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03 May 2022

Our Ref: 2750 – Camden Lifestyle, Bayham St.
Your Ref: 2020/5647/P

Camden Council

Dear Sir/Madam,

RE: Camden Lifestyle, Bayham St – Discharge of Condition 9

We have been commissioned by our client (Camden Lifestyle (UK) Limited to discharge **Planning Condition 9** associated with the consented planning application reference 2018/3647/P.

This specific pre-commencement condition stated:

Prior to commencement of any development other then works of demolition, site clearance & preparation, details of a sustainable urban drainage system shall be submitted to and approved in writing by the local planning authority. Such system shall be based on a 1:100 year event with 30% provision for climate change demonstrating 50% attenuation of all runoff. The system shall be implemented as part of the development and thereafter retained and maintained.

The existing site has been calcauted to have an existing discharge rate of 25.0 l/s for the 1:100 year event period, refer to Appendix A for MicroDrainage Calculations. As such the scheme has been designed on the basis of limiting the surface water discharge rate to 12.5 l/s for the 1:100 year + 30% climate change event.

This will be soley achieved by the use of a blue roof system, with some of the roof areas and a small area of hardstanding outside the building footprint draining unrestricted towards the outfall manhole from the site. The total blue roof plan extent is 201m^2 and 100mm deep blue roof crates are proposed. The proposed drainage strategy (Appendix B), shows that the site will discharge at a rate of 12.4 l/s or lower for the 1:100 year + 30% climate change event. Refer to Appendix C for Bauder blue roof caclautions.

A summary of the proposed discharge rates are provided below:

- 1:1 Year Event = 2.1 l/s
- 1:30 Year Event = 7.1 l/s
- 1:100 + 30% CC Year Event = 12.4 l/s

Therefore the proposed drainage strategy complies with the requirement of 50% reduction on existing rates. Table 1 outlines each catchment area and the breakdown of discharge rates from the site.

Table 1: Catchment areas and discharge rates

Catment Area Name	Catchment Area (m^2)	Blue Roof Area (m^2)	Discharge Rate (l/s)
Roof 1	73	48	0.18 (discharge rate calculated by Bauder)
Roof 2a	24	12	0.18 (discharge rate calculated by Bauder)
Roof 2b	96 + *(102 from roof 3b) = 198*	77	1.74 (discharge rate calculated by Bauder)
Roof 2c	16	7	0.18 (discharge rate calculated by Bauder)
Roof 3a	104	57	0.37 (discharge rate calculated by Bauder)
Roof 3b	102	0	Routed to roof 2b
Roof 4	40	0	Modified rational method used: Q=2.78iA = 2.78 x137x0.0040 = 1.523
External areas at ground level	185	0	Modified rational method used: Q=2.78iA =2.78x137x0.0185 = 7.046
Total	**640**	**201**	**11.22**

Drainage exceedance routes have also been considered and allowed for as part of the development of parameters to ensure that any surface water runoff exceeding the drainage network capacity would naturally flow away towards the existing highway drainage netwrok. These exceedance routes are shown on drawing BST-MHT-XX-GF-DR-CV-0100 in Appendix B

Thames Water have confirmed that a discharge rate of 12.4 l/s from the site is acceptable, refer to the Thames Water correspondence in Appendix D.

A Drainage Maintenance and Management Strategy has been produced based on the information provided within the SUDS Manual, this is outlined in Appendix E. Camden Lifestyle (UK) Limited will be responsible for maintaining the drainage systems on-site once operational. Accordingly Camden Lifestyle (UK) Limited will 'appoint suitably qualified maintenance specialists directly or via a management agreement to undertake the maintenance work'.

As part of this package of information we have provided the following:

Appendix A – Existing Surface Water Dicharge Rates Model (1:100 Year)

Appendix B – Drainage Strategy Drawings

Appendix C – Bauder Blue Roof Design

Appendix D – Thames Water Consultation

Appendix E – Drainage Maintenance and Management Strategy

If you have any queries we would be very pleased to discuss these with you.

Yours sincerely

Jasmine Houze
Senior Civil Engineer

Meinhardt (UK) Ltd, 10 Aldersgate Street, London, EC1A 4HJ
TEL: 020 7831 7969

Appendix A – Existing Surface Water Dicharge Rates Model (1:100 Year)

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	100.000	1.200	Open Manhole	1200	1.000	98.800	150				
2	100.000	1.575	Open Manhole	1200	1.001	98.425	150	1.000	98.500	150	75
	100.000	1.875	Open Manhole	0		OUTFALL		1.001	98.125	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-9.081	99.003	-9.081	99.003	Required	
2	62.860	100.188	62.860	100.188	Required	
	105.234	101.569			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	1	100.000	98.800	1.050	Open Manhole	1200
1.001	o	150	2	100.000	98.425	1.425	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	30.000#	100.0	2	100.000	98.500	1.350	Open Manhole	1200
1.001	30.000#	100.0		100.000	98.125	1.725	Open Manhole	0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.032	0.032	0.032
1.001	-	-	100	0.032	0.032	0.032
				Total	Total	Total
				0.064	0.064	0.064

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.001		100.000	98.125	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.700	Storm Duration (mins)	30
Ratio R	0.438		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.437
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.600	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 20, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%	100/15 Summer				98.854
1.001	2	15 Winter	1	+0%	20/15 Summer				98.501

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.096	0.000	0.28			4.7	OK	
1.001	2	-0.074	0.000	0.51			8.6	OK	

20 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.437
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.600	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 20, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	20	+0%	100/15 Summer				98.887
1.001	2	15 Winter	20	+0%	20/15 Summer				98.675

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.063	0.000	0.61			10.4	OK	
1.001	2	0.100	0.000	1.15			19.6	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.437
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.600	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 20, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	30	+0%	100/15 Summer				98.892
1.001	2	15 Winter	30	+0%	20/15 Summer				98.737

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.058	0.000	0.67			11.4	OK	
1.001	2	0.162	0.000	1.23			21.0	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.437
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.600	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 20, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	100	+0%	100/15 Summer				99.110
1.001	2	15 Winter	100	+0%	20/15 Summer				98.932

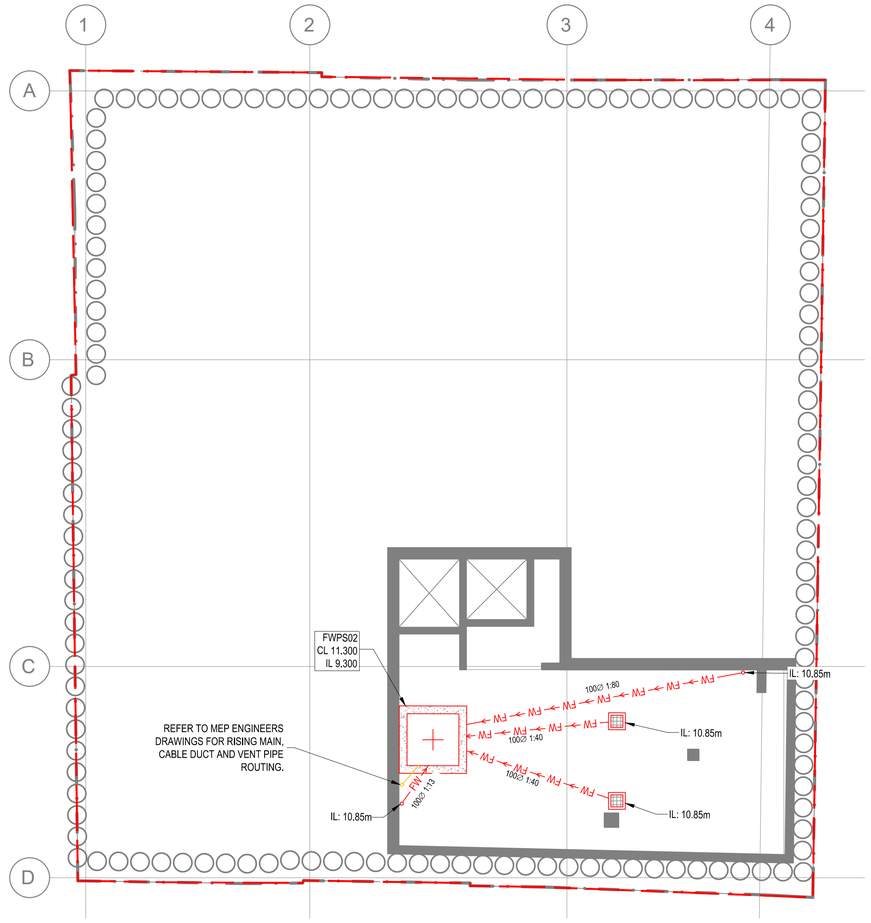
PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.160	0.000	0.77			13.1	SURCHARGED	
1.001	2	0.357	0.000	1.47			25.0	SURCHARGED	

Appendix B – Drainage Strategy Drawings

ISO A1 841mm x 594mm

NOTE:

- CAVITY DRAINAGE NETWORK AND ASSOCIATED PUMP REQUIREMENTS DESIGNED BY DELTA MEMBRANES. REFER TO DELTA MEMBRANES DRAWINGS FOR LOCATIONS OF SUMPS AND CAVITY DRAINAGE SYSTEMS.
- FOUL WATER PUMP STATION ELECTRICAL SUPPLY TO BE CONNECTED TO BACK UP GENERATOR.



STAGE 4+ ISSUE

REV	DESCRIPTION	BY	DATE
P01	STAGE 3 ISSUE	DHF	23.07.21
P02	STAGE 4 ISSUE	JH	17.12.21
P03	STAGE 4+ ISSUE	JH	21.04.22

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR STAGE 4+ PURPOSES ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. DRAWING BASED ON:
   - TOPOGRAPHICAL SURVEY RECEIVED MAY 2020 BY POINT 2 SURVEYORS
   - THAMES WATER ASSET RECORDS OBTAINED 16.04.20
   - DEXTER MOREN ASSOCIATES ARCHITECTURAL LAYOUTS RECEIVED 23.03.22
   - MEINHARDT STRUCTURAL DRAWINGS ISSUED 09.09.21
   - MEINHARDT MEP LAYOUTS ISSUED 11.04.22
6. ALL DOWN POINTS TO BE RODDABLE FROM ABOVE THE STRUCTURAL SLAB
7. RISING MAIN AND VENT PIPE ROUTING FROM PUMP CHAMBER TO MEP ENGINEERS DESIGN.
8. FOR BELOW GROUND DRAINAGE DETAILS REFER TO MHT DRAWING SERIES 2750-MHT-CV-BG-DR-20X.
9. FOR BELOW GROUND DRAINAGE MANHOLE SCHEDULES REFER TO MHT DRAWING SERIES 2750-MHT-CV-BG-DR-25X.

KEY:

- SITE BOUNDARY
- FW → FW → PROPOSED FOUL WATER PIPE
- FWRM → PROPOSED FOUL WATER RISING MAIN
- PROPOSED FOUL WATER INSPECTION CHAMBER / MANHOLE
- FOUL WATER GULLY
- FOUL WATER DRAIN POINT
- BACKDROP

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

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PROJECT
7 A,B,C BAYHAM STREET
LONDON
NW1 0EY

CLIENT
CAMDEN LIFESTYLE (UK)

TITLE
PROPOSED BELOW GROUND
FOUL WATER
DRAINAGE LAYOUT BASEMENT -2

DISCIPLINE			SCALE
CIVIL			1:100
DRAWN	DESIGNED	CHECKED	APPROVED
JH	JH	CM	GB
DRAWING No			ISSUE
BST-MHT-XX-B2-DR-CV-0120			P03

DATE: 14/04/2022
FILE LOCATION: \\MEINHARDT-DC1\PROJECTDATA\PROJECTS\2750 - CAMDEN LIFESTYLE, BAYHAM ST\1. MHT\CIVIL\DRAWINGS\DRAWINGS\BST-MHT-XX-B2-DR-CV-0120.DWG

ISO A1 841mm x 594mm

NOTE:

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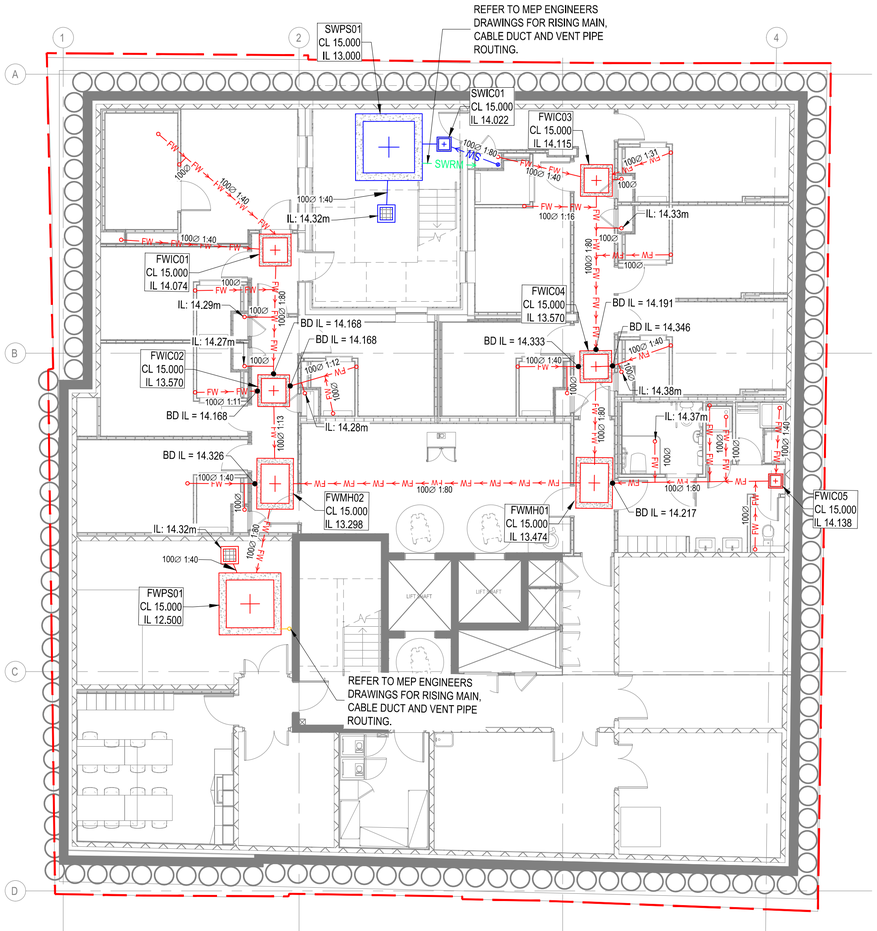
- FOUL WATER PUMP STATION ELECTRICAL SUPPLY TO BE CONNECTED TO BACK UP GENERATOR.



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   - MEINHARDT MEP LAYOUTS ISSUED 11.04.22.
6. ALL DOWN POINTS TO BE RODDABLE FROM ABOVE THE STRUCTURAL SLAB
7. RISING MAIN AND VENT PIPE ROUTING FROM PUMP CHAMBERS TO MEP ENGINEERS DESIGN.
8. THE INVERT LEVEL OF ALL DOWN POINTS AT B1 LEVEL ARE TO BE +14.320mAOD UNLESS OTHERWISE STATED.
9. PIPES TO BE LAID AT A MAXIMUM GRADIENT OF 1:10.
10. FOR BELOW GROUND DRAINAGE DETAILS REFER TO MHT DRAWING SERIES 2750-MHT-CV-BG-DR-20X.
11. FOR BELOW GROUND DRAINAGE MANHOLE SCHEDULES REFER TO MHT DRAWING SERIES 2750-MHT-CV-BG-DR-25X.

KEY:

- SITE BOUNDARY
- SW → SW → PROPOSED SURFACE WATER PIPE
- FW → FW → PROPOSED FOUL WATER PIPE
- FWRM → PROPOSED FOUL WATER RISING MAIN
- SWRM → PROPOSED SURFACE WATER RISING MAIN
- PROPOSED SURFACE WATER INSPECTION CHAMBER / MANHOLE
- PROPOSED FOUL WATER INSPECTION CHAMBER / MANHOLE
- SURFACE WATER DRAINAGE CHANNEL
- SURFACE WATER GULLY
- SURFACE WATER DRAIN POINT
- FOUL WATER GULLY
- FOUL WATER DRAIN POINT
- BACKDROP

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PROJECT
7 A,B,C BAYHAM STREET
LONDON
NW1 0EY

CLIENT
CAMDEN LIFESTYLE (UK)

TITLE
PROPOSED BELOW GROUND COMBINED WATER DRAINAGE LAYOUT BASEMENT -1

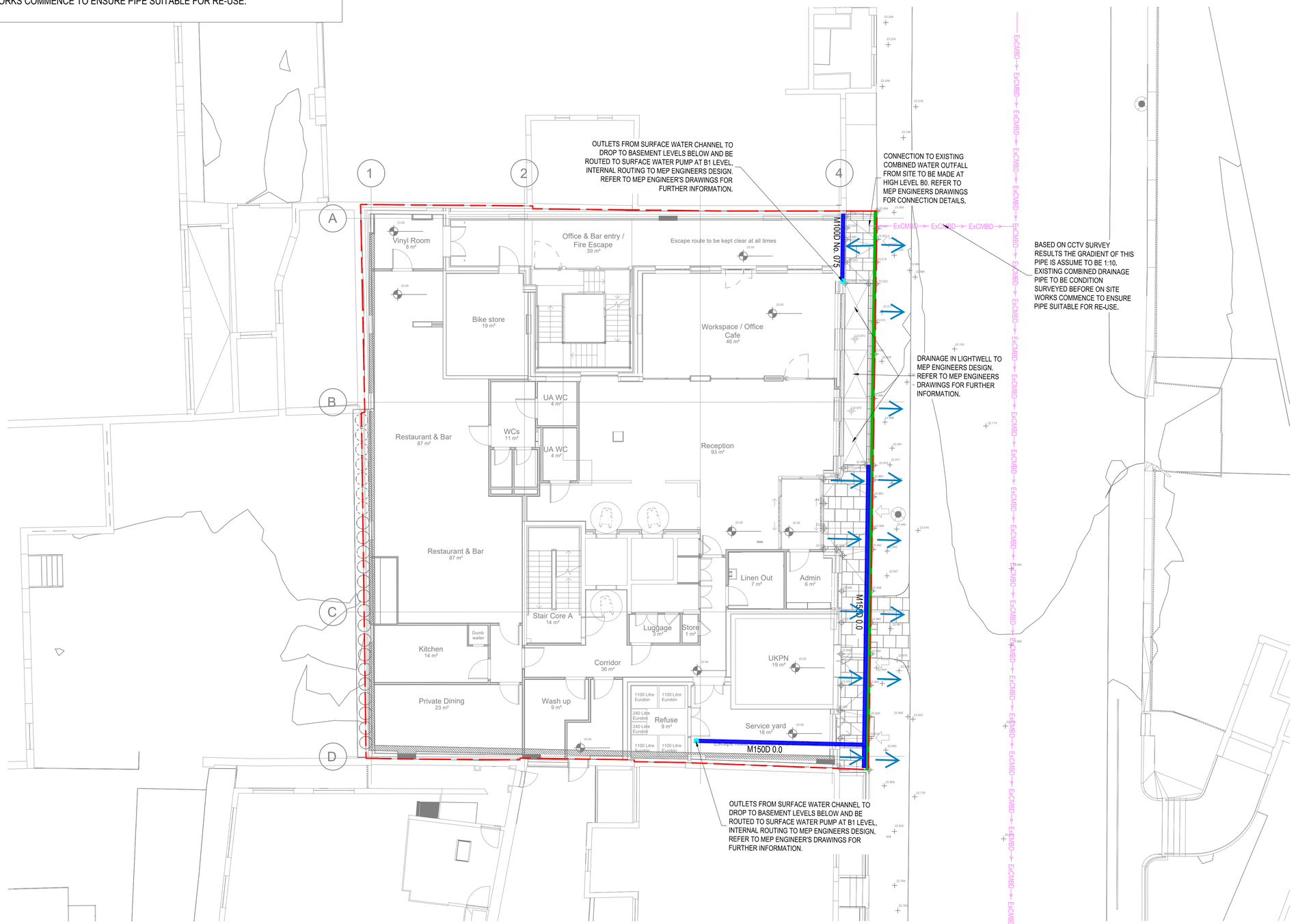
DISCIPLINE			SCALE
CIVIL			1:100
DRAWN	DESIGNED	CHECKED	APPROVED
JH	JH	CM	GB
DRAWING No			ISSUE
BST-MHT-XX-B1-DR-CV-0100			P03

DATE: 20/04/2022
FILE LOCATION: \\MEINHARDT-DC1\PROJECTDATA\PROJECTS\2750 - CAMDEN LIFESTYLE, BAYHAM ST1\..MHT\CIVIL\DRAWINGS\DRAWINGS\BST-MHT-XX-B1-DR-CV-0100.DWG

ISO A1 841mm x 594mm

NOTE:

- EXISTING COMBINED DRAINAGE OUTFALL PIPE FROM THE SITE TO BE SURVEYED BEFORE ON SITE WORKS COMMENCE TO ENSURE PIPE SUITABLE FOR RE-USE.



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   - THAMES WATER ASSET RECORDS OBTAINED 16.04.20
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   - MEINHARDT STRUCTURAL DRAWINGS ISSUED 09.09.21
   - MEINHARDT MEP LAYOUTS ISSUED 11.04.22
6. FOR BELOW GROUND DRAINAGE DETAILS REFER TO MHT DRAWING SERIES 2750-MHT-CV-BG-DR-20X.

KEY:

- SITE BOUNDARY
- EXISTING COMBINED WATER SEWER (ExCMBD)
- SURFACE WATER DRAINAGE CHANNEL
- SURFACE WATER DRAINAGE CHANNEL OUTLET TO BASEMENT LEVELS BELOW.
- FLUSH KERB
- SURFACE WATER EXCEEDANCE ROUTES

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7 A,B,C BAYHAM STREET
LONDON
NW1 0EY

CLIENT
CAMDEN LIFESTYLE (UK)

TITLE
PROPOSED BELOW GROUND COMBINED WATER DRAINAGE LAYOUT GROUND FLOOR

DISCIPLINE			SCALE
CIVIL			1:100
DRAWN	DESIGNED	CHECKED	APPROVED
JH	JH	CM	GB
DRAWING No			ISSUE
BST-MHT-XX-GF-DR-CV-0100			P03

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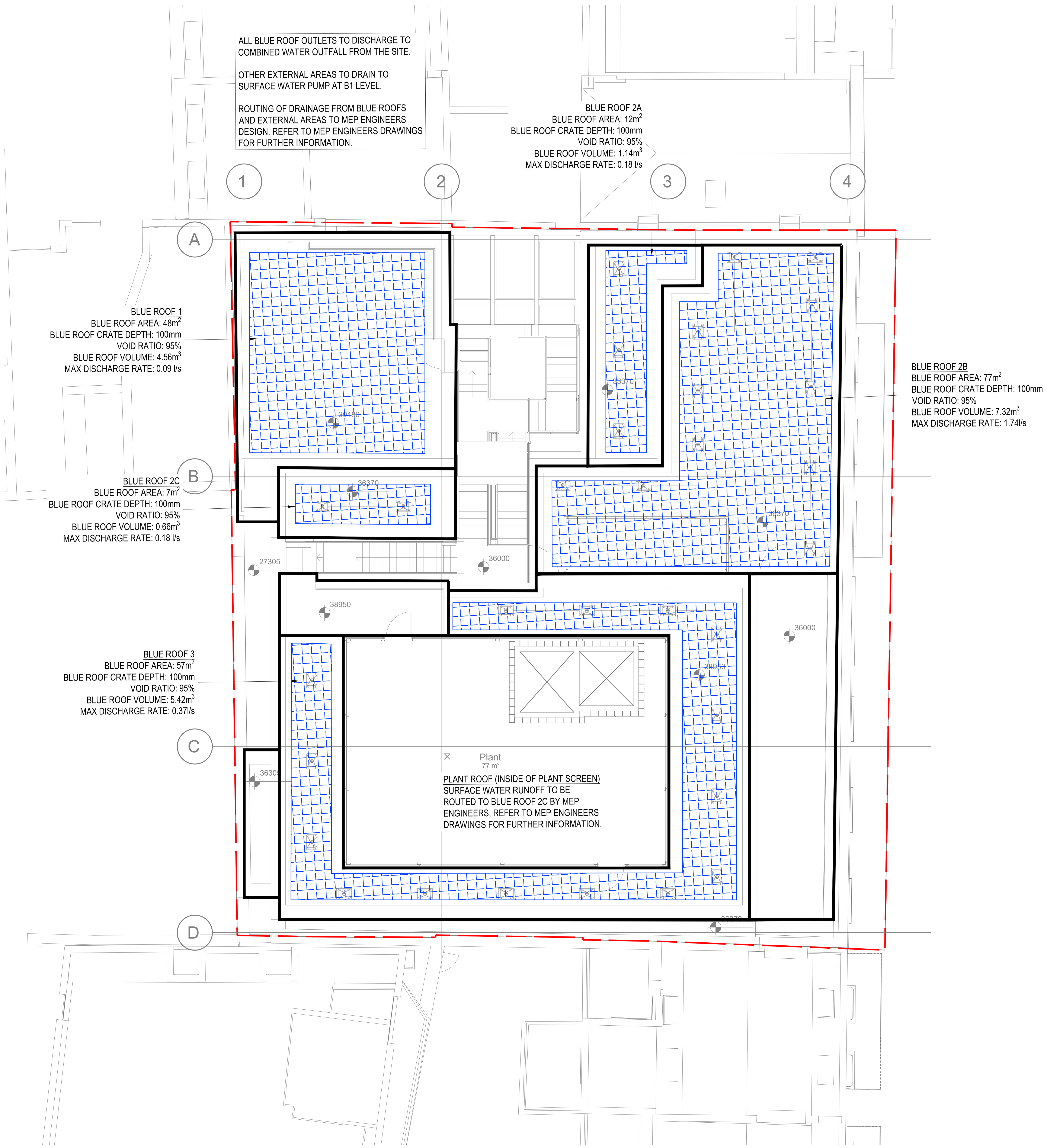
NOTE:

- DRAWING FOR CO-ORDINATION PURPOSES ONLY, FOR FULL BLUE ROOF DESIGN PLEASE REFER TO ARCHITECTS AND BAUDER DRAWINGS AND SPECIFICATIONS.



STAGE 4+ ISSUE

REV	DESCRIPTION	BY	DATE
P01	STAGE 3 ISSUE	DHF	23.07.21
P02	STAGE 4 ISSUE	JH	17.12.21
P03	STAGE 4+ ISSUE	JH	21.04.22

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. DRAWING BASED ON:
   - DEXTER MOREN ASSOCIATES ARCHITECTURAL LAYOUT RECEIVED 23.03.2022.
   - BAUDER BLUE ROOF CALCULATIONS (REV D) DATED 04.03.2022.

KEY:

SITE BOUNDARY

PROPOSED BLUE ROOF CRATES

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

MEINHARDT

10 Aldersgate Street, London EC1A 4JU
Telephone: +44 (0)20 7831 7969
www.meinhardt.co.uk

PROJECT
7 A,B,C BAYHAM STREET
LONDON
NW1 0EY

CLIENT
CAMDEN LIFESTYLE (UK)

TITLE
PROPOSED ROOF LEVEL
DRAINAGE LAYOUT

DISCIPLINE			SCALE
CIVIL			1:100
DRAWN	DESIGNED	CHECKED	APPROVED
JH	JH	CM	GB
DRAWING No			ISSUE
BST-MHT-XX-RF-DR-CV-0100			P03

DATE: 19/04/2022
FILE LOCATION: \\MEINHARDT-DC1\PROJECTDATA\PROJECTS\2750 - CAMDEN LIFESTYLE, BAYHAM ST\1. MHT\CIVIL\DRAWINGS\DRAWINGS\BST-MHT-XX-RF-DR-CV-0100.DWG

Appendix C – Bauder Blue Roof Design

BlueRoofDesign Software

Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH. T: +44 (0)1473 257671 e: info@bauder.co.uk

Date: 04/03/2022 Revision: D (1209)

Client:

Project: Camden Lifestyle

Location: London

Roof Location: Roof 1

Roof Details:

BlueRoof	48 m²	x 100 %
Additional Area	25 m²	x 100 %
Effective Area	73 m²	

Storage Details:

Length	48 m
Width	1 m
Depth	100 mm
Porosity	95 %
Slope	none

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	30 %
r value	0.44
M5-60	20.7 mm

Summer Storm Profile

Duration	Intensity mm	mm/h	Required storage(m³)
5 min	19.5	233.8	1.4
10 min	28.7	172.3	2.1
15 min	34.4	137.7	2.4
30 min	44.4	88.9	3.1
45 min	50.3	67.1	3.4
60 min	54.5	54.5	3.6
2 hours	64.7	32.3	3.9
6 hours	80.6	13.4	3.8
24 hours	104.1	4.3	2.7

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	1 hole
Sump Depth	None
Discharge rate	0.18 l/s
Outlet	2 No
Flow Per Outlet	0.09 l/s

Result:

Outcome	Pass
Critical Storm Duration	2.5 hrs
Hmax	86 mm
Required Volume	3.9 m³
Time to half empty	3 hrs
Roof Loading	81.25 Kg/m²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

Details practices principles values and calculations should be verified for accuracy and suitability for the required purpose for use.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. The H-Max is measured from the mean roof level

Overflow discharge requirements based on a CAT1 storm event to BSEN12056-3:2000.

Total flow rate: 73m2x0.023l/s/m2 = 1.68l/s

NOTE: Roof loading data shown in the results section is for the blue roof only. For total loading of blue roof and overflows then Hmax + 35mm should be factored in.

Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH. T: +44 (0)1473 257671 e: info@bauder.co.uk

Date: 04/03/2022 Revision: D (1209)

Client:

Project: Camden Lifestyle

Location: London

Roof Location: Roof 2

Roof Details:

BlueRoof	12 m²	x 100 %
Additional Area	12 m²	x 100 %
Effective Area	24 m²	

Storage Details:

Length	12 m
Width	1 m
Depth	100 mm
Porosity	95 %
Slope	none

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	30 %
r value	0.44
M5-60	20.7 mm

Summer Storm Profile

Duration	Intensity mm	mm/h	Required storage(m³)
5 min	19.5	233.8	0.4
10 min	28.7	172.3	0.6
15 min	34.4	137.7	0.7
30 min	44.4	88.9	0.9
45 min	50.3	67.1	0.9
60 min	54.5	54.5	0.9
2 hours	64.7	32.3	0.9
6 hours	80.6	13.4	0.7
24 hours	104.1	4.3	0.3

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	1 hole
Sump Depth	None
Discharge rate	0.18 l/s
Outlet	2 No
Flow Per Outlet	0.09 l/s

Result:

Outcome	Pass
Critical Storm Duration	1.28 hrs
Hmax	82 mm
Required Volume	0.9 m³
Time to half empty	44.3 min
Roof Loading	75 Kg/m²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

Details practices principles values and calculations should be verified for accuracy and suitability for the required purpose for use.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. The H-Max is measured from the mean roof level

Overflow discharge requirements based on a CAT1 storm event to BSEN12056-3:2000.

Total flow rate: 24m2x0.023l/s/m2 = 0.55l/s.

NOTE: Roof loading data shown in the results section is for the blue roof only. For total loading of blue roof and overflows then Hmax + 35mm should be factored in.

Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH. T: +44 (0)1473 257671 e: info@bauder.co.uk

Client:

Project: Camden Lifestyle

Location: London

Roof Location: Roof 2b

Roof Details:

BlueRoof	77 m²	x 100 %
Additional Area	121 m²	x 100 %
Effective Area	198 m²	

Storage Details:

Length	77 m
Width	1 m
Depth	100 mm
Porosity	95 %
Slope	none

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	30 %
r value	0.44
M5-60	20.7 mm

Summer Storm Profile

Duration	Intensity mm	mm/h	Required storage(m³)
5 min	19.5	233.8	3.6
10 min	28.7	172.3	5.1
15 min	34.4	137.7	5.9
30 min	44.4	88.9	6.9
45 min	50.3	67.1	7.1
60 min	54.5	54.5	7.2
2 hours	64.7	32.3	6.9
6 hours	80.6	13.4	4.9
24 hours	104.1	4.3	1.6

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	9 holes
Sump Depth	None
Discharge rate	1.74 l/s
Outlet	2 No
Flow Per Outlet	0.87 l/s

Result:

Outcome	Pass
Critical Storm Duration	1.1 hrs
Hmax	99 mm
Required Volume	7.2 m³
Time to half empty	34.6 min
Roof Loading	93.51 Kg/m²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

Details practices principles values and calculations should be verified for accuracy and suitability for the required purpose for use.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. The H-Max is measured from the mean roof level

Overflow discharge requirements based on a CAT1 storm event to BSEN12056-3:2000.

Total flow rate: 198m2x0.023l/s/m2 = 4.55l/s.

NOTE: Roof loading data shown in the results section is for the blue roof only. For total loading of blue roof and overflows then Hmax + 35mm should be factored in.

Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH. T: +44 (0)1473 257671 e: info@bauder.co.uk

Date: 04/03/2022 Revision: D (1209)

Client:

Project: Camden Lifestyle

Location: London

Roof Location: Roof 2c

Roof Details:

BlueRoof	7 m²	x 100 %
Additional Area	9 m²	x 100 %
Effective Area	16 m²	

Storage Details:

Length	7 m
Width	1 m
Depth	100 mm
Porosity	95 %
Slope	none

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	30 %
r value	0.44
M5-60	20.7 mm

Summer Storm Profile

Duration	Intensity mm	mm/h	Required storage(m³)
5 min	19.5	233.8	0.3
10 min	28.7	172.3	0.4
15 min	34.4	137.7	0.5
30 min	44.4	88.9	0.5
45 min	50.3	67.1	0.5
60 min	54.5	54.5	0.5
2 hours	64.7	32.3	0.5
6 hours	80.6	13.4	0.3
24 hours	104.1	4.3	0.1

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	1 hole
Sump Depth	None
Discharge rate	0.18 l/s
Outlet	2 No
Flow Per Outlet	0.09 l/s

Result:

Outcome	Pass
Critical Storm Duration	55 min
Hmax	81 mm
Required Volume	0.5 m³
Time to half empty	25.6 min
Roof Loading	71.43 Kg/m²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

Details practices principles values and calculations should be verified for accuracy and suitability for the required purpose for use.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. The H-Max is measured from the mean roof level

Overflow discharge requirements based on a CAT1 storm event to BSEN12056-3:2000.

Total flow rate: 16m2x0.023l/s/m2 = 0.37l/s.

NOTE: Roof loading data shown in the results section is for the blue roof only. For total loading of blue roof and overflows then Hmax + 35mm should be factored in.

Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH. T: +44 (0)1473 257671 e: info@bauder.co.uk

Date: 04/03/2022 Revision: D (1209)

Client:

Project: Camden Lifestyle

Location: London

Roof Location: Roof 3

Roof Details:

BlueRoof	57 m²	x 100 %
Additional Area	47 m²	x 100 %
Effective Area	104 m²	

Storage Details:

Length	58 m
Width	1 m
Depth	100 mm
Porosity	95 %
Slope	none

Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	30 %
r value	0.44
M5-60	20.7 mm

Summer Storm Profile

Duration	Intensity mm	mm/h	Required storage(m³)
5 min	19.5	233.8	2.0
10 min	28.7	172.3	2.9
15 min	34.4	137.7	3.4
30 min	44.4	88.9	4.2
45 min	50.3	67.1	4.6
60 min	54.5	54.5	4.9
2 hours	64.7	32.3	5.1
6 hours	80.6	13.4	4.6
24 hours	104.1	4.3	2.8

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	2 holes
Sump Depth	None
Discharge rate	0.37 l/s
Outlet	2 No
Flow Per Outlet	0.19 l/s

Result:

Outcome	Pass
Critical Storm Duration	2.13 hrs
Hmax	92 mm
Required Volume	5.1 m³
Time to half empty	1.9 hrs
Roof Loading	89.47 Kg/m²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

Details practices principles values and calculations should be verified for accuracy and suitability for the required purpose for use.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. The H-Max is measured from the mean roof level

Overflow discharge requirements based on a CAT1 storm event to BSEN12056-3:2000.

Total flow rate: 104m2x0.023l/s/m2 = 2.39l/s.

NOTE: Roof loading data shown in the results section is for the blue roof only. For total loading of blue roof and overflows then Hmax + 35mm should be factored in.

Appendix D – Thames Water Consultation

Jasmine Houze

MEINHARDT (UK) LTD
10 ALDERSGATE STREET
LONDON
EC1A 4HJ

Wastewater pre-planning
Our ref DS6094071

28 April 2022

Pre-planning enquiry: Confirmation of sufficient capacity

Site: 7 A, B & C Bayham Street, London, NW1 0EY

Dear Jasmine,

Thank you for providing information on your development.

Proposed demolished Restaurant/day care (147 cap), Offices (208m2)

Proposed Hotel (79 beds)

Existing FW discharge into d/s vent combined TQ29832425

Existing SW discharge at 25 l/s into d/s vent combined TQ29832425 with impermeable area of 640m2

Proposed FW discharge into d/s vent combined TQ29832425

Proposed SW discharge at 12.5 l/s into d/s vent combined TQ29832425 with impermeable area of 640m2

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

When developing a site, policy SI 13 of the London Plan states "Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:"

The disposal hierarchy being:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. rainwater infiltration to ground at or close to source
3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. rainwater discharge direct to a watercourse (unless not appropriate)
5. controlled rainwater discharge to a surface water sewer or drain
6. controlled rainwater discharge to a combined sewer

Where connection to the public sewerage network is still required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

If the above surface water hierarchy has been followed and if the flows are restricted to a total of 12.5 l/s for all storm events up to and including 1:100yr+40%CC., then Thames Water would not have any objections to the proposal. Please see the attached 'Planning your wastewater' leaflet for additional information.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you have any further questions, please contact me on 0774 764 6498.

Kind Regards,

Long Tran
Developer Services – Adoptions Engineer, Sewer Adoptions Team
Tel: 0800 009 3921
Get advice on making your sewer connection correctly at connectright.org.uk
Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk

Appendix E - Drainage Maintenance and Management Strategy

Table 2: Proposed Drainage Maintenance Strategy

Drainage Feature	Regular Maintenance	Occasional Maintenance	Monitoring
Drainage Channels	Inspections will be frequent and regular, depending on local conditions, but at least annually by Site management. Inspections will include gratings; covers including their locking bolts; sumps and sump buckets; exposed concrete surround and adjacent paving. Channels will be flushed with water or high-pressure jetting (no boiling water or cleaning agent will be used). All silt buckets and sumps will be cleaned out replaced back into the units ensuring they are correctly fitted.	All channel surfaces and joints will be checked and repaired as necessary.	Inspected every 6 months or after large storm.
Geo-Cellular Blue Roof	Blue roofs to be maintained in accordance with manufacturers recommendations. These may include: • Remove debris from the catchment surface where it may cause risk to performance (monthly). • Inspection chambers will be checked every 6 months for the accumulation of debris and silt and cleaned as necessary. • Inspect all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed. • Inspect waterproofing membrane and underside of roof for evidence of leakage.		
Manholes / Inspection Chambers	Inspection chambers will be checked every 6 months for the accumulation of debris and silt and cleaned as necessary.		Inspect every 6 months or after large storm.
Pumps	Pumps to be maintained in accordance with pump manufacturers recommendations.		