	A 50mm+ layer of rounded pebble or cobble providing a continuous layer of stone.	50mm +	80Kg +
2 Bauder Filter Fleece	Filtration layer that prevents dirt and leaves from washing into the drainage and water storage layers.	1mm	0.13Kg/m²
3 Bauder Attenuation Cell 100	A high strength void element which is 95%+ void. This can hold 95 litres per m2. Allowing it to slowly discharge through the flow restrictor (fitted to the outlet).	100mm	8.06Kg/m²
4 Bauder FSM600 Protection layer	Polyester and polypropylene fibre mix protection layer to prevent mechanical damage to the underlying waterproofing.	4mm	3.6Kg/m²
5 Bauder Waterproofing System	Bauder's BTGRS Bituminous Membrane or Bauder Holt-melt Bituminous Waterproofing system.	N/A	N/A
6 Bauder Blue Roof Flow Restrictor	A combined restrictor plate and overflow, enabling discharge flow rates to be altered for SUDS requirements.	N/A	N/A
Blue Roof Build up (excludes water held within the Attenuation Cell during rain events and the underlying waterproofing)		**155mm +**	**92Kg/m² +**

Note:
Blue roof systems require bespoke flow rate calculations please contact Bauder's technical department

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bauder.ie

Revision: November 2020 V1

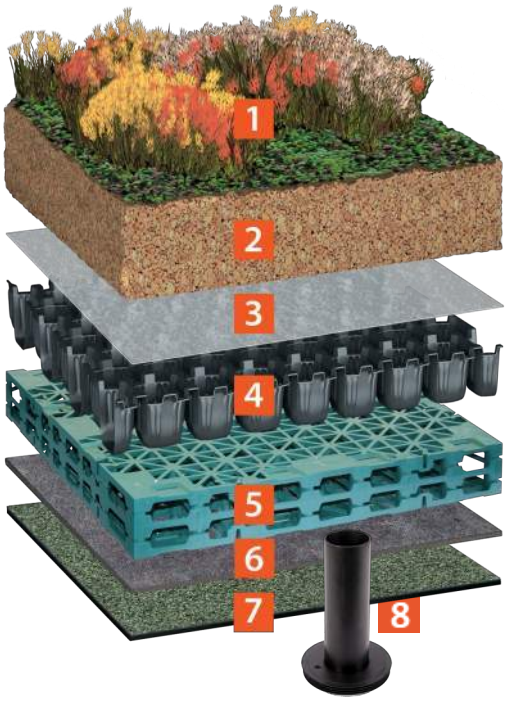
SYSTEM SUMMARY

Bauder Blue Roof - Sedum on substrate system

Green / Blue Roof Solution

Green roofs are an ideal partner for blue roofs as they will naturally delay and reduce rain water run-off from the roof. Green roofs when combined with the blue roof system (Bauder's Attenuation Cell 100) and flow restrictors allow the precise control of the roofs discharge rate and enable large volumes of water to be attenuated at roof level.

A sedum blanket system offers a low maintenance green roof. Laying Bauder's mature SB sedum blanket on a bed of Bauder's extensive substrate gives the system both rooting depth and water retention to make it the most resilient of green roof finishes.



Product	Description	thickness	weight
1 Bauder SB Sedum Blanket *	Typically sown with 17 species of sedums and grown by Bauder for around 12 months before it is harvested.	25mm	24.0Kg/m²
2 Bauder Extensive Substrate	A lightweight, low nutrient growing material tested to BS8616 and manufactured to meet both GRO and FLL guidelines.	80mm	96Kg/m²
3 Bauder Filter Fleece	Filtration layer that prevents substrate fines from washing into the drainage and water storage layer.	1mm	0.125Kg/m²
4 Bauder DSE 20 Drainage Layer	A 20mm drainage board, holding 7.4 ltr/m2. It is manufactured from 100% recycled HDPE.	20mm	8.6Kg/m² (water filled)
5 Attenuation Cell 100	A high strength void element which is 95%+ void. This can hold 95 litres per m2. Allowing it to slowly discharge through the flow restrictor (fitted to the outlet).	100mm	8.06 kg/m2
6 Bauder FSM 600 Protection Layer	Is 100% recycled Polyester and polypropylene fibre mix protection layer to prevent mechanical damage to the underlying waterproofing.	4mm	0.6Kg/m²
7 Underlying Waterproofing System	Bauder's BTGRS Bituminous Membrane or Bauder Hot melt, Bituminous Waterproofing system.	N/A	N/A
8 Bauder Blue Roof Flow Restrictor	A combined restrictor plate and overflow, enabling discharge flow rates to be altered for SUDS requirements.	N/A	N/A
Blue & Green Roof Build up (fully saturated excluding the water held in the Attenuation Cell during a rain event and the underlying waterproofing)		**230mm**	**137Kg/m²**

Note: *Bauder Blue roof systems require bespoke flow rate calculations please contact Bauder's technical department*

*Bauder also produce Wildflower and seeded solutions

When to specify

Where an immediate vegetated finish is required on completion. Bauder SB sedum blanket gives instant ground cover and a low maintenance solution. Ideal for very exposed roof environment.

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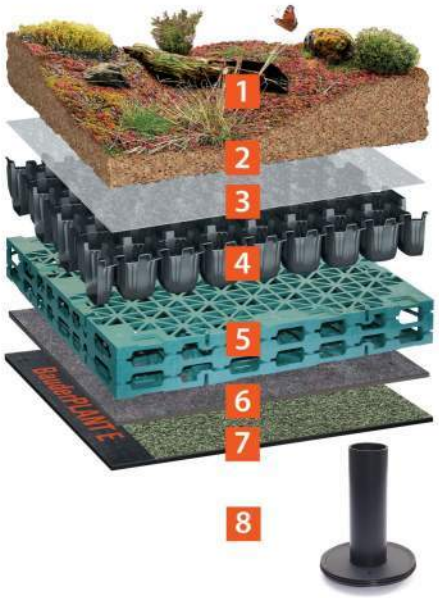
Revision: July 2021 V1

SYSTEM SUMMARY

Bauder Extensive Biodiverse Green Roof Solution

Biodiverse green roof over blue roof system

This specific type of biodiverse (or brown roof) is designed to incorporate as many types of habitat as possible giving a home and food source to invertebrates and pollinators which in turn are food for many birds and bat species. The roof is typically sown or plug planted with a very broad range of plant species. Additional habitat features such as dead wood, stone/sand piles and dew ponds can also be incorporated into the design. The Bauder "Green Roof Promise" is available for this system.



Product	Description	Thickness	Saturated weight
1 Vegetation *	Typically Bauder's range of native seed and plug mixes are used in combination with other habitat features.	Thickness and weight varies with season	
2 Bauder Biodiverse Substrate	Bauder's Biodiverse substrate is a lightweight growing medium tested to BS 8616 and designed to meet GRO and FLL guidelines, these are usually contoured	Varies typically 100-150mm	120-180 Kg/m²
3 Bauder Filter Fleece	Filtration layer that prevents substrate fines from washing into the drainage and water storage layer.	1mm	0.13Kg/m²
4 Bauder DSE 40 Drainage Layer	DSE40 is a 40mm drainage board, holding 13.5 ltr/m2. The light weight board is made from 100% Recycled HDPE	40mm	15.3Kg/m² (water filled)
5 Bauder Attenuation Cell 100	A high strength void element which is 95%+ void (holding 95 litres per m2). Allowing slow discharge through the flow restrictor (8) fitted in the outlet.	100mm	8.06Kg/m²
6 Bauder FSM600 Protection layer	Polyester and polypropylene fibre mix protection layer to prevent mechanical damage to the underlying waterproofing.	4mm	3.6Kg/m²
7 Bauder Waterproofing System	Bauder's BTGRS Bituminous Membrane or Bauder Holt-melt Bituminous Waterproofing system.	N/A	N/A
8 Bauder Blue Roof Flow Restrictor	A combined restrictor plate and overflow, enabling discharge flow rates to be matched to SUDS requirements.	N/A	N/A
Green Roof System Build Up (fully saturated, excludes waterproofing & vegetation)		**245-295 mm**	**147-207 Kg/m²**

*Bauder also produce a biodiverse wildflower blanket solution

Please note: All green roofs require water during times of drought. Bauder recommend that the watering and maintenance of this roof is considered and addressed during its design.

Where to specify:

Primarily used when Biodiversity and habitat creation are the primary goals, such as for BREEAM or to comply with a local planning requirement.

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Robert West

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Appendix M – Preliminary Drainage Strategy Plan and Outline Storage Calculations

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NOTES

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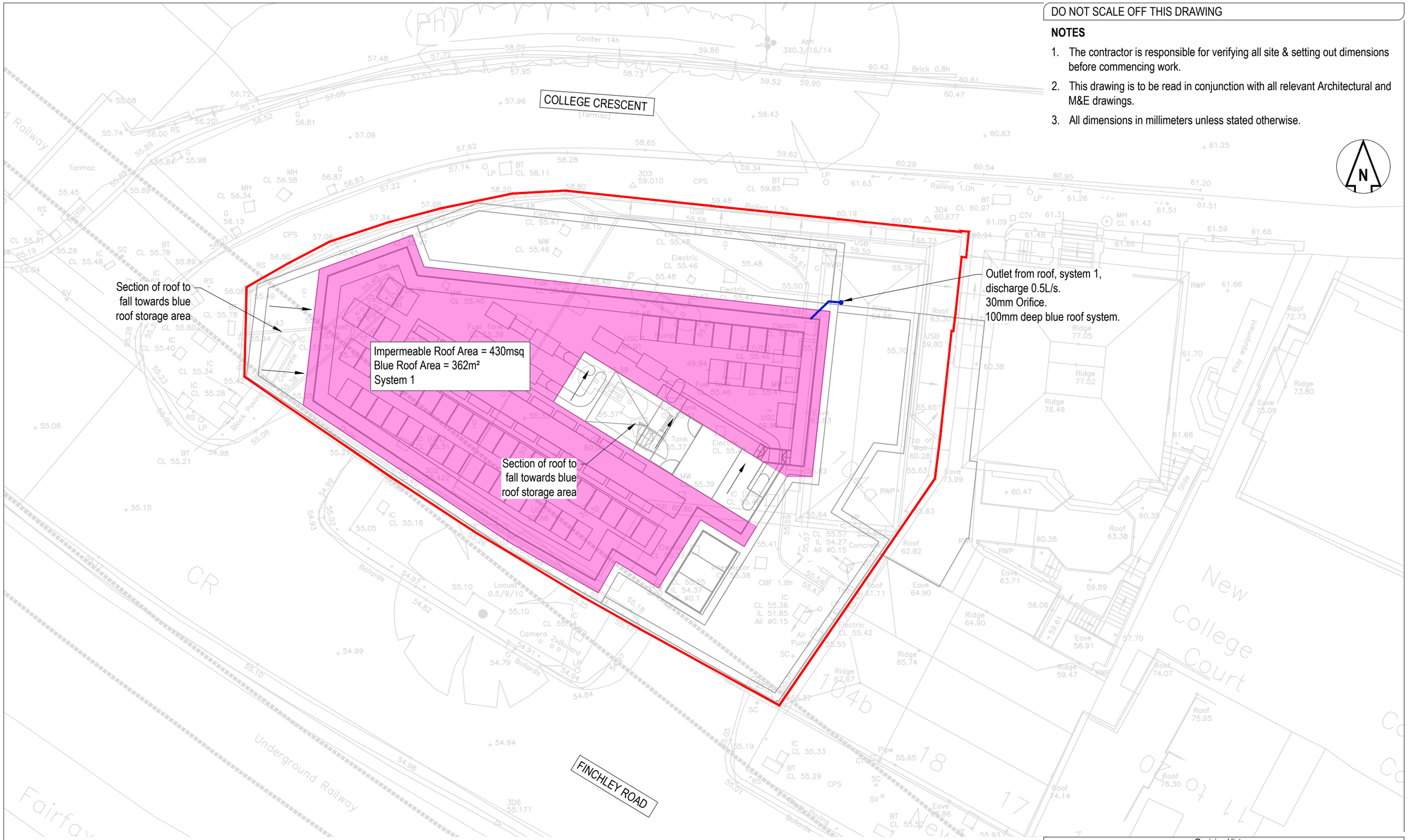
2. This drawing is to be read in conjunction with all relevant Architectural and M&E drawings.
3. All dimensions in millimeters unless stated otherwise.



INFORMATION

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Project
FINCHLEY ROAD

Drawing Title
ROOF LEVEL
SURFACE WATER STRATEGY

1:200

RWCL Internal Register reference: 5179-002 Scales @ A3

5179-002-5000-P01

Revision History

Rev	Comment	By	Chkd	Appr	Date

Current Revision

P01	ISSUED FOR INFORMATION	SK	SB	SB	05.08.2022

Summary of Results for 30 year Return Period

Half Drain Time : 601 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.919	0.019	0.0	0.1	0.1	6.5	Flood Risk
30 min Summer	0.924	0.024	0.0	0.1	0.1	8.4	Flood Risk
60 min Summer	0.930	0.030	0.0	0.2	0.2	10.2	Flood Risk
120 min Summer	0.935	0.035	0.0	0.2	0.2	12.2	Flood Risk
180 min Summer	0.939	0.039	0.0	0.3	0.3	13.3	Flood Risk
240 min Summer	0.940	0.040	0.0	0.3	0.3	14.0	Flood Risk
360 min Summer	0.942	0.042	0.0	0.3	0.3	14.6	Flood Risk
480 min Summer	0.943	0.043	0.0	0.3	0.3	15.0	Flood Risk
600 min Summer	0.944	0.044	0.0	0.3	0.3	15.2	Flood Risk
720 min Summer	0.944	0.044	0.0	0.3	0.3	15.3	Flood Risk
960 min Summer	0.944	0.044	0.0	0.3	0.3	15.3	Flood Risk
1440 min Summer	0.943	0.043	0.0	0.3	0.3	14.9	Flood Risk
2160 min Summer	0.941	0.041	0.0	0.3	0.3	14.1	Flood Risk
2880 min Summer	0.939	0.039	0.0	0.3	0.3	13.3	Flood Risk
4320 min Summer	0.935	0.035	0.0	0.2	0.2	12.1	Flood Risk
5760 min Summer	0.933	0.033	0.0	0.2	0.2	11.2	Flood Risk
7200 min Summer	0.931	0.031	0.0	0.2	0.2	10.6	Flood Risk
8640 min Summer	0.929	0.029	0.0	0.2	0.2	10.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	81.562	0.0	3.6	19
30 min Summer	52.797	0.0	5.2	34
60 min Summer	32.694	0.0	8.4	64
120 min Summer	20.125	0.0	10.6	122
180 min Summer	15.140	0.0	12.2	182
240 min Summer	12.346	0.0	13.4	240
360 min Summer	9.206	0.0	15.2	324
480 min Summer	7.438	0.0	16.4	380
600 min Summer	6.278	0.0	17.4	440
720 min Summer	5.450	0.0	18.1	506
960 min Summer	4.333	0.0	19.1	644
1440 min Summer	3.101	0.0	20.3	910
2160 min Summer	2.196	0.0	23.8	1316
2880 min Summer	1.719	0.0	24.7	1704
4320 min Summer	1.224	0.0	25.7	2464
5760 min Summer	0.970	0.0	29.1	3224
7200 min Summer	0.818	0.0	30.5	3960
8640 min Summer	0.718	0.0	31.8	4680

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.928	0.028	0.0	0.2	0.2	9.8	Flood Risk
15 min Winter	0.921	0.021	0.0	0.1	0.1	7.3	Flood Risk
30 min Winter	0.927	0.027	0.0	0.2	0.2	9.4	Flood Risk
60 min Winter	0.933	0.033	0.0	0.2	0.2	11.5	Flood Risk
120 min Winter	0.940	0.040	0.0	0.3	0.3	13.6	Flood Risk
180 min Winter	0.943	0.043	0.0	0.3	0.3	14.9	Flood Risk
240 min Winter	0.945	0.045	0.0	0.3	0.3	15.6	Flood Risk
360 min Winter	0.948	0.048	0.0	0.3	0.3	16.4	Flood Risk
480 min Winter	0.949	0.049	0.0	0.3	0.3	16.7	Flood Risk
600 min Winter	0.949	0.049	0.0	0.3	0.3	16.9	Flood Risk
720 min Winter	0.949	0.049	0.0	0.3	0.3	17.0	Flood Risk
960 min Winter	0.949	0.049	0.0	0.3	0.3	16.8	Flood Risk
1440 min Winter	0.946	0.046	0.0	0.3	0.3	16.0	Flood Risk
2160 min Winter	0.942	0.042	0.0	0.3	0.3	14.6	Flood Risk
2880 min Winter	0.939	0.039	0.0	0.3	0.3	13.5	Flood Risk
4320 min Winter	0.934	0.034	0.0	0.2	0.2	11.9	Flood Risk
5760 min Winter	0.931	0.031	0.0	0.2	0.2	10.8	Flood Risk
7200 min Winter	0.929	0.029	0.0	0.2	0.2	10.0	Flood Risk
8640 min Winter	0.927	0.027	0.0	0.2	0.2	9.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.647	0.0	33.0	5448
15 min Winter	81.562	0.0	4.2	19
30 min Winter	52.797	0.0	6.0	33
60 min Winter	32.694	0.0	9.6	62
120 min Winter	20.125	0.0	12.1	120
180 min Winter	15.140	0.0	13.9	178
240 min Winter	12.346	0.0	15.3	234
360 min Winter	9.206	0.0	17.2	342
480 min Winter	7.438	0.0	18.6	392
600 min Winter	6.278	0.0	19.7	464
720 min Winter	5.450	0.0	20.5	542
960 min Winter	4.333	0.0	21.7	692
1440 min Winter	3.101	0.0	23.0	982
2160 min Winter	2.196	0.0	26.8	1388
2880 min Winter	1.719	0.0	27.8	1788
4320 min Winter	1.224	0.0	29.1	2592
5760 min Winter	0.970	0.0	32.7	3344
7200 min Winter	0.818	0.0	34.3	4104
8640 min Winter	0.718	0.0	35.8	4840

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.926	0.026	0.0	0.1	0.1	9.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.647	0.0	37.2	5544

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.043

Time (mins) From:	To:	Area (ha)
0	4	0.043

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	363.0	0.0	0.101	0.0	0.0
0.100	363.0	0.0			

Orifice Outflow Control

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period

Half Drain Time : 601 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.925	0.025	0.0	0.1	0.1	8.7	Flood Risk
30 min Summer	0.933	0.033	0.0	0.2	0.2	11.3	Flood Risk
60 min Summer	0.940	0.040	0.0	0.3	0.3	13.8	Flood Risk
120 min Summer	0.947	0.047	0.0	0.3	0.3	16.3	Flood Risk
180 min Summer	0.951	0.051	0.0	0.4	0.4	17.7	Flood Risk
240 min Summer	0.954	0.054	0.0	0.4	0.4	18.6	Flood Risk
360 min Summer	0.956	0.056	0.0	0.4	0.4	19.4	Flood Risk
480 min Summer	0.958	0.058	0.0	0.4	0.4	19.8	Flood Risk
600 min Summer	0.958	0.058	0.0	0.4	0.4	20.0	Flood Risk
720 min Summer	0.958	0.058	0.0	0.4	0.4	20.1	Flood Risk
960 min Summer	0.958	0.058	0.0	0.4	0.4	20.0	Flood Risk
1440 min Summer	0.956	0.056	0.0	0.4	0.4	19.2	Flood Risk
2160 min Summer	0.951	0.051	0.0	0.4	0.4	17.7	Flood Risk
2880 min Summer	0.948	0.048	0.0	0.3	0.3	16.4	Flood Risk
4320 min Summer	0.942	0.042	0.0	0.3	0.3	14.4	Flood Risk
5760 min Summer	0.938	0.038	0.0	0.3	0.3	13.1	Flood Risk
7200 min Summer	0.935	0.035	0.0	0.2	0.2	12.2	Flood Risk
8640 min Summer	0.933	0.033	0.0	0.2	0.2	11.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	108.876	0.0	5.4	19
30 min Summer	71.038	0.0	7.6	34
60 min Summer	44.285	0.0	11.9	64
120 min Summer	27.093	0.0	15.0	122
180 min Summer	20.301	0.0	17.0	182
240 min Summer	16.505	0.0	18.6	240
360 min Summer	12.255	0.0	20.8	342
480 min Summer	9.856	0.0	22.4	394
600 min Summer	8.285	0.0	23.6	452
720 min Summer	7.168	0.0	24.5	518
960 min Summer	5.670	0.0	25.7	654
1440 min Summer	4.025	0.0	27.0	924
2160 min Summer	2.818	0.0	30.9	1320
2880 min Summer	2.183	0.0	31.8	1704
4320 min Summer	1.523	0.0	32.5	2464
5760 min Summer	1.187	0.0	35.7	3224
7200 min Summer	0.988	0.0	37.0	3960
8640 min Summer	0.857	0.0	38.3	4672

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.932	0.032	0.0	0.2	0.2	11.0	Flood Risk
15 min Winter	0.928	0.028	0.0	0.2	0.2	9.7	Flood Risk
30 min Winter	0.937	0.037	0.0	0.3	0.3	12.6	Flood Risk
60 min Winter	0.945	0.045	0.0	0.3	0.3	15.5	Flood Risk
120 min Winter	0.953	0.053	0.0	0.4	0.4	18.3	Flood Risk
180 min Winter	0.958	0.058	0.0	0.4	0.4	19.9	Flood Risk
240 min Winter	0.961	0.061	0.0	0.4	0.4	21.0	Flood Risk
360 min Winter	0.964	0.064	0.0	0.4	0.4	22.0	Flood Risk
480 min Winter	0.965	0.065	0.0	0.4	0.4	22.3	Flood Risk
600 min Winter	0.965	0.065	0.0	0.4	0.4	22.4	Flood Risk
720 min Winter	0.965	0.065	0.0	0.4	0.4	22.4	Flood Risk
960 min Winter	0.964	0.064	0.0	0.4	0.4	22.0	Flood Risk
1440 min Winter	0.960	0.060	0.0	0.4	0.4	20.7	Flood Risk
2160 min Winter	0.953	0.053	0.0	0.4	0.4	18.4	Flood Risk
2880 min Winter	0.948	0.048	0.0	0.3	0.3	16.6	Flood Risk
4320 min Winter	0.941	0.041	0.0	0.3	0.3	14.0	Flood Risk
5760 min Winter	0.936	0.036	0.0	0.2	0.2	12.4	Flood Risk
7200 min Winter	0.933	0.033	0.0	0.2	0.2	11.4	Flood Risk
8640 min Winter	0.931	0.031	0.0	0.2	0.2	10.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.766	0.0	39.4	5440
15 min Winter	108.876	0.0	6.3	19
30 min Winter	71.038	0.0	8.8	33
60 min Winter	44.285	0.0	13.6	62
120 min Winter	27.093	0.0	17.0	120
180 min Winter	20.301	0.0	19.3	178
240 min Winter	16.505	0.0	21.0	234
360 min Winter	12.255	0.0	23.6	344
480 min Winter	9.856	0.0	25.3	444
600 min Winter	8.285	0.0	26.6	474
720 min Winter	7.168	0.0	27.6	550
960 min Winter	5.670	0.0	29.0	702
1440 min Winter	4.025	0.0	30.5	996
2160 min Winter	2.818	0.0	34.8	1408
2880 min Winter	2.183	0.0	35.8	1812
4320 min Winter	1.523	0.0	36.7	2552
5760 min Winter	1.187	0.0	40.1	3296
7200 min Winter	0.988	0.0	41.6	4104
8640 min Winter	0.857	0.0	43.0	4840

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.929	0.029	0.0	0.2	0.2	10.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.766	0.0	44.3	5544

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.043

Time (mins) From:	To:	Area (ha)
0	4	0.043

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	363.0	0.0	0.101	0.0	0.0
0.100	363.0	0.0			

Orifice Outflow Control

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 634 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.935	0.035	0.0	0.2	0.2	12.2	Flood Risk
30 min Summer	0.946	0.046	0.0	0.3	0.3	15.7	Flood Risk
60 min Summer	0.956	0.056	0.0	0.4	0.4	19.3	Flood Risk
120 min Summer	0.966	0.066	0.0	0.4	0.4	22.9	Flood Risk
180 min Summer	0.972	0.072	0.0	0.4	0.4	25.0	Flood Risk
240 min Summer	0.976	0.076	0.0	0.5	0.5	26.3	Flood Risk
360 min Summer	0.980	0.080	0.0	0.5	0.5	27.6	Flood Risk
480 min Summer	0.982	0.082	0.0	0.5	0.5	28.1	Flood Risk
600 min Summer	0.982	0.082	0.0	0.5	0.5	28.3	Flood Risk
720 min Summer	0.982	0.082	0.0	0.5	0.5	28.4	Flood Risk
960 min Summer	0.982	0.082	0.0	0.5	0.5	28.2	Flood Risk
1440 min Summer	0.979	0.079	0.0	0.5	0.5	27.1	Flood Risk
2160 min Summer	0.972	0.072	0.0	0.4	0.4	24.9	Flood Risk
2880 min Summer	0.966	0.066	0.0	0.4	0.4	22.9	Flood Risk
4320 min Summer	0.957	0.057	0.0	0.4	0.4	19.7	Flood Risk
5760 min Summer	0.950	0.050	0.0	0.4	0.4	17.4	Flood Risk
7200 min Summer	0.946	0.046	0.0	0.3	0.3	15.8	Flood Risk
8640 min Summer	0.943	0.043	0.0	0.3	0.3	14.7	Flood Risk
10080 min Summer	0.940	0.040	0.0	0.3	0.3	14.0	Flood Risk
15 min Winter	0.940	0.040	0.0	0.3	0.3	13.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	152.426	0.0	8.3	19
30 min Summer	99.453	0.0	11.6	34
60 min Summer	62.000	0.0	17.4	64
120 min Summer	37.930	0.0	21.7	122
180 min Summer	28.421	0.0	24.6	182
240 min Summer	23.107	0.0	26.8	242
360 min Summer	17.157	0.0	29.9	360
480 min Summer	13.798	0.0	32.1	416
600 min Summer	11.599	0.0	33.8	476
720 min Summer	10.035	0.0	35.0	538
960 min Summer	7.939	0.0	36.8	666
1440 min Summer	5.636	0.0	38.6	938
2160 min Summer	3.945	0.0	43.9	1344
2880 min Summer	3.056	0.0	45.1	1732
4320 min Summer	2.133	0.0	46.4	2504
5760 min Summer	1.661	0.0	50.4	3232
7200 min Summer	1.383	0.0	52.3	3960
8640 min Summer	1.200	0.0	54.1	4664
10080 min Summer	1.073	0.0	55.8	5440
15 min Winter	152.426	0.0	9.6	19

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	0.951	0.051	0.0	0.4	0.4	17.6	Flood Risk
60 min Winter	0.963	0.063	0.0	0.4	0.4	21.6	Flood Risk
120 min Winter	0.975	0.075	0.0	0.5	0.5	25.7	Flood Risk
180 min Winter	0.981	0.081	0.0	0.5	0.5	28.1	Flood Risk
240 min Winter	0.986	0.086	0.0	0.5	0.5	29.6	Flood Risk
360 min Winter	0.991	0.091	0.0	0.5	0.5	31.3	Flood Risk
480 min Winter	0.992	0.092	0.0	0.5	0.5	31.8	Flood Risk
600 min Winter	0.992	0.092	0.0	0.5	0.5	31.8	Flood Risk
720 min Winter	0.992	0.092	0.0	0.5	0.5	31.8	Flood Risk
960 min Winter	0.991	0.091	0.0	0.5	0.5	31.3	Flood Risk
1440 min Winter	0.985	0.085	0.0	0.5	0.5	29.5	Flood Risk
2160 min Winter	0.976	0.076	0.0	0.5	0.5	26.2	Flood Risk
2880 min Winter	0.968	0.068	0.0	0.4	0.4	23.4	Flood Risk
4320 min Winter	0.955	0.055	0.0	0.4	0.4	19.1	Flood Risk
5760 min Winter	0.947	0.047	0.0	0.3	0.3	16.2	Flood Risk
7200 min Winter	0.942	0.042	0.0	0.3	0.3	14.4	Flood Risk
8640 min Winter	0.939	0.039	0.0	0.3	0.3	13.3	Flood Risk
10080 min Winter	0.936	0.036	0.0	0.2	0.2	12.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	99.453	0.0	13.3	33
60 min Winter	62.000	0.0	19.7	62
120 min Winter	37.930	0.0	24.5	120
180 min Winter	28.421	0.0	27.7	178
240 min Winter	23.107	0.0	30.2	236
360 min Winter	17.157	0.0	33.7	348
480 min Winter	13.798	0.0	36.2	454
600 min Winter	11.599	0.0	38.0	500
720 min Winter	10.035	0.0	39.4	564
960 min Winter	7.939	0.0	41.4	716
1440 min Winter	5.636	0.0	43.4	1022
2160 min Winter	3.945	0.0	49.3	1448
2880 min Winter	3.056	0.0	50.7	1848
4320 min Winter	2.133	0.0	52.3	2636
5760 min Winter	1.661	0.0	56.6	3344
7200 min Winter	1.383	0.0	58.7	4040
8640 min Winter	1.200	0.0	60.8	4760
10080 min Winter	1.073	0.0	62.8	5544

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.043

Time (mins) From:	To:	Area (ha)
0	4	0.043

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	363.0	0.0	0.101	0.0	0.0
0.100	363.0	0.0			

Orifice Outflow Control

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 0.900

DO NOT SCALE OFF THIS DRAWING

NOTES

1. The contractor is responsible for verifying all site & setting out dimensions before commencing work.
2. This drawing is to be read in conjunction with all relevant Architectural and M&E drawings.
3. All dimensions in millimeters unless stated otherwise.

INFORMATION

TREVELLYAN DEVELOPMENTS

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Project
FINCHLEY ROAD

Drawing Title
FOURTH FLOOR
SURFACE WATER STRATEGY

1:200

RWCL Internal Register reference: 5179-002 Scales @ A3

5179-002-5001-P01

Revision History

Rev	Comment	By	Chkd	Appr	Date

Current Revision

P01	ISSUED FOR INFORMATION	SK	SB	SB	05.08.2022

Summary of Results for 30 year Return Period

Half Drain Time : 796 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.917	0.017	0.0	0.0	0.0	1.2	Flood Risk
30 min Summer	0.922	0.022	0.0	0.0	0.0	1.6	Flood Risk
60 min Summer	0.927	0.027	0.0	0.0	0.0	1.9	Flood Risk
120 min Summer	0.932	0.032	0.0	0.0	0.0	2.3	Flood Risk
180 min Summer	0.935	0.035	0.0	0.0	0.0	2.5	Flood Risk
240 min Summer	0.937	0.037	0.0	0.0	0.0	2.7	Flood Risk
360 min Summer	0.940	0.040	0.0	0.0	0.0	2.8	Flood Risk
480 min Summer	0.941	0.041	0.0	0.0	0.0	2.9	Flood Risk
600 min Summer	0.941	0.041	0.0	0.0	0.0	3.0	Flood Risk
720 min Summer	0.942	0.042	0.0	0.0	0.0	3.0	Flood Risk
960 min Summer	0.942	0.042	0.0	0.0	0.0	3.0	Flood Risk
1440 min Summer	0.941	0.041	0.0	0.0	0.0	2.9	Flood Risk
2160 min Summer	0.938	0.038	0.0	0.0	0.0	2.7	Flood Risk
2880 min Summer	0.936	0.036	0.0	0.0	0.0	2.5	Flood Risk
4320 min Summer	0.932	0.032	0.0	0.0	0.0	2.2	Flood Risk
5760 min Summer	0.928	0.028	0.0	0.0	0.0	2.0	Flood Risk
7200 min Summer	0.926	0.026	0.0	0.0	0.0	1.9	Flood Risk
8640 min Summer	0.924	0.024	0.0	0.0	0.0	1.7	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	81.562	0.0	0.9	19
30 min Summer	52.797	0.0	1.2	34
60 min Summer	32.694	0.0	1.7	64
120 min Summer	20.125	0.0	2.2	122
180 min Summer	15.140	0.0	2.5	182
240 min Summer	12.346	0.0	2.7	242
360 min Summer	9.206	0.0	3.0	360
480 min Summer	7.438	0.0	3.2	480
600 min Summer	6.278	0.0	3.4	534
720 min Summer	5.450	0.0	3.5	588
960 min Summer	4.333	0.0	3.7	712
1440 min Summer	3.101	0.0	3.9	980
2160 min Summer	2.196	0.0	4.6	1384
2880 min Summer	1.719	0.0	4.8	1788
4320 min Summer	1.224	0.0	5.0	2592
5760 min Summer	0.970	0.0	5.5	3344
7200 min Summer	0.818	0.0	5.8	4104
8640 min Summer	0.718	0.0	6.1	4840

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.923	0.023	0.0	0.0	0.0	1.6	Flood Risk
15 min Winter	0.919	0.019	0.0	0.0	0.0	1.4	Flood Risk
30 min Winter	0.924	0.024	0.0	0.0	0.0	1.7	Flood Risk
60 min Winter	0.930	0.030	0.0	0.0	0.0	2.1	Flood Risk
120 min Winter	0.936	0.036	0.0	0.0	0.0	2.6	Flood Risk
180 min Winter	0.940	0.040	0.0	0.0	0.0	2.8	Flood Risk
240 min Winter	0.942	0.042	0.0	0.0	0.0	3.0	Flood Risk
360 min Winter	0.945	0.045	0.0	0.0	0.0	3.2	Flood Risk
480 min Winter	0.947	0.047	0.0	0.0	0.0	3.3	Flood Risk
600 min Winter	0.947	0.047	0.0	0.0	0.0	3.4	Flood Risk
720 min Winter	0.947	0.047	0.0	0.0	0.0	3.4	Flood Risk
960 min Winter	0.947	0.047	0.0	0.0	0.0	3.3	Flood Risk
1440 min Winter	0.945	0.045	0.0	0.0	0.0	3.2	Flood Risk
2160 min Winter	0.941	0.041	0.0	0.0	0.0	2.9	Flood Risk
2880 min Winter	0.938	0.038	0.0	0.0	0.0	2.7	Flood Risk
4320 min Winter	0.932	0.032	0.0	0.0	0.0	2.3	Flood Risk
5760 min Winter	0.927	0.027	0.0	0.0	0.0	2.0	Flood Risk
7200 min Winter	0.924	0.024	0.0	0.0	0.0	1.7	Flood Risk
8640 min Winter	0.922	0.022	0.0	0.0	0.0	1.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.647	0.0	6.3	5552
15 min Winter	81.562	0.0	1.0	19
30 min Winter	52.797	0.0	1.3	33
60 min Winter	32.694	0.0	2.0	62
120 min Winter	20.125	0.0	2.5	120
180 min Winter	15.140	0.0	2.8	180
240 min Winter	12.346	0.0	3.0	236
360 min Winter	9.206	0.0	3.4	350
480 min Winter	7.438	0.0	3.6	462
600 min Winter	6.278	0.0	3.8	568
720 min Winter	5.450	0.0	4.0	664
960 min Winter	4.333	0.0	4.2	750
1440 min Winter	3.101	0.0	4.3	1054
2160 min Winter	2.196	0.0	5.1	1496
2880 min Winter	1.719	0.0	5.3	1928
4320 min Winter	1.224	0.0	5.6	2728
5760 min Winter	0.970	0.0	6.2	3520
7200 min Winter	0.818	0.0	6.5	4256
8640 min Winter	0.718	0.0	6.8	5016

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.920	0.020	0.0	0.0	0.0	1.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.647	0.0	7.1	5744

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.008

Time (mins) From:	To:	Area (ha)
0	4	0.008

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	75.0	0.0	0.101	0.0	0.0
0.100	75.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period

Half Drain Time : 908 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.923	0.023	0.0	0.0	0.0	1.6	Flood Risk
30 min Summer	0.929	0.029	0.0	0.0	0.0	2.1	Flood Risk
60 min Summer	0.936	0.036	0.0	0.0	0.0	2.6	Flood Risk
120 min Summer	0.943	0.043	0.0	0.0	0.0	3.1	Flood Risk
180 min Summer	0.948	0.048	0.0	0.0	0.0	3.4	Flood Risk
240 min Summer	0.951	0.051	0.0	0.0	0.0	3.6	Flood Risk
360 min Summer	0.954	0.054	0.0	0.0	0.0	3.8	Flood Risk
480 min Summer	0.955	0.055	0.0	0.0	0.0	3.9	Flood Risk
600 min Summer	0.956	0.056	0.0	0.0	0.0	4.0	Flood Risk
720 min Summer	0.956	0.056	0.0	0.0	0.0	4.0	Flood Risk
960 min Summer	0.956	0.056	0.0	0.0	0.0	4.0	Flood Risk
1440 min Summer	0.954	0.054	0.0	0.0	0.0	3.8	Flood Risk
2160 min Summer	0.950	0.050	0.0	0.0	0.0	3.6	Flood Risk
2880 min Summer	0.946	0.046	0.0	0.0	0.0	3.3	Flood Risk
4320 min Summer	0.940	0.040	0.0	0.0	0.0	2.9	Flood Risk
5760 min Summer	0.936	0.036	0.0	0.0	0.0	2.5	Flood Risk
7200 min Summer	0.932	0.032	0.0	0.0	0.0	2.3	Flood Risk
8640 min Summer	0.930	0.030	0.0	0.0	0.0	2.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	108.876	0.0	1.2	19
30 min Summer	71.038	0.0	1.6	34
60 min Summer	44.285	0.0	2.4	64
120 min Summer	27.093	0.0	3.0	122
180 min Summer	20.301	0.0	3.3	182
240 min Summer	16.505	0.0	3.6	242
360 min Summer	12.255	0.0	4.0	362
480 min Summer	9.856	0.0	4.3	480
600 min Summer	8.285	0.0	4.5	574
720 min Summer	7.168	0.0	4.7	622
960 min Summer	5.670	0.0	4.8	742
1440 min Summer	4.025	0.0	5.0	998
2160 min Summer	2.818	0.0	5.9	1408
2880 min Summer	2.183	0.0	6.1	1816
4320 min Summer	1.523	0.0	6.3	2596
5760 min Summer	1.187	0.0	6.7	3400
7200 min Summer	0.988	0.0	7.0	4112
8640 min Summer	0.857	0.0	7.3	4848

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.928	0.028	0.0	0.0	0.0	2.0	Flood Risk
15 min Winter	0.925	0.025	0.0	0.0	0.0	1.8	Flood Risk
30 min Winter	0.933	0.033	0.0	0.0	0.0	2.4	Flood Risk
60 min Winter	0.941	0.041	0.0	0.0	0.0	2.9	Flood Risk
120 min Winter	0.949	0.049	0.0	0.0	0.0	3.5	Flood Risk
180 min Winter	0.954	0.054	0.0	0.0	0.0	3.8	Flood Risk
240 min Winter	0.957	0.057	0.0	0.0	0.0	4.1	Flood Risk
360 min Winter	0.961	0.061	0.0	0.0	0.0	4.3	Flood Risk
480 min Winter	0.963	0.063	0.0	0.1	0.1	4.5	Flood Risk
600 min Winter	0.964	0.064	0.0	0.1	0.1	4.5	Flood Risk
720 min Winter	0.964	0.064	0.0	0.1	0.1	4.5	Flood Risk
960 min Winter	0.963	0.063	0.0	0.1	0.1	4.5	Flood Risk
1440 min Winter	0.960	0.060	0.0	0.0	0.0	4.3	Flood Risk
2160 min Winter	0.955	0.055	0.0	0.0	0.0	3.9	Flood Risk
2880 min Winter	0.950	0.050	0.0	0.0	0.0	3.5	Flood Risk
4320 min Winter	0.941	0.041	0.0	0.0	0.0	2.9	Flood Risk
5760 min Winter	0.935	0.035	0.0	0.0	0.0	2.5	Flood Risk
7200 min Winter	0.931	0.031	0.0	0.0	0.0	2.2	Flood Risk
8640 min Winter	0.927	0.027	0.0	0.0	0.0	1.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.766	0.0	7.5	5640
15 min Winter	108.876	0.0	1.4	19
30 min Winter	71.038	0.0	1.8	33
60 min Winter	44.285	0.0	2.7	62
120 min Winter	27.093	0.0	3.3	122
180 min Winter	20.301	0.0	3.8	180
240 min Winter	16.505	0.0	4.1	238
360 min Winter	12.255	0.0	4.5	352
480 min Winter	9.856	0.0	4.8	466
600 min Winter	8.285	0.0	5.0	574
720 min Winter	7.168	0.0	5.2	678
960 min Winter	5.670	0.0	5.4	772
1440 min Winter	4.025	0.0	5.5	1070
2160 min Winter	2.818	0.0	6.6	1516
2880 min Winter	2.183	0.0	6.8	1960
4320 min Winter	1.523	0.0	7.0	2768
5760 min Winter	1.187	0.0	7.6	3576
7200 min Winter	0.988	0.0	7.9	4328
8640 min Winter	0.857	0.0	8.2	5096

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.925	0.025	0.0	0.0	0.0	1.8	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.766	0.0	8.4	5848

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.008

Time (mins) From:	To:	Area (ha)
0	4	0.008

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	75.0	0.0	0.101	0.0	0.0
0.100	75.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1065 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.932	0.032	0.0	0.0	0.0	2.3	Flood Risk
30 min Summer	0.941	0.041	0.0	0.0	0.0	2.9	Flood Risk
60 min Summer	0.951	0.051	0.0	0.0	0.0	3.6	Flood Risk
120 min Summer	0.961	0.061	0.0	0.0	0.0	4.3	Flood Risk
180 min Summer	0.967	0.067	0.0	0.1	0.1	4.8	Flood Risk
240 min Summer	0.972	0.072	0.0	0.1	0.1	5.1	Flood Risk
360 min Summer	0.977	0.077	0.0	0.1	0.1	5.5	Flood Risk
480 min Summer	0.979	0.079	0.0	0.1	0.1	5.6	Flood Risk
600 min Summer	0.980	0.080	0.0	0.1	0.1	5.7	Flood Risk
720 min Summer	0.980	0.080	0.0	0.1	0.1	5.7	Flood Risk
960 min Summer	0.980	0.080	0.0	0.1	0.1	5.7	Flood Risk
1440 min Summer	0.977	0.077	0.0	0.1	0.1	5.5	Flood Risk
2160 min Summer	0.973	0.073	0.0	0.1	0.1	5.2	Flood Risk
2880 min Summer	0.968	0.068	0.0	0.1	0.1	4.8	Flood Risk
4320 min Summer	0.959	0.059	0.0	0.0	0.0	4.2	Flood Risk
5760 min Summer	0.953	0.053	0.0	0.0	0.0	3.8	Flood Risk
7200 min Summer	0.948	0.048	0.0	0.0	0.0	3.4	Flood Risk
8640 min Summer	0.945	0.045	0.0	0.0	0.0	3.2	Flood Risk
10080 min Summer	0.942	0.042	0.0	0.0	0.0	3.0	Flood Risk
15 min Winter	0.936	0.036	0.0	0.0	0.0	2.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	152.426	0.0	1.8	19
30 min Summer	99.453	0.0	2.3	34
60 min Summer	62.000	0.0	3.4	64
120 min Summer	37.930	0.0	4.2	124
180 min Summer	28.421	0.0	4.7	182
240 min Summer	23.107	0.0	5.1	242
360 min Summer	17.157	0.0	5.6	362
480 min Summer	13.798	0.0	6.0	480
600 min Summer	11.599	0.0	6.2	600
720 min Summer	10.035	0.0	6.4	688
960 min Summer	7.939	0.0	6.5	792
1440 min Summer	5.636	0.0	6.5	1038
2160 min Summer	3.945	0.0	8.3	1448
2880 min Summer	3.056	0.0	8.5	1848
4320 min Summer	2.133	0.0	8.7	2640
5760 min Summer	1.661	0.0	9.5	3456
7200 min Summer	1.383	0.0	9.8	4184
8640 min Summer	1.200	0.0	10.2	5008
10080 min Summer	1.073	0.0	10.6	5744
15 min Winter	152.426	0.0	2.0	19

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	0.946	0.046	0.0	0.0	0.0	3.3	Flood Risk
60 min Winter	0.957	0.057	0.0	0.0	0.0	4.1	Flood Risk
120 min Winter	0.968	0.068	0.0	0.1	0.1	4.9	Flood Risk
180 min Winter	0.976	0.076	0.0	0.1	0.1	5.4	Flood Risk
240 min Winter	0.980	0.080	0.0	0.1	0.1	5.7	Flood Risk
360 min Winter	0.987	0.087	0.0	0.1	0.1	6.2	Flood Risk
480 min Winter	0.990	0.090	0.0	0.1	0.1	6.4	Flood Risk
600 min Winter	0.991	0.091	0.0	0.1	0.1	6.5	Flood Risk
720 min Winter	0.992	0.092	0.0	0.1	0.1	6.5	Flood Risk
960 min Winter	0.991	0.091	0.0	0.1	0.1	6.5	Flood Risk
1440 min Winter	0.987	0.087	0.0	0.1	0.1	6.2	Flood Risk
2160 min Winter	0.980	0.080	0.0	0.1	0.1	5.7	Flood Risk
2880 min Winter	0.974	0.074	0.0	0.1	0.1	5.3	Flood Risk
4320 min Winter	0.962	0.062	0.0	0.0	0.0	4.4	Flood Risk
5760 min Winter	0.954	0.054	0.0	0.0	0.0	3.8	Flood Risk
7200 min Winter	0.947	0.047	0.0	0.0	0.0	3.4	Flood Risk
8640 min Winter	0.942	0.042	0.0	0.0	0.0	3.0	Flood Risk
10080 min Winter	0.938	0.038	0.0	0.0	0.0	2.7	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	99.453	0.0	2.5	33
60 min Winter	62.000	0.0	3.8	62
120 min Winter	37.930	0.0	4.7	122
180 min Winter	28.421	0.0	5.2	180
240 min Winter	23.107	0.0	5.7	238
360 min Winter	17.157	0.0	6.2	354
480 min Winter	13.798	0.0	6.6	468
600 min Winter	11.599	0.0	6.8	580
720 min Winter	10.035	0.0	7.0	688
960 min Winter	7.939	0.0	7.1	892
1440 min Winter	5.636	0.0	7.1	1100
2160 min Winter	3.945	0.0	9.3	1560
2880 min Winter	3.056	0.0	9.5	1992
4320 min Winter	2.133	0.0	9.8	2852
5760 min Winter	1.661	0.0	10.6	3640
7200 min Winter	1.383	0.0	11.0	4464
8640 min Winter	1.200	0.0	11.5	5192
10080 min Winter	1.073	0.0	11.9	5952

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.008

Time (mins) From:	To:	Area (ha)
0	4	0.008

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	75.0	0.0	0.101	0.0	0.0
0.100	75.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 30 year Return Period

Half Drain Time : 1277 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.916	0.016	0.0	0.0	0.0	1.8	Flood Risk
30 min Summer	0.921	0.021	0.0	0.0	0.0	2.3	Flood Risk
60 min Summer	0.925	0.025	0.0	0.0	0.0	2.9	Flood Risk
120 min Summer	0.931	0.031	0.0	0.0	0.0	3.5	Flood Risk
180 min Summer	0.934	0.034	0.0	0.0	0.0	3.9	Flood Risk
240 min Summer	0.936	0.036	0.0	0.0	0.0	4.2	Flood Risk
360 min Summer	0.940	0.040	0.0	0.0	0.0	4.5	Flood Risk
480 min Summer	0.941	0.041	0.0	0.0	0.0	4.7	Flood Risk
600 min Summer	0.942	0.042	0.0	0.0	0.0	4.8	Flood Risk
720 min Summer	0.943	0.043	0.0	0.0	0.0	4.9	Flood Risk
960 min Summer	0.943	0.043	0.0	0.0	0.0	4.9	Flood Risk
1440 min Summer	0.943	0.043	0.0	0.0	0.0	4.9	Flood Risk
2160 min Summer	0.941	0.041	0.0	0.0	0.0	4.7	Flood Risk
2880 min Summer	0.940	0.040	0.0	0.0	0.0	4.5	Flood Risk
4320 min Summer	0.937	0.037	0.0	0.0	0.0	4.2	Flood Risk
5760 min Summer	0.934	0.034	0.0	0.0	0.0	3.9	Flood Risk
7200 min Summer	0.932	0.032	0.0	0.0	0.0	3.7	Flood Risk
8640 min Summer	0.931	0.031	0.0	0.0	0.0	3.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	81.562	0.0	1.1	19
30 min Summer	52.797	0.0	1.5	34
60 min Summer	32.694	0.0	2.4	64
120 min Summer	20.125	0.0	3.0	124
180 min Summer	15.140	0.0	3.4	182
240 min Summer	12.346	0.0	3.6	242
360 min Summer	9.206	0.0	4.0	362
480 min Summer	7.438	0.0	4.3	482
600 min Summer	6.278	0.0	4.5	600
720 min Summer	5.450	0.0	4.6	720
960 min Summer	4.333	0.0	4.8	856
1440 min Summer	3.101	0.0	4.7	1084
2160 min Summer	2.196	0.0	6.6	1476
2880 min Summer	1.719	0.0	6.8	1900
4320 min Summer	1.224	0.0	7.0	2720
5760 min Summer	0.970	0.0	8.2	3512
7200 min Summer	0.818	0.0	8.6	4320
8640 min Summer	0.718	0.0	9.0	5096

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.930	0.030	0.0	0.0	0.0	3.4	Flood Risk
15 min Winter	0.918	0.018	0.0	0.0	0.0	2.0	Flood Risk
30 min Winter	0.923	0.023	0.0	0.0	0.0	2.6	Flood Risk
60 min Winter	0.928	0.028	0.0	0.0	0.0	3.2	Flood Risk
120 min Winter	0.934	0.034	0.0	0.0	0.0	3.9	Flood Risk
180 min Winter	0.938	0.038	0.0	0.0	0.0	4.4	Flood Risk
240 min Winter	0.941	0.041	0.0	0.0	0.0	4.7	Flood Risk
360 min Winter	0.945	0.045	0.0	0.0	0.0	5.1	Flood Risk
480 min Winter	0.947	0.047	0.0	0.0	0.0	5.3	Flood Risk
600 min Winter	0.948	0.048	0.0	0.0	0.0	5.5	Flood Risk
720 min Winter	0.949	0.049	0.0	0.0	0.0	5.5	Flood Risk
960 min Winter	0.949	0.049	0.0	0.0	0.0	5.6	Flood Risk
1440 min Winter	0.948	0.048	0.0	0.0	0.0	5.5	Flood Risk
2160 min Winter	0.946	0.046	0.0	0.0	0.0	5.2	Flood Risk
2880 min Winter	0.943	0.043	0.0	0.0	0.0	4.9	Flood Risk
4320 min Winter	0.939	0.039	0.0	0.0	0.0	4.4	Flood Risk
5760 min Winter	0.935	0.035	0.0	0.0	0.0	4.0	Flood Risk
7200 min Winter	0.933	0.033	0.0	0.0	0.0	3.7	Flood Risk
8640 min Winter	0.930	0.030	0.0	0.0	0.0	3.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.647	0.0	9.3	5848
15 min Winter	81.562	0.0	1.2	19
30 min Winter	52.797	0.0	1.6	33
60 min Winter	32.694	0.0	2.7	62
120 min Winter	20.125	0.0	3.3	122
180 min Winter	15.140	0.0	3.8	180
240 min Winter	12.346	0.0	4.1	238
360 min Winter	9.206	0.0	4.5	356
480 min Winter	7.438	0.0	4.8	470
600 min Winter	6.278	0.0	5.0	584
720 min Winter	5.450	0.0	5.1	694
960 min Winter	4.333	0.0	5.2	912
1440 min Winter	3.101	0.0	5.2	1140
2160 min Winter	2.196	0.0	7.4	1600
2880 min Winter	1.719	0.0	7.6	2048
4320 min Winter	1.224	0.0	7.8	2900
5760 min Winter	0.970	0.0	9.1	3752
7200 min Winter	0.818	0.0	9.6	4544
8640 min Winter	0.718	0.0	10.1	5360

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.928	0.028	0.0	0.0	0.0	3.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.647	0.0	10.5	6152

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	120.0	0.0	0.101	0.0	0.0
0.100	120.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1715 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.930	0.030	0.0	0.0	0.0	3.4	Flood Risk
30 min Summer	0.939	0.039	0.0	0.0	0.0	4.4	Flood Risk
60 min Summer	0.948	0.048	0.0	0.0	0.0	5.5	Flood Risk
120 min Summer	0.958	0.058	0.0	0.0	0.0	6.6	Flood Risk
180 min Summer	0.965	0.065	0.0	0.1	0.1	7.4	Flood Risk
240 min Summer	0.969	0.069	0.0	0.1	0.1	7.9	Flood Risk
360 min Summer	0.975	0.075	0.0	0.1	0.1	8.6	Flood Risk
480 min Summer	0.979	0.079	0.0	0.1	0.1	9.0	Flood Risk
600 min Summer	0.981	0.081	0.0	0.1	0.1	9.2	Flood Risk
720 min Summer	0.982	0.082	0.0	0.1	0.1	9.4	Flood Risk
960 min Summer	0.983	0.083	0.0	0.1	0.1	9.4	Flood Risk
1440 min Summer	0.981	0.081	0.0	0.1	0.1	9.2	Flood Risk
2160 min Summer	0.977	0.077	0.0	0.1	0.1	8.8	Flood Risk
2880 min Summer	0.974	0.074	0.0	0.1	0.1	8.5	Flood Risk
4320 min Summer	0.968	0.068	0.0	0.1	0.1	7.8	Flood Risk
5760 min Summer	0.963	0.063	0.0	0.1	0.1	7.2	Flood Risk
7200 min Summer	0.959	0.059	0.0	0.0	0.0	6.7	Flood Risk
8640 min Summer	0.956	0.056	0.0	0.0	0.0	6.4	Flood Risk
10080 min Summer	0.954	0.054	0.0	0.0	0.0	6.1	Flood Risk
15 min Winter	0.934	0.034	0.0	0.0	0.0	3.8	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	152.426	0.0	2.1	19
30 min Summer	99.453	0.0	2.6	34
60 min Summer	62.000	0.0	4.6	64
120 min Summer	37.930	0.0	5.5	124
180 min Summer	28.421	0.0	6.1	184
240 min Summer	23.107	0.0	6.4	242
360 min Summer	17.157	0.0	6.9	362
480 min Summer	13.798	0.0	7.1	482
600 min Summer	11.599	0.0	7.3	602
720 min Summer	10.035	0.0	7.4	722
960 min Summer	7.939	0.0	7.4	960
1440 min Summer	5.636	0.0	7.3	1224
2160 min Summer	3.945	0.0	11.7	1580
2880 min Summer	3.056	0.0	11.8	1984
4320 min Summer	2.133	0.0	11.3	2808
5760 min Summer	1.661	0.0	14.1	3624
7200 min Summer	1.383	0.0	14.6	4400
8640 min Summer	1.200	0.0	15.1	5192
10080 min Summer	1.073	0.0	15.5	5960
15 min Winter	152.426	0.0	2.3	19

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	0.944	0.044	0.0	0.0	0.0	5.0	Flood Risk
60 min Winter	0.954	0.054	0.0	0.0	0.0	6.2	Flood Risk
120 min Winter	0.965	0.065	0.0	0.1	0.1	7.4	Flood Risk
180 min Winter	0.972	0.072	0.0	0.1	0.1	8.3	Flood Risk
240 min Winter	0.978	0.078	0.0	0.1	0.1	8.9	Flood Risk
360 min Winter	0.985	0.085	0.0	0.1	0.1	9.6	Flood Risk
480 min Winter	0.989	0.089	0.0	0.1	0.1	10.1	Flood Risk
600 min Winter	0.991	0.091	0.0	0.1	0.1	10.4	Flood Risk
720 min Winter	0.993	0.093	0.0	0.1	0.1	10.6	Flood Risk
960 min Winter	0.994	0.094	0.0	0.1	0.1	10.7	Flood Risk
1440 min Winter	0.992	0.092	0.0	0.1	0.1	10.5	Flood Risk
2160 min Winter	0.987	0.087	0.0	0.1	0.1	9.9	Flood Risk
2880 min Winter	0.983	0.083	0.0	0.1	0.1	9.4	Flood Risk
4320 min Winter	0.974	0.074	0.0	0.1	0.1	8.5	Flood Risk
5760 min Winter	0.967	0.067	0.0	0.1	0.1	7.7	Flood Risk
7200 min Winter	0.962	0.062	0.0	0.0	0.0	7.0	Flood Risk
8640 min Winter	0.957	0.057	0.0	0.0	0.0	6.5	Flood Risk
10080 min Winter	0.954	0.054	0.0	0.0	0.0	6.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	99.453	0.0	2.8	34
60 min Winter	62.000	0.0	5.1	64
120 min Winter	37.930	0.0	6.1	122
180 min Winter	28.421	0.0	6.6	180
240 min Winter	23.107	0.0	7.0	240
360 min Winter	17.157	0.0	7.5	356
480 min Winter	13.798	0.0	7.7	472
600 min Winter	11.599	0.0	7.9	588
720 min Winter	10.035	0.0	8.0	702
960 min Winter	7.939	0.0	8.0	926
1440 min Winter	5.636	0.0	7.8	1354
2160 min Winter	3.945	0.0	13.0	1668
2880 min Winter	3.056	0.0	13.0	2132
4320 min Winter	2.133	0.0	12.3	3024
5760 min Winter	1.661	0.0	15.8	3872
7200 min Winter	1.383	0.0	16.3	4752
8640 min Winter	1.200	0.0	16.9	5536
10080 min Winter	1.073	0.0	17.4	6352

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	120.0	0.0	0.101	0.0	0.0
0.100	120.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period

Half Drain Time : 1461 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.921	0.021	0.0	0.0	0.0	2.4	Flood Risk
30 min Summer	0.928	0.028	0.0	0.0	0.0	3.2	Flood Risk
60 min Summer	0.934	0.034	0.0	0.0	0.0	3.9	Flood Risk
120 min Summer	0.941	0.041	0.0	0.0	0.0	4.7	Flood Risk
180 min Summer	0.946	0.046	0.0	0.0	0.0	5.2	Flood Risk
240 min Summer	0.949	0.049	0.0	0.0	0.0	5.6	Flood Risk
360 min Summer	0.953	0.053	0.0	0.0	0.0	6.1	Flood Risk
480 min Summer	0.955	0.055	0.0	0.0	0.0	6.3	Flood Risk
600 min Summer	0.957	0.057	0.0	0.0	0.0	6.5	Flood Risk
720 min Summer	0.957	0.057	0.0	0.0	0.0	6.5	Flood Risk
960 min Summer	0.957	0.057	0.0	0.0	0.0	6.5	Flood Risk
1440 min Summer	0.956	0.056	0.0	0.0	0.0	6.4	Flood Risk
2160 min Summer	0.954	0.054	0.0	0.0	0.0	6.1	Flood Risk
2880 min Summer	0.951	0.051	0.0	0.0	0.0	5.8	Flood Risk
4320 min Summer	0.947	0.047	0.0	0.0	0.0	5.3	Flood Risk
5760 min Summer	0.943	0.043	0.0	0.0	0.0	4.9	Flood Risk
7200 min Summer	0.940	0.040	0.0	0.0	0.0	4.6	Flood Risk
8640 min Summer	0.938	0.038	0.0	0.0	0.0	4.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	108.876	0.0	1.5	19
30 min Summer	71.038	0.0	2.0	34
60 min Summer	44.285	0.0	3.3	64
120 min Summer	27.093	0.0	4.0	124
180 min Summer	20.301	0.0	4.5	182
240 min Summer	16.505	0.0	4.8	242
360 min Summer	12.255	0.0	5.3	362
480 min Summer	9.856	0.0	5.5	482
600 min Summer	8.285	0.0	5.7	602
720 min Summer	7.168	0.0	5.8	720
960 min Summer	5.670	0.0	5.9	932
1440 min Summer	4.025	0.0	5.8	1140
2160 min Summer	2.818	0.0	8.5	1516
2880 min Summer	2.183	0.0	8.6	1928
4320 min Summer	1.523	0.0	8.5	2728
5760 min Summer	1.187	0.0	10.0	3528
7200 min Summer	0.988	0.0	10.4	4328
8640 min Summer	0.857	0.0	10.7	5104

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.936	0.036	0.0	0.0	0.0	4.1	Flood Risk
15 min Winter	0.924	0.024	0.0	0.0	0.0	2.7	Flood Risk
30 min Winter	0.931	0.031	0.0	0.0	0.0	3.5	Flood Risk
60 min Winter	0.938	0.038	0.0	0.0	0.0	4.4	Flood Risk
120 min Winter	0.946	0.046	0.0	0.0	0.0	5.3	Flood Risk
180 min Winter	0.951	0.051	0.0	0.0	0.0	5.9	Flood Risk
240 min Winter	0.955	0.055	0.0	0.0	0.0	6.3	Flood Risk
360 min Winter	0.960	0.060	0.0	0.0	0.0	6.8	Flood Risk
480 min Winter	0.963	0.063	0.0	0.1	0.1	7.1	Flood Risk
600 min Winter	0.964	0.064	0.0	0.1	0.1	7.3	Flood Risk
720 min Winter	0.965	0.065	0.0	0.1	0.1	7.4	Flood Risk
960 min Winter	0.965	0.065	0.0	0.1	0.1	7.4	Flood Risk
1440 min Winter	0.963	0.063	0.0	0.1	0.1	7.2	Flood Risk
2160 min Winter	0.960	0.060	0.0	0.0	0.0	6.9	Flood Risk
2880 min Winter	0.957	0.057	0.0	0.0	0.0	6.5	Flood Risk
4320 min Winter	0.950	0.050	0.0	0.0	0.0	5.7	Flood Risk
5760 min Winter	0.945	0.045	0.0	0.0	0.0	5.1	Flood Risk
7200 min Winter	0.941	0.041	0.0	0.0	0.0	4.7	Flood Risk
8640 min Winter	0.938	0.038	0.0	0.0	0.0	4.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.766	0.0	11.1	5856
15 min Winter	108.876	0.0	1.7	19
30 min Winter	71.038	0.0	2.2	34
60 min Winter	44.285	0.0	3.7	64
120 min Winter	27.093	0.0	4.5	122
180 min Winter	20.301	0.0	5.0	180
240 min Winter	16.505	0.0	5.4	240
360 min Winter	12.255	0.0	5.8	356
480 min Winter	9.856	0.0	6.1	472
600 min Winter	8.285	0.0	6.2	586
720 min Winter	7.168	0.0	6.3	700
960 min Winter	5.670	0.0	6.4	920
1440 min Winter	4.025	0.0	6.2	1208
2160 min Winter	2.818	0.0	9.5	1624
2880 min Winter	2.183	0.0	9.6	2076
4320 min Winter	1.523	0.0	9.4	2944
5760 min Winter	1.187	0.0	11.2	3808
7200 min Winter	0.988	0.0	11.6	4616
8640 min Winter	0.857	0.0	12.1	5440

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.935	0.035	0.0	0.0	0.0	4.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.766	0.0	12.4	6160

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	120.0	0.0	0.101	0.0	0.0
0.100	120.0	0.0			

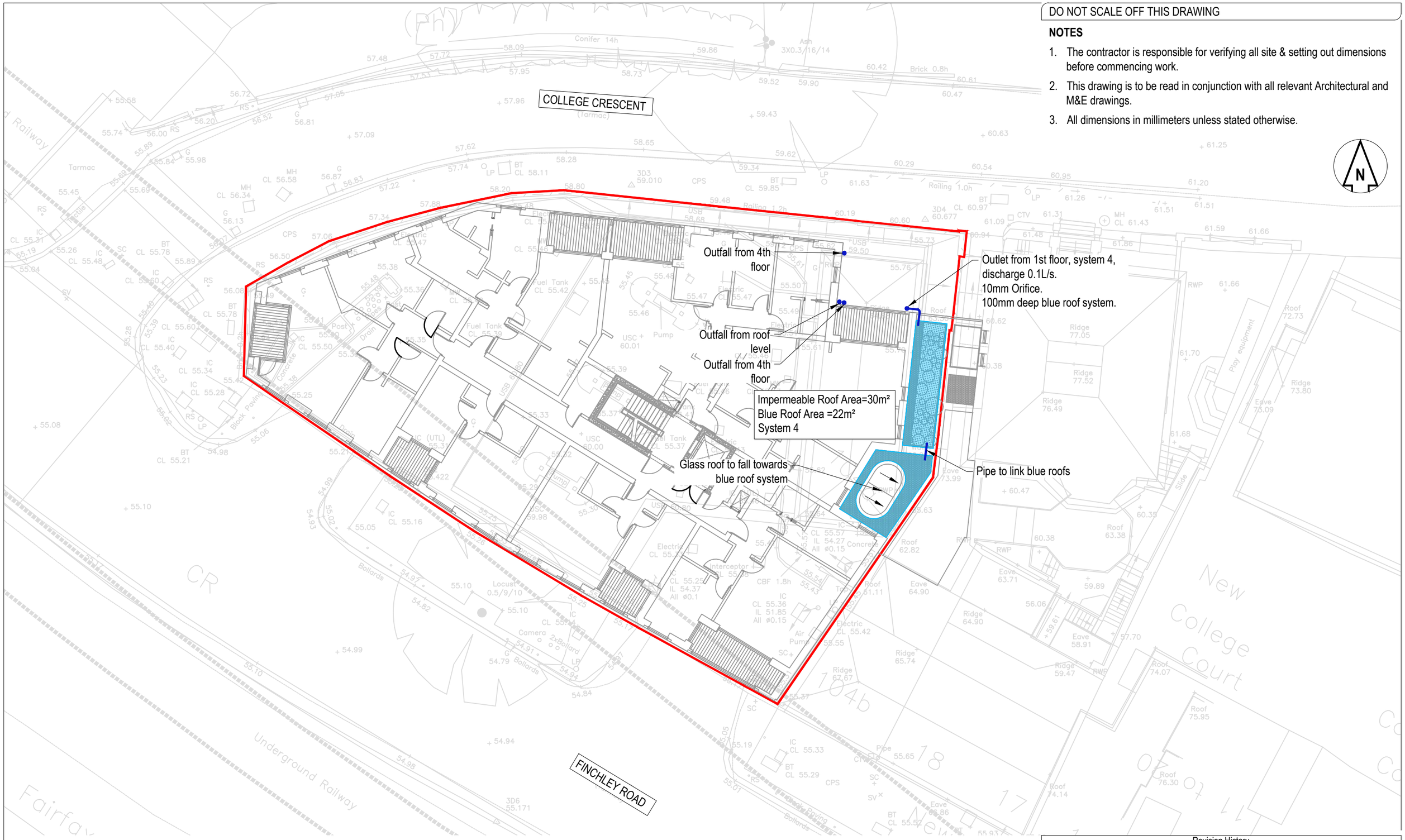
Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

DO NOT SCALE OFF THIS DRAWING

NOTES

1. The contractor is responsible for verifying all site & setting out dimensions before commencing work.
2. This drawing is to be read in conjunction with all relevant Architectural and M&E drawings.
3. All dimensions in millimeters unless stated otherwise.



INFORMATION

TREVELLYAN DEVELOPMENTS

Robert West

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Project
FINCHLEY ROAD

Drawing Title
FIRST FLOOR
SURAFCE WATER STRATEGY

1:200

RWCL Internal Register reference: 5179-002 Scales @ A3

5179-002-5002-P01

Revision History					
Rev	Comment	By	Chkd	Appr	Date
Current Revision					
P01	ISSUED FOR INFORMATION	SK	SB	SB	05.08.2022

Summary of Results for 30 year Return Period

Half Drain Time : 226 minutes.

	Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15	min Summer	0.921	0.021	0.0	0.0	0.0	0.4	Flood Risk
30	min Summer	0.927	0.027	0.0	0.0	0.0	0.6	Flood Risk
60	min Summer	0.932	0.032	0.0	0.0	0.0	0.7	Flood Risk
120	min Summer	0.936	0.036	0.0	0.0	0.0	0.8	Flood Risk
180	min Summer	0.938	0.038	0.0	0.0	0.0	0.8	Flood Risk
240	min Summer	0.939	0.039	0.0	0.0	0.0	0.8	Flood Risk
360	min Summer	0.940	0.040	0.0	0.0	0.0	0.8	Flood Risk
480	min Summer	0.940	0.040	0.0	0.0	0.0	0.8	Flood Risk
600	min Summer	0.940	0.040	0.0	0.0	0.0	0.8	Flood Risk
720	min Summer	0.939	0.039	0.0	0.0	0.0	0.8	Flood Risk
960	min Summer	0.936	0.036	0.0	0.0	0.0	0.8	Flood Risk
1440	min Summer	0.932	0.032	0.0	0.0	0.0	0.7	Flood Risk
2160	min Summer	0.926	0.026	0.0	0.0	0.0	0.6	Flood Risk
2880	min Summer	0.922	0.022	0.0	0.0	0.0	0.5	Flood Risk
4320	min Summer	0.917	0.017	0.0	0.0	0.0	0.4	Flood Risk
5760	min Summer	0.915	0.015	0.0	0.0	0.0	0.3	Flood Risk
7200	min Summer	0.913	0.013	0.0	0.0	0.0	0.3	Flood Risk
8640	min Summer	0.912	0.012	0.0	0.0	0.0	0.3	Flood Risk

	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15	min Summer	81.562	0.0	0.4	18
30	min Summer	52.797	0.0	0.6	33
60	min Summer	32.694	0.0	0.7	62
120	min Summer	20.125	0.0	0.9	120
180	min Summer	15.140	0.0	1.0	156
240	min Summer	12.346	0.0	1.1	186
360	min Summer	9.206	0.0	1.2	252
480	min Summer	7.438	0.0	1.3	322
600	min Summer	6.278	0.0	1.4	388
720	min Summer	5.450	0.0	1.4	458
960	min Summer	4.333	0.0	1.5	590
1440	min Summer	3.101	0.0	1.6	852
2160	min Summer	2.196	0.0	1.8	1232
2880	min Summer	1.719	0.0	1.8	1588
4320	min Summer	1.224	0.0	2.0	2296
5760	min Summer	0.970	0.0	2.1	3000
7200	min Summer	0.818	0.0	2.2	3744
8640	min Summer	0.718	0.0	2.3	4416

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.912	0.012	0.0	0.0	0.0	0.2	Flood Risk
15 min Winter	0.924	0.024	0.0	0.0	0.0	0.5	Flood Risk
30 min Winter	0.930	0.030	0.0	0.0	0.0	0.6	Flood Risk
60 min Winter	0.936	0.036	0.0	0.0	0.0	0.8	Flood Risk
120 min Winter	0.941	0.041	0.0	0.0	0.0	0.9	Flood Risk
180 min Winter	0.943	0.043	0.0	0.0	0.0	0.9	Flood Risk
240 min Winter	0.944	0.044	0.0	0.0	0.0	0.9	Flood Risk
360 min Winter	0.945	0.045	0.0	0.0	0.0	0.9	Flood Risk
480 min Winter	0.944	0.044	0.0	0.0	0.0	0.9	Flood Risk
600 min Winter	0.943	0.043	0.0	0.0	0.0	0.9	Flood Risk
720 min Winter	0.941	0.041	0.0	0.0	0.0	0.9	Flood Risk
960 min Winter	0.938	0.038	0.0	0.0	0.0	0.8	Flood Risk
1440 min Winter	0.932	0.032	0.0	0.0	0.0	0.7	Flood Risk
2160 min Winter	0.925	0.025	0.0	0.0	0.0	0.5	Flood Risk
2880 min Winter	0.920	0.020	0.0	0.0	0.0	0.4	Flood Risk
4320 min Winter	0.915	0.015	0.0	0.0	0.0	0.3	Flood Risk
5760 min Winter	0.913	0.013	0.0	0.0	0.0	0.3	Flood Risk
7200 min Winter	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk
8640 min Winter	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.647	0.0	2.4	5144
15 min Winter	81.562	0.0	0.5	18
30 min Winter	52.797	0.0	0.6	32
60 min Winter	32.694	0.0	0.8	60
120 min Winter	20.125	0.0	1.0	118
180 min Winter	15.140	0.0	1.1	170
240 min Winter	12.346	0.0	1.2	194
360 min Winter	9.206	0.0	1.4	270
480 min Winter	7.438	0.0	1.5	346
600 min Winter	6.278	0.0	1.6	422
720 min Winter	5.450	0.0	1.6	494
960 min Winter	4.333	0.0	1.7	636
1440 min Winter	3.101	0.0	1.8	906
2160 min Winter	2.196	0.0	2.0	1276
2880 min Winter	1.719	0.0	2.1	1644
4320 min Winter	1.224	0.0	2.2	2308
5760 min Winter	0.970	0.0	2.3	3048
7200 min Winter	0.818	0.0	2.5	3744
8640 min Winter	0.718	0.0	2.6	4504

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.647	0.0	2.7	5144

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.003

Time (mins) From:	To:	Area (ha)
0	4	0.003

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	22.0	0.0	0.101	0.0	0.0
0.100	22.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period

Half Drain Time : 256 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.928	0.028	0.0	0.0	0.0	0.6	Flood Risk
30 min Summer	0.936	0.036	0.0	0.0	0.0	0.8	Flood Risk
60 min Summer	0.944	0.044	0.0	0.0	0.0	0.9	Flood Risk
120 min Summer	0.950	0.050	0.0	0.0	0.0	1.0	Flood Risk
180 min Summer	0.952	0.052	0.0	0.0	0.0	1.1	Flood Risk
240 min Summer	0.953	0.053	0.0	0.0	0.0	1.1	Flood Risk
360 min Summer	0.954	0.054	0.0	0.0	0.0	1.1	Flood Risk
480 min Summer	0.954	0.054	0.0	0.0	0.0	1.1	Flood Risk
600 min Summer	0.953	0.053	0.0	0.0	0.0	1.1	Flood Risk
720 min Summer	0.952	0.052	0.0	0.0	0.0	1.1	Flood Risk
960 min Summer	0.949	0.049	0.0	0.0	0.0	1.0	Flood Risk
1440 min Summer	0.943	0.043	0.0	0.0	0.0	0.9	Flood Risk
2160 min Summer	0.935	0.035	0.0	0.0	0.0	0.7	Flood Risk
2880 min Summer	0.930	0.030	0.0	0.0	0.0	0.6	Flood Risk
4320 min Summer	0.922	0.022	0.0	0.0	0.0	0.5	Flood Risk
5760 min Summer	0.918	0.018	0.0	0.0	0.0	0.4	Flood Risk
7200 min Summer	0.915	0.015	0.0	0.0	0.0	0.3	Flood Risk
8640 min Summer	0.914	0.014	0.0	0.0	0.0	0.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	108.876	0.0	0.6	18
30 min Summer	71.038	0.0	0.8	33
60 min Summer	44.285	0.0	1.0	62
120 min Summer	27.093	0.0	1.2	120
180 min Summer	20.301	0.0	1.4	170
240 min Summer	16.505	0.0	1.5	196
360 min Summer	12.255	0.0	1.6	260
480 min Summer	9.856	0.0	1.8	328
600 min Summer	8.285	0.0	1.8	398
720 min Summer	7.168	0.0	1.9	464
960 min Summer	5.670	0.0	2.0	600
1440 min Summer	4.025	0.0	2.1	866
2160 min Summer	2.818	0.0	2.3	1252
2880 min Summer	2.183	0.0	2.3	1616
4320 min Summer	1.523	0.0	2.4	2336
5760 min Summer	1.187	0.0	2.6	3056
7200 min Summer	0.988	0.0	2.7	3752
8640 min Summer	0.857	0.0	2.8	4488

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.913	0.013	0.0	0.0	0.0	0.3	Flood Risk
15 min Winter	0.932	0.032	0.0	0.0	0.0	0.7	Flood Risk
30 min Winter	0.941	0.041	0.0	0.0	0.0	0.9	Flood Risk
60 min Winter	0.949	0.049	0.0	0.0	0.0	1.0	Flood Risk
120 min Winter	0.956	0.056	0.0	0.0	0.0	1.2	Flood Risk
180 min Winter	0.959	0.059	0.0	0.0	0.0	1.2	Flood Risk
240 min Winter	0.960	0.060	0.0	0.0	0.0	1.3	Flood Risk
360 min Winter	0.961	0.061	0.0	0.0	0.0	1.3	Flood Risk
480 min Winter	0.960	0.060	0.0	0.0	0.0	1.3	Flood Risk
600 min Winter	0.959	0.059	0.0	0.0	0.0	1.2	Flood Risk
720 min Winter	0.957	0.057	0.0	0.0	0.0	1.2	Flood Risk
960 min Winter	0.952	0.052	0.0	0.0	0.0	1.1	Flood Risk
1440 min Winter	0.944	0.044	0.0	0.0	0.0	0.9	Flood Risk
2160 min Winter	0.934	0.034	0.0	0.0	0.0	0.7	Flood Risk
2880 min Winter	0.927	0.027	0.0	0.0	0.0	0.6	Flood Risk
4320 min Winter	0.918	0.018	0.0	0.0	0.0	0.4	Flood Risk
5760 min Winter	0.914	0.014	0.0	0.0	0.0	0.3	Flood Risk
7200 min Winter	0.913	0.013	0.0	0.0	0.0	0.3	Flood Risk
8640 min Winter	0.912	0.012	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.766	0.0	2.9	5144
15 min Winter	108.876	0.0	0.6	18
30 min Winter	71.038	0.0	0.9	32
60 min Winter	44.285	0.0	1.1	62
120 min Winter	27.093	0.0	1.3	118
180 min Winter	20.301	0.0	1.5	172
240 min Winter	16.505	0.0	1.6	222
360 min Winter	12.255	0.0	1.8	276
480 min Winter	9.856	0.0	2.0	354
600 min Winter	8.285	0.0	2.1	428
720 min Winter	7.168	0.0	2.1	504
960 min Winter	5.670	0.0	2.3	646
1440 min Winter	4.025	0.0	2.4	922
2160 min Winter	2.818	0.0	2.5	1300
2880 min Winter	2.183	0.0	2.6	1672
4320 min Winter	1.523	0.0	2.7	2380
5760 min Winter	1.187	0.0	2.9	3056
7200 min Winter	0.988	0.0	3.0	3744
8640 min Winter	0.857	0.0	3.1	4464

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.766	0.0	3.2	5240

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.003

Time (mins) From:	To:	Area (ha)
0	4	0.003

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	22.0	0.0	0.101	0.0	0.0
0.100	22.0	0.0			

Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 314 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.940	0.040	0.0	0.0	0.0	0.8	Flood Risk
30 min Summer	0.951	0.051	0.0	0.0	0.0	1.1	Flood Risk
60 min Summer	0.962	0.062	0.0	0.0	0.0	1.3	Flood Risk
120 min Summer	0.971	0.071	0.0	0.1	0.1	1.5	Flood Risk
180 min Summer	0.975	0.075	0.0	0.1	0.1	1.6	Flood Risk
240 min Summer	0.977	0.077	0.0	0.1	0.1	1.6	Flood Risk
360 min Summer	0.978	0.078	0.0	0.1	0.1	1.6	Flood Risk
480 min Summer	0.978	0.078	0.0	0.1	0.1	1.6	Flood Risk
600 min Summer	0.977	0.077	0.0	0.1	0.1	1.6	Flood Risk
720 min Summer	0.976	0.076	0.0	0.1	0.1	1.6	Flood Risk
960 min Summer	0.972	0.072	0.0	0.1	0.1	1.5	Flood Risk
1440 min Summer	0.964	0.064	0.0	0.1	0.1	1.3	Flood Risk
2160 min Summer	0.953	0.053	0.0	0.0	0.0	1.1	Flood Risk
2880 min Summer	0.945	0.045	0.0	0.0	0.0	0.9	Flood Risk
4320 min Summer	0.934	0.034	0.0	0.0	0.0	0.7	Flood Risk
5760 min Summer	0.927	0.027	0.0	0.0	0.0	0.6	Flood Risk
7200 min Summer	0.923	0.023	0.0	0.0	0.0	0.5	Flood Risk
8640 min Summer	0.920	0.020	0.0	0.0	0.0	0.4	Flood Risk
10080 min Summer	0.918	0.018	0.0	0.0	0.0	0.4	Flood Risk
15 min Winter	0.945	0.045	0.0	0.0	0.0	0.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	152.426	0.0	0.8	19
30 min Summer	99.453	0.0	1.1	33
60 min Summer	62.000	0.0	1.4	62
120 min Summer	37.930	0.0	1.7	122
180 min Summer	28.421	0.0	1.9	180
240 min Summer	23.107	0.0	2.1	210
360 min Summer	17.157	0.0	2.3	272
480 min Summer	13.798	0.0	2.5	338
600 min Summer	11.599	0.0	2.6	408
720 min Summer	10.035	0.0	2.7	476
960 min Summer	7.939	0.0	2.8	614
1440 min Summer	5.636	0.0	3.0	880
2160 min Summer	3.945	0.0	3.2	1272
2880 min Summer	3.056	0.0	3.3	1644
4320 min Summer	2.133	0.0	3.4	2376
5760 min Summer	1.661	0.0	3.6	3112
7200 min Summer	1.383	0.0	3.7	3816
8640 min Summer	1.200	0.0	3.9	4496
10080 min Summer	1.073	0.0	4.0	5240
15 min Winter	152.426	0.0	0.9	18

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	0.957	0.057	0.0	0.0	0.0	1.2	Flood Risk
60 min Winter	0.969	0.069	0.0	0.1	0.1	1.5	Flood Risk
120 min Winter	0.980	0.080	0.0	0.1	0.1	1.7	Flood Risk
180 min Winter	0.985	0.085	0.0	0.1	0.1	1.8	Flood Risk
240 min Winter	0.987	0.087	0.0	0.1	0.1	1.8	Flood Risk
360 min Winter	0.988	0.088	0.0	0.1	0.1	1.8	Flood Risk
480 min Winter	0.988	0.088	0.0	0.1	0.1	1.8	Flood Risk
600 min Winter	0.986	0.086	0.0	0.1	0.1	1.8	Flood Risk
720 min Winter	0.984	0.084	0.0	0.1	0.1	1.8	Flood Risk
960 min Winter	0.978	0.078	0.0	0.1	0.1	1.6	Flood Risk
1440 min Winter	0.967	0.067	0.0	0.1	0.1	1.4	Flood Risk
2160 min Winter	0.952	0.052	0.0	0.0	0.0	1.1	Flood Risk
2880 min Winter	0.942	0.042	0.0	0.0	0.0	0.9	Flood Risk
4320 min Winter	0.929	0.029	0.0	0.0	0.0	0.6	Flood Risk
5760 min Winter	0.922	0.022	0.0	0.0	0.0	0.4	Flood Risk
7200 min Winter	0.917	0.017	0.0	0.0	0.0	0.4	Flood Risk
8640 min Winter	0.915	0.015	0.0	0.0	0.0	0.3	Flood Risk
10080 min Winter	0.914	0.014	0.0	0.0	0.0	0.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	99.453	0.0	1.2	33
60 min Winter	62.000	0.0	1.5	62
120 min Winter	37.930	0.0	1.9	118
180 min Winter	28.421	0.0	2.1	174
240 min Winter	23.107	0.0	2.3	228
360 min Winter	17.157	0.0	2.6	286
480 min Winter	13.798	0.0	2.8	362
600 min Winter	11.599	0.0	2.9	440
720 min Winter	10.035	0.0	3.0	514
960 min Winter	7.939	0.0	3.2	662
1440 min Winter	5.636	0.0	3.4	940
2160 min Winter	3.945	0.0	3.6	1340
2880 min Winter	3.056	0.0	3.7	1728
4320 min Winter	2.133	0.0	3.8	2460
5760 min Winter	1.661	0.0	4.0	3152
7200 min Winter	1.383	0.0	4.2	3888
8640 min Winter	1.200	0.0	4.3	4504
10080 min Winter	1.073	0.0	4.5	5088

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.003

Time (mins) From:	To:	Area (ha)
0	4	0.003

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	22.0	0.0	0.101	0.0	0.0
0.100	22.0	0.0			

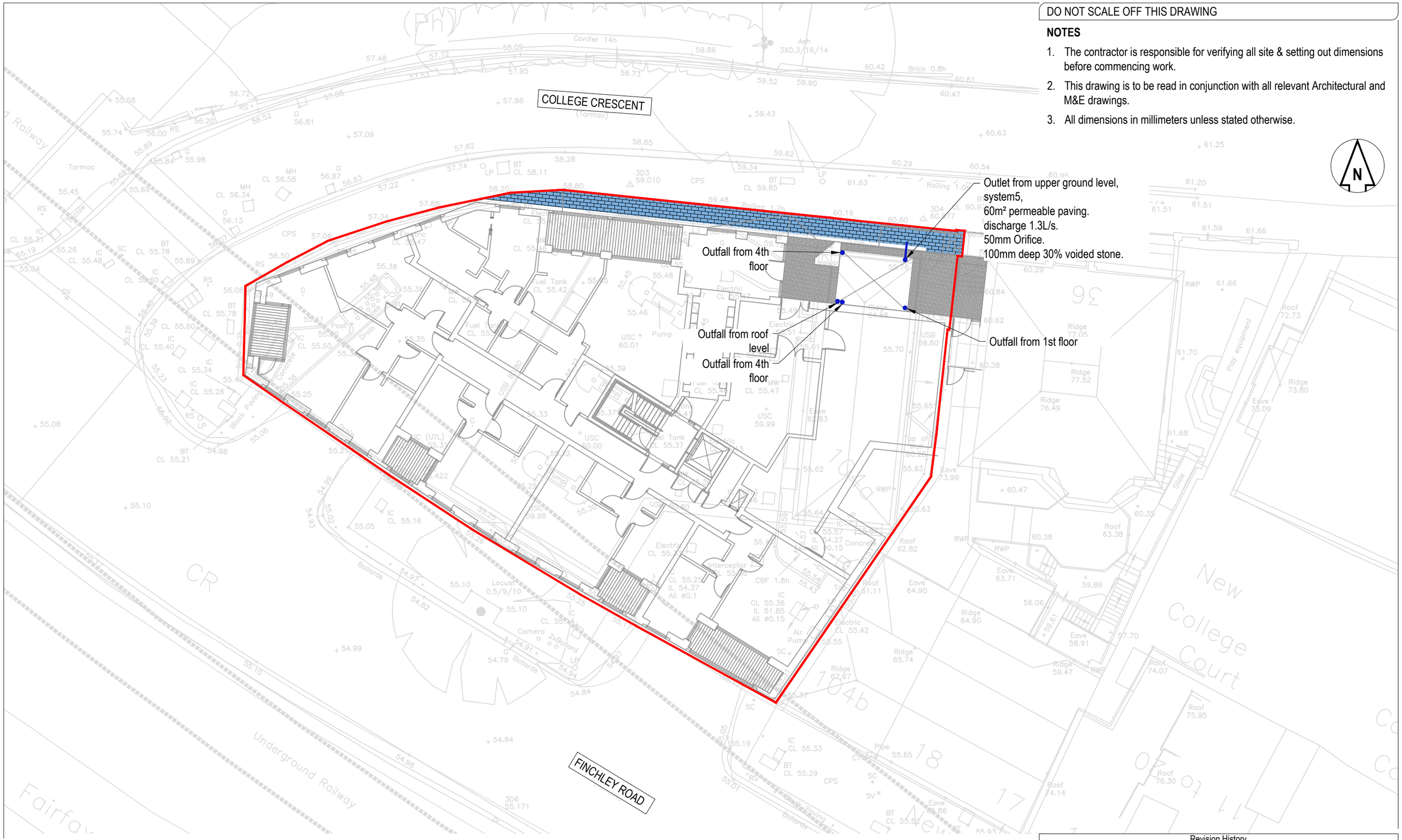
Orifice Outflow Control

Diameter (m) 0.010 Discharge Coefficient 0.600 Invert Level (m) 0.900

DO NOT SCALE OFF THIS DRAWING

NOTES

1. The contractor is responsible for verifying all site & setting out dimensions before commencing work.
2. This drawing is to be read in conjunction with all relevant Architectural and M&E drawings.
3. All dimensions in millimeters unless stated otherwise.



INFORMATION

TREVELLYAN DEVELOPMENTS

Robert West

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Project
FINCHLEY ROAD

Drawing Title
UPPER GROUND
SURAFCE WATER STRATEGY

1:200

RWCL Internal Register reference: 5179-002 Scales @ A3

5179-002-5003-P01

Revision History

Rev	Comment	By	Chkd	Appr	Date

Current Revision

P01	ISSUED FOR INFORMATION	SK	SB	SB	05.08.2022

Summary of Results for 30 year Return Period

Half Drain Time : 18 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.940	0.040	0.0	0.5	0.5	0.7	Flood Risk
30 min Summer	0.945	0.045	0.0	0.6	0.6	0.8	Flood Risk
60 min Summer	0.946	0.046	0.0	0.6	0.6	0.8	Flood Risk
120 min Summer	0.944	0.044	0.0	0.5	0.5	0.8	Flood Risk
180 min Summer	0.941	0.041	0.0	0.5	0.5	0.7	Flood Risk
240 min Summer	0.938	0.038	0.0	0.4	0.4	0.7	Flood Risk
360 min Summer	0.934	0.034	0.0	0.4	0.4	0.6	Flood Risk
480 min Summer	0.931	0.031	0.0	0.3	0.3	0.5	Flood Risk
600 min Summer	0.928	0.028	0.0	0.3	0.3	0.5	Flood Risk
720 min Summer	0.927	0.027	0.0	0.2	0.2	0.5	Flood Risk
960 min Summer	0.925	0.025	0.0	0.2	0.2	0.4	Flood Risk
1440 min Summer	0.921	0.021	0.0	0.1	0.1	0.4	Flood Risk
2160 min Summer	0.918	0.018	0.0	0.1	0.1	0.3	Flood Risk
2880 min Summer	0.916	0.016	0.0	0.1	0.1	0.3	Flood Risk
4320 min Summer	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
5760 min Summer	0.912	0.012	0.0	0.0	0.0	0.2	Flood Risk
7200 min Summer	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk
8640 min Summer	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	81.562	0.0	0.9	14
30 min Summer	52.797	0.0	1.2	22
60 min Summer	32.694	0.0	1.5	38
120 min Summer	20.125	0.0	1.8	70
180 min Summer	15.140	0.0	2.0	102
240 min Summer	12.346	0.0	2.2	132
360 min Summer	9.206	0.0	2.5	194
480 min Summer	7.438	0.0	2.7	252
600 min Summer	6.278	0.0	2.8	314
720 min Summer	5.450	0.0	2.9	374
960 min Summer	4.333	0.0	3.1	492
1440 min Summer	3.101	0.0	3.3	738
2160 min Summer	2.196	0.0	3.5	1100
2880 min Summer	1.719	0.0	3.7	1468
4320 min Summer	1.224	0.0	4.0	2200
5760 min Summer	0.970	0.0	4.2	2936
7200 min Summer	0.818	0.0	4.4	3672
8640 min Summer	0.718	0.0	4.6	4336

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk
15 min Winter	0.945	0.045	0.0	0.6	0.6	0.8	Flood Risk
30 min Winter	0.949	0.049	0.0	0.6	0.6	0.9	Flood Risk
60 min Winter	0.948	0.048	0.0	0.6	0.6	0.9	Flood Risk
120 min Winter	0.943	0.043	0.0	0.5	0.5	0.8	Flood Risk
180 min Winter	0.939	0.039	0.0	0.4	0.4	0.7	Flood Risk
240 min Winter	0.935	0.035	0.0	0.4	0.4	0.6	Flood Risk
360 min Winter	0.930	0.030	0.0	0.3	0.3	0.5	Flood Risk
480 min Winter	0.927	0.027	0.0	0.3	0.3	0.5	Flood Risk
600 min Winter	0.926	0.026	0.0	0.2	0.2	0.5	Flood Risk
720 min Winter	0.924	0.024	0.0	0.2	0.2	0.4	Flood Risk
960 min Winter	0.922	0.022	0.0	0.2	0.2	0.4	Flood Risk
1440 min Winter	0.918	0.018	0.0	0.1	0.1	0.3	Flood Risk
2160 min Winter	0.915	0.015	0.0	0.1	0.1	0.3	Flood Risk
2880 min Winter	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
4320 min Winter	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk
5760 min Winter	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk
7200 min Winter	0.909	0.009	0.0	0.0	0.0	0.2	Flood Risk
8640 min Winter	0.909	0.009	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.647	0.0	4.9	5120
15 min Winter	81.562	0.0	1.0	15
30 min Winter	52.797	0.0	1.3	23
60 min Winter	32.694	0.0	1.6	40
120 min Winter	20.125	0.0	2.0	74
180 min Winter	15.140	0.0	2.3	106
240 min Winter	12.346	0.0	2.5	136
360 min Winter	9.206	0.0	2.8	196
480 min Winter	7.438	0.0	3.0	256
600 min Winter	6.278	0.0	3.2	316
720 min Winter	5.450	0.0	3.3	380
960 min Winter	4.333	0.0	3.5	502
1440 min Winter	3.101	0.0	3.7	736
2160 min Winter	2.196	0.0	4.0	1124
2880 min Winter	1.719	0.0	4.1	1496
4320 min Winter	1.224	0.0	4.4	2204
5760 min Winter	0.970	0.0	4.7	2880
7200 min Winter	0.818	0.0	4.9	3584
8640 min Winter	0.718	0.0	5.2	4368

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.908	0.008	0.0	0.0	0.0	0.1	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.647	0.0	5.5	5144

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	0.0	0.101	0.0	0.0
0.100	60.0	0.0			

Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period

Half Drain Time : 19 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.952	0.052	0.0	0.7	0.7	0.9	Flood Risk
30 min Summer	0.958	0.058	0.0	0.8	0.8	1.1	Flood Risk
60 min Summer	0.959	0.059	0.0	0.9	0.9	1.1	Flood Risk
120 min Summer	0.955	0.055	0.0	0.8	0.8	1.0	Flood Risk
180 min Summer	0.950	0.050	0.0	0.7	0.7	0.9	Flood Risk
240 min Summer	0.947	0.047	0.0	0.6	0.6	0.8	Flood Risk
360 min Summer	0.941	0.041	0.0	0.5	0.5	0.7	Flood Risk
480 min Summer	0.937	0.037	0.0	0.4	0.4	0.7	Flood Risk
600 min Summer	0.934	0.034	0.0	0.4	0.4	0.6	Flood Risk
720 min Summer	0.931	0.031	0.0	0.3	0.3	0.6	Flood Risk
960 min Summer	0.928	0.028	0.0	0.3	0.3	0.5	Flood Risk
1440 min Summer	0.924	0.024	0.0	0.2	0.2	0.4	Flood Risk
2160 min Summer	0.920	0.020	0.0	0.1	0.1	0.4	Flood Risk
2880 min Summer	0.918	0.018	0.0	0.1	0.1	0.3	Flood Risk
4320 min Summer	0.915	0.015	0.0	0.1	0.1	0.3	Flood Risk
5760 min Summer	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
7200 min Summer	0.912	0.012	0.0	0.1	0.1	0.2	Flood Risk
8640 min Summer	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	108.876	0.0	1.2	14
30 min Summer	71.038	0.0	1.6	22
60 min Summer	44.285	0.0	2.0	38
120 min Summer	27.093	0.0	2.4	70
180 min Summer	20.301	0.0	2.7	100
240 min Summer	16.505	0.0	3.0	132
360 min Summer	12.255	0.0	3.3	192
480 min Summer	9.856	0.0	3.5	254
600 min Summer	8.285	0.0	3.7	314
720 min Summer	7.168	0.0	3.9	372
960 min Summer	5.670	0.0	4.1	492
1440 min Summer	4.025	0.0	4.3	736
2160 min Summer	2.818	0.0	4.6	1100
2880 min Summer	2.183	0.0	4.7	1468
4320 min Summer	1.523	0.0	4.9	2204
5760 min Summer	1.187	0.0	5.1	2920
7200 min Summer	0.988	0.0	5.3	3664
8640 min Summer	0.857	0.0	5.5	4328

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk
15 min Winter	0.958	0.058	0.0	0.8	0.8	1.0	Flood Risk
30 min Winter	0.963	0.063	0.0	0.9	0.9	1.1	Flood Risk
60 min Winter	0.961	0.061	0.0	0.9	0.9	1.1	Flood Risk
120 min Winter	0.953	0.053	0.0	0.7	0.7	1.0	Flood Risk
180 min Winter	0.947	0.047	0.0	0.6	0.6	0.9	Flood Risk
240 min Winter	0.943	0.043	0.0	0.5	0.5	0.8	Flood Risk
360 min Winter	0.937	0.037	0.0	0.4	0.4	0.7	Flood Risk
480 min Winter	0.932	0.032	0.0	0.3	0.3	0.6	Flood Risk
600 min Winter	0.929	0.029	0.0	0.3	0.3	0.5	Flood Risk
720 min Winter	0.927	0.027	0.0	0.3	0.3	0.5	Flood Risk
960 min Winter	0.925	0.025	0.0	0.2	0.2	0.4	Flood Risk
1440 min Winter	0.921	0.021	0.0	0.1	0.1	0.4	Flood Risk
2160 min Winter	0.917	0.017	0.0	0.1	0.1	0.3	Flood Risk
2880 min Winter	0.915	0.015	0.0	0.1	0.1	0.3	Flood Risk
4320 min Winter	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
5760 min Winter	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk
7200 min Winter	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk
8640 min Winter	0.910	0.010	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.766	0.0	5.8	5064
15 min Winter	108.876	0.0	1.4	14
30 min Winter	71.038	0.0	1.8	23
60 min Winter	44.285	0.0	2.2	40
120 min Winter	27.093	0.0	2.7	72
180 min Winter	20.301	0.0	3.1	104
240 min Winter	16.505	0.0	3.3	136
360 min Winter	12.255	0.0	3.7	196
480 min Winter	9.856	0.0	4.0	256
600 min Winter	8.285	0.0	4.2	314
720 min Winter	7.168	0.0	4.3	370
960 min Winter	5.670	0.0	4.6	494
1440 min Winter	4.025	0.0	4.9	740
2160 min Winter	2.818	0.0	5.1	1100
2880 min Winter	2.183	0.0	5.3	1472
4320 min Winter	1.523	0.0	5.5	2256
5760 min Winter	1.187	0.0	5.7	2848
7200 min Winter	0.988	0.0	6.0	3600
8640 min Winter	0.857	0.0	6.2	4488

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.909	0.009	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.766	0.0	6.5	5240

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	0.0	0.101	0.0	0.0
0.100	60.0	0.0			

Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 18 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.971	0.071	0.0	1.1	1.1	1.3	Flood Risk
30 min Summer	0.979	0.079	0.0	1.2	1.2	1.4	Flood Risk
60 min Summer	0.979	0.079	0.0	1.2	1.2	1.4	Flood Risk
120 min Summer	0.971	0.071	0.0	1.1	1.1	1.3	Flood Risk
180 min Summer	0.964	0.064	0.0	1.0	1.0	1.2	Flood Risk
240 min Summer	0.959	0.059	0.0	0.8	0.8	1.1	Flood Risk
360 min Summer	0.952	0.052	0.0	0.7	0.7	0.9	Flood Risk
480 min Summer	0.946	0.046	0.0	0.6	0.6	0.8	Flood Risk
600 min Summer	0.942	0.042	0.0	0.5	0.5	0.8	Flood Risk
720 min Summer	0.939	0.039	0.0	0.4	0.4	0.7	Flood Risk
960 min Summer	0.934	0.034	0.0	0.4	0.4	0.6	Flood Risk
1440 min Summer	0.928	0.028	0.0	0.3	0.3	0.5	Flood Risk
2160 min Summer	0.924	0.024	0.0	0.2	0.2	0.4	Flood Risk
2880 min Summer	0.921	0.021	0.0	0.1	0.1	0.4	Flood Risk
4320 min Summer	0.918	0.018	0.0	0.1	0.1	0.3	Flood Risk
5760 min Summer	0.916	0.016	0.0	0.1	0.1	0.3	Flood Risk
7200 min Summer	0.914	0.014	0.0	0.1	0.1	0.3	Flood Risk
8640 min Summer	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
10080 min Summer	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
15 min Winter	0.978	0.078	0.0	1.2	1.2	1.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	152.426	0.0	1.7	14
30 min Summer	99.453	0.0	2.2	22
60 min Summer	62.000	0.0	2.8	38
120 min Summer	37.930	0.0	3.4	70
180 min Summer	28.421	0.0	3.8	100
240 min Summer	23.107	0.0	4.2	132
360 min Summer	17.157	0.0	4.6	192
480 min Summer	13.798	0.0	5.0	252
600 min Summer	11.599	0.0	5.2	314
720 min Summer	10.035	0.0	5.4	374
960 min Summer	7.939	0.0	5.7	494
1440 min Summer	5.636	0.0	6.1	736
2160 min Summer	3.945	0.0	6.4	1100
2880 min Summer	3.056	0.0	6.6	1468
4320 min Summer	2.133	0.0	6.9	2184
5760 min Summer	1.661	0.0	7.2	2936
7200 min Summer	1.383	0.0	7.5	3624
8640 min Summer	1.200	0.0	7.8	4384
10080 min Summer	1.073	0.0	8.1	5112
15 min Winter	152.426	0.0	1.9	14

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	0.986	0.086	0.0	1.3	1.3	1.5	Flood Risk
60 min Winter	0.981	0.081	0.0	1.2	1.2	1.5	Flood Risk
120 min Winter	0.968	0.068	0.0	1.1	1.1	1.2	Flood Risk
180 min Winter	0.960	0.060	0.0	0.9	0.9	1.1	Flood Risk
240 min Winter	0.954	0.054	0.0	0.7	0.7	1.0	Flood Risk
360 min Winter	0.946	0.046	0.0	0.6	0.6	0.8	Flood Risk
480 min Winter	0.941	0.041	0.0	0.5	0.5	0.7	Flood Risk
600 min Winter	0.936	0.036	0.0	0.4	0.4	0.6	Flood Risk
720 min Winter	0.933	0.033	0.0	0.3	0.3	0.6	Flood Risk
960 min Winter	0.929	0.029	0.0	0.3	0.3	0.5	Flood Risk
1440 min Winter	0.925	0.025	0.0	0.2	0.2	0.4	Flood Risk
2160 min Winter	0.921	0.021	0.0	0.1	0.1	0.4	Flood Risk
2880 min Winter	0.918	0.018	0.0	0.1	0.1	0.3	Flood Risk
4320 min Winter	0.915	0.015	0.0	0.1	0.1	0.3	Flood Risk
5760 min Winter	0.913	0.013	0.0	0.1	0.1	0.2	Flood Risk
7200 min Winter	0.912	0.012	0.0	0.1	0.1	0.2	Flood Risk
8640 min Winter	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk
10080 min Winter	0.911	0.011	0.0	0.0	0.0	0.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	99.453	0.0	2.5	23
60 min Winter	62.000	0.0	3.1	40
120 min Winter	37.930	0.0	3.8	72
180 min Winter	28.421	0.0	4.3	102
240 min Winter	23.107	0.0	4.6	134
360 min Winter	17.157	0.0	5.2	194
480 min Winter	13.798	0.0	5.6	256
600 min Winter	11.599	0.0	5.8	318
720 min Winter	10.035	0.0	6.1	378
960 min Winter	7.939	0.0	6.4	490
1440 min Winter	5.636	0.0	6.8	714
2160 min Winter	3.945	0.0	7.1	1080
2880 min Winter	3.056	0.0	7.4	1496
4320 min Winter	2.133	0.0	7.7	2168
5760 min Winter	1.661	0.0	8.0	2888
7200 min Winter	1.383	0.0	8.4	3736
8640 min Winter	1.200	0.0	8.7	4280
10080 min Winter	1.073	0.0	9.1	4952

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	60.0	0.0	0.101	0.0	0.0
0.100	60.0	0.0			

Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 0.900

DO NOT SCALE OFF THIS DRAWING

NOTES

1. The contractor is responsible for verifying all site & setting out dimensions before commencing work.
2. This drawing is to be read in conjunction with all relevant Architectural and M&E drawings.
3. All dimensions in millimeters unless stated otherwise.

COLLEGE CRESCENT

FINCHLEY ROAD

Existing Thames Water MH 4509
CL:56.58
IL:55.45

Existing Thames Water MH 4508
CL:56.34
IL:53.21

Existing Thames Water MH 4507
CL:54.72
IL:53.27

Existing Combined 150Ø Thames Water Sewer

Existing Thames Water MH 4510
CL:61.48
IL:TBC

Existing London Underground

Existing Combined 225Ø Thames Water Sewer

Existing Combined 1168 x 762 Thames Water Sewer

Existing Thames Water Sewer to be maintained

Outlet from permeable paving at upper ground level

Proposed foul water MH

Pipe inlets from roof drainage to connect into proposed surface water manhole in courtyard

Outlet from courtyard, system 6,
13.5m² permeable paving.
discharge 1.0L/s.
50mm Orifice.
100mm deep 30% voided stone.

Proposed surface water MH

Proposed foul water MH

Proposed foul water MH

Proposed surface water MH

Proposed foul and surface water connections to existing sewer, subject to S106 approval.

Provision to be made for re-construction of manhole

Existing MH
CL:55.36
IL:51.85

Existing MH
CL:55.57
IL:54.27

Existing foul connections from adjacent building to be maintained, further investigation required.

Existing combined connection to public sewer to be maintained.

Existing London Underground

INFORMATION

TREVELLYAN DEVELOPMENTS

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Project
FINCHLEY ROAD

Drawing Title
LOWER GROUND
PROPOSED DRAINAGE STRATEGY

1:200

RWCL Internal Register reference: 5179-002 Scales @ A3

5179-002-5004-P01

Revision History

Rev	Comment	By	Chkd	Appr	Date

Current Revision

Rev	Comment	By	Chkd	Appr	Date
P01	ISSUED FOR INFORMATION	SK	SB	SB	05.08.2022

Summary of Results for 30 year Return Period

Half Drain Time : 6 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.940	0.040	0.0	0.4	0.4	0.2	Flood Risk
30 min Summer	0.940	0.040	0.0	0.4	0.4	0.2	Flood Risk
60 min Summer	0.935	0.035	0.0	0.4	0.4	0.1	Flood Risk
120 min Summer	0.929	0.029	0.0	0.3	0.3	0.1	Flood Risk
180 min Summer	0.926	0.026	0.0	0.2	0.2	0.1	Flood Risk
240 min Summer	0.924	0.024	0.0	0.2	0.2	0.1	Flood Risk
360 min Summer	0.921	0.021	0.0	0.1	0.1	0.1	Flood Risk
480 min Summer	0.919	0.019	0.0	0.1	0.1	0.1	Flood Risk
600 min Summer	0.917	0.017	0.0	0.1	0.1	0.1	Flood Risk
720 min Summer	0.916	0.016	0.0	0.1	0.1	0.1	Flood Risk
960 min Summer	0.915	0.015	0.0	0.1	0.1	0.1	Flood Risk
1440 min Summer	0.912	0.012	0.0	0.1	0.1	0.0	Flood Risk
2160 min Summer	0.910	0.010	0.0	0.0	0.0	0.0	Flood Risk
2880 min Summer	0.909	0.009	0.0	0.0	0.0	0.0	Flood Risk
4320 min Summer	0.908	0.008	0.0	0.0	0.0	0.0	Flood Risk
5760 min Summer	0.907	0.007	0.0	0.0	0.0	0.0	Flood Risk
7200 min Summer	0.906	0.006	0.0	0.0	0.0	0.0	Flood Risk
8640 min Summer	0.906	0.006	0.0	0.0	0.0	0.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	81.562	0.0	0.3	12
30 min Summer	52.797	0.0	0.4	19
60 min Summer	32.694	0.0	0.5	34
120 min Summer	20.125	0.0	0.6	64
180 min Summer	15.140	0.0	0.7	96
240 min Summer	12.346	0.0	0.7	126
360 min Summer	9.206	0.0	0.8	186
480 min Summer	7.438	0.0	0.9	246
600 min Summer	6.278	0.0	0.9	308
720 min Summer	5.450	0.0	1.0	368
960 min Summer	4.333	0.0	1.0	490
1440 min Summer	3.101	0.0	1.1	726
2160 min Summer	2.196	0.0	1.2	1100
2880 min Summer	1.719	0.0	1.2	1444
4320 min Summer	1.224	0.0	1.3	2196
5760 min Summer	0.970	0.0	1.4	2864
7200 min Summer	0.818	0.0	1.5	3616
8640 min Summer	0.718	0.0	1.5	4400

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.905	0.005	0.0	0.0	0.0	0.0	Flood Risk
15 min Winter	0.942	0.042	0.0	0.5	0.5	0.2	Flood Risk
30 min Winter	0.940	0.040	0.0	0.4	0.4	0.2	Flood Risk
60 min Winter	0.932	0.032	0.0	0.3	0.3	0.1	Flood Risk
120 min Winter	0.926	0.026	0.0	0.2	0.2	0.1	Flood Risk
180 min Winter	0.923	0.023	0.0	0.2	0.2	0.1	Flood Risk
240 min Winter	0.921	0.021	0.0	0.1	0.1	0.1	Flood Risk
360 min Winter	0.918	0.018	0.0	0.1	0.1	0.1	Flood Risk
480 min Winter	0.916	0.016	0.0	0.1	0.1	0.1	Flood Risk
600 min Winter	0.915	0.015	0.0	0.1	0.1	0.1	Flood Risk
720 min Winter	0.914	0.014	0.0	0.1	0.1	0.1	Flood Risk
960 min Winter	0.912	0.012	0.0	0.1	0.1	0.0	Flood Risk
1440 min Winter	0.911	0.011	0.0	0.0	0.0	0.0	Flood Risk
2160 min Winter	0.909	0.009	0.0	0.0	0.0	0.0	Flood Risk
2880 min Winter	0.908	0.008	0.0	0.0	0.0	0.0	Flood Risk
4320 min Winter	0.906	0.006	0.0	0.0	0.0	0.0	Flood Risk
5760 min Winter	0.906	0.006	0.0	0.0	0.0	0.0	Flood Risk
7200 min Winter	0.905	0.005	0.0	0.0	0.0	0.0	Flood Risk
8640 min Winter	0.905	0.005	0.0	0.0	0.0	0.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.647	0.0	1.6	4960
15 min Winter	81.562	0.0	0.3	12
30 min Winter	52.797	0.0	0.4	20
60 min Winter	32.694	0.0	0.5	36
120 min Winter	20.125	0.0	0.7	64
180 min Winter	15.140	0.0	0.8	98
240 min Winter	12.346	0.0	0.8	128
360 min Winter	9.206	0.0	0.9	186
480 min Winter	7.438	0.0	1.0	238
600 min Winter	6.278	0.0	1.1	314
720 min Winter	5.450	0.0	1.1	368
960 min Winter	4.333	0.0	1.2	488
1440 min Winter	3.101	0.0	1.2	752
2160 min Winter	2.196	0.0	1.3	1060
2880 min Winter	1.719	0.0	1.4	1436
4320 min Winter	1.224	0.0	1.5	2156
5760 min Winter	0.970	0.0	1.6	2992
7200 min Winter	0.818	0.0	1.6	3712
8640 min Winter	0.718	0.0	1.7	4592

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.904	0.004	0.0	0.0	0.0	0.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.647	0.0	1.8	5144

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.002

Time (mins) From:	To:	Area (ha)
0	4	0.002

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	13.5	0.0	0.101	0.0	0.0
0.100	13.5	0.0			

Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 0.900

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 4 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.964	0.064	0.0	1.0	1.0	0.3	Flood Risk
30 min Summer	0.964	0.064	0.0	1.0	1.0	0.3	Flood Risk
60 min Summer	0.954	0.054	0.0	0.8	0.8	0.2	Flood Risk
120 min Summer	0.944	0.044	0.0	0.5	0.5	0.2	Flood Risk
180 min Summer	0.938	0.038	0.0	0.4	0.4	0.2	Flood Risk
240 min Summer	0.933	0.033	0.0	0.4	0.4	0.1	Flood Risk
360 min Summer	0.928	0.028	0.0	0.3	0.3	0.1	Flood Risk
480 min Summer	0.926	0.026	0.0	0.2	0.2	0.1	Flood Risk
600 min Summer	0.924	0.024	0.0	0.2	0.2	0.1	Flood Risk
720 min Summer	0.923	0.023	0.0	0.2	0.2	0.1	Flood Risk
960 min Summer	0.920	0.020	0.0	0.1	0.1	0.1	Flood Risk
1440 min Summer	0.917	0.017	0.0	0.1	0.1	0.1	Flood Risk
2160 min Summer	0.914	0.014	0.0	0.1	0.1	0.1	Flood Risk
2880 min Summer	0.912	0.012	0.0	0.1	0.1	0.0	Flood Risk
4320 min Summer	0.910	0.010	0.0	0.0	0.0	0.0	Flood Risk
5760 min Summer	0.909	0.009	0.0	0.0	0.0	0.0	Flood Risk
7200 min Summer	0.908	0.008	0.0	0.0	0.0	0.0	Flood Risk
8640 min Summer	0.908	0.008	0.0	0.0	0.0	0.0	Flood Risk
10080 min Summer	0.907	0.007	0.0	0.0	0.0	0.0	Flood Risk
15 min Winter	0.967	0.067	0.0	1.0	1.0	0.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	152.426	0.0	0.6	12
30 min Summer	99.453	0.0	0.7	19
60 min Summer	62.000	0.0	0.9	34
120 min Summer	37.930	0.0	1.1	64
180 min Summer	28.421	0.0	1.3	96
240 min Summer	23.107	0.0	1.4	126
360 min Summer	17.157	0.0	1.5	186
480 min Summer	13.798	0.0	1.7	246
600 min Summer	11.599	0.0	1.7	304
720 min Summer	10.035	0.0	1.8	368
960 min Summer	7.939	0.0	1.9	490
1440 min Summer	5.636	0.0	2.0	734
2160 min Summer	3.945	0.0	2.1	1100
2880 min Summer	3.056	0.0	2.2	1448
4320 min Summer	2.133	0.0	2.3	2188
5760 min Summer	1.661	0.0	2.4	2880
7200 min Summer	1.383	0.0	2.5	3608
8640 min Summer	1.200	0.0	2.6	4272
10080 min Summer	1.073	0.0	2.7	5136
15 min Winter	152.426	0.0	0.6	12

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	0.962	0.062	0.0	0.9	0.9	0.2	Flood Risk
60 min Winter	0.950	0.050	0.0	0.7	0.7	0.2	Flood Risk
120 min Winter	0.938	0.038	0.0	0.4	0.4	0.2	Flood Risk
180 min Winter	0.932	0.032	0.0	0.3	0.3	0.1	Flood Risk
240 min Winter	0.928	0.028	0.0	0.3	0.3	0.1	Flood Risk
360 min Winter	0.925	0.025	0.0	0.2	0.2	0.1	Flood Risk
480 min Winter	0.923	0.023	0.0	0.2	0.2	0.1	Flood Risk
600 min Winter	0.920	0.020	0.0	0.1	0.1	0.1	Flood Risk
720 min Winter	0.919	0.019	0.0	0.1	0.1	0.1	Flood Risk
960 min Winter	0.917	0.017	0.0	0.1	0.1	0.1	Flood Risk
1440 min Winter	0.914	0.014	0.0	0.1	0.1	0.1	Flood Risk
2160 min Winter	0.912	0.012	0.0	0.0	0.0	0.0	Flood Risk
2880 min Winter	0.910	0.010	0.0	0.0	0.0	0.0	Flood Risk
4320 min Winter	0.909	0.009	0.0	0.0	0.0	0.0	Flood Risk
5760 min Winter	0.908	0.008	0.0	0.0	0.0	0.0	Flood Risk
7200 min Winter	0.907	0.007	0.0	0.0	0.0	0.0	Flood Risk
8640 min Winter	0.906	0.006	0.0	0.0	0.0	0.0	Flood Risk
10080 min Winter	0.906	0.006	0.0	0.0	0.0	0.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	99.453	0.0	0.8	19
60 min Winter	62.000	0.0	1.0	34
120 min Winter	37.930	0.0	1.3	66
180 min Winter	28.421	0.0	1.4	96
240 min Winter	23.107	0.0	1.6	124
360 min Winter	17.157	0.0	1.7	186
480 min Winter	13.798	0.0	1.9	244
600 min Winter	11.599	0.0	1.9	312
720 min Winter	10.035	0.0	2.0	370
960 min Winter	7.939	0.0	2.1	472
1440 min Winter	5.636	0.0	2.3	714
2160 min Winter	3.945	0.0	2.4	1064
2880 min Winter	3.056	0.0	2.5	1472
4320 min Winter	2.133	0.0	2.6	2088
5760 min Winter	1.661	0.0	2.7	2848
7200 min Winter	1.383	0.0	2.8	3608
8640 min Winter	1.200	0.0	2.9	4256
10080 min Winter	1.073	0.0	3.0	4968

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 444178 275813 SP 44178 75813
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.002

Time (mins) From:	To:	Area (ha)
0	4	0.002

Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.30
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	13.5	0.0	0.101	0.0	0.0
0.100	13.5	0.0			

Orifice Outflow Control

Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 0.900

Robert West

Rail
Buildings
Infrastructure
Transport & Environment

Appendix N – SuDS Designer Risk Assessment

Robert West Consulting **104a Finchley Road** **Designer's Risk Assessment** **02/08/22**

No.	Activity / Situation	Hazard Description	Risk	Assessment			Control Measures	Residual Risk			Ownership
				S *1-5*	L *1-5*	RR *LxS*		S *1-5*	L *1-5*	RR *LxS*	
1	Excavation for below-ground drainage features	Collapse	Suffocation	4	2	8	Shallow attenuation features and drains	4	1	4	Designer
2	Excavation for below-ground drainage features	Utilities clash	Electrocution, explosion	5	2	10	Obtain utility records; pass to Contractor; hand-dig pits to expose	5	1	5	Designer, Contractor
3	Roof access for maintenance of attenuation	Fall from height	Injury due to fall	5	3	15	In detailed design, incorporate suitable roof safety system; include in H&S File	5	1	5	Architect, Principal Designer, Principal Contractor

S=Severity Rating **L=Likelihood Rating** **RR=Risk Rating**

Severity (S)		Likelihood (L)		Score (RR)	
Fatal or multi-fatal outcome	5	Very likely to occur	5	1-8	Low risk
Major Injury outcome (i.e. RIDDOR reportable)	4	Probable	4		
3-day injury, as determined in RIDDOR	3	Possible	3	9-16	Medium risk
Minor injury – first aid only	2	Remote	2		
Accident or incident where no injury occurs	1	Improbable	1	17-25	High risk

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Appendix O – LBC Flood and SuDS Proformas

Camden

GREATERLONDONAUTHORITY

LoDEG

1. Project & Site Details		
	Project / Site Name (including sub-catchment / stage / phase where appropriate)	Former BP Service Station
	Address & post code	104A Finchley Rd, South Hampstead, London NW3 5EY
	OS Grid ref. (Easting, Northing)	E 184588
		N 526462
	LPA reference (if applicable)	N/A
	Brief description of proposed work	Demolition of the existing BP Service Station and the construction of a 6-storey building comprising a mixed-use development consisting of commercial units and a school extension with 31 apartments
	Total site Area	800 m^2
	Total existing impervious area	800 m^2
	Total proposed impervious area	730 m^2
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
	Existing drainage connection type and location	Unrestricted Thames Water 1168mm x 762mm combined sewer
	Designer Name	Steve Burgess
	Designer Position	Principal Engineer
	Designer Company	Robert West Consulting

2. Proposed Discharge Arrangements			
	2a. Infiltration Feasibility		
	Superficial geology classification	London Clay Formation	
	Bedrock geology classification	London Clay Formation	
	Site infiltration rate	0	m/s
	Depth to groundwater level	1.4	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	*Proposed (Y/N)*
	1 store rainwater for later use	Y	N
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	N	N
	7 discharge rainwater to the combined sewer.	Y	Y
	2c. Proposed Discharge Details		
	Proposed discharge location	Thames Water combined sewer	
	Has the owner/regulator of the discharge location been consulted?	Yes	

3. Drainage Strategy

3a. Discharge Rates & Required Storage

	Greenfield (GF) runoff rate (l/s)	*Existing discharge rate (l/s)*	*Required storage for GF rate (m^3)*	*Proposed discharge rate (l/s)*
Qbar	0.8			
1 in 1	0.7	17.3		
1 in 30	2	33.4	22	1.7
1 in 100	2.7	40	29	2.3
1 in 100 + CC				3.1
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Orifice plates / Blue roof Restrictors		

3c. Proposed SuDS Measures

	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	0		0
Infiltration systems	0		0
Green roofs	0	0	0
Blue roofs	655	580	58
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	73	73	2
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	0		0
Total	**728**	**653**	**60**

4. Supporting Information

4a. Discharge & Drainage Strategy	*Page/section of drainage report*
Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 4 and Appendix D
Drainage hierarchy (2b)	Section 8
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 4 and 8 Appendix B and H
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 8 and Appendix M
Proposed SuDS measures & specifications (3b)	Section 8 Appendix M
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	Appendix J
Detailed drainage design drawings, including exceedance flow routes	Appendix G and Appendix M
Detailed landscaping plans	N/A
Maintenance strategy	Appendix P
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Section 8
b) biodiversity?	Section 8
c) amenity?	Section 8

Pro-forma for any schemes in flood risk areas & all major development - Camden LLFA

All yellow boxes **must** be completed on this and all relevant tabs
Complete peach cells with source document and section/page references, required to support/justify responses
Do not edit grey cells
Please note guidelines / notes in column M
Complete all relevant tabs

Introduction: This Proforma is intended to help you understand the Sustainable Drainage and Flood Risk considerations that the Lead Local Flood Authority (LLFA) and Local Planning Authority (LPA) will take into account when considering an application in Camden, as well as helping us to consider the application. This does not replace the need also to provide where required a Drainage Statement, Flood Risk Assessment, and GLA-Camden SuDS Pro-forma, and observe the detailed guidance in ' Camden Planning Guidance (CPG) Water & Flooding'. Any information provided should be referenced to the relevant section of submitted supporting documents. This summary page will help provide key details on the application. Note that certain cells on this and other tabs will be populated automatically from previous answers given.

A. Application details

Planning reference (if known)	N/A			
Scheme name	Former BP Service Station			
Scheme address	104A Finchley Rd, South Hampstead, London			
Postcode	NW3 5EY			
Scale of development as registered	Major			
Scale - policy subcategory	Major - other	Residential parts	Major - other	Non-residential parts
Type(s) of development	Mixed	New/re-build		
Site area, hectares	0.08	*100%*		
Of which total permeable area, to nearest 0.0001 ha	0	0%		
Of which total impermeable area, to nearest 0.0001 ha	0.08	100%		

	Existing	Proposed				
	TOTAL pre-development	For demolition	New-build incl. infills, re-build, extensions	Retained (refurbished or change of use)	TOTAL post-development	Net UPLIFT post-development
Total floor area of development (GIA)	0.08	0.08	0.073	0	0.073	-0.007
of which residential	0	0			0	0
of which non- residential	0.08	0.08			0	-0.08
Number of residential units	0	0	31	0	31	
List all use class(es)	Comercial	Comercial	Resi/Comercial/School	N/A	N/A	

Drainage Statement document details	5719/002/002 - Finchley Road FRA	
Flood Risk Assessment document details	5719/002/002- Finchley Road FRA	

Recommendation (Council to complete)	B. Flood Risk and SuDS - Policy & Documents Filter		
	Site area 1 hectare or greater?	*No*	
	Major application?	*Yes*	
	In Critical Drainage Area?	No	
	In or bordering (<50m) Local Flood Risk Zone(s)?	No	
	Name of LFRZ(s):	N/A	
	On Historically Flooded Street 1975 or 2002?	Yes	
	Name of HFS(s):	Fincley Road	
	Area at risk of flooding (surface water)?	*CHECK SITE DETAILS*	
	Elevated groundwater susceptibility or <50m of GW incident?	No	
	In area with recorded sewer flooding incident?	No	
	In street with historical underground watercourse?	No	
	Area at risk of flooding (other relevant types)?	*No*	
	Basement proposed - new, enlarged or change of use?	No	
	IF YES, list proposed basement uses (all spaces):	N/A	
Approve/Condition/Refuse	*IF YES, are habitable or vulnerable use(s) included?*	N/A	
Approve/Condition/Refuse	*IF NO, is other (non-basement) vulnerable development proposed?*	Yes	
	Vulnerable development in flood-prone area?	*Yes*	
	Site-specific Flood Risk Assessment (FRA) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Site-specific FRA submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Drainage Statement (DS) required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	DS submitted?	Yes	**If Yes, go to Flood Risk Proposals tab**
	Sustainable drainage (SuDS) proposals required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	SuDS proposals submitted?	Yes	**If Yes, go to SuDS Proposals tab**
	FRA/DS/SuDS supporting evidence required?	*CHECK SITE DETAILS*	
Approve/Condition/Refuse	Supporting evidence submitted?	Yes	**If Yes, go to Flood Risk Proposals &/or SuDS Proposals ta**

Sustainable Drainage (SuDS) Assessment, Evidence and Proposals

Recommendation (Council to complete)	**Assessments**	Document submitted?	Document title	Page/ section reference	**Guidelines / notes**
	Drainage Statement (DS)	*Yes*			Policy CC3 c. consider the impact of development in areas at risk of flooding (including drainage);
	GLA-Camden SuDS Pro-forma (fully completed)	Yes			Download from www.london.gov.uk/what-we-do/environment/climate-change/surface-

Recommendation (Council to complete)	**Policy compliance**	Requirement met?	Document title	Page/ section reference	
	DS must include identification of flood risk	Yes			
	DS must include assessment of existing, greenfield & proposed runoff rates	Yes			Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible & Policy CC3 supporting text §8.67
	DS must include identification of measures, in line with the drainage hierarchy, to reduce runoff rates	Yes			
	Achieve greenfield runoff rates wherever feasible, or as close as possible	Yes			Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible & Policy CC3 supporting text §8.66
	Constrain runoff volumes to greenfield for 100yr 6hr event where feasible	Yes			
	Backstop target for unaltered buildings: >50% reduction in existing run-off	Yes			
	Developments must include SuDS unless inappropriate	Yes			Policy CC3 e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible & Policy CC3 supporting text §8.68
	Development should follow the detailed London Plan drainage hierarchy	Yes			
	EA climate change factor applied: 2080s upper rainfall intensity allowance (40%)	Yes			

Recommendation (Council to complete)	**Evidence supporting Assessments & Proposals**	Evidence submitted?	Document title	Page/ section reference
	Drawings detailing SuDS extent & position (incl. outfalls, control points, levels)	Yes		
	Blue-green roof details with area & minimum 150mm substrate for storage	Yes		
	Results of cross-site infiltration rate or similar tests to show soil (in)compatibility	No		
	Professional run-off calculations supporting rates & volumes reported in DS	Yes		
	Drawings showing on&off-site overland exceedance flows	Yes		
	Evidence of site surveys and investigations relating to drainage	Yes		
	Lifetime maintenance and adoption arrangements (and maintenance owner)	Yes		
	Management of health & safety risks related to SuDS design	Yes		
	Confirmation of discharge capacity (or correspondence) from relevant body eg TW	TBC		

Flood Risk Assessment, Proposals & Evidence

Recommendation (Council to complete)	Assessments	Required?	Document submitted?	Document title	Page/ section reference	Guidelines / notes
	Site-specific Flood Risk Assessment	*CHECK SITE DETAILS*	Yes			Policy CC3 c. consider the impact of development in areas at risk of flooding (including drainage) & d. incorporate flood resilient measures in areas prone to flooding; Where an assessment of flood risk is required, developments should consider surface water flooding in detail and groundwater flooding where applicable.
	Drainage Statement	*CHECK SITE DETAILS*	Yes			Policy CC3 c. consider the impact of development in areas at risk of flooding (including drainage);
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes			
	SuDS Proposals	*CHECK SITE DETAILS*	Yes			Policy CC3 b. avoid harm to the water environment and improve water quality & e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible
	SuDS Proposals tab completed	*CHECK SITE DETAILS*	Yes			

Recommendation (Council to complete)	Policy compliance	Required?	Requirement met?	Document title	Page/ section reference	
	Assessments address local, regional & national policies	*CHECK SITE DETAILS*	Yes			*including Local Plan CC3, CPG, new London Plan, National Planning Policy Framework*
	include suitable research & quantification of site flood risks	*CHECK SITE DETAILS*	Yes			*including Strategic Flood Risk Assessment, Update LFRZ Map & EA Mapping*
	address cumulative impact of developments	*CHECK SITE DETAILS*	Yes			Policy CC3 c. consider the impact of development in areas at risk of flooding
	propose suitable flood ingress internal coping measures	*CHECK SITE DETAILS*	Yes			Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;
	propose suitable flood risk mitigation measures	*CHECK SITE DETAILS*	Yes			Policy CC3 d. incorporate flood resilient measures in areas prone to flooding;
	Internal water consumption target 105 l/p/d (residential)	*Yes*	TBC			Policy CC3 a. incorporate water efficiency measures
	External water consumption target 5 l/p/d (residential)	*Yes*	TBC			Policy CC3 a. incorporate water efficiency measures
	BREEAM Excellent water consumption target (non-resi >500m2)	*Yes*	TBC			Policy CC3 a. incorporate water efficiency measures
	Will not locate vulnerable development in flood-prone area	*CHECK SITE DETAILS*	*CHECK SITE DETAILS*			Policy CC3 f. not locate vulnerable development in flood-prone areas.
	Scheme does not increase flood risk on & off site	*CHECK SITE DETAILS*	Yes			Policy CC3 The Council will seek to ensure that development does not increase flood risk
	Scheme reduces on&off-site flood risk where possible	*CHECK SITE DETAILS*	Yes			Policy CC3 The Council will seek to ensure that development...reduces the risk of flooding where possible

Recommendation (Council to complete)	Evidence supporting Assessments & Proposals	Required?	Evidence submitted?	Document title	Page/ section reference	
	Drawings showing site-specific flood risk up to 100yr+40%	*CHECK SITE DETAILS*	Yes			*allowing 300mm freeboard to potential water ingress points*
	Drawings showing proposed internal coping measures	*CHECK SITE DETAILS*	No			
	Drawings showing proposed flood mitigation measures	*CHECK SITE DETAILS*	No			
	Drawings showing proposed basement/ground floor uses	*CHECK SITE DETAILS*	Yes			
	Building flood risk emergency evacuation plan		Yes			
	Drawings showing on&off-site overland exceedance flows	*CHECK SITE DETAILS*	Yes			
	Internal water calculations & proposals (resi)	*Yes*	TBC			Policy CC3 a. incorporate water efficiency measures
	External water calculations & proposals (resi)	*Yes*	TBC			Policy CC3 a. incorporate water efficiency measures
	BREEAM water calculations & proposals (non-resi >500m2)	*Yes*	TBC			Policy CC3 a. incorporate water efficiency measures

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Rail
Buildings
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Appendix P – Outline Drainage Maintenance Schedule

5719/002/002

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Drainage Maintenance Schedule

Project – 104a Finchley Road, Camden	**Date: August 2022**

Drainage Maintenance Arrangements

Maintenance During Construction

1. Once appointed the Contractor will prepare a site-specific method statement for the control of silt and other pollutants during construction. CIRIA Report C532 'Control of Water Pollution from Construction Sites' provides further guidance on this.
2. During the construction phase, should hardstanding areas be constructed prior to the completion of the proposed drainage scheme, surface water flow will be temporarily channelled into localised lined storage units before being discharged at no greater than 3.1/ls into the existing surface water sewers. Appropriate water quality mitigation in accordance with CIRIA Report C532 will be provided. This approach allows for surface water to be attenuated and sediments captured during the construction phase.
3. The Contractor will maintain the proposed drainage system during construction and until the site is handed over to the Management Company.

Management and Maintenance of Proposed SuDS Drainage System

4. Upon completion, the applicant will form a Management Company who will own, manage and maintain the development in perpetuity the building, footpaths, communal landscape areas and any communal structures and services (including underground drainage) in order to protect the integrity and appearance of the site.
5. The Management Company will be set up prior to the occupation of the development.
6. All maintenance will be carried out by an appointed specialist retained by the Management Company on a fixed contract (of at least 1 year) paid for by the Management Company in perpetuity via an annual maintenance fee for the upkeep of the communal areas including the SuDS network.
7. The Management Company will appoint a Managing Agent, who shall be responsible for the day-to-day maintenance of the site, and will appoint relevant subcontractors, arranging Public Liability Insurance and look after the financial arrangements, establishing a budget for the maintenance and upkeep of the site, and setting up and collecting service charges from the Residents.
8. The contact details for the Management Company are as follows:
   (Details to be included here once appointed)
9. The Developer is obliged to pay the service charge for any unsold units to the Managing Agent until the last plot on the site has been sold.
10. The regular and corrective maintenance of all shared elements of the drainage systems, including the storage structures, catchpits, and permeable paving will be managed and funded through the Management Company on behalf of the Occupiers.

11. The Management Company is obliged to provide the services listed however individual Occupiers are obliged to contribute to the Reserved Fund Contribution and any expenses the Management Company may have incurred.
12. Provisions will be made to replace any infrastructure that has reached the end of its serviceable design life and will be replaced on a like for like basis as far as reasonably practicable.
13. The Blue / Green Roof systems will be maintained in accordance with Bauder guidance, operation and maintenance manuals.
14. In the event that the Management Company becomes unable to discharge its duties within 2 years of first appointment the Developer will endeavour to appoint an alternative on behalf of the Occupiers.
15. Regular maintenance of all private drainage connections will be the responsibility of the individual homeowner and should be undertaken every 3 months.
16. Collection of all litter and debris from communal areas is to be undertaken on a monthly basis by the Management Company.

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Drainage Maintenance Schedule

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from silt trap chambers, gullies traps, channel drains and inlet chambers	3 monthly
	Litter and debris removal – catch pits / gullies	Monthly or as required
	Surface and foul water pipework – jetting / rodding	Every 2 years or as required
	Manage other vegetation and remove nuisance plants – aesthetics	Annually (or as required based on inspection)
	Inspect for sediment and debris in pre-treatment components and floor of storage structure inspection tubes or chambers.	Annually
	Cleaning of gutters and any filters on down pipes.	Annually (or as required based on inspection)
	Trim any roots that may be cause blockages to the system.	Annually (or as required based on inspection)
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly for 3 months, then annually
	Blue / Green Roof - Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing & structural stability.	Annually and after severe storms
	Blue / Green Roof - Inspect soil substrate for evidence of erosion channels and identify any sediment sources.	Annually and after severe storms
	Blue / Green Roof - Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system.	Annually and after severe storms
	Blue / Green Roof - Inspect underside of roof for evidence of leakage.	Annually and after severe storms
	Blue / Green Roof - Quarterly each outlet, should be inspected and cleared of any build up or debris. All leaf litter mainly autumnal visit, should be removed from the roof surface. Debris must be removed from the roof and not simply flushed down rainwater pipes.	Quarterly

	Manhole and Inspection Chamber - Inspect and identify blockages, debris and litter. If required, take remedial action.	Annually (or as required based on inspection)
	Manhole and Inspection Chamber - Removal of sediments, debris and litter from the manhole and inspection chamber.	Annually (or as required based on inspection)
	Permeable Paving - Brushing and vacuuming (standard cosmetic sweep over whole surface.	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufactures recommendations - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of storage structures inspection tubes or chambers and inside of concrete manhole rings.	Annually (or as required based on inspection)
	Inspection gullies to determine whether they are operating correctly.	Annually (or as required based on inspection)
	Inspect all manholes and inspection chambers to determine whether they are operating correctly	3 monthly
	Blue / Green Roof - Remove debris and litter to prevent clogging of inlet drains and interference with plant growth.	Six monthly and annually or as required
	Blue / Green Roof - During establishment (ie year one), replace dead plants as required.	Monthly (but usually responsibility of manufacturer)
	Blue / Green Roof - Post establishment, replace dead plants as required where >5% of coverage.	Annually (in autumn)
	Blue / Green Roof - Remove fallen leaves and debris from deciduous plant foliage.	Six monthly or as required
	Blue / Green Roof - Remove nuisance and invasive vegetation, including weeds.	Six monthly or as required

	Blue / Green Roof - Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate.	Six monthly or as required
	Permeable Paving - Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying.	As required - once per year on less frequently used pavements
Corrective Maintenance	Repairs to access chambers / manhole covers	As required based on inspection
	Remove debris / blockages to silt traps / channel drains	As required based on inspection
	Reconstruct storage structures if performance deteriorates or failure occurs	As required based on inspection
	Replacement of defective geotextile (will require reconstruction of storage structures)	As required based on inspection
	Repair gullies and any identified areas that are not operating correctly.	As required based on inspection
	Removal of any blockages by rodding or jetting through an access point	As required based on inspection
	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled.	As required based on inspection
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required based on inspection
	Permeable Paving - Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required based on inspection
	Permeable Paving - Surface remedial works to any depressions or rutting	As required based on inspection

	Permeable Paving - Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required
Monitoring	Inspect inlet, outlet from downpipes, channel drains and gullies for blockages, standing water and clear	Monthly
	Permeable Paving - Initial inspection.	Monthly for three months after installation
	Permeable Paving - Inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Three monthly, 48 h after large storms in first six months
	Permeable Paving - Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Permeable Paving - Monitor inspection chambers.	Annually
	Inspect silt traps and note the rate sediment has Accumulated	Monthly in the first year and then annually
	Inspect storage structures to ensure it is fully emptying	Annually
	Blue / Green Roof - Visually inspect the waterproofing system at all upstands, to ensure it is firmly adhered to the detail that it is waterproofing.	Monthly

Table 1: Schedule of Regular and Corrective Maintenance

Design Life

17. The design life of the development is likely to exceed the design life of the components within the SuDS network. During the routine drainage inspections it may be determined that some components have reached the end of their functional life cycle. Where possible repairs should be the first option considered however if repairs are unviable, it will be necessary for the property owner / Management Company to replace the faulty component.

Emergency Plan

18. Potential flood and maintenance indicators:
    - Manhole chambers / PPICs overflowing
    - Vent pipe overflowing
    - Gullies / permeable paving overflowing or ponding
    - Channel drains overflowing or ponding
    - Blue / Green roof leaking
    - Other visual indicators of the drainage system not performing as it should

19. Should any of the items above occur then immediate action as outlined below should be undertaken:
    - Inspect for blockages in the problem area
    - Should the problem not be identified via an initial inspection and the drainage system is connected to Thames Water's network then make them aware and report the problem.
    - For Management Company controlled drainage a suitable drainage inspection engineer should be contacted to survey the system and jet any blockages.

Spillages

20. If a serious spillage in volume or toxicity occurs on site then the spillage should be isolated with soil, turf or specialist fabric and all downstream outlets should be bunged / blocked.
21. Once the spillage is contained contact the Environment Agency immediately. Tel: 0370 850 6506