DRAINAGE STRATEGY REPORT FOR 11-17

VICTORIA ROAD, RUISLIP, HA4 9AA

DOCUMENT NUMBER.: C3525-R1-REV-B

PREPARED BY

Nimbus
ENGINEERING CONSULTANTS

Contents

APPENDICES

1. INTRODUCTION

1.1 Appointment

Nimbus Engineering have been appointed to provide a solution on the management of Foul and Surface Water runoff and to ensure that there is no risk of flooding caused by the development at 11-17 Victoria Road, Ruislip, HA4 9AA. The proposed development involves the upward extension above the existing ground floor commercial units to create 7 new flats, including access from the rear.

The proposed plans can be found in Appendix A.

1.2 Objectives

This report will provide information on a suitable drainage strategy as requested by the Local Authority.

1.3 Limitations

The general limitations of this report are:

- A number of data and information sources have been used to prepare this report. Whilst Nimbus Engineering believes them to be trustworthy, Nimbus Engineering is unable to guarantee the accuracy of data and information that has been provided by others;

- This report has been prepared using the best data and information that was available at the time of writing. There is the potential for further information or data to become available, leading to changes in the conclusions drawn by this report, for which Nimbus Engineering cannot be held responsible.

2. GEOLOGY OF THE AREA

According to the British Geological Survey, there is no superficial deposit information available at the site, as shown in Figure 1 below. The bedrock in the area is of the Lambeth Group – consisting of clay, silt and sand, as shown in Figure 2 below.

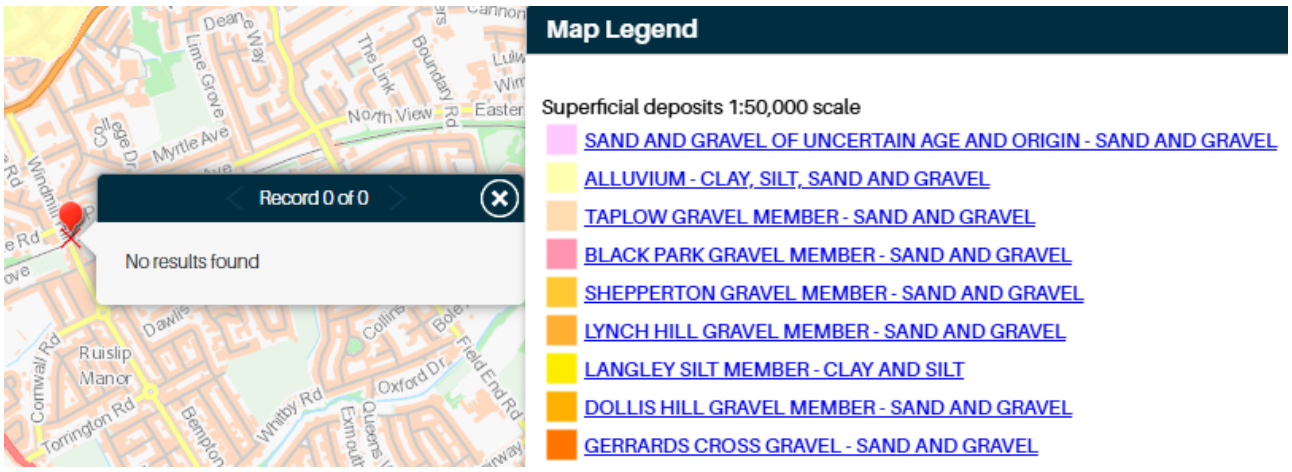


Figure 1 - Superficial deposits at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2025]. Base mapping is provided by ESRI)).

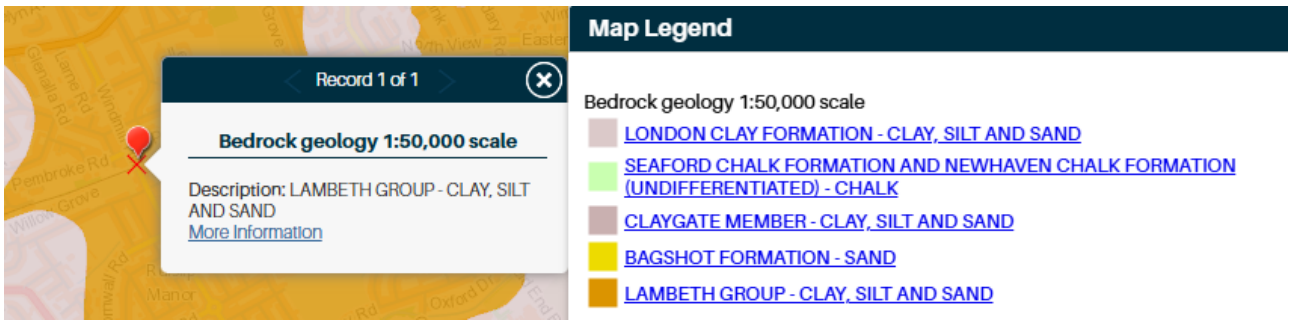


Figure 2 - Bedrock at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2025]. Base mapping is provided by ESRI)).

3. SUSTAINABLE URBAN DRAINAGE SYSTEMS

The total area of the site is 371m^2, and the existing impermeable areas at the site are 369m^2. Following the development proposals, the impermeable areas at the site will have decreased to 363m^2.

Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Reducing the rate of surface water discharge from urban sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.

- Reduction in groundwater levels and dry weather flows in watercourses.

- Reduce amenity and adversely affect biodiversity due to the surface water run-off containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures designed to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the natural landscape of an area which as well as slowing down the rate of runoff provides a number of environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality. As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through fine soils and the roots of specially selected plants. Pollutants washed off the hard landscaping by rainfall will be safely removed before the water reaches the natural receiving water course.

- A sympathetic approach to the environmental setting by providing opportunities to create habitats for flora and fauna in urban watercourses and open spaces.

- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	

Preferably a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders, such as developers, architects, landscape architects and engineers to work in order to determine a feasible solution.

4. PROPOSED SUDS SOLUTION

The development proposals involves the upward extension above the existing ground floor commercial units to create 7 new flats, including access from the rear, as per the drawings provided in Appendix A.

In order to ensure that the SuDS management train has been followed, the proposals involve a wall mounted rainwater harvesting tank, in order to promote rainwater re-use. Approximately, 48m^2 of green or sedum roofing will also be implemented, in order to provide source control for most of the roof run off, as well as two raingarden planters.

Additionally, any new hardstanding areas will be formed of porous surfacing, with the surface water from any sloped areas caught by slot drains.

We believe the Sustainable Urban Drainage System hierarchy has been considered fully, and following these SuDS proposals the peak flow rate leaving the site will reduce from 11.9/s to 10.3l/s for a 1 in 1 year storm event plus 45% climate change and from 37.7l/s to 32.6l/s for a 1 in 100 year storm event plus 45% climate change event. Surface water runoff calculations can be located within Appendix B.

We believe the above SuDS solution is proportionate to the nature and scale of the development proposals

5. FOUL DRAINAGE STRATEGY

The development proposals involves the erection of 7 new flats in this proposed extension, and therefore the increase in foul flow for these 7 flats will be 0.35l/s, as per DCG Guidance for Surface Water & Foul Sewers (Section B3.1). The proposed foul flow will then be conveyed by gravity to an existing foul sewer at the site.

There is an existing foul sewer running adjacent to the site, therefore connection by gravity to this sewer is viable.

6. TIMESCALE AND MAINTENANCE OF WORKS

All drainage works shall be completed prior to first occupation and there shall be no adoption of any of the drainage works within the site, and a management company will be responsible to oversee the long-term maintenance of the communal drains.

The following outline maintenance strategy sets out recommended timescales for maintenance of the proposed drainage works, in line with CIRIA SuDS Design Guide:

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months.

- Regular jet-washing of permeable block paving can be used to keep joints and voids clear, this should be carried out every 3 to 6 months.

The following table outlines the maintenance requirements for the porous paving:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	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 or clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is the most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required
	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
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in six months
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 1: Operation and maintenance requirements for pervious pavements.

The following table outlines the maintenance requirements for green or sedum roofs:

Maintenance schedule	Required action	Typical Frequency
Regular Inspections	Inspect all components including soil substrate vegetation, drains irrigation systems (if applicable), membranes and roof structure for proper operation integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one) replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	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
Remedial Actions	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
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Table 2: Operation and maintenance requirement for green roofs.

The following table outlines the maintenance requirements for the rainwater harvesting systems:

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 3: Operation and maintenance requirement for RWH systems.

The following table outlines the maintenance requirements for the raingarden planters:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Pipe inlets to the raingarden planters should be checked every month and especially after an extreme rainstorm to ensure that there are no blockages.	Monthly
	Periodic inspections & removal of debris or other items that represent blockage risks particularly in vicinity of the inlet to the raingarden planters	Monthly
	Weeding, cutting of plants and removal of any dead plants to ensure that the system works effectively	Every three months
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockages by sediment, algae or other matter: remove and replace surface infiltration medium as necessary.	Annually
Remedial actions	Repair inlets, outlets, overflows	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that the are in good condition and operating as designed	Annually

Table 4: Operation and maintenance requirement for rainwater garden planters

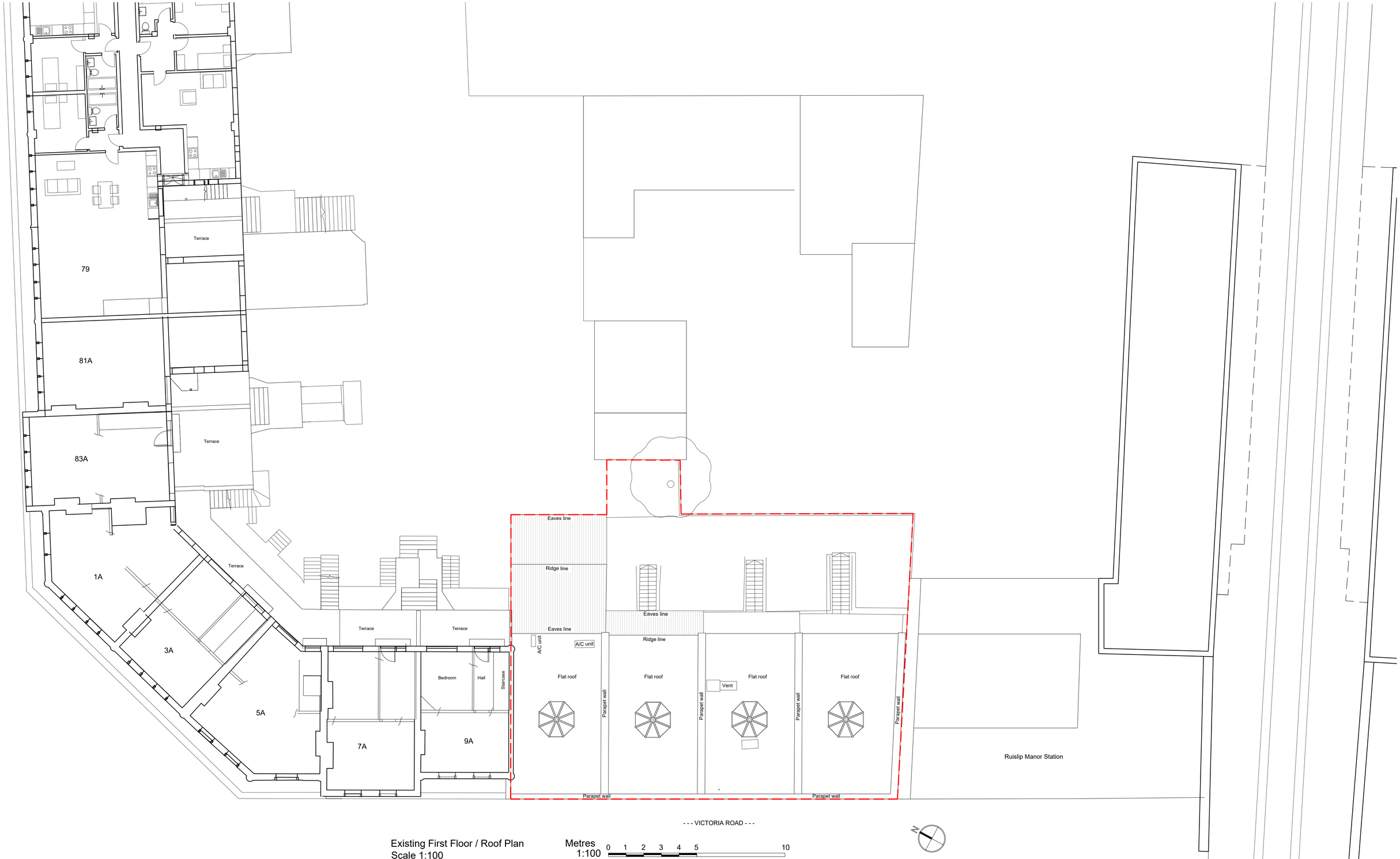
7. CONCLUSIONS

The purpose of this report, is to provide the local planning authority with a suitable drainage strategy. An assessment of the existing and proposed surface water run off has been carried out and a suitable SuDS strategy, which follows the SuDS hierarchy, has been proposed.

The foul water strategy involves discharge from the proposed building via gravity to an existing foul sewer on site.

The timetable of works is to complete all drainage prior to occupation of dwellings, and maintenance requirements are also included in this report.

APPENDIX A – DRAWINGS



Existing First Floor / Roof Plan
Scale 1:100

Metres 1:100 0 1 2 3 4 5 10

A1 SHEET

General Notes

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This drawing supersedes all prior versions with the same drawing number and earlier revisions.

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11-17 Victoria Road
London, HA4 9AA

CLIENT
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PLANNING			A1 SHEET
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SCALE	DATE	DRAWN	CHECKED
1:100	09/04/2025	MS	MSS

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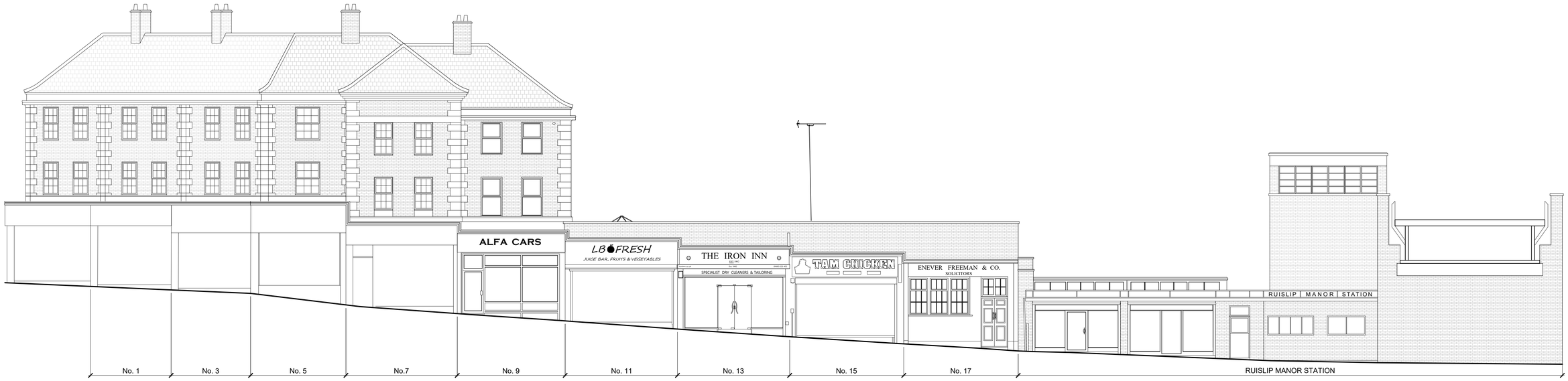

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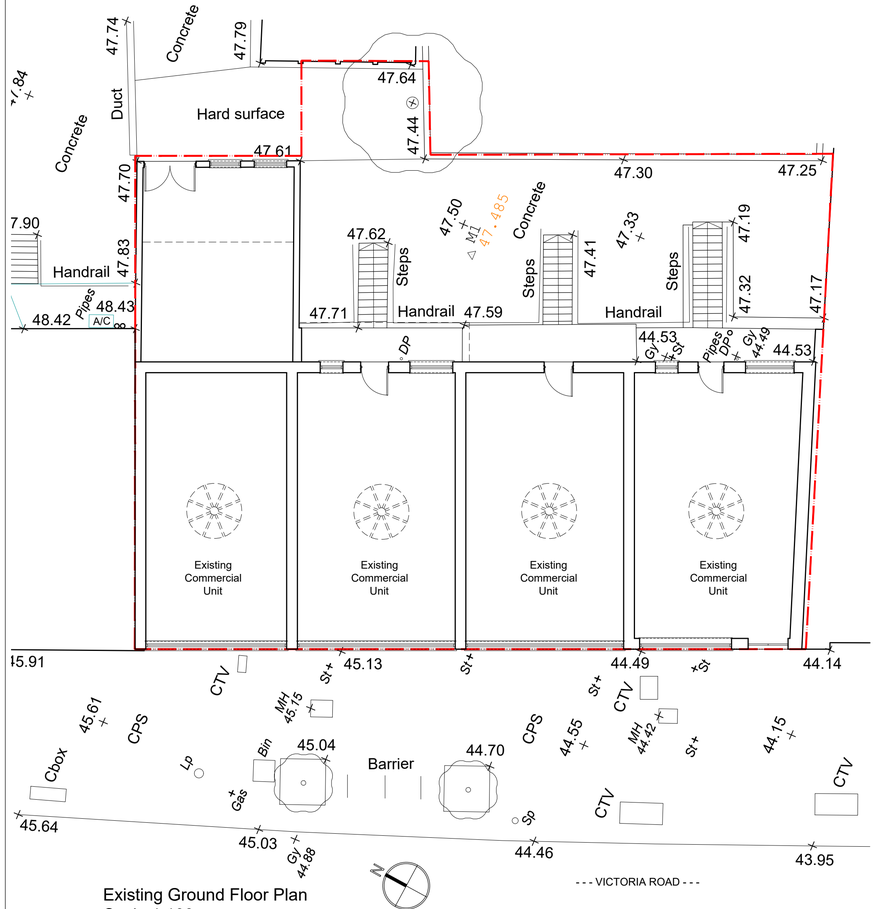
Metres 1:100 0 1 2 3 4 5 10



Existing Ground Floor Plan
Scale 1:100

Existing Rear Elevation/Section
Scale 1:100

Metres 1:100 0 1 2 3 4 5 10

A1 SHEET

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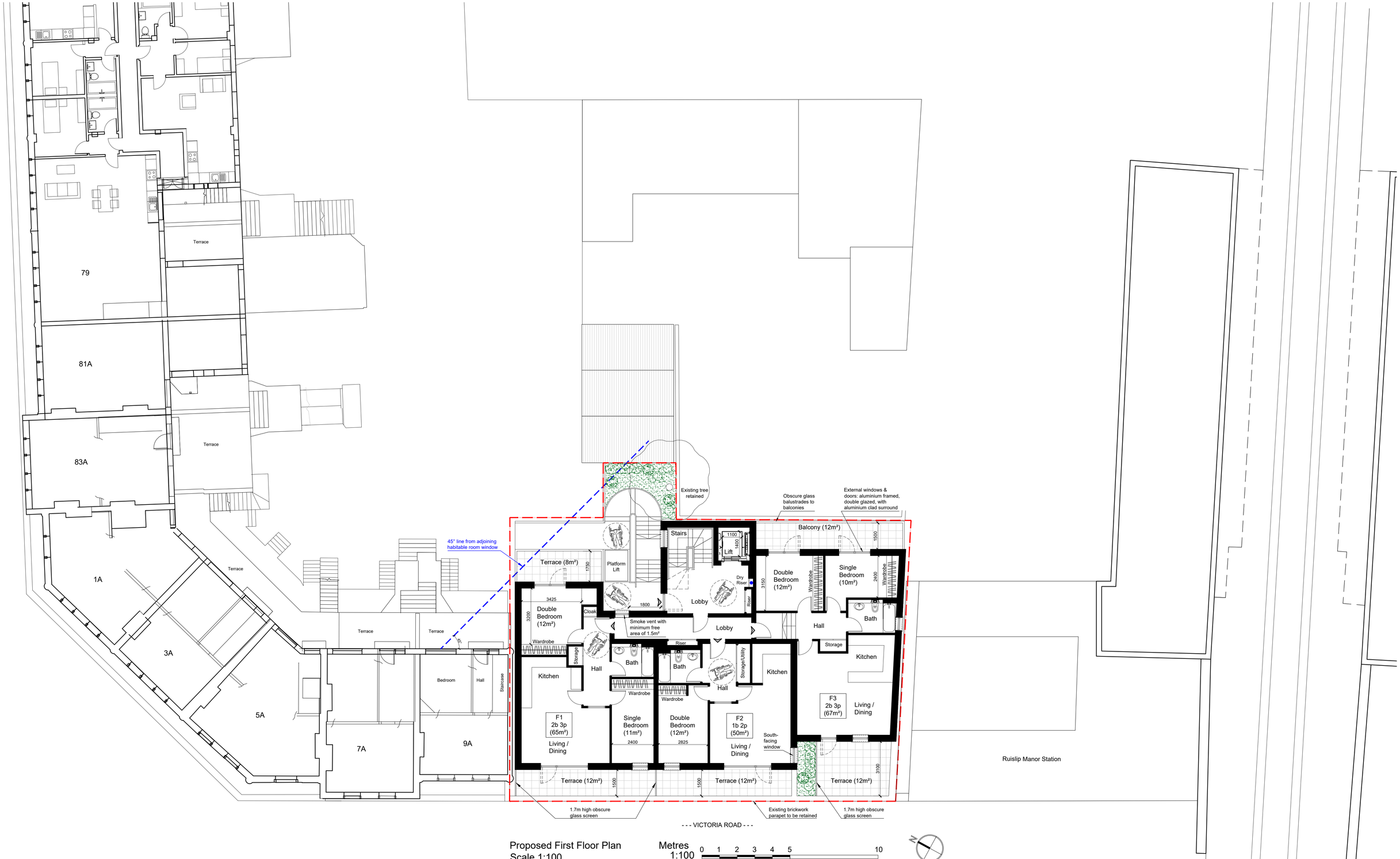

Proposed First Floor Plan
Scale 1:100

Metres
1:100 0 1 2 3 4 5 10

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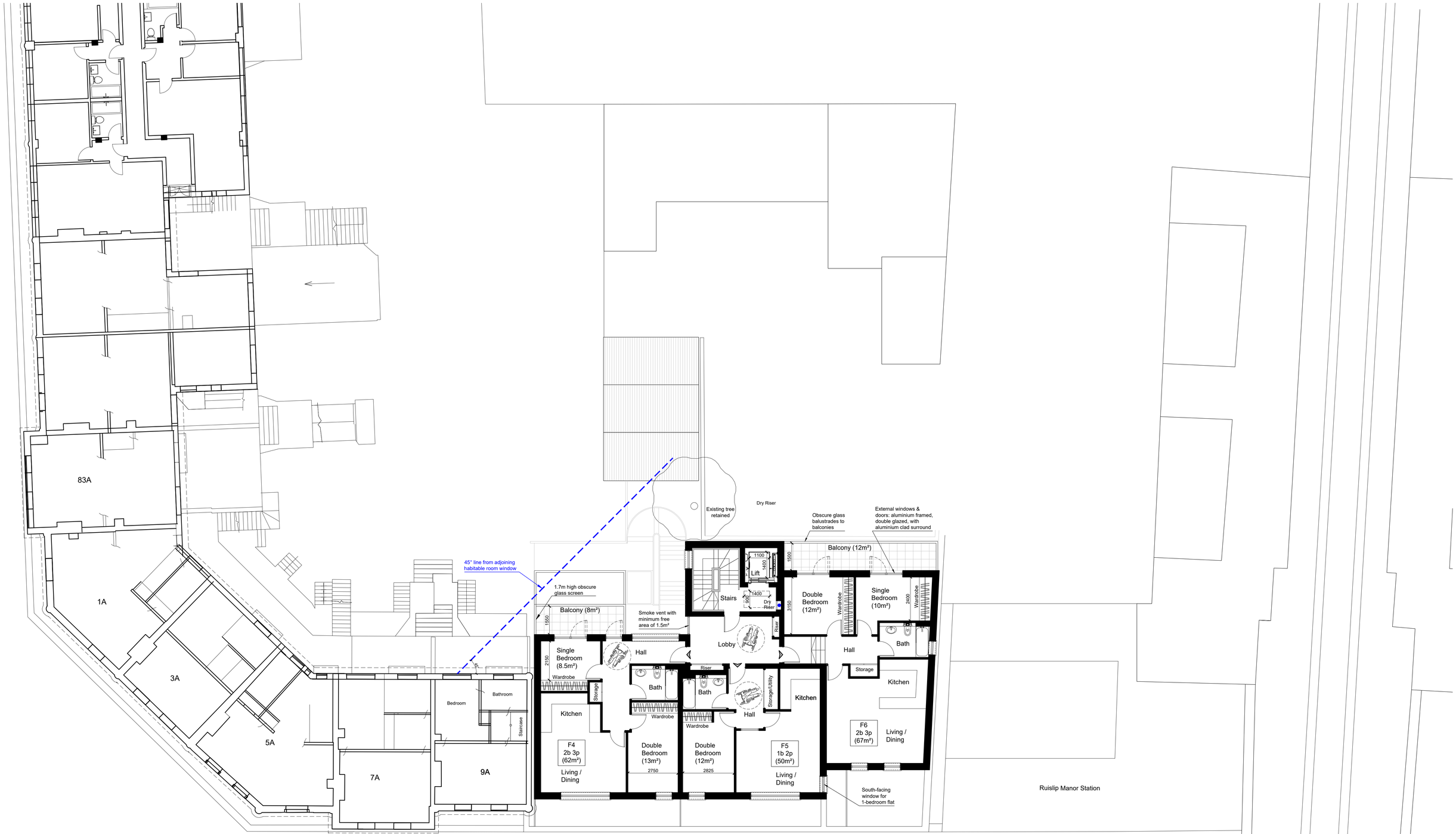

Proposed Second Floor Plan
Scale 1:100

Metres
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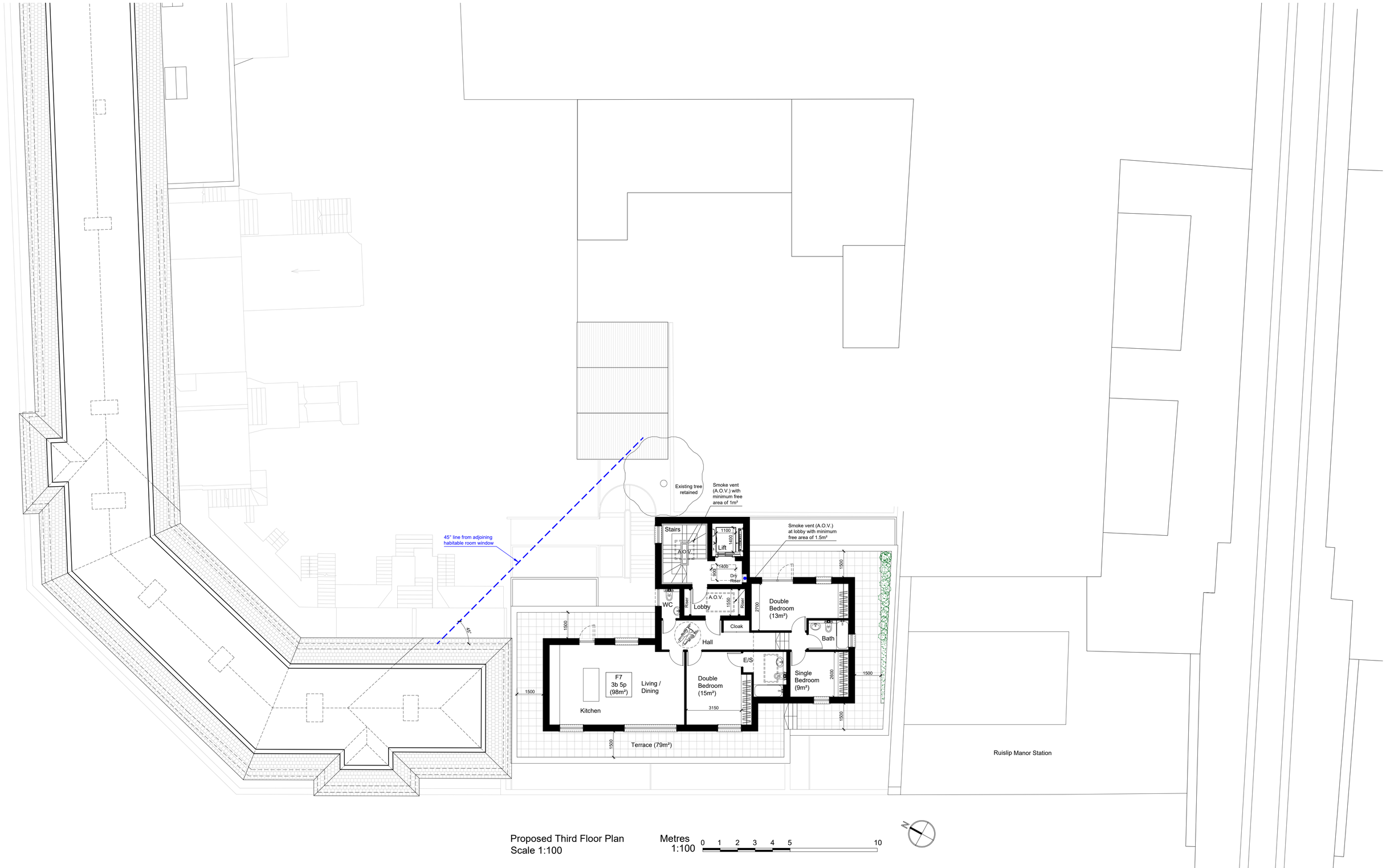

Proposed Third Floor Plan
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Metres
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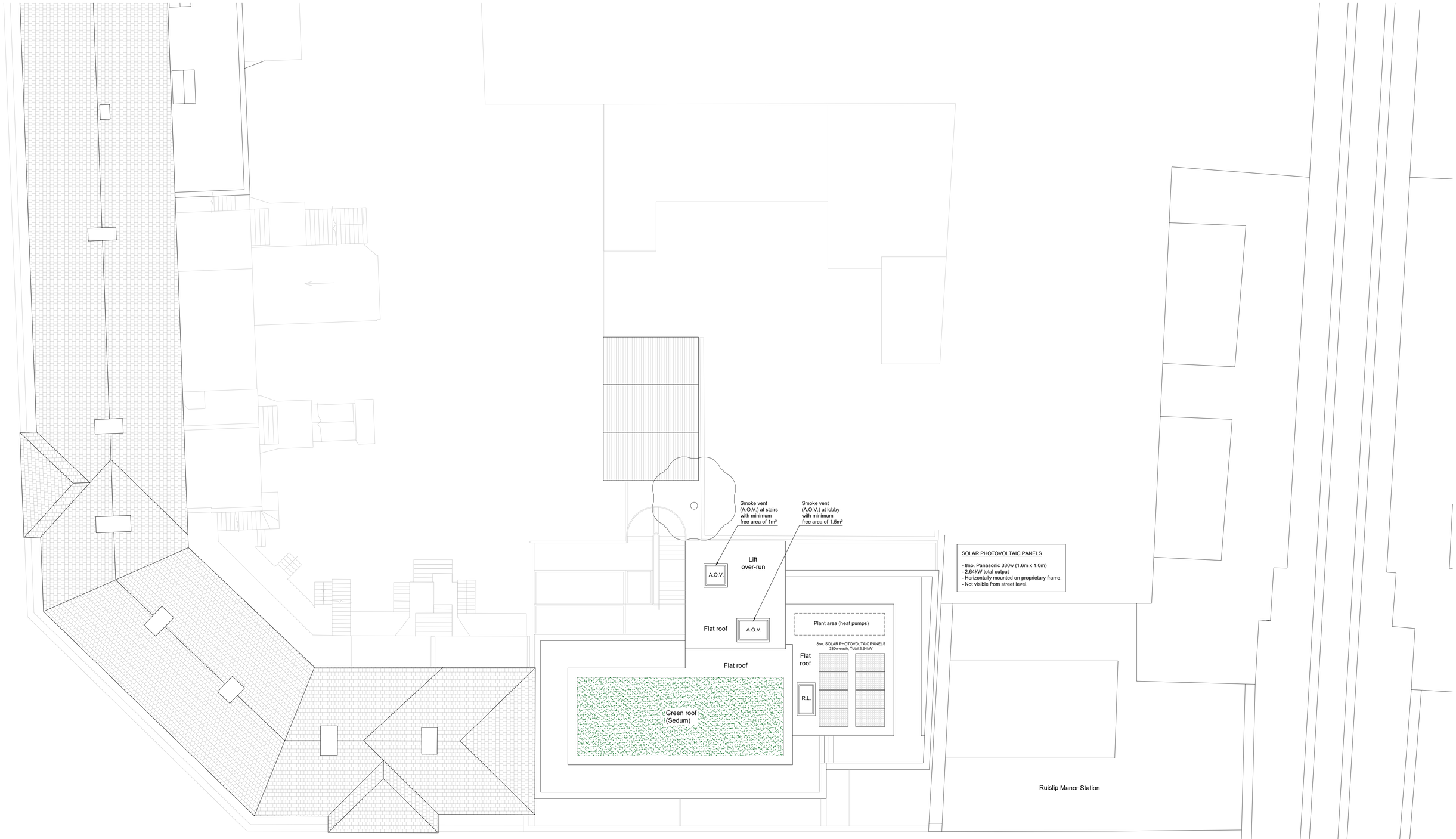

Proposed Roof Plan
Scale 1:100

Metres
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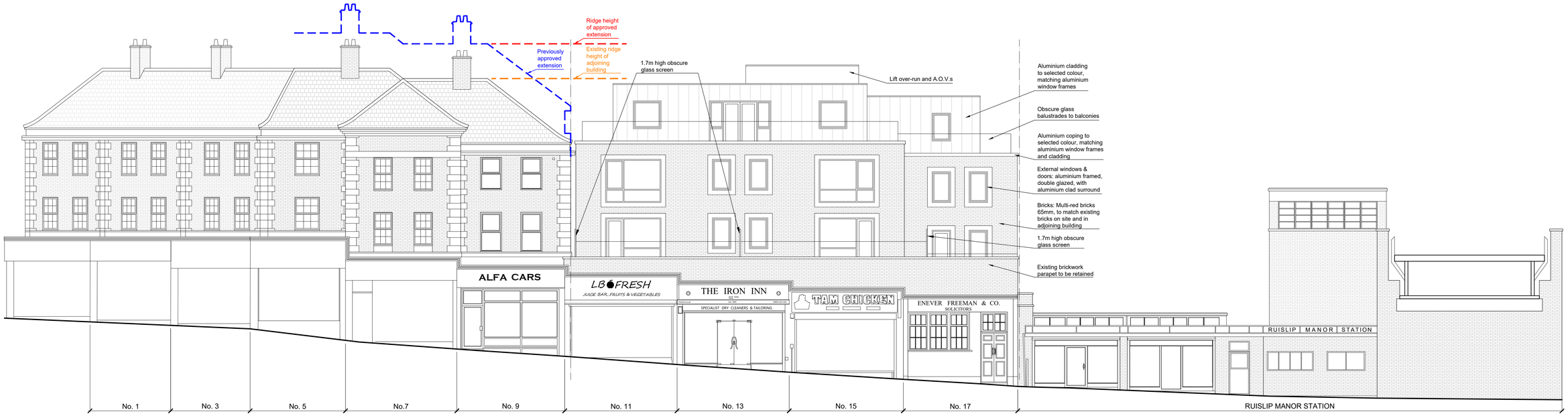

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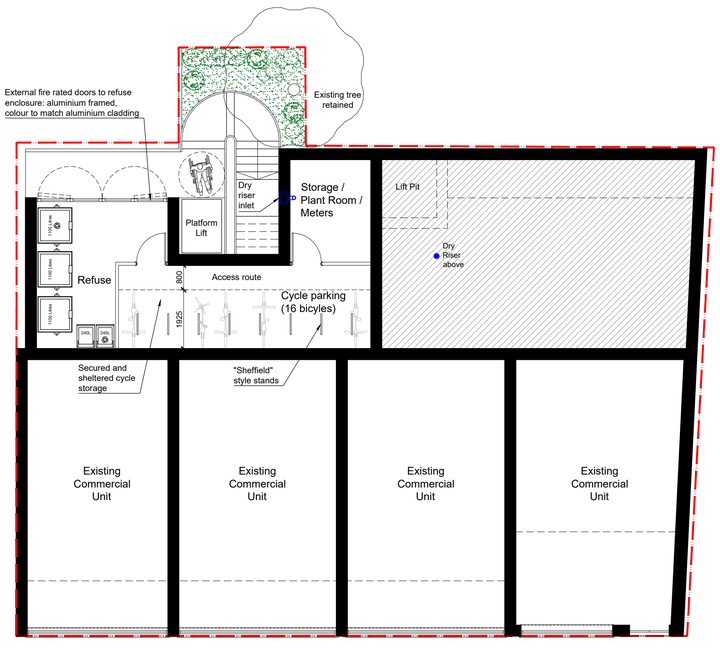

Proposed Ground Floor Plan
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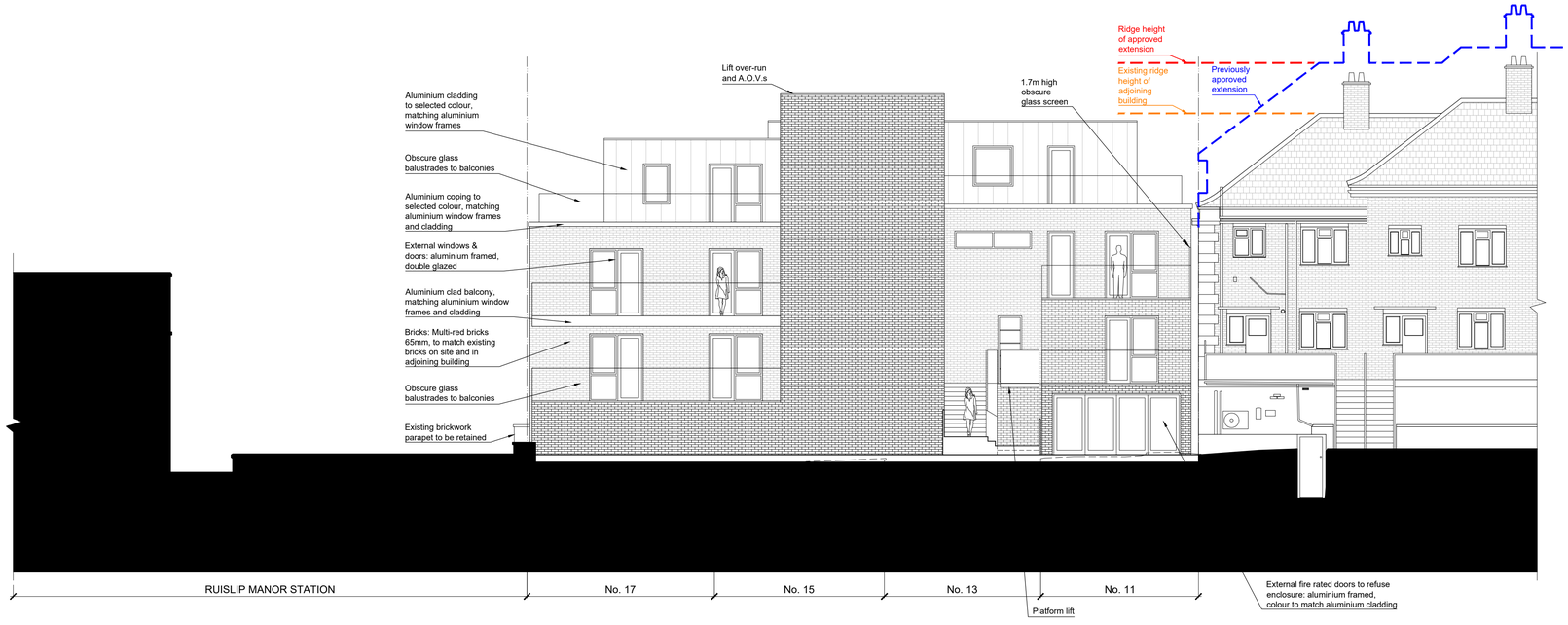

Proposed Rear Elevation
Scale 1:100

Metres 1:100 0 1 2 3 4 5 10

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A1 SHEET

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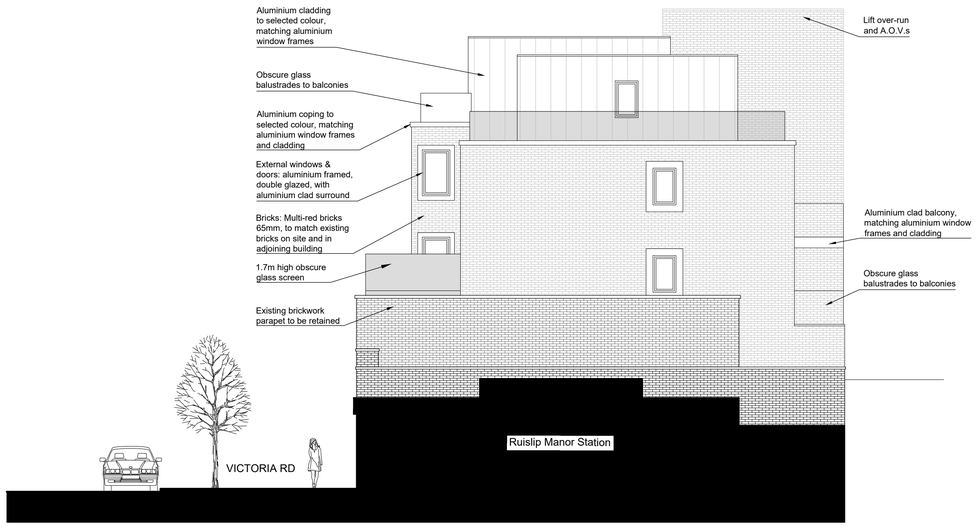


Proposed Side (South) Elevation
Scale 1:100

Metres 1:100 0 1 2 3 4 5 10

PLANNING STATEMENT:

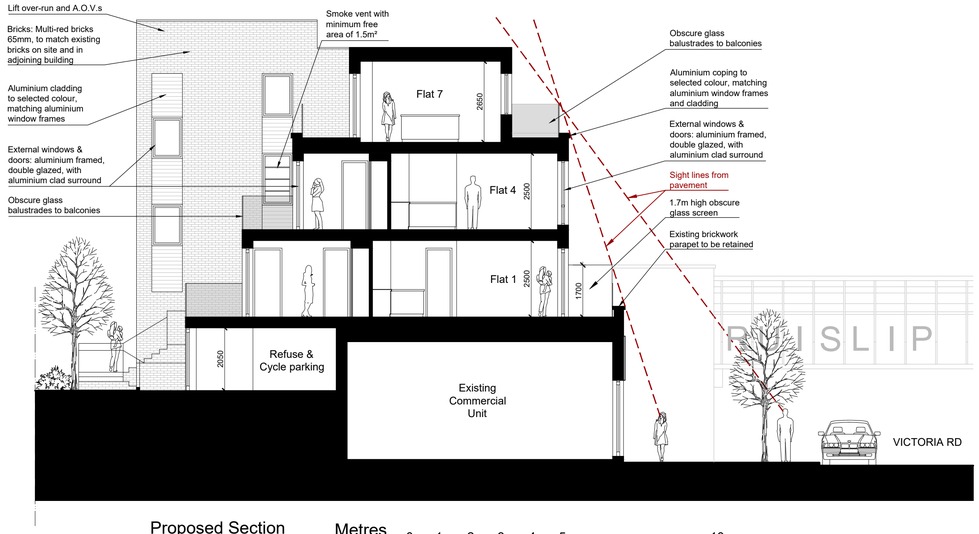
- Floor areas of each unit - In compliance with London Plan. See proposed plans and table below.
- Room sizes - In compliance with London Plan. See proposed plans and table below.
- Parking facilities - In compliance with London Plan. 16no. sheltered secured cycle spaces provided - See proposed Ground Floor Plan.
- Amenity areas - In compliance with London Plan. See table below.
- Refuse / recycling facilities - See proposed Ground Floor Plan for Refuse Areas.

	Flat No.	No. of bedrooms / persons	Amenity required by London Plan	Private Amenity area	Min. London Plan flat area	Proposed flat area (Excess over min. area required)
1st FLOOR	F1	2 bedrooms / 3 persons	7m²	20m²	61m²	65m² (4m² over min. area required)
	F2	1 bedroom / 2 persons	5m²	12m²	50m²	50m²
	F3	2 bedrooms / 3 persons	6m²	24m²	61m²	67m² (6m² over min. area required)
2nd FLOOR	F4	2 bedrooms / 3 persons	6m²	8m²	61m²	62m² (1m² over min. area required)
	F5	1 bedroom / 2 persons	5m²	0m²	50m²	50m²
	F6	2 bedrooms / 3 persons	6m²	12m²	61m²	67m² (6m² over min. area required)
3rd	F7	3 bedrooms / 5 persons	8m²	79m²	86m²	98m² (12m² over min. area required)
		Total required outdoor amenity area:	43m²			
		Total private amenity area (patios, balconies, terraces):		155m²		

29m² over min. combined area req.

UNITS BREAKDOWN:

3-Bed units:	1 (14%)
2-Bed units:	4 (57%)
1-Bed units:	2 (29%)
TOTAL FAMILY UNITS:	1
% of Total Units:	**14%**



Proposed Section
Scale 1:100

Metres 1:100 0 1 2 3 4 5 10

REFUSE STRATEGY:

As part of the Site Management, an agent will move the refuse bins from the refuse area to the designated collection point at street level where they can be collected by the Council's refuse personnel on collection days.
The bins will then be returned to the dedicated refuse enclosure at the building immediately after being emptied.

Communal Refuse & Recycling store facilities			
	No. of Units / No. of Bedrooms	Storage Capacity Required (litres)	No. of Bins
Proposed	(1U/3B)+(4U/2B)+(2U/1B)	Waste: (1x240)+(4x170)+(2x100) = 1120 litres Recycling: (1x240)+(4x170)+(2x100) = 1120 litres Garden waste: 240 litres	Waste: 2x1100l Recycling: 1x1100l + 1x240l Garden waste: 1x240l

REV	DATE	Initials	REVISION

PROJECT
11-17 Victoria Road
London, HA4 9AA

CLIENT
PERL EQUITY (RUISLIP) 4 LIMITED

DRAWING NUMBER: 1117VR-PP1-08			REVISION:
STATUS: PLANNING			PAPER SIZE: A1 SHEET
DRAWING TITLE: Proposed Side Elevation Proposed Section			
SCALE: 1:100	DATE: 09/04/2025	DRAWN: MS	CHECKED: MSS

A1 SHEET

WAVE ARCHITECTS

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T. 07597 511 486

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PROJECT TITLE: 11-17 Victoria Road, London HA4 9AA

EXISTING

PROPOSED

General Notes

Local authorities, including Planning Groups and Building Control, may request additional items or information to be added or revised.

Contractors, sub-contractors, or suppliers are required to promptly report any errors, omissions, or discrepancies found on these drawings. Any deviations from the drawings' specifications must receive prior approval from the architect. Contractors, sub-contractors, or suppliers are responsible for seeking any necessary clarifications from the architect to ensure the accurate execution of the work.

All specialist work intended for inclusion in the main contract works, such as shop drawings, illustrations, and specifications, must be supplied to the architect. In case any aspect of this drawing does not align with industry-recognized codes of practice or local authority regulations, it should be brought to the attention of the architect without delay.

Contractors must verify all dimensions on-site before commencing any work or preparing shop drawings. Figured dimensions take precedence over scaled dimensions.

Contractors, sub-contractors, or suppliers are obliged to inform the architect or quantity surveyor promptly of any alterations to the proposed works, including their impact on the project's schedule and cost.

This drawing supersedes all prior versions with the same drawing number and earlier revisions.

REV	DATE	Initials	REVISION

PROJECT
11-17 Victoria Road
London, HA4 9AA

CLIENT
PERL EQUITY (RUISLIP) 4 LIMITED

A1 SHEET

DRAWING NUMBER			REVISION
1117VR-PP1-09			
STATUS			PAPER SIZE
PLANNING			A1 SHEET
DRAWING TITLE	Existing Photographs Proposed CGI Photomontages		
SCALE	DATE	DRAWN	CHECKED
N.T.S.	09/04/2025	MS	MSS

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PROJECT TITLE 11-17 Victoria Road, London HA4 9AA

APPENDIX B – SURFACE WATER RUNOFF CALCULATIONS

Nimbus Engineering Consultants Ltd
www.nimbusengineering.co.uk

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152 City Road,
London, EC1V 2NX
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Job No.	C3523
Sheet no.	1
Date	10/04/25
By	M.HAM
Checked	
Reviewed	

MasterDrain
HY 10.01

Project: 11-17 Victoria Road, Ruislip, HA4 9AA

Title: Pre & Post SW Calcs w/ Green Roof

Data:-

Hydrology (FSR):-

Location = RUISLIP (MIDDX)		WRAP	= 4
Long reference = 509187		Grid reference	= TQ0987
M5-60 (mm)	= 20.1	SAAR (mm/yr)	= 660
r	= 0.44	Soil	=0.47
Hyd. area	= 6	Hyd. zone	= 8
Hydrograph	= Winter	Area = England & Wales	

Site values used in design:-

Total site area	= 0.0371 ha	Climate change factor	= 45%
Pre-dev area drained	= 0.0369 ha	Post-dev area drained	= 0.0363 ha
Imperm runoff factor	= 100%	Perm runoff factor	= 20%
Pre-development			
Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Pre-dev flow to drain	= 0.00 l/s
Post-development			
Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0049 ha
Perv. area to SUDS	= 0.0000 ha	Post-dev flow to drain	= 0.00 l/s

Calculations:-

Revised Post-dev Imperm. area = 0.031 ha
Equiv. Post-dev Imperm. area = 0.031 ha
Equiv. Post-dev Perm. area = 0.000 ha
Total Pre-dev equiv. area ha = 0.037 ha
Total Post-dev equiv. area ha = 0.032 ha
100 yr 6 hour mean intensity = 10.08mm/hr

Results:-

Pre-dev peakflow runoff (l/s) (m³/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	8.3	5.4	3.4	2.0	1.2	0.9	0.7	0.6	8.3	N/A	8.3	1
30	20.2	13.0	7.9	4.7	2.7	2.0	1.6	1.3	20.2	N/A	20.2	30
100	26.3	17.0	10.4	6.2	3.6	2.6	2.0	1.7	26.3	N/A	26.3	100

Post-dev peakflow runoff (l/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	7.1	4.6	2.9	1.7	1.0	0.8	0.6	0.5	7.1	45	10.3	1
30	17.3	11.1	6.8	4.0	2.3	1.7	1.4	1.1	17.3	45	25.1	30
100	22.5	14.5	8.9	5.3	3.1	2.2	1.7	1.5	22.5	45	32.6	100

100 year 6 hour (x Climate Change Factor) storm gives:-
Pre-dev runoff volume m³ = 22.3m³
Post-dev rainfall volume = 32.0m³
Post-dev volume m³ (excess above SUDS) = 27.7m³
100 yr 6 hour mean intensity = 10.08mm/hr
Pre-dev volume to drain at 0 l/s = 0.0 m³
Post-dev volume to drain at 0 l/s = 0.0 m³
Post-dev storage volume = 27.7m³
Post-dev 5mm imperm volume = 1.8 m³
Post-dev 5mm perm volume = 0.0 m³

$Q_{BAR(rural)}$ = 0.167 l/s or 4.507 l/s/ha or 0.000 cumecs - from IoH 124.

The rainfall rates are calculated using the location specific values above in accordance with the Wallingford procedure.

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Job No.	C3523
Sheet no.	2
Date	10/04/25

MasterDrain
HY 10.01

Project	11-17 Victoria Road, Ruislip, HA4 9AA	By	Checked	Reviewed
Title	BREEAM SUR1 calculations for RUISLIP (MIDDX)	M.HAM		

Data summary.

Use the data below for the SUR1 form

Site areas:-

Total site area =	0.0371 ha ;371.0 m²	[3A]
Pre-development impermeable area =	0.0369 ha	[3B]
Pre-development permeable area =	0.0002 ha	
Post-development impermeable area =	0.0363 ha	[3C]
Post-development permeable area =	0.0008 ha	

Peak runoff:-

Pre-development 1 year storm (15min) =	8.3 l/s	[6A]
Pre-development 100 year storm (15min) =	26.3 l/s	[6C]
Post-development 1 year storm (15min) =	7.1 l/s	[6B]
Post-development 100 year storm (15min)=	22.48 l/s	[6D]

Greenfield runoff:-

$Q_{BAR(rural)}$ = 0.167 l/s or 4.507 l/s/ha or 0.000 cumecs - from IoH 124.

Climate change factor:-
CCF = 45%

Volumes:-
Pre-development 100 yr/6hr storm [12A]= 32.4m³
Post-development 100 yr/6hr storm (add. volume with no SUDS) [12B]= 32.0m³
Post-development 100 yr/6hr storm (add. volume with SUDS) = 27.7m³
Post-development add. predicted volume (No SUDS) [12C] = -0.4m³

You may also require
Data relating to the infiltration test calculations (if applicable)
Evidence to show runoff reduction (if applicable)
Information on calculation methods (if applicable see next sheet)

Note
Numbers in square brackets relate to the
Nov. 2010 v1.1 / issued 11/02/10 copy of SUR1

Definitions and methods

Hydrology

The hydrological constants are derived from the Wallingford maps. They are used to calculate location specific rainfall figures.

Site values and factors

Areas of the site should be entered in hectares (10000 m²). If the Pre-development site is a green field, this box is blank.
Climate Change Factor is initially set at 20% - this may be changed as required.
Greenfield runoff is calculated using the method described in IoH 124.
Runoff factors

The impermeable runoff factor is initially set at 98%
The permeable runoff factor is initially set at 20%

Note: the CCF and the runoff factors may be changed by the user to suit the development
The areas draining to soakaways and other SUDS are entered in the appropriate box (in hectares)

Calculations

The post-development area is reduced by subtracting the areas that drain to soakaways or other SUDS, to give a revised figure.
All areas are then multiplied by the appropriate runoff factor to give an equivalent area with 100% runoff.
These are then summated.
This gives a total pre-development equivalent area, and a similar figure for the post-development area.
The 'Post-dev volume to drain (no SUDS)' gives the total runoff to drain if no SUDS were used.

Results

The pre- and post-development areas are subjected to 1,30 and 100 year return period storms with a duration of 15 to 600 minutes.
The Revised Post-dev Imperm. area is the area (in ha) that is not going to SUDS x impervious runoff factor.
The runoff rates are calculated for the chosen hydrograph (Summer or Winter) as l/s. Figures in red indicate m³/s
The peak value is measured, multiplied by the CCF and the total maximum rate is shown.
The pre- and post-development volumes for a 100 year / 6 hour storm are calculated from the area under the hydrograph curve.
Post-dev volume (i.e. excess above SUDS) is that volume produced by the drained area that does not go to SUDS.
Qbar(rural) is calculated in accordance with the procedure laid down in IoH 124

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Job No.	C3523
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Date	10/04/25
By	M.HAM
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Reviewed	

MasterDrain
HY 10.01

Project: 11-17 Victoria Road, Ruislip, HA4 9AA

Title: Pre & Post SW Calcs prior to Green Roof

Data:-

Hydrology (FSR):-

Location = RUISLIP (MIDDX)		WRAP	= 4
Long reference = 509187		Grid reference	= TQ0987
M5-60 (mm)	= 20.1	SAAR (mm/yr)	= 660
r	= 0.44	Soil	=0.47
Hyd. area	= 6	Hyd. zone	= 8
Hydrograph	= Winter	Area = England & Wales	

Site values used in design:-

Total site area	= 0.0371 ha	Climate change factor	= 45%
Pre-dev area drained	= 0.0369 ha	Post-dev area drained	= 0.0363 ha
Imperm runoff factor	= 100%	Perm runoff factor	= 20%
Pre-development			
Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Pre-dev flow to drain	= 0.00 l/s
Post-development			
Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Post-dev flow to drain	= 0.00 l/s

Calculations:-

Revised Post-dev Imperm. area = 0.036 ha
Equiv. Post-dev Imperm. area = 0.036 ha
Equiv. Post-dev Perm. area = 0.000 ha
Total Pre-dev equiv. area ha = 0.037 ha
Total Post-dev equiv. area ha = 0.036 ha
100 yr 6 hour mean intensity = 10.08mm/hr

Results:-

Pre-dev peakflow runoff (l/s) (m³/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	8.3	5.4	3.4	2.0	1.2	0.9	0.7	0.6	8.3	N/A	8.3	1
30	20.2	13.0	7.9	4.7	2.7	2.0	1.6	1.3	20.2	N/A	20.2	30
100	26.3	17.0	10.4	6.2	3.6	2.6	2.0	1.7	26.3	N/A	26.3	100

Post-dev peakflow runoff (l/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	8.2	5.4	3.4	2.0	1.2	0.9	0.7	0.6	8.2	45	11.9	1
30	20.0	12.8	7.8	4.7	2.7	2.0	1.6	1.3	20.0	45	29.0	30
100	26.0	16.8	10.3	6.1	3.5	2.6	2.0	1.7	26.0	45	37.7	100

100 year 6 hour (x Climate Change Factor) storm gives:-
Pre-dev runoff volume m³ = 22.3m³
Post-dev rainfall volume = 32.0m³
Post-dev volume m³ (excess above SUDS) = 32.0m³
100 yr 6 hour mean intensity = 10.08mm/hr
Pre-dev volume to drain at 0 l/s = 0.0 m³
Post-dev volume to drain at 0 l/s = 0.0 m³
Post-dev storage volume = 32.0m³
Post-dev 5mm imperm volume = 1.8 m³
Post-dev 5mm perm volume = 0.0 m³

$Q_{BAR(rural)}$ = 0.167 l/s or 4.507 l/s/ha or 0.000 cumecs - from IoH 124.

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Job No.	C3523
Sheet no.	2
Date	10/04/25
Project	11-17 Victoria Road, Ruislip, HA4 9AA
Title	BREEAM SUR1 calculations for RUISLIP (MIDDX)

By	Checked	Reviewed
M.HAM		

MasterDrain
HY 10.01

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Peak runoff:-

Pre-development 1 year storm (15min) =	8.3 l/s [6A]
Pre-development 100 year storm (15min) =	26.3 l/s [6C]
Post-development 1 year storm (15min) =	8.2 l/s [6B]
Post-development 100 year storm (15min)=	25.97 l/s [6D]

Greenfield runoff:-

$Q_{BAR(rural)}$ = 0.167 l/s or 4.507 l/s/ha or 0.000 cumecs - from IoH 124.

Climate change factor:-
CCF = 45%

Volumes:-
Pre-development 100 yr/6hr storm [12A]= 32.4m³
Post-development 100 yr/6hr storm (add. volume with no SUDS) [12B]= 32.0m³
Post-development 100 yr/6hr storm (add. volume with SUDS) = 32.0m³
Post-development add. predicted volume (No SUDS) [12C] = -0.4m³

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The areas draining to soakaways and other SUDS are entered in the appropriate box (in hectares)

Calculations

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Post-dev volume (i.e. excess above SUDS) is that volume produced by the drained area that does not go to SUDS.
Qbar(rural) is calculated in accordance with the procedure laid down in IoH 124