
Surface Water Drainage and SuDS Strategy Report

L26/123/03

88-90 Westbury Avenue

London

N22 6QT



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Revisions and Additional Material

Document History and Status

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-	27.05.2026	First Issue

Document Details

Project Director	Ben Norman
Report Author	Mathan Rengasamy
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Preamble

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1.0 Introduction

- 1.1.1 JMS Engineers have been appointed to prepare a surface water drainage strategy and SuDS that will support the planning application for the development at 88-90 Westbury Avenue, London, N22 6QT.
- 1.1.2 This report will review and aim to meet the requirements set out by the London Borough of Haringey. The report will include a surface water drainage strategy and will consider the use of SuDS wherever possible.

2.0 Location & Existing Conditions

- 2.0.1 The application site is in the London Borough of Haringey.
- 2.0.2 The site is specifically located to the rear of 88-90 Westbury Avenue, along Rusper Road, and currently comprises a single storey garage. The impermeable area of the site totals approximately 0.007 ha.
- 2.0.3 The British Geological Survey (BGS) information shows the site is free from any superficial deposits as shown in **Figure 1**. The bedrock shown in **Figure 2** is London Clay Formation-Clay, silt and sand.

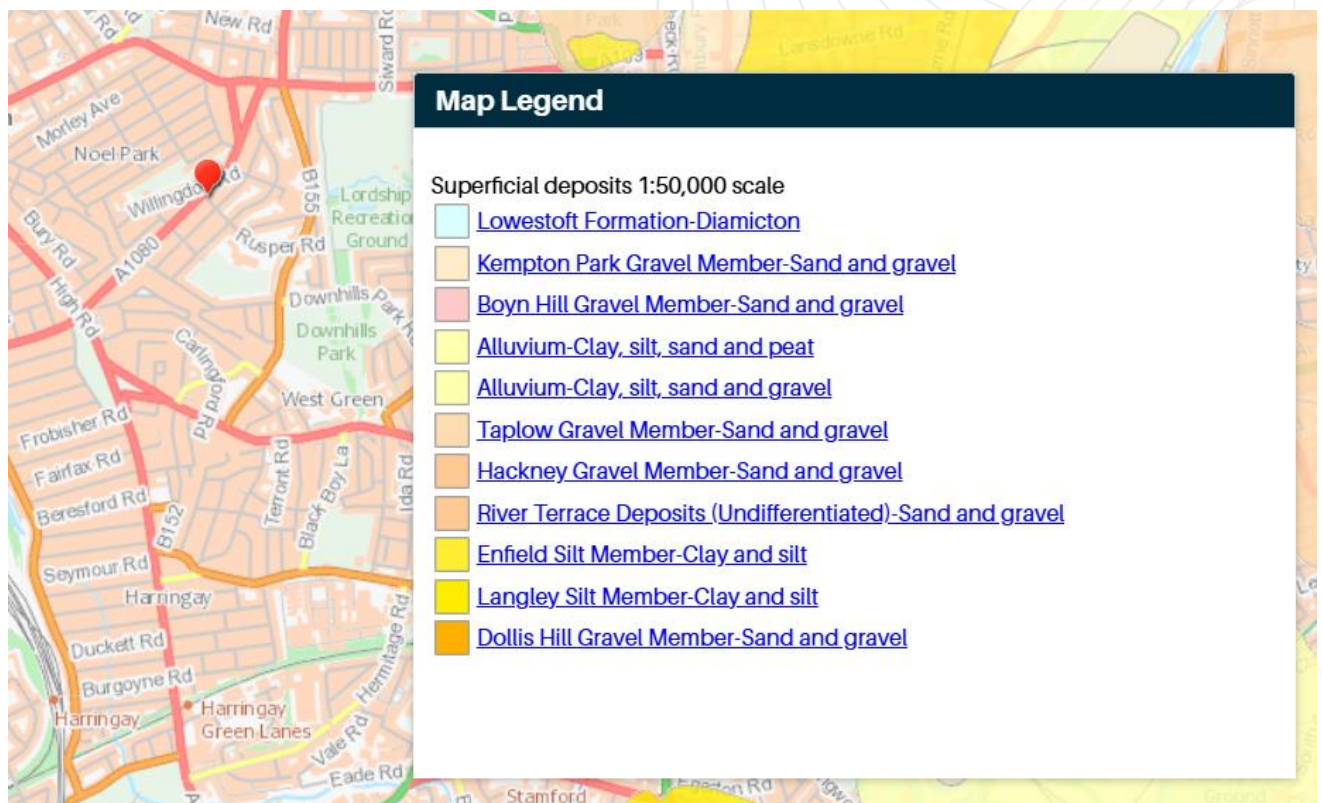


Figure 1 Superficial Deposits

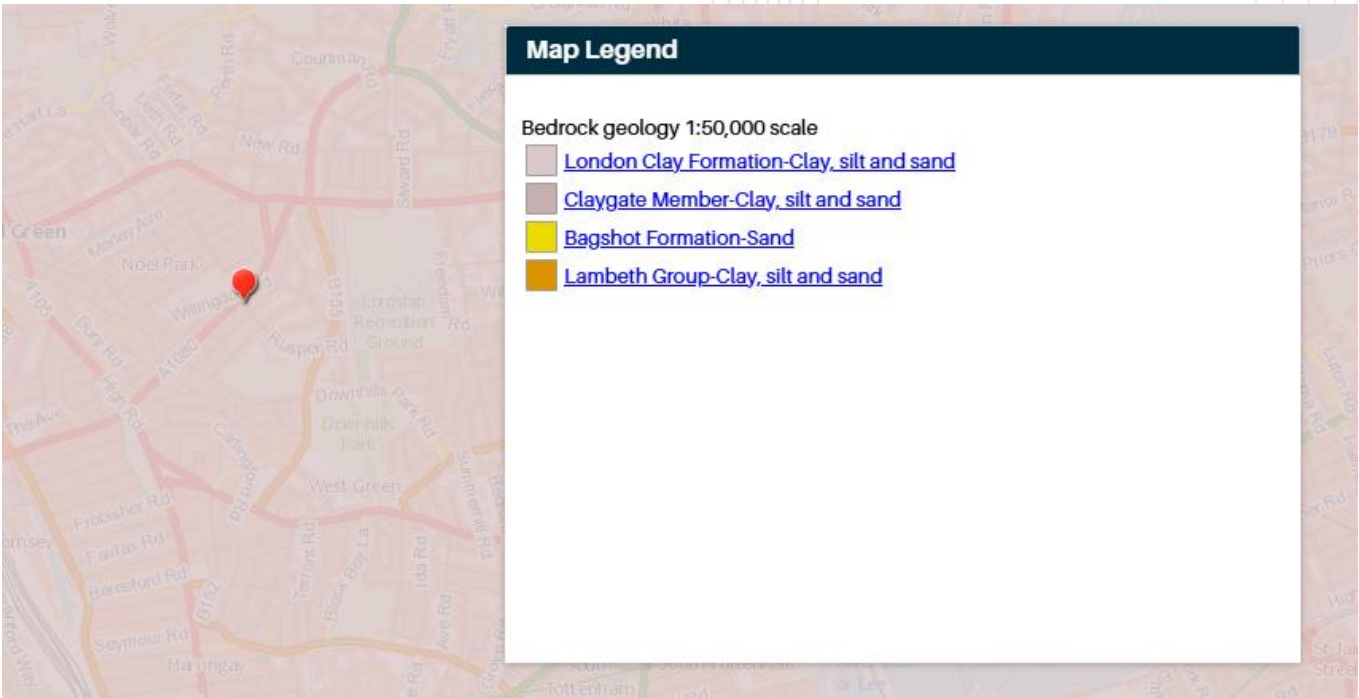


Figure 2 Bedrock Geology

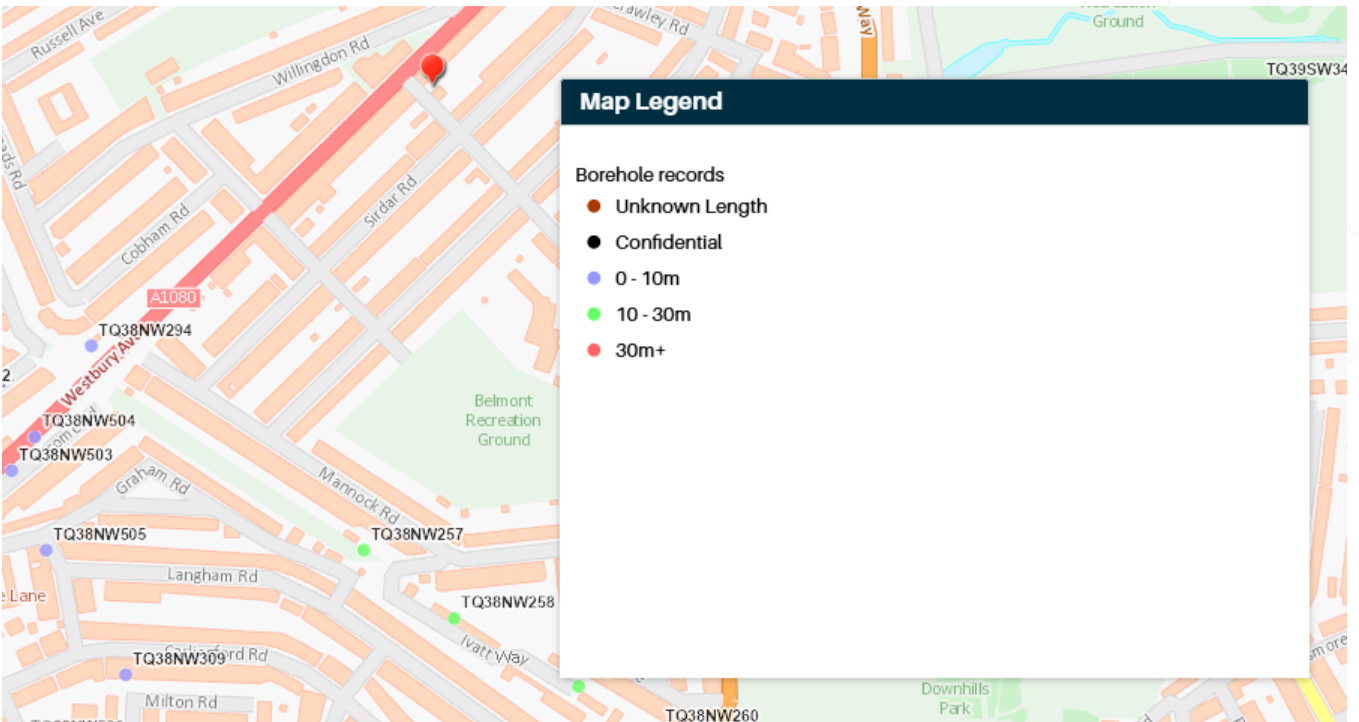


Figure 3 Local Borehole Location Plan

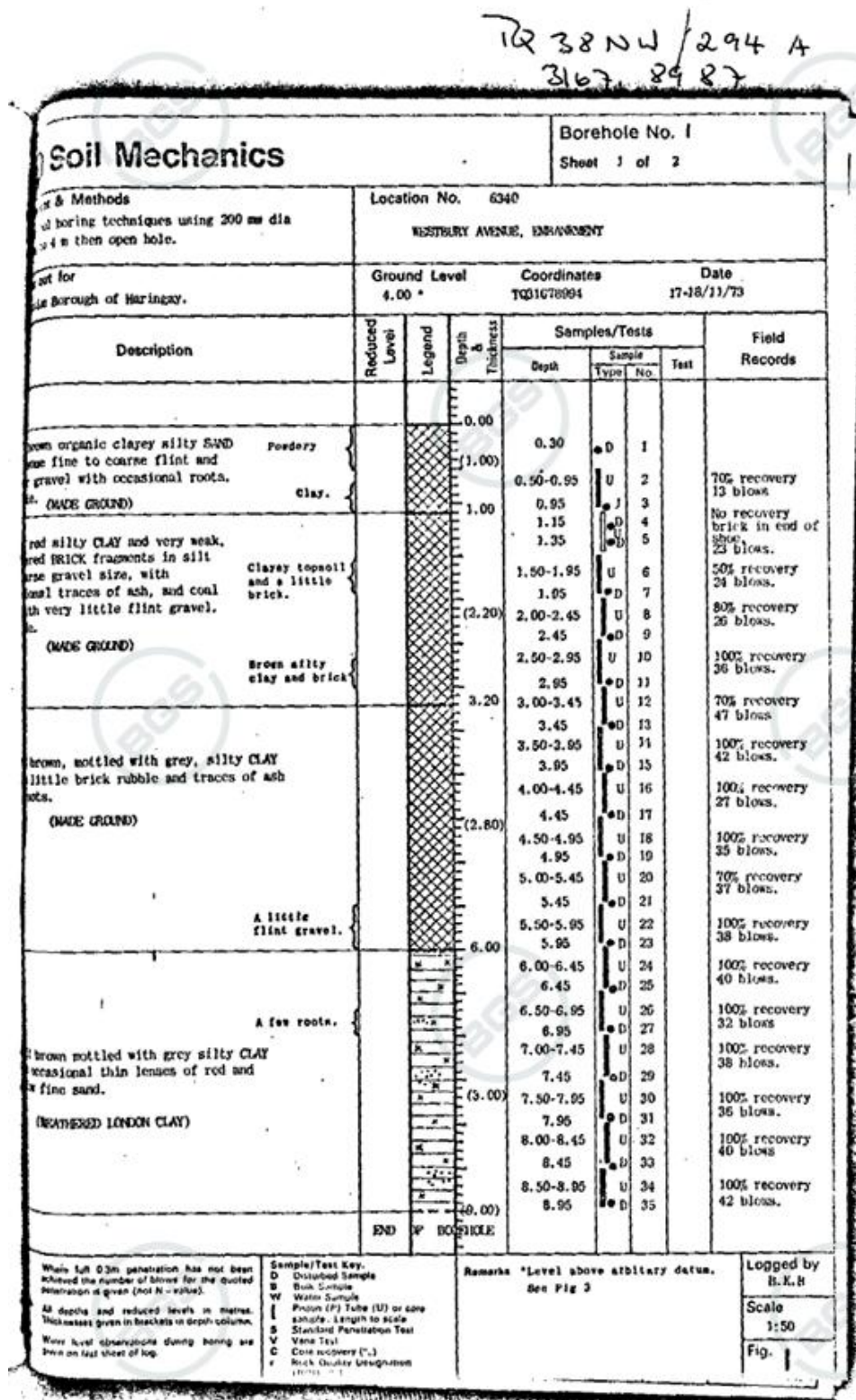


Figure 4 Borehole TQ38NW294

- 2.0.4 The British Geological Survey (BGS) borehole record indicates that made ground comprising clayey silty sand with fine to coarse flint and gravel extends to approximately 1.0 m below ground level (bgl). This is underlain by brown silty clay with brick fragments and traces of ash extending to approximately 6.0 m bgl. Weathered London Clay was encountered from approximately 6.0 m to the terminated depth of 9.0 m bgl. Groundwater was not encountered during the investigation.

2.1 Existing Sewer Assets

- 2.1.1 Thames Water asset plans show both foul and surface water sewer in Westbury Avenue flowing northeast. Thames Water asset plans can be found in **Appendix A**.

2.2 Site Proposals

- 2.2.1 Demolition of single storey lockup garage and erection of single storey detached two-bedroom dwelling with basement. The total impermeable area for the proposed site is 0.007ha. The proposals at the time of writing can be seen in **Appendix B**.

2.3 Existing Drainage Regime

- 2.3.1 It is assumed that both foul and surface water flows drain positively to the public sewer network in the vicinity of the site. Therefore, the surface water runoff generated by the existing site is assumed to be picked up by the private drainage network around the property and ultimately to the surface water sewer in the Westbury Avenue.
- 2.3.2 The average existing runoff rate can be calculated for the existing impermeable area of approximately 0.006ha. The Modified Rational Method is used to consider the existing runoff as set out below:

Section 24.6 of CIRIA 753 states that a value of 35-50mm can be used for rainfall intensity.

$$Q(l/s) = C_v \times C_r \times (2.78 \times I \text{ (mm/hr)} \times A \text{ (ha)})$$

Where:

$$A = 0.006\text{ha}$$

$$C_v = 0.75$$

$$C_r = 1.3$$

Taking $I = 50\text{mm}$ (max. value)

$$Q = 1.9\text{l/s}$$

- 2.3.3 The table below shows the greenfield and existing site peak runoff rate for each storm event when considering the 60-minute duration and site-specific rainfall intensity values as follows:

	1:1 Year Storm Event	1:2 Year Storm Event	1:30 Year Storm Event	1:100 Year Storm Event
Greenfield Runoff (l/s)	0	-	0.1	0.1
Rainfall Intensity (l)	-	52.883	135.467	178.264
Existing Site Peak Runoff Rate (l/s)	-	0.86	2.2	2.9

Table 1: Existing site peak runoff rate

3.0 SuDS Considerations

3.0.1 Consideration of SuDS is a planning requirement for new developments. SuDS are designed to replicate the natural course of drainage as closely as possible with a view to reducing the impact of flooding, removing pollutants at source and combining water management with green space.

Developments should utilise SuDS where possible and ensure that surface water run-off is managed as close to its source as possible in line with the following hierarchy:

1. Into ground (infiltration).
2. To a surface water body.
3. To a surface water sewer.
4. To a combined sewer.

3.0.2 Sustainable Drainage Systems should be included in the design in order to manage surface water flood risk. SuDS should be inspired by natural drainage processes and manage water as close to its source as possible whilst offering pollution control and landscape benefits.

3.1 National and Local Planning Policy

3.1.1 For this development, the London Borough of Haringey is the Local Planning Authority, and the requirements relating to the drainage strategy and Sustainable Drainage Systems (SuDS) are set out within the relevant local and national planning policies and guidance documents.

3.1.2 The London Borough of Haringey Local Plan policies, together with London Plan Policy SI 13, promote sustainable development and require developments to incorporate Sustainable Drainage Systems (SuDS) measures to manage surface water runoff as close to source as reasonably practicable. The policies also encourage the inclusion of urban greening measures, such as blue/green roofs and soft landscaping, which provide biodiversity enhancement, water quality improvement, and surface water attenuation benefits.

3.1.3 The London Borough of Haringey planning policies set out the following requirements for surface water management and SuDS:

- Developments should seek to reduce surface water runoff rates as close to greenfield rates as reasonably practicable.
- Appropriate SuDS measures should be incorporated to control the rate and volume of surface water runoff.
- Ensure separation of foul and surface water systems.
- Make reasonable provision for the safe storage of flood water in excessive events.
- Adequate arrangements should be provided for the long-term maintenance and management of SuDS features.

3.2 SuDS Incorporation

- 3.2.1 The underlying geology suggests that disposal of surface water via infiltration is unlikely owing to the site being situated directly above clay soil.
- 3.2.2 Therefore, following the hierarchy, and with no surface water body in the vicinity of the site, proposals are to discharge to the existing surface water sewer along Westbury Avenue.
- 3.2.3 Table 7.1 below from the SuDS Manual sets out the various components that may be considered in providing SuDS.

Component Type	Description	Collection Mechanism	Design Criteria						Further Information (Chapter Ref)
			Water Quantity (Chapter 3)			Water Quality (Chapter 4)	Amenity (Chapter 5)	Biodiversity (Chapter 6)	
			Peak Runoff Rate	Runoff Volumes					
				Small Events (Interceptions)	Large Events				
Rainwater Harvesting Systems	Systems that collect runoff from the roof of a building or other paved surface for use	P		●	●		●		11
Green roofs	Planted soil layers on the roof of buildings that slow and store runoff	S	○	●		●	●	●	12
Infiltration systems	Systems that collect and store runoff, allowing it to infiltrate into the ground	P	●	●	●	●	●	●	13
Proprietary treatment systems	Subsurface structures design to provide treatment to runoff	P				●			14
Filter strips	Grass strips hat promote sedimentation and filtration as runoff is conveyed over the surface	L		●		●	○	○	15
Filter drains	Shallow stone-filled trenches that provide attenuation, conveyance and treatment of runoff	L	●	○		●	○	○	16
Swales	Shallow landscaped depressions that allow runoff to pond temporarily on the surface, before filtering through vegetation and underlying soils	L	●	●	●	●	●	●	17
Bioretention systems	Trees with soil-filled tree pits, tree planters or structural soils used to collect, store and treat runoff	P	●	●	●	●	●	●	18
Trees	Structural paving through which runoff can soak and subsequently be stored in the sub-base beneath, and/or allowed to infiltrate into the ground below	P	●	●		●	●	●	19
Pervious pavements	Structural paving through which runoff can soak and subsequently be stored in the sub-base beneath, and/or allowed to infiltrate into the ground below	S	●	●	●	●	○	○	20
Attenuation storage tanks	Large, below-ground voided spaces used to temporarily store runoff before infiltration-controlled release or use	P	●						21
Detention basins	Vegetated depressions that store and treat runoff	P	●	●		●	●	●	22
Ponds and wetlands	Permanent pools of water used to facilitate treatment of runoff – runoff can also be stored in an attenuation zone above the pool	P	●			●	●	●	23
P-Point L-Lateral S-Surface									
● – likely valuable contribution to delivery of design criterion									
○ - some potential contribution to delivery of design criterion, if specifically included in the design									

Figure 5 CIRIA Table 7.1 SuDS Components

3.2.4 In accordance with the requirements of London Plan Policy SI 13 and the London Borough of Haringey development policies, all developments are required to submit a SuDS strategy incorporating appropriate climate change allowances.

3.2.5 The proposed site layout offers the opportunity to apply a range of SuDS measures in accordance with the table above. Proposals are as follows:

- **Blue/green roofs** – Roof systems incorporating vegetation, cellular storage layers, and temporary water storage attenuation to reduce, store, and slowly release surface water runoff.

Proposals can be seen in **Appendix C**. Proposals are to reduce flows and volumes by use of the SuDS features provided.

3.2.6 By use of the above, the development proposals aim to drain all developed areas via SuDS measures and satisfy the four SuDS pillars as below:

- **Water Quantity** – reducing peak runoff rates and volumes through attenuation and controlled discharge;
- **Water Quality** – improving runoff quality through filtration, vegetation uptake, and natural treatment processes;
- **Biodiversity** – enhancing urban greening and providing habitat opportunities through vegetated roof areas; and
- **Amenity** – contributing to visual enhancement and sustainable urban design within the development.



Figure 6 - Reference 4 pillars of SuDS Diagram CIRICA C753 p.6

3.2.7 The above table provides examples of various SuDS components that may be incorporated in accordance with the relevant policy requirements. The proposed blue/green roof system, incorporating vegetation and cellular attenuation storage, provides an effective method of managing surface water runoff at source. As identified

within Table 7.1 (Figure 5), rainfall is attenuated and temporarily stored within the roof build-up before being gradually released into the drainage network. In addition to reducing peak runoff rates and volumes, the blue/green roof also provides biodiversity, urban greening, and water quality benefits through natural filtration and evapotranspiration.

- 3.2.8 In accordance with Table 26.2 of CIRIA Report C753, the pollution hazard level can be classified as ‘very low’ and ‘Low’. Using table 26.3 of the same document, the mitigation indices values for permeable surfacing exceed the pollution hazard values taken from the previous table. This ensures that proposals offer enough pollution risk mitigation.

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie <300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Figure 7 Extract from Table 26.2 CIRIA SuDS Manual Pollution hazard indices for different land use classifications

Mitigation Indices			
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8

Figure 8 Extract from Table 26.3 CIRIA SuDS Manual 2015 Indicative SuDS mitigation indices for discharges to surface waters

3.2.9 The above proposals ensure that an ‘at source’ SuDS measure is applied, and betterment is provided in terms of surface water runoff velocity and quality. Pollution indices from different land types can be found per as per table 26.15 CIRIA SuDS Manual 2015, below.

Land use surface type (Lust)	Impermeability (IMP _{REF})	Total suspended solids pollution index (PI _{TSS})	Organic pollution index (PI _{Org})	Hydrocarbon pollution index (PI _{PAD})	Metals Pollution index (PI)
Roofs					
• Industrial / Commercial	1.0	0.3	0.3-0.4	0.2	0.4-0.8
• Residential	0.9	0.4-0.5	0.6-0.7	0.1	0.2-0.5
Highways					
1. Motorways	0.8-0.9	0.9	0.7	0.9	0.8
2. Major arterial highways	0.7-0.8	0.8	0.7	0.8	0.8
3. Urban distributor roads	0.6-0.7	0.7-0.8	0.5	0.8	0.7
4. Residential Street	0.4-0.6	0.4	0.6	0.6	0.6
5. Pavements	0.5-0.6	0.4	0.6	0.3	0.3
Car Parks / Hardstanding					
• Industrial/Commercial	0.6-0.8	0.6-0.7	0.6-0.7	0.7	0.4-0.5
• Driveways (Residential)	0.5	0.5	0.6	0.4	0.3
Open Areas					
• Gardens (All types)	0.1	0.3	0.2-0.3	0	0.01
• Parks/Golf Courses	0.2	0.2-0.3	0.2	0	0.02
• Grassed Areas (including verges, all types)	0.1	0.2-0.3	0.2-0.3	0.05	0.05
Note					
1	Pollution index values are based on reported land use type EMC distributions and impact potential thresholds from House et al (1991), Luker and Montague (1994), Butler and Clark (1995), D'Arcy et al (2000), Mitchell (2005) and Moy et al (2003)				

Figure 9: Impermeability and pollution indices for different land use types

- 3.2.10 Due to the existing ground conditions, infiltration is considered unlikely to be feasible on site. Therefore, the proposed blue/green roof system has been designed to provide source control attenuation through integrated vegetation and cellular storage layers, enabling the temporary storage and controlled release of surface water runoff.
- 3.2.11 All impermeable area runoff generated by the development will be directed towards the proposed blue/green roof attenuation system before discharging to the site drainage network. A flow control chamber integrated within the outlet of the blue/green roof system will restrict discharge to an acceptable rate prior to connection to the existing surface water sewer network.
- 3.2.12 As there is no public surface water sewer located within the road immediately adjacent to the site frontage, a new adoptable surface water sewer is proposed. The proposed drainage arrangement will involve the construction of a new sewer within the highway to connect to the existing Thames Water sewer located on Westbury Road. Surface water runoff from the development will discharge to the Thames Water sewer network via the proposed connection at a restricted and acceptable rate, subject to Thames Water approval and adoption requirements.
- 3.2.13 In determining the flow rate, reference is made to the Non-Statutory Technical Standards for SuDS, March 2015. Paragraphs S3 and S5 require the discharge rate and volume from previously developed sites to be as close as

reasonably practicable to the greenfield runoff rate for the equivalent rainfall event. The discharge rate and volume of runoff should never exceed the rate of discharge from the development prior to redevelopment for that event.

- 3.2.14 For this previously developed (brownfield) site, the calculated Greenfield runoff rate is extremely low and would require a very small diameter flow control, increasing the risk of blockage and maintenance issues. Therefore, in accordance with best practice guidance for brownfield developments, the proposed drainage strategy seeks to achieve the maximum practical reduction in runoff while maintaining a suitable and maintainable flow control arrangement. The existing runoff calculations presented in Section 2.3.2 indicate that the current peak runoff rate from the site is approximately 2.9 l/s during the 1 in 100-year rainfall event, whereas the proposed discharge rate will be restricted to 0.5 l/s. This provides a significant reduction in runoff whilst ensuring the system remains practical, resilient, and compliant with current SuDS requirements.
- 3.2.15 Discharge rates should be managed as close as possible to the required standard by adopting a suitable flow control measure. On the basis that flow controls can manage flow rates as low as 0.5l/s without incurring blockages this has been taken as the allowable flow rate and applied to this site.
- 3.2.16 A flow control chamber integrated within the outlet of the proposed blue/green roof system is to be used in conjunction with the cellular storage layer to attenuate and restrict surface water discharge.
- 3.2.17 Proposals for this development incorporate green roof areas which offer a SuDS element to the design. The green roof has the potential to reduce the peak runoff rate and runoff volume.
- 3.2.18 Where a green roof is proposed, the surface water runoff will be slowed at source by soaking through the substrate. For small events, most are absorbed with any excess runoff being directed to the roof drainage system. Green roofs offer the added benefit of biodiversity and improved quality of surface water runoff using vegetation to remove urban pollutants. The figure below shows the makeup of a typical green roof.

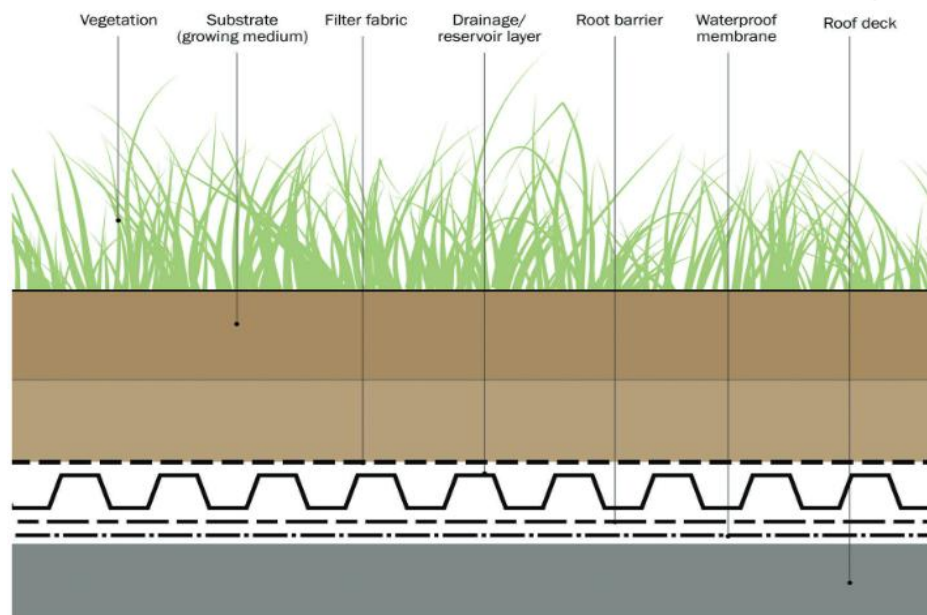


Figure 10: CIRIA Figure 12.1 SuDS Manual

3.2.19 The below figure summarises the rainfall interception performance of a green roof for varying substrate depths. The evidence suggests that for 70-80% of rain events there is no runoff from green roofs. Only 10 out of 100 rain days per annum would see a roof act in the same way as an impermeable surface when the substrate had become saturated. Therefore, the interception qualities of a green roof demonstrate that runoff and volume can be reduced for some rainfall events throughout the year.

BOX 12.1 **Reported evidence of Interception delivered by green roofs**

Table 12.2 summarises the results of research into the performance of green roofs in reducing runoff frequencies and volumes.

Table 12.2 Summary of available evidence of performance of green roofs

Reference	Interception provided by green roofs ¹	Substrate depth
GSA (2011)	12.5–19 mm (USA)	Substrate depth 75–100 mm
Stovin <i>et al</i> (2012)	About 12–15 mm (estimated based on 100% retention of rainfall for 1:1 year, 1 hour event in Sheffield, UK and 72% retention for 1:1 year 24 hour event)	80 mm substrate
Fassman-Beck and Simcock (2013)	About 20 mm (most frequent result was 0 mm runoff for events up to 20 mm)	100–150 mm substrate
Paudel (2009)	16.5 mm (Detroit, Michigan, USA)	100 mm substrate
Martin (2008)	About 10 mm (Ontario, Canada)	100 mm substrate

Note

¹ ie no runoff for majority of events up to these depths.

Martin (2008) reported that the reduction in depth and frequency of runoff from a green roof with 100 mm of substrate is similar to that of a naturally vegetated catchment. For the majority (70–80%) of rain events there is no runoff from green roofs (**Figure 12.6**) but for about 10 out of approximately 100 rain days a year green roofs have a response that is more similar to an impermeable surface (demonstrating the shift towards impermeable runoff characteristics when the substrate is saturated).

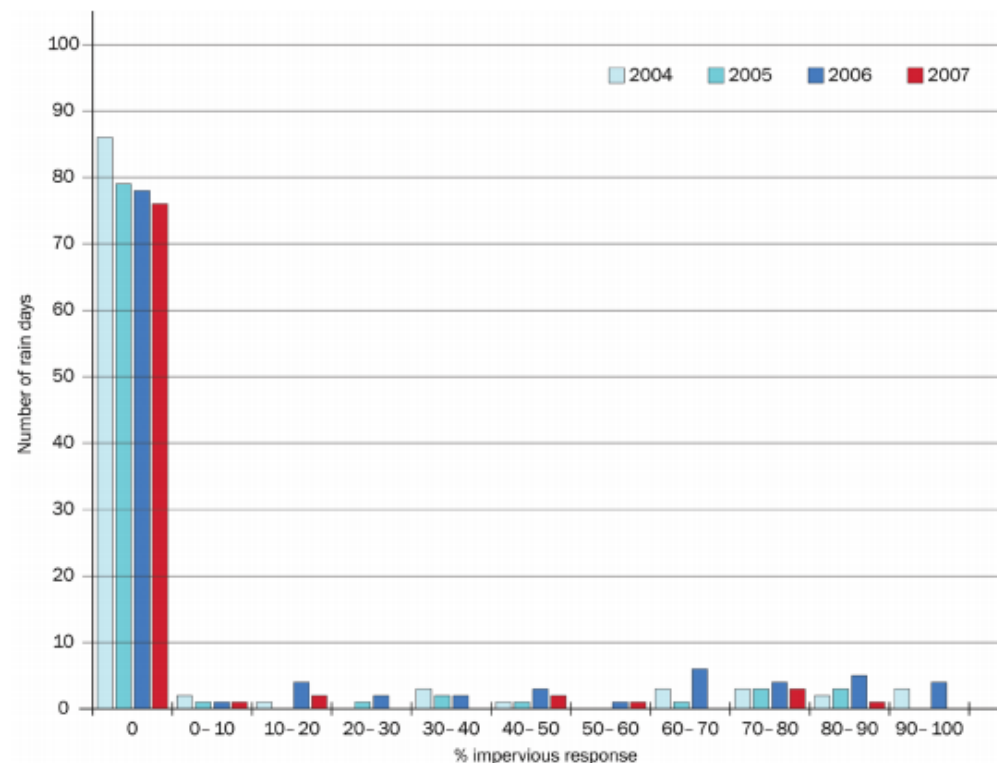


Figure 12.6 Distribution of runoff response (0% imperviousness means no runoff) (from Martin, 2008)

Figure 11 (Box 12.1) Reported evidence of Interception delivered by green roofs

3.2.20 The above proposals ensure that SuDS measures are applied, and betterment is provided in terms of surface water runoff velocity, quantity and quality.

3.3 Climate change

3.3.1 The appended drainage calculation allows for a 1:100-year storm plus 40% climate change, this has been sourced from the [DEFRA Hydrology Data Explorer for Climate Change Allowances](#), as per **figure 9**, below.

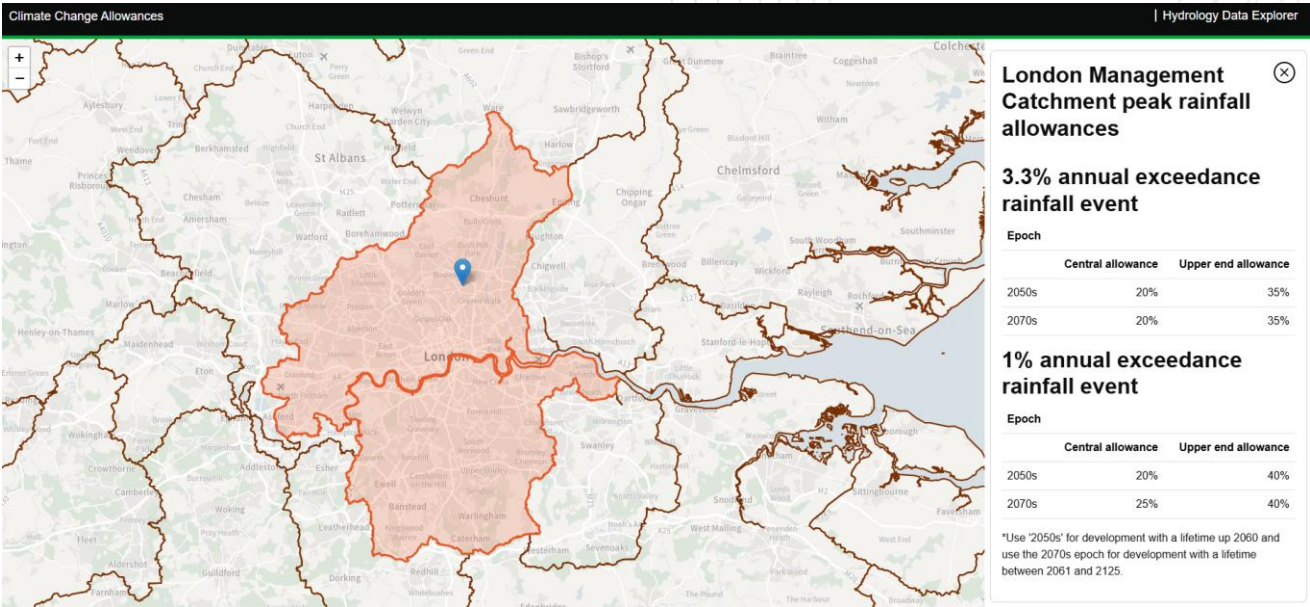


Figure 12: Climate change allowances for peak rainfall in England by catchment area

3.4 Preliminary Surface Water Drainage Maintenance Schedules

3.4.1 This section of the report gives guidance on the maintenance of the drainage system and outlines who will be responsible. The proposed development comprises of site clearance, landscaping, parking, drainage and supporting infrastructure. The SuDS systems will aim to control runoff in terms of velocity and quality.

3.4.2 The rainwater from the roofs is collected via rainwater pipes and will be carried to the network. The maintenance of the collection system is the responsibility of the developer, see **Table 2** below.

Table 2: System storage operation and maintenance requirements (rainwater pipes and chambers)

Maintenance Schedule	Required Action	Recommended Frequency
Regular Maintenance	Inspection of silt trap chamber and removal of debris when necessary	Quarterly or as required following monitoring
Remedial actions	Check for blockages in manholes and pipes. Rodding and jetting of pipes to be carried out. CCTV survey can be carried out to inspect condition of pipework.	Quarterly or as required following monitoring
Monitoring	Inspect collection apparatus for debris and litter. Remove where necessary to prevent blockages in the system	Monthly or after periods of heavy rainfall

3.4.3 The maintenance of the flow control is the responsibility of the developer, see **Table 4** below.

Table 3: System Storage operation and maintenance requirements (flow control)

Maintenance Schedule	Required Action	Recommended Frequency
Regular Maintenance	Remove litter and debris and grass cuttings from upstream to prevent being washed into the flow control. Inspection of the flow control chamber and the removal of any sediment/debris when required.	Quarterly or as required following monitoring
Remedial Actions	Check flow control is functional	Quarterly or as required following monitoring
Monitoring	Inspect flow control and check flows are not impeded	Monthly or after periods of heavy rainfall

3.4.4 The maintenance of the Cellular attenuation is the responsibility of the developer, see **Table 6** below.

Table 4: System Storage operation and maintenance requirements (Green Roof)

Maintenance Schedule	Required Action	Recommended 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. Inspect soil substrate for evidence of erosion channels and identify any sediment sources Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system Inspect underside of roof for evidence of leakage	Annual and after severe storms
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth During establishment (i.e year one), replace dead plants as required. Post establishment, replace dead plants as required (where > 5% of coverage) Remove fallen leaves and debris from deciduous plant foliage. Remove nuisance and invasive vegetation, including weeds Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clipping should be removed and not allowed to accumulate.	Six monthly and annually or as required Monthly (but usually responsibility of manufacturer) Annually (in autumn) Six monthly or as required Six monthly or as required 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. If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required As required

3.3.6 The design life of the development is likely to exceed the design life of each of the SuDS components listed above. During the routine inspections of any drainage components, it may become apparent that they have reached the end of their functional lifetime. In the interest of sustainability, repairs should be the first-choice solution where practicable. If this is not the case, then it will be necessary for the property owners to undertake complete replacement of the component in question.

4.0 Surface Water Strategy

The surface water strategy is based upon the SuDS implementation as outlined above and The London Plan Policy 5.13 hierarchy for surface water disposal as follows:

A. Store rainwater for later use:

Not applicable.

B. Use infiltration techniques, such as porous surfaces:

The ground conditions do not appear to support the use of infiltration techniques.

C. Attenuate rainwater in ponds or open water features for gradual release:

The site layout does not offer the opportunity for open water features.

D. Permeable storage structure water features for gradual release:

Surface water runoff from the proposed development will be collected from the roof areas and directed towards the proposed drainage network. The proposed blue/green roof system, incorporating integrated cellular attenuation storage and flow control devices, will provide source control attenuation prior to discharge to the sewer network.

The drainage strategy will utilise the proposed site drainage system to convey surface water runoff to the proposed connection into the Thames Water sewer network on Westbury Road. As the site is classified as a brownfield development, the proposals provide a significant betterment over the existing runoff conditions.

Paragraph 2.3.2 demonstrates that the existing site generates an average peak runoff rate of approximately 2.9 l/s from the roof and hardstanding areas during the 1 in 100-year rainfall event. The equivalent Greenfield runoff rate for the site was found to be extremely low and impractical to achieve due to flow control limitations and blockage risk. Accordingly, the proposed surface water discharge rate from the development will be restricted to 0.5 l/s for all storm events up to and including the 1 in 100-year event with an allowance for climate change. The proposals therefore provide a significant reduction in runoff rates compared with the existing site conditions.

Table 5: Existing and proposed peak runoff rates

	1:1 Year Storm Event	1:2 Year Storm Event	1:30 Year Storm Event	1:100 Year Storm Event	1:100 Year Storm Event (+40% Climate Change)
Greenfield Runoff Rate (l/s)	-	0	0.1	0.1	-
Existing Site Peak Runoff Rate (l/s)	-	0.86	2.2	2.9	-
Proposed Peak Runoff Rate (l/s)		0.4	0.7	0.8	0.9
Betterment Provided by Proposals (%)	-	79	84.4	86.6	-

Calculations and drawings supporting the above are in **Appendices C & D**.

E. Direct rainwater direct to the watercourse:

Not applicable.

F. Discharge rainwater to a surface water sewer/drain:

Not applicable.

G. Discharge rainwater to combined sewer:

The surface water runoff is to discharge to the existing combined water sewer along the Dalston Lane at the front.

H. Discharge rainwater to foul sewer:

Not applicable.

4.1 Surface Water Management During Construction

4.1.1 Consideration for surface water needs to be taken during the construction process, and how it is managed, including flood risk and pollution control.

4.1.2 Generally, there are three options for managing surface water during construction

6. Build, use and remediate permanent surface water drainage system
7. Install, use and remove a temporary surface water drainage system
8. Utilise existing drainage system with pollution control measures (brownfield sites only)

4.1.3 For this developed site, it is recommended to build, use and remediate the permanent surface water drainage system.

4.1.4 Project and Site Managers should sign up for the Met Office weather warning system and take appropriate action. <https://www.metoffice.gov.uk/public/weather/warnings>

- 4.1.5 Consideration for the following legislation and guidance should be made for a construction surface water management plan:

Legislation and Guidance
The Water Environment (England and Wales) Regulation 2009
Land Drainage Act 1991
SEPA Engineering in the Water Environment Good Practice Guide Temporary Construction Methods
Control of Water Pollution from Construction Sites – Guide to Good Practice (SP156)
Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (C532)
Control of Water Pollution from Linear Construction Projects – Technical Guidance (C648)
Control of Water Pollution from Linear Construction Projects – Site Guide (C649)
Environmental Good Practice – Site Guide (C650)
Site Handbook for the Construction of SuDS (C698)
The SuDS Manual (C753)
BS 8582:2013 Code of Practice for Surface Water Management for Development Sites

Figure 13 Legislation and Guidance for Surface Water Construction Management

4.2 Designing for Exceedance

- 4.2.0 Consideration should be given to external levels to ensure they are set above overland flood risk levels, and low points are created to direct water away from the building footprints during exceedance events.
- 4.2.1 CIRIA document C635 *Designing for exceedance in urban drainage – good practice* states that “at present there are no guidelines on the return period of event (extreme event) that should be used for design exceedance”. However, Section 3.4 also states that “it is suggested that return periods of 1 in 30, to 1 in 100 year events would form a suitable framework for most applications”.
- 4.2.2 In accordance with the above, the system has been modelled using a 1 in 100-year event inclusive of climate change.

5.0 Conclusions

- 5.1 JMS Engineers have been appointed to prepare a Drainage Strategy and SuDS Report for the proposed development at 88-90 Westbury Avenue, London, N22 6QT
- 5.2 Information obtained from the British Geological Survey (BGS) and available site information indicates that the underlying ground conditions are unlikely to support infiltration drainage techniques.
- 5.3 The proposed drainage strategy has been designed to limit surface water runoff from the development to an appropriate restricted discharge rate of 0.5 l/s.
- 5.4 The proposed SuDS strategy incorporates a blue/green roof system with integrated cellular attenuation storage and flow control measures to provide source control attenuation and manage surface water runoff in accordance with sustainable drainage principles.
- 5.5 In conclusion, the proposed development incorporates appropriate SuDS measures that provide source control, runoff attenuation, water quality, and urban greening benefits whilst significantly reducing surface water discharge from the existing site conditions.

6.0 Appendices

Appendix A – Thames Water Asset Plan

CommercialDW Drainage and Water Enquiry Sewer Map- CDWS/CDWS Standard/2022 4748459



The width of the displayed area is 200m

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no survey information is available.

Manhole Reference	Manhole Cover Level	Manhole Invert Level
811B	n/a	n/a
8107	17.3	15.84
811A	n/a	n/a
9107	n/a	n/a
9108	n/a	n/a
0105	16.74	15.38
0106	16.74	13.81
0107	16.61	15.28
011C	n/a	n/a
801J	n/a	n/a
8002	17.55	15.29
9001	17.38	16.01
911C	n/a	n/a
901C	n/a	n/a
9102	17.31	14.48
9106	n/a	n/a
9101	17.18	15.79
901B	n/a	n/a
9903	17.56	16.06
9902	17.6	15.4
901F	n/a	n/a
901H	n/a	n/a
0003	17.6	16.08
0002	17.61	15.04
9002	17.25	15.89
901E	n/a	n/a
001A	n/a	n/a
901D	n/a	n/a
9004	17.08	15.7
9003	17.12	14.84
0001	16.9	15.58
901G	n/a	n/a
0101	16.91	14.3
9105	17.13	15.81
9104	17.15	14.62
011B	n/a	n/a
0102	16.74	15.41
911A	n/a	n/a
911D	n/a	n/a
9103	16.87	15.59

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



Con29DW Commercial Drainage and Water Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer
	Culverted Watercourse
	Proposed
	Decommissioned Sewer
	Content of this drainage network is currently unknown
	Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

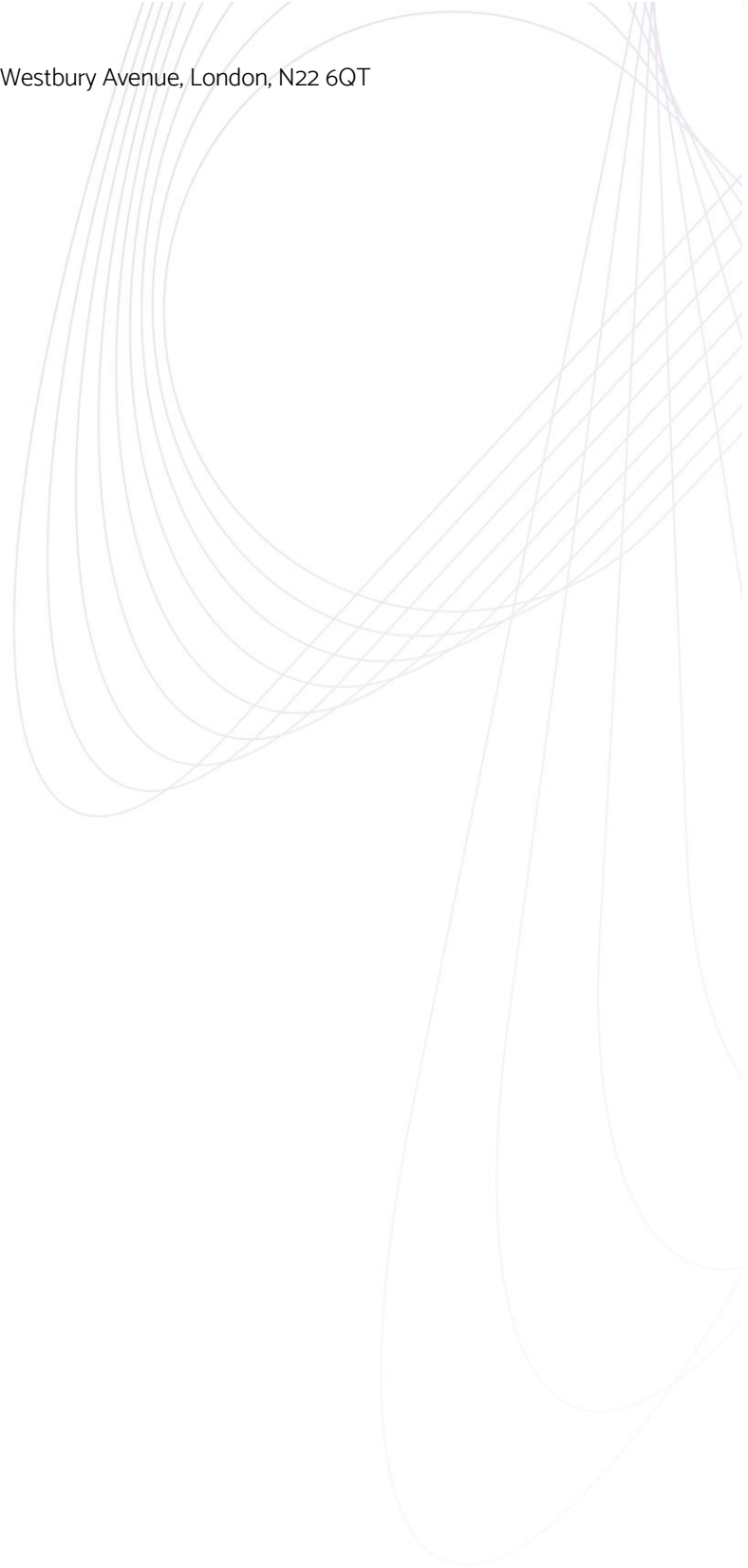
Ducts or Crossings

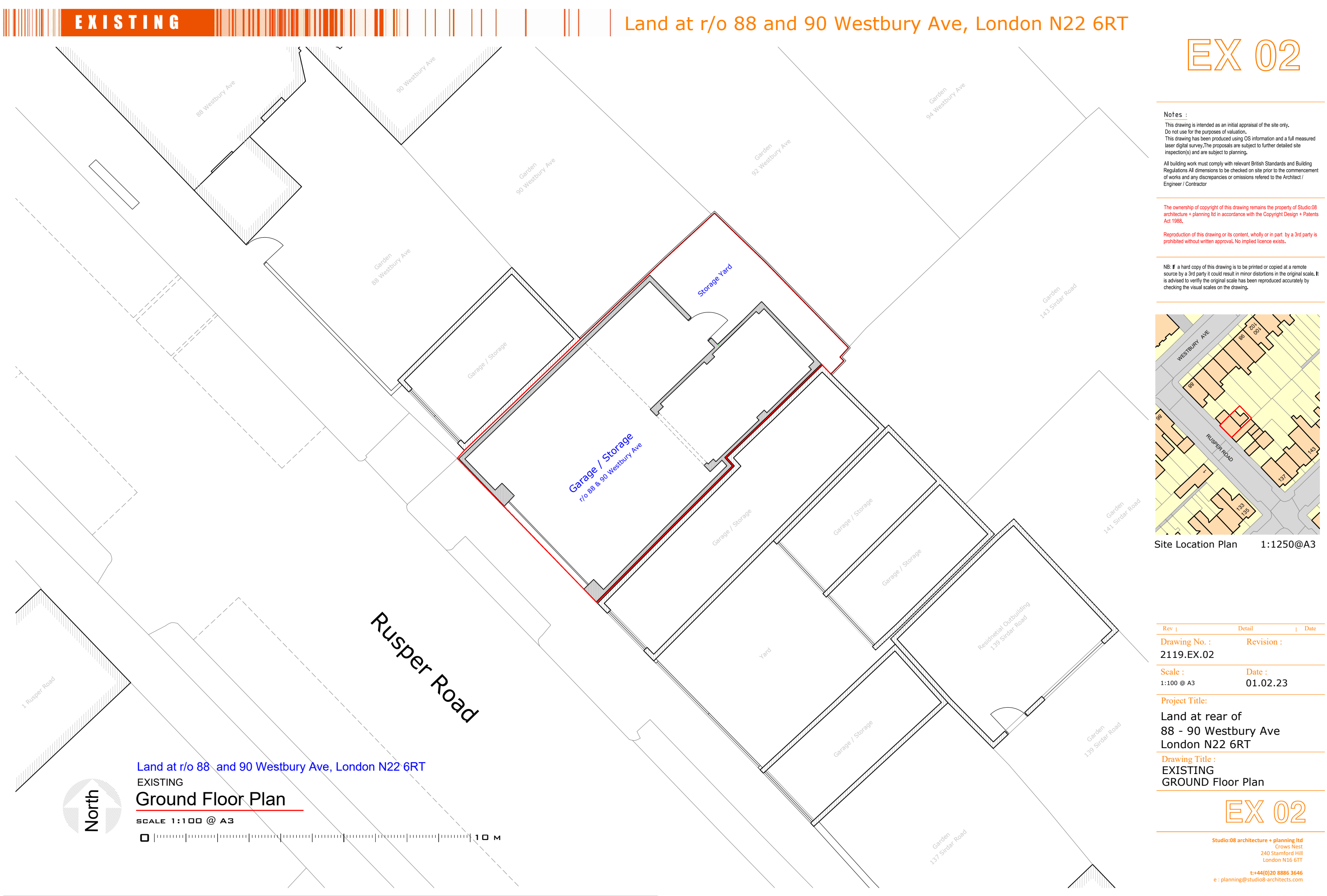
	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Appendix B – Architectural Plans





Notes :

This drawing is intended as an initial appraisal of the site only.
Do not use for the purposes of valuation.
This drawing has been produced using OS information and a full measured laser digital survey. The proposals are subject to further detailed site inspection(s) and are subject to planning.

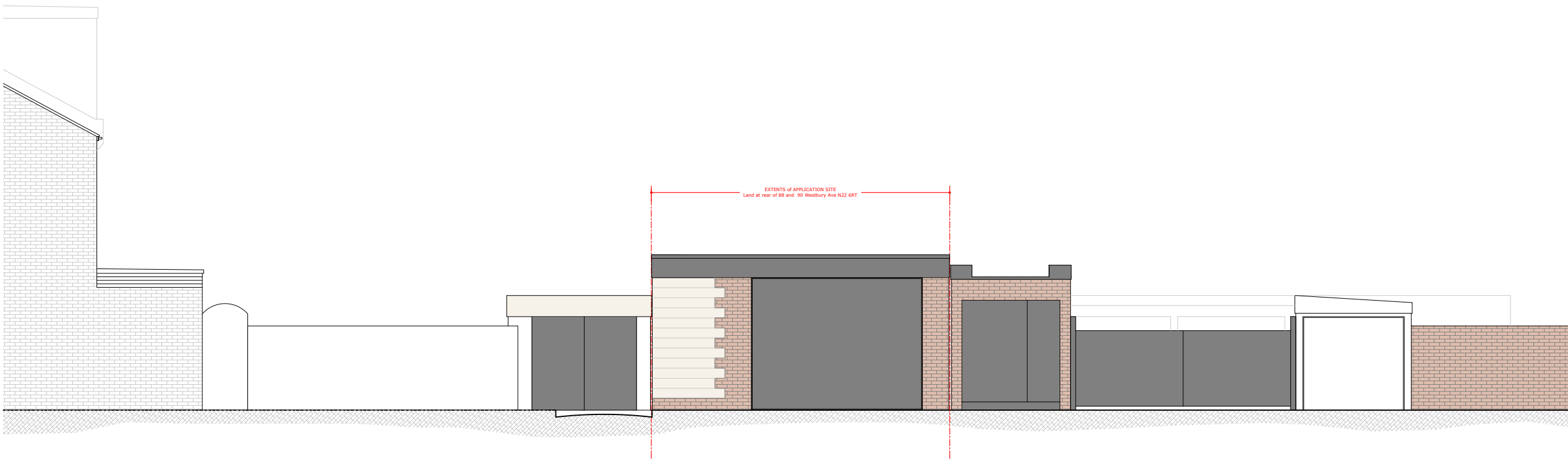
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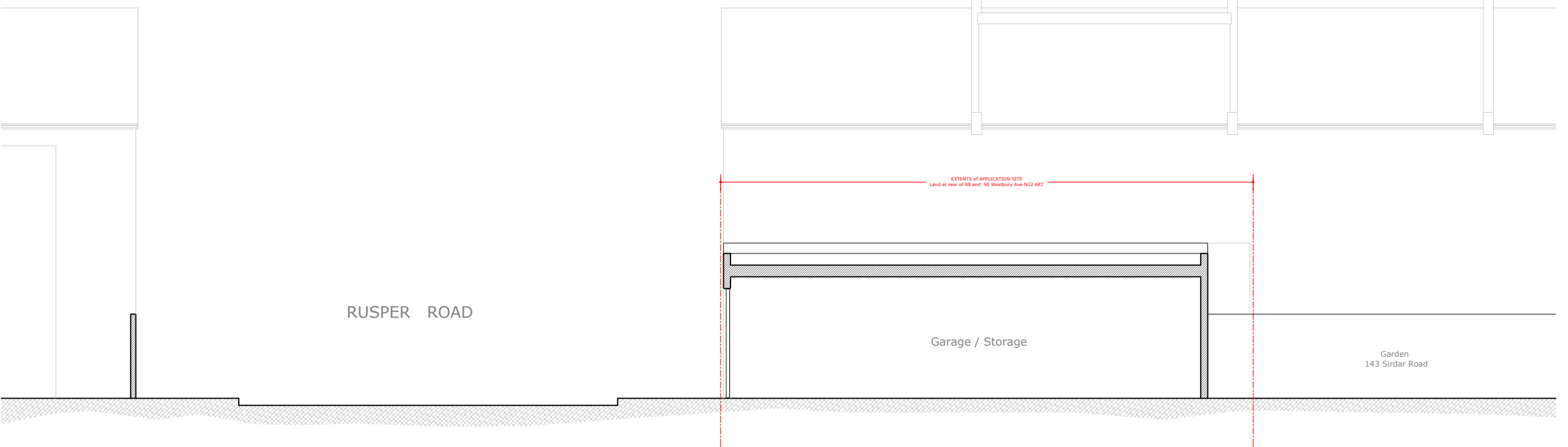


Land at r/o 88 and 90 Westbury Ave, London N22 6RT

EXISTING

Elevation AA - Front / Rusper Road - (South / West)

SCALE 1:100 @ A3



Land at r/o 88 and 90 Westbury Ave, London N22 6RT

EXISTING

Elevation BB - Side - (South / East)

SCALE 1:100 @ A3

Notes :

This drawing is intended as an initial appraisal of the site only.
Do not use for the purposes of valuation.
This drawing has been produced using OS information and a full measured laser digital survey. The proposals are subject to further detailed site inspection(s) and are subject to planning.

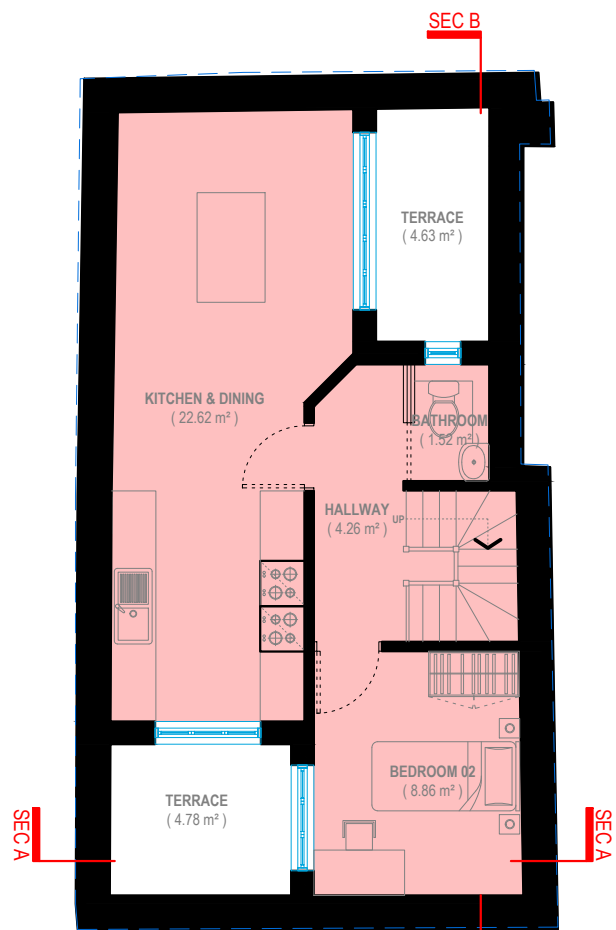
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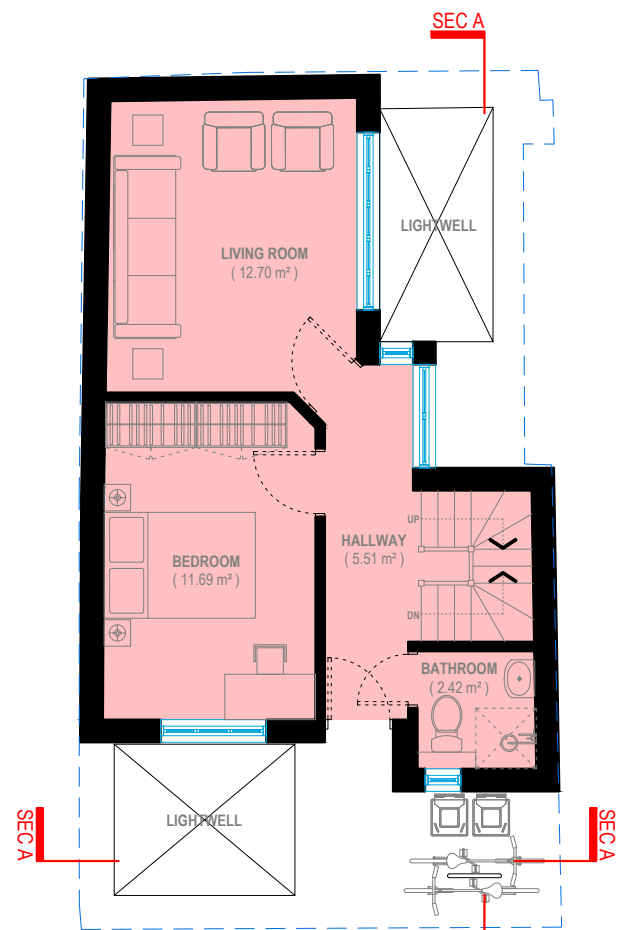
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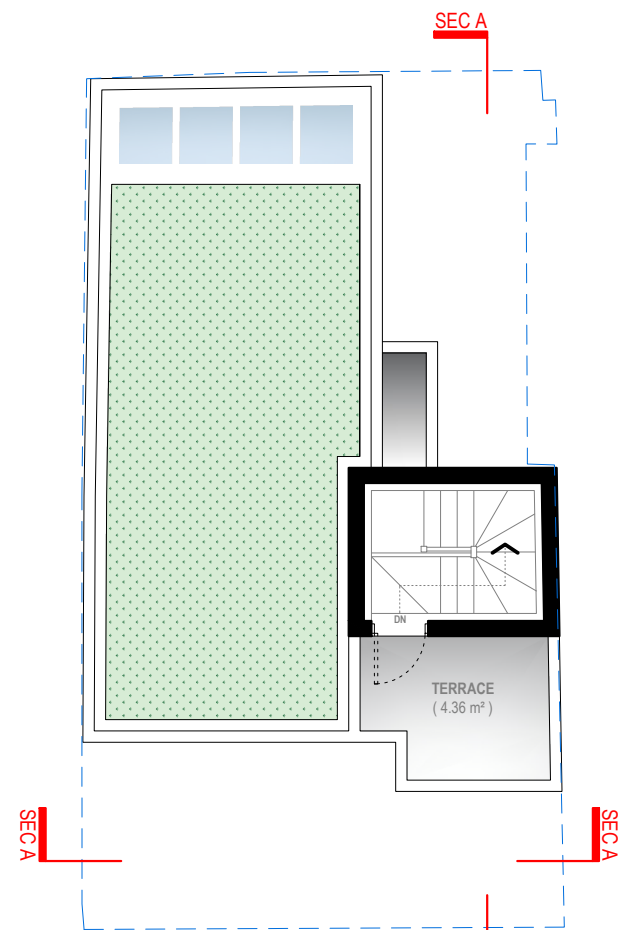




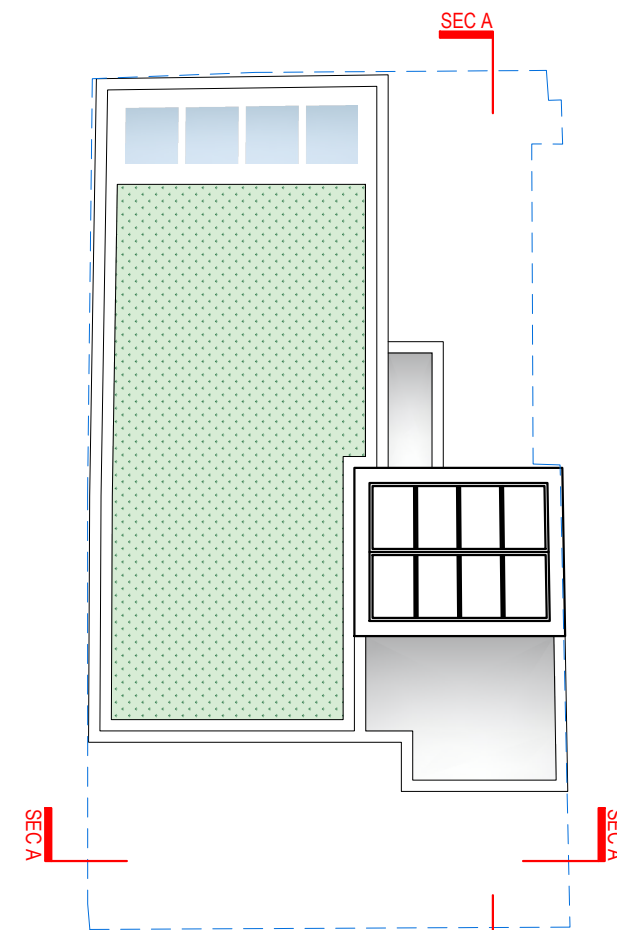
BASEMENT FLOOR



GROUND FLOOR



FIRST FLOOR



ROOF PLAN



FLAT 01
2 STOREY (2B 3P)
G.I.A. = 77.85 M²

FLAT SCHEDULE					
FLAT	TYPE OF DWELLING	MINIMUM GROSS INTERNAL FLOOR AREAS (GIA)	PROPOSED GROSS FLOOR AREA (GIA)	MIN. BUILT-IN STORAGE	PROPOSED BUILT-IN STORAGE
01	2 BED - 3 PERSON	70 m²	77.85 m²	2.0 m²	3.57 m²



Address - Unit 4, Grosvenor Way, London E5 9ND
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E-mail - office@redwoodsprojects.co.uk
Web - www.redwoodsprojects.co.uk

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This drawing is copyright © Redwoods Projects.
All dimensions to be checked on site Prior work.

REFERENCE: 88-90 WESTBURY AVENUE, LONDON N22 6QT, UK

TITLE: PROPOSED DRAWINGS
FLOOR PLANS

PROJECT No 3906 DATE: 27-03-2026

SHEET No **P 01**

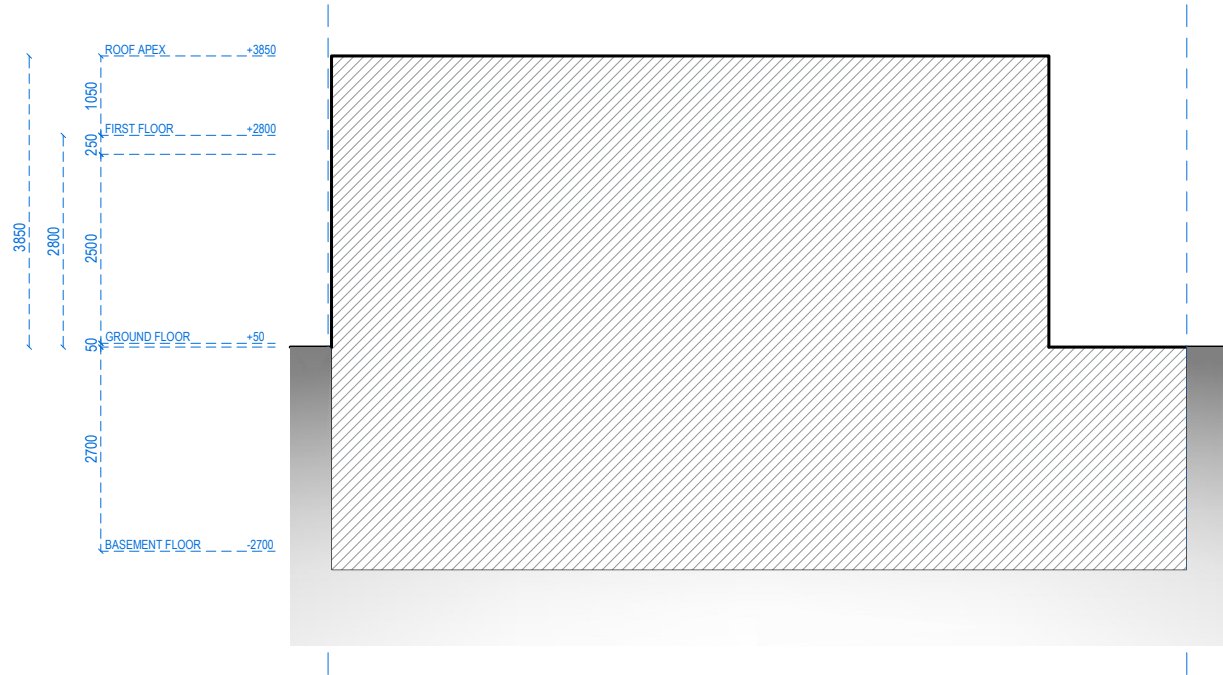


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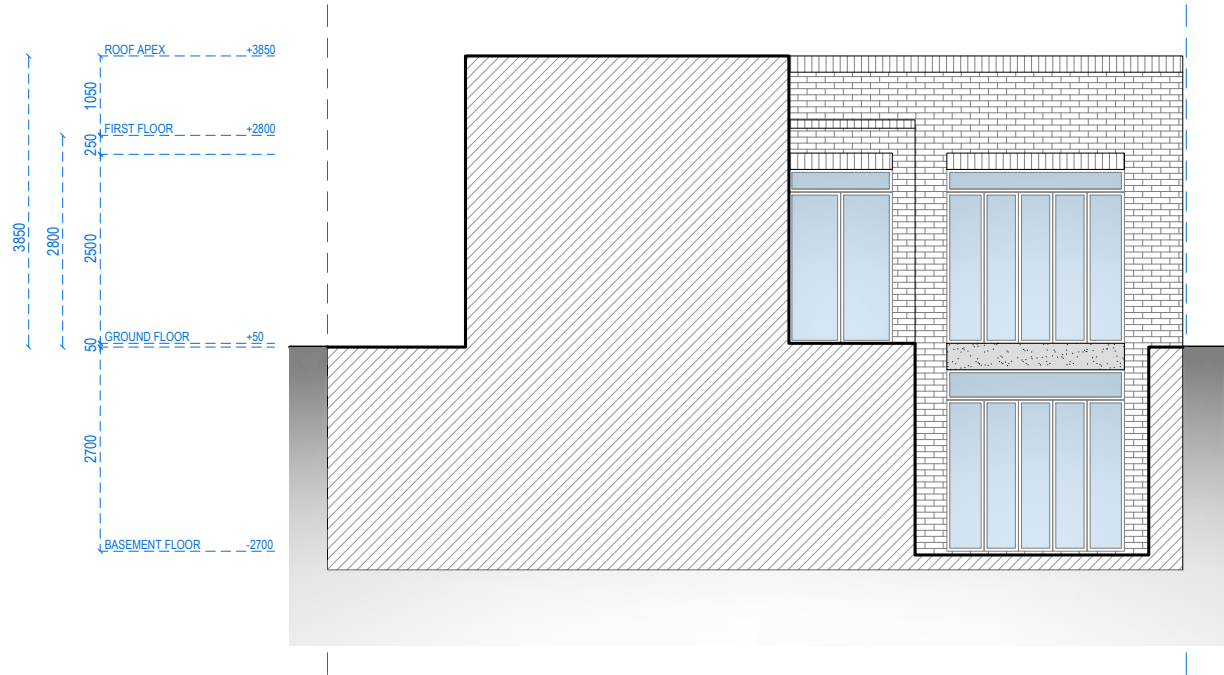
NOTES:

DRAWN BY AAA

EDITED BY



RIGHT-SIDE ELEVATION

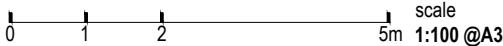


LEFT-SIDE ELEVATION

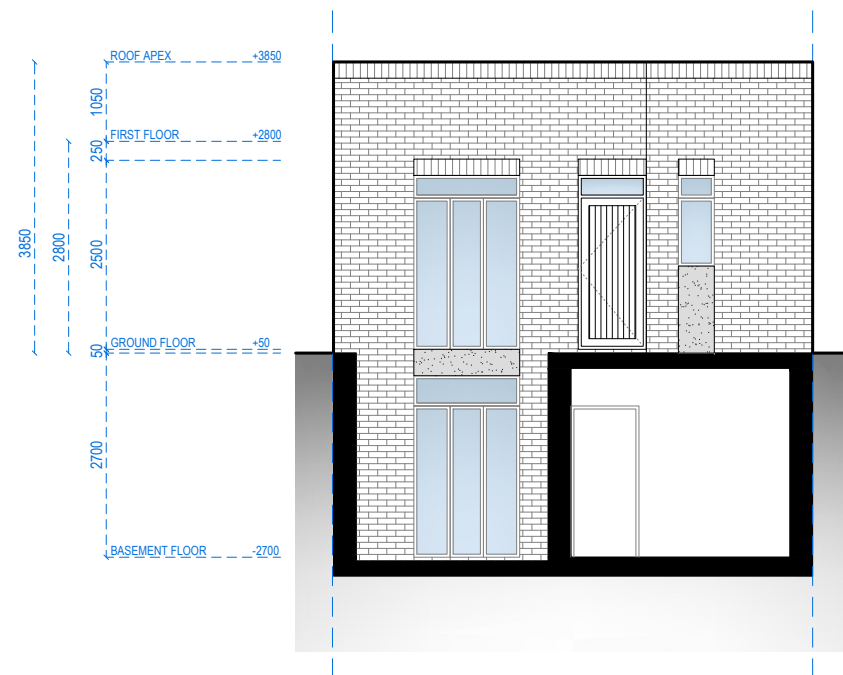


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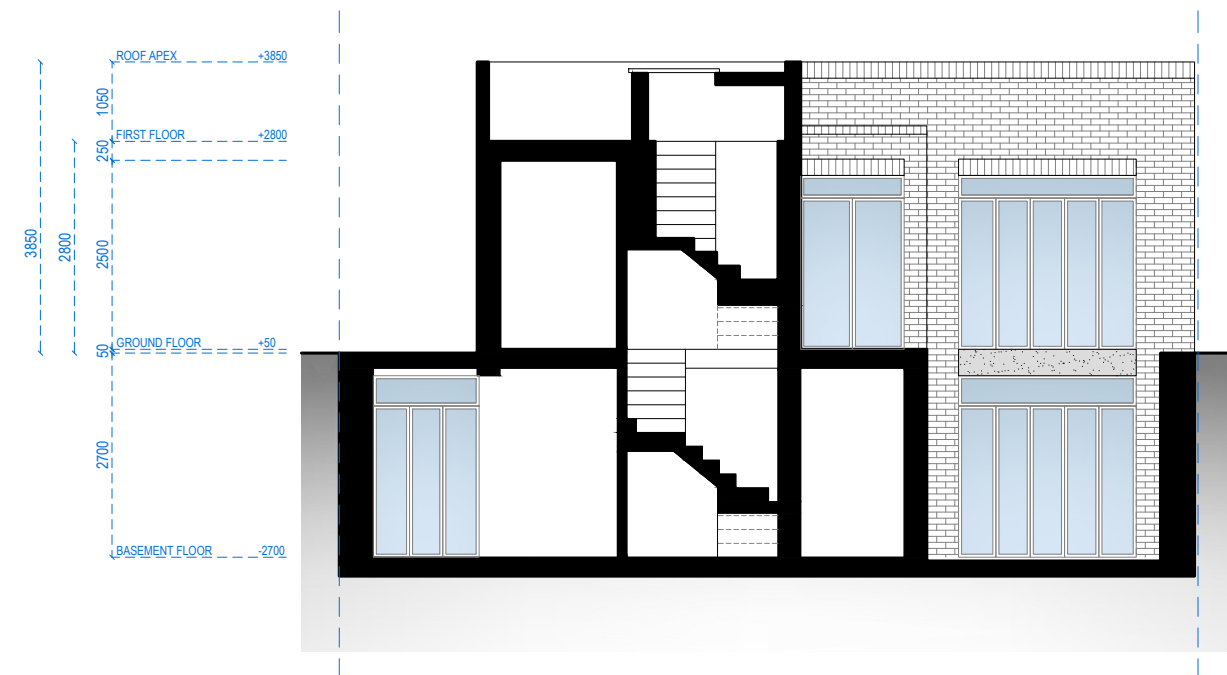
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TITLE: PROPOSED DRAWINGS ELEVATIONS	
PROJECT No 3906	DATE: 27-03-2026
SHEET No P 03	



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SECTION A-A



SECTION B-B



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TITLE: PROPOSED DRAWINGS
SECTIONS

PROJECT No 3906 DATE: 27-03-2026

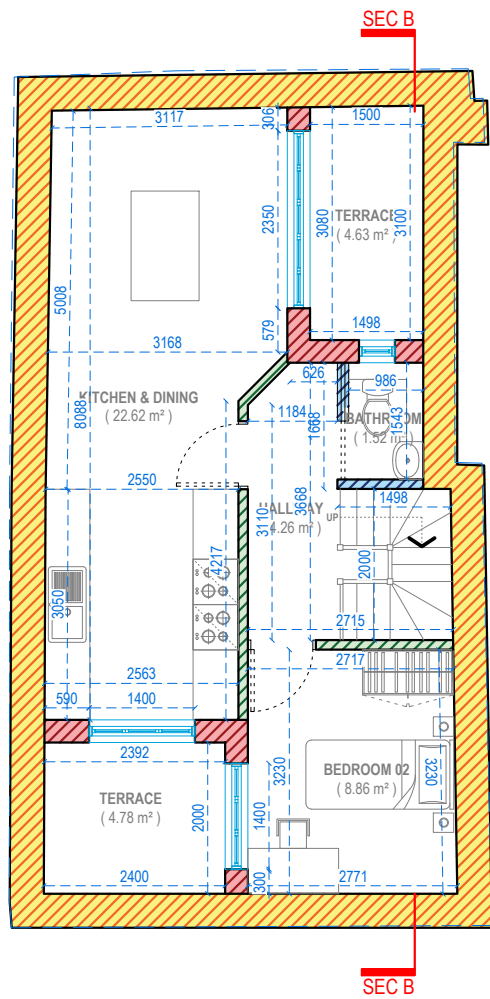
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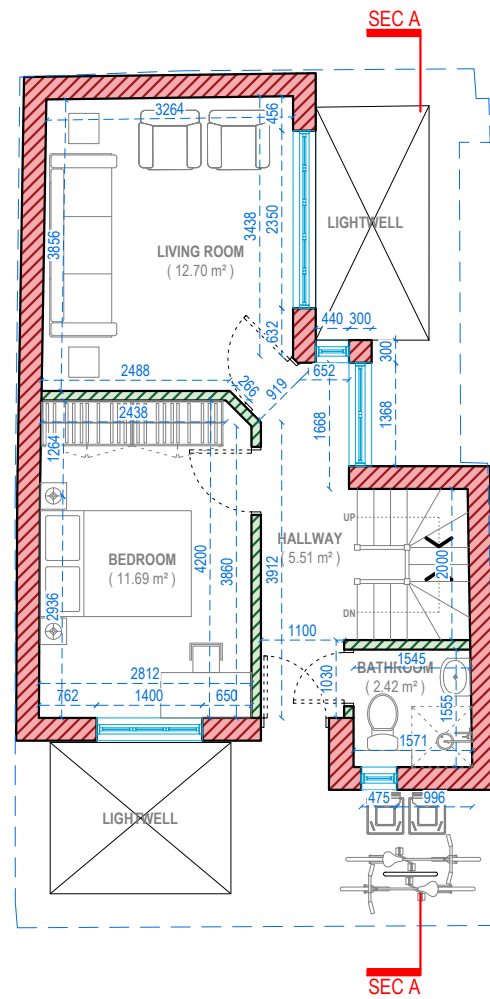
NOTES:

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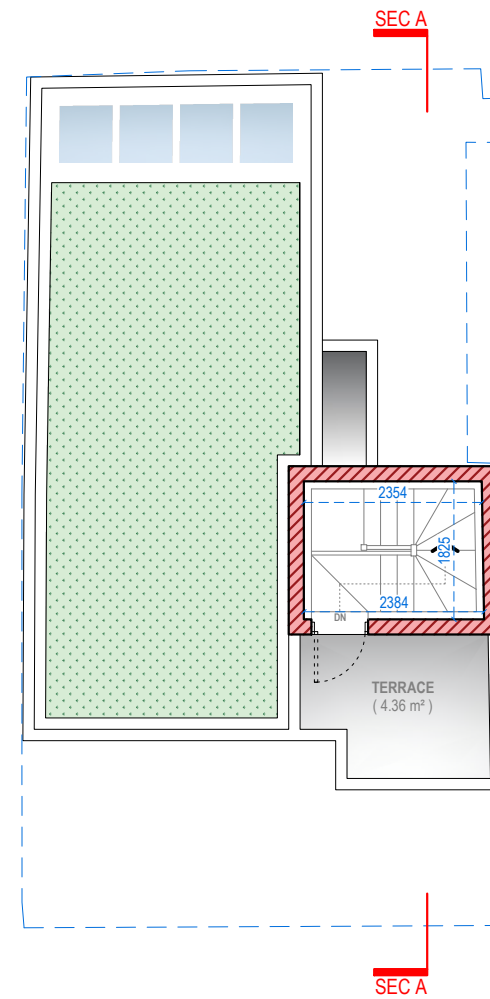
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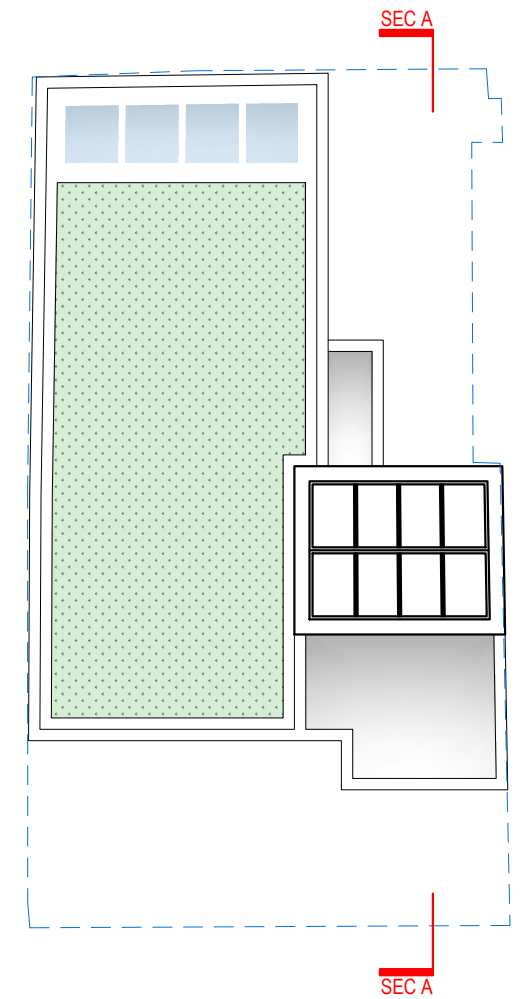
BASEMENT FLOOR



GROUND FLOOR



FIRST FLOOR



ROOF PLAN

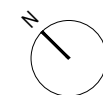
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-  NEW STRUCTURAL WALLS (WT-02)
-  NEW PARTITIONAL WALLS (WT-03)
-  NEW PARTITIONAL WALLS (WT-04)



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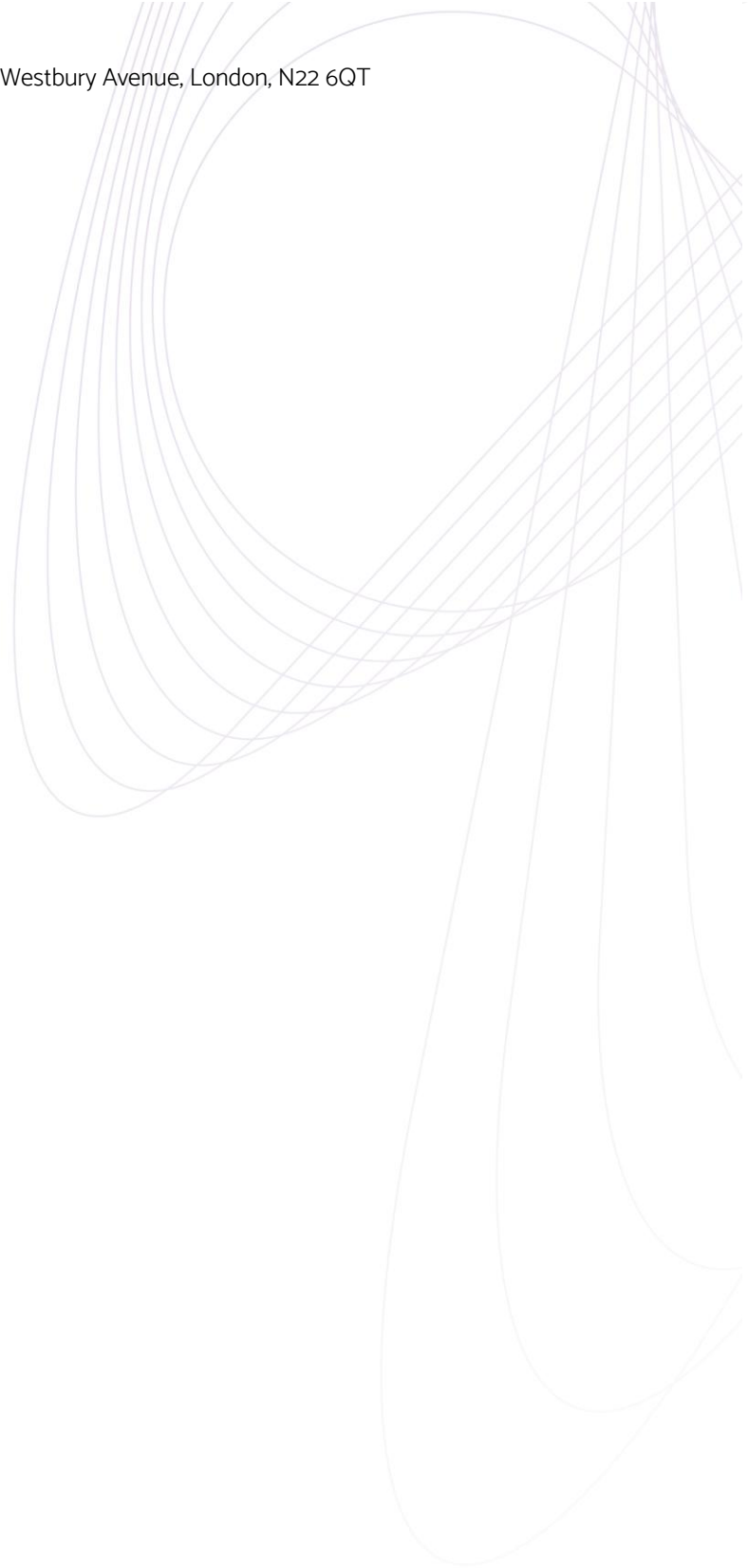
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TITLE: BUILDING REGULATIONS FLOOR PLANS	
PROJECT No 3906	DATE: 27-03-2026
SHEET No BR 01	



0 1 2 scale 5m 1:100 @A3

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Appendix C – Drainage Calculations



JMS Chelmsford Ltd

BIC110 - The MedBIC

Alan Cherry Drive

Chelmsford CM1 1SQ

Date 27/05/2026 17:39

File BLUE OR GREENROOF CALC ...

Designed by MathanKumarRenga...

Checked by

XP Solutions

Source Control 2018.1

Page 1



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

Half Drain Time : 58 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	9.941	0.041	0.0	0.5	0.5	2.0	Flood Risk
30 min Summer	9.953	0.053	0.0	0.5	0.5	2.5	Flood Risk
60 min Summer	9.959	0.059	0.0	0.5	0.5	2.8	Flood Risk
120 min Summer	9.964	0.064	0.0	0.5	0.5	3.0	Flood Risk
180 min Summer	9.963	0.063	0.0	0.5	0.5	3.0	Flood Risk
240 min Summer	9.961	0.061	0.0	0.5	0.5	2.9	Flood Risk
360 min Summer	9.955	0.055	0.0	0.5	0.5	2.6	Flood Risk
480 min Summer	9.947	0.047	0.0	0.5	0.5	2.2	Flood Risk
600 min Summer	9.940	0.040	0.0	0.5	0.5	1.9	Flood Risk
720 min Summer	9.934	0.034	0.0	0.4	0.4	1.6	Flood Risk
960 min Summer	9.923	0.023	0.0	0.4	0.4	1.1	Flood Risk
1440 min Summer	9.909	0.009	0.0	0.3	0.3	0.4	Flood Risk
2160 min Summer	9.900	0.000	0.0	0.3	0.3	0.0	Flood Risk
2880 min Summer	9.900	0.000	0.0	0.2	0.2	0.0	Flood Risk
4320 min Summer	9.900	0.000	0.0	0.2	0.2	0.0	Flood Risk
5760 min Summer	9.900	0.000	0.0	0.1	0.1	0.0	Flood Risk
7200 min Summer	9.900	0.000	0.0	0.0	0.0	0.0	Flood Risk
8640 min Summer	9.900	0.000	0.0	0.0	0.0	0.0	Flood Risk
10080 min Summer	9.900	0.000	0.0	0.0	0.0	0.0	Flood Risk
15 min Winter	9.941	0.041	0.0	0.5	0.5	2.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	168.168	0.0	2.9	19
30 min Summer	108.136	0.0	3.8	33
60 min Summer	65.954	0.0	4.6	62
120 min Summer	41.587	0.0	5.8	98
180 min Summer	31.327	0.0	6.6	130
240 min Summer	25.417	0.0	7.2	164
360 min Summer	18.653	0.0	7.9	230
480 min Summer	14.824	0.0	8.4	296
600 min Summer	12.337	0.0	8.7	360
720 min Summer	10.582	0.0	9.0	422
960 min Summer	8.256	0.0	9.3	544
1440 min Summer	5.775	0.0	9.8	778
2160 min Summer	4.011	0.0	10.2	1100
2880 min Summer	3.099	0.0	10.5	0
4320 min Summer	2.168	0.0	10.9	0
5760 min Summer	1.693	0.0	11.3	0
7200 min Summer	-0.012	0.0	-0.1	0
8640 min Summer	-0.010	0.0	-0.1	0
10080 min Summer	-0.008	0.0	-0.1	0
15 min Winter	168.168	0.0	2.9	19

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JMS Chelmsford Ltd

Page 2

BIC110 - The MedBIC

Alan Cherry Drive

Chelmsford CM1 1SQ

Date 27/05/2026 17:39

File BLUE OR GREENROOF CALC ...

Designed by MathanKumarRenga...

Checked by

XP Solutions

Source Control 2018.1

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	9.953	0.053	0.0	0.5	0.5	2.5	Flood Risk
60 min Winter	9.960	0.060	0.0	0.5	0.5	2.8	Flood Risk
120 min Winter	9.963	0.063	0.0	0.5	0.5	3.0	Flood Risk
180 min Winter	9.962	0.062	0.0	0.5	0.5	3.0	Flood Risk
240 min Winter	9.958	0.058	0.0	0.5	0.5	2.8	Flood Risk
360 min Winter	9.948	0.048	0.0	0.5	0.5	2.3	Flood Risk
480 min Winter	9.938	0.038	0.0	0.4	0.4	1.8	Flood Risk
600 min Winter	9.929	0.029	0.0	0.4	0.4	1.4	Flood Risk
720 min Winter	9.921	0.021	0.0	0.4	0.4	1.0	Flood Risk
960 min Winter	9.910	0.010	0.0	0.4	0.4	0.5	Flood Risk
1440 min Winter	9.900	0.000	0.0	0.3	0.3	0.0	Flood Risk
2160 min Winter	9.900	0.000	0.0	0.2	0.2	0.0	Flood Risk
2880 min Winter	9.900	0.000	0.0	0.2	0.2	0.0	Flood Risk
4320 min Winter	9.900	0.000	0.0	0.1	0.1	0.0	Flood Risk
5760 min Winter	9.900	0.000	0.0	0.1	0.1	0.0	Flood Risk
7200 min Winter	9.900	0.000	0.0	0.0	0.0	0.0	Flood Risk
8640 min Winter	9.900	0.000	0.0	0.0	0.0	0.0	Flood Risk
10080 min Winter	9.900	0.000	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	108.136	0.0	3.7	33
60 min Winter	65.954	0.0	4.6	60
120 min Winter	41.587	0.0	5.8	102
180 min Winter	31.327	0.0	6.6	136
240 min Winter	25.417	0.0	7.2	174
360 min Winter	18.653	0.0	7.9	244
480 min Winter	14.824	0.0	8.4	310
600 min Winter	12.337	0.0	8.7	374
720 min Winter	10.582	0.0	9.0	436
960 min Winter	8.257	0.0	9.3	552
1440 min Winter	5.775	0.0	9.8	0
2160 min Winter	4.011	0.0	10.2	0
2880 min Winter	3.099	0.0	10.5	0
4320 min Winter	2.168	0.0	10.9	0
5760 min Winter	1.693	0.0	11.3	0
7200 min Winter	-0.012	0.0	-0.1	0
8640 min Winter	-0.010	0.0	-0.1	0
10080 min Winter	-0.008	0.0	-0.1	0

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JMS Chelmsford Ltd		Page 3
BIC110 - The MedBIC Alan Cherry Drive Chelmsford CM1 1SQ		
Date 27/05/2026 17:39 File BLUE OR GREENROOF CALC ...	Designed by MathanKumarRenga... Checked by	
XP Solutions		
Source Control 2018.1		

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 531971 190100 TQ 31971 90100
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Green Roof

Area (m³)	22	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.000400		32 36 0.000081		64 68 0.000016		96 100 0.000003	
4 8 0.000327		36 40 0.000066		68 72 0.000013		100 104 0.000003	
8 12 0.000268		40 44 0.000054		72 76 0.000011		104 108 0.000002	
12 16 0.000219		44 48 0.000044		76 80 0.000009		108 112 0.000002	
16 20 0.000180		48 52 0.000036		80 84 0.000007		112 116 0.000001	
20 24 0.000147		52 56 0.000030		84 88 0.000006		116 120 0.000001	
24 28 0.000120		56 60 0.000024		88 92 0.000005			
28 32 0.000099		60 64 0.000020		92 96 0.000004			

Time Area Diagram

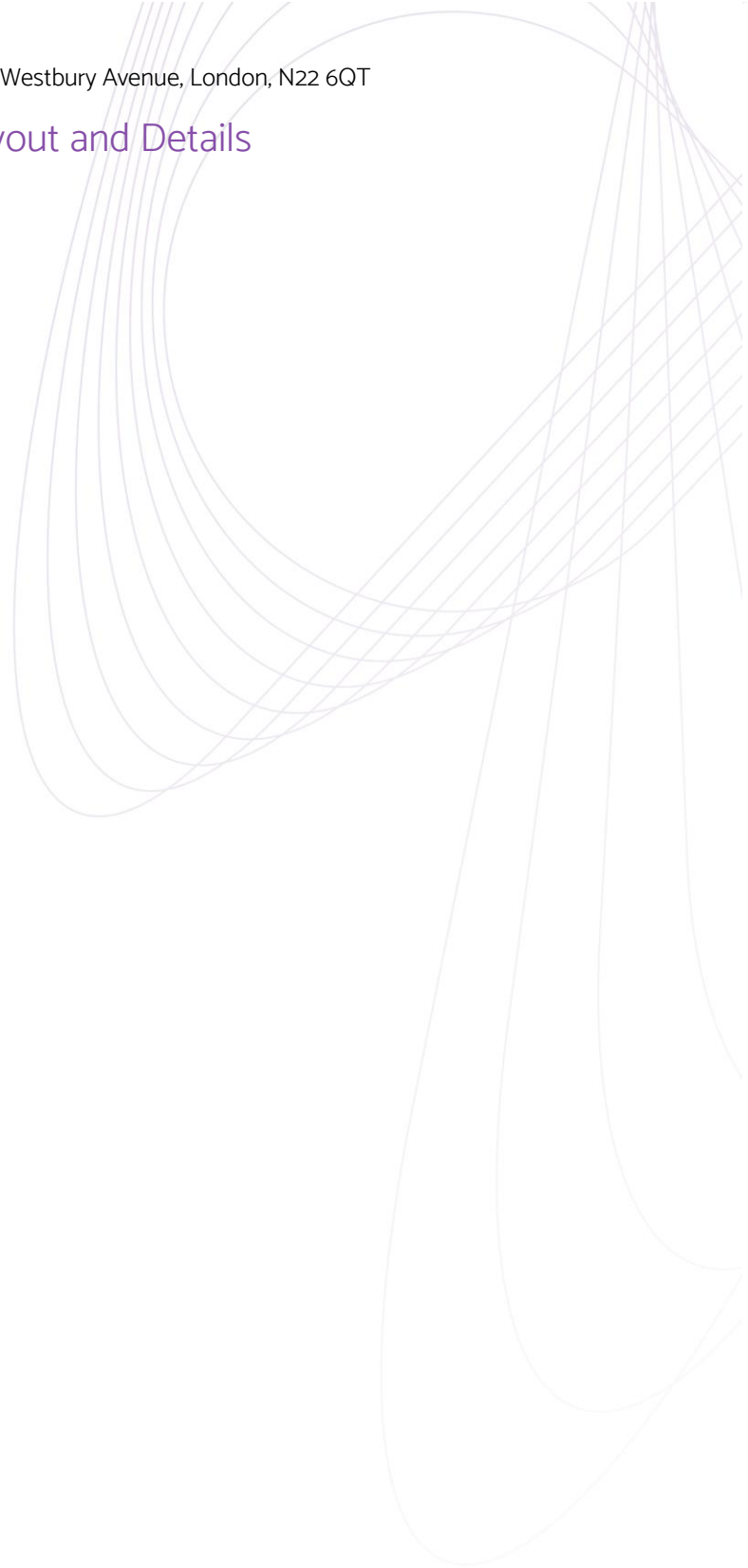
Total Area (ha) 0.005

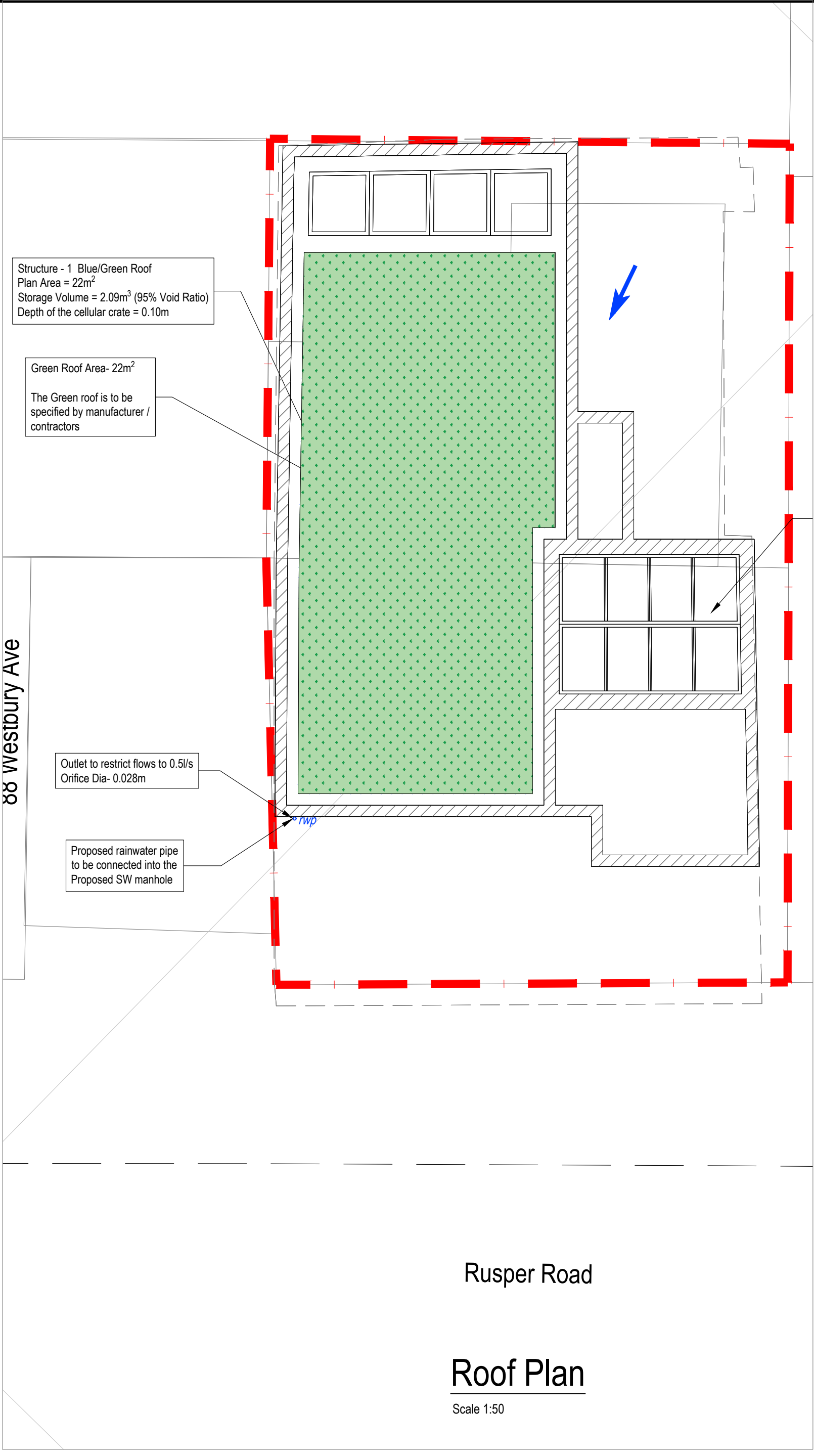
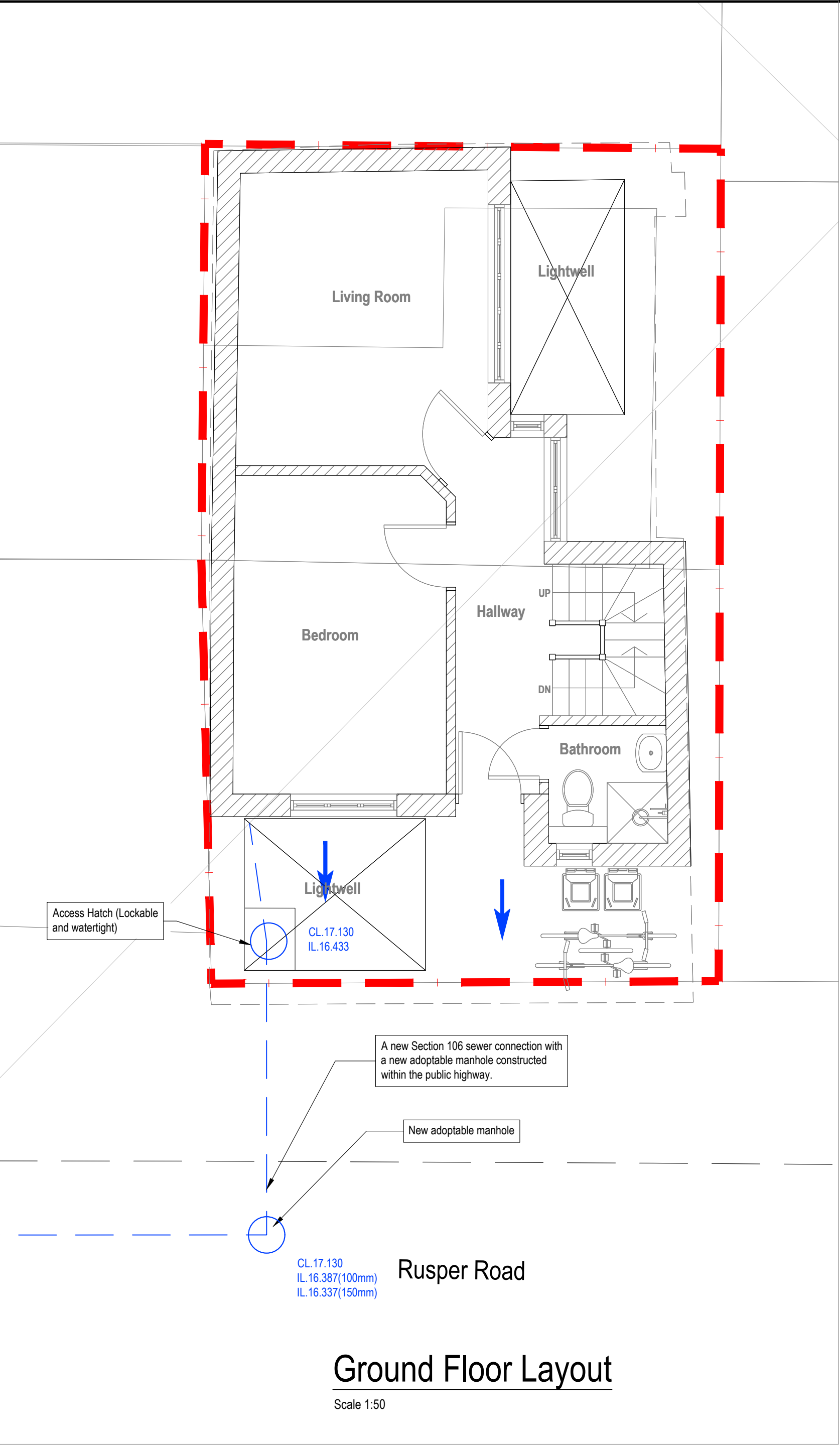
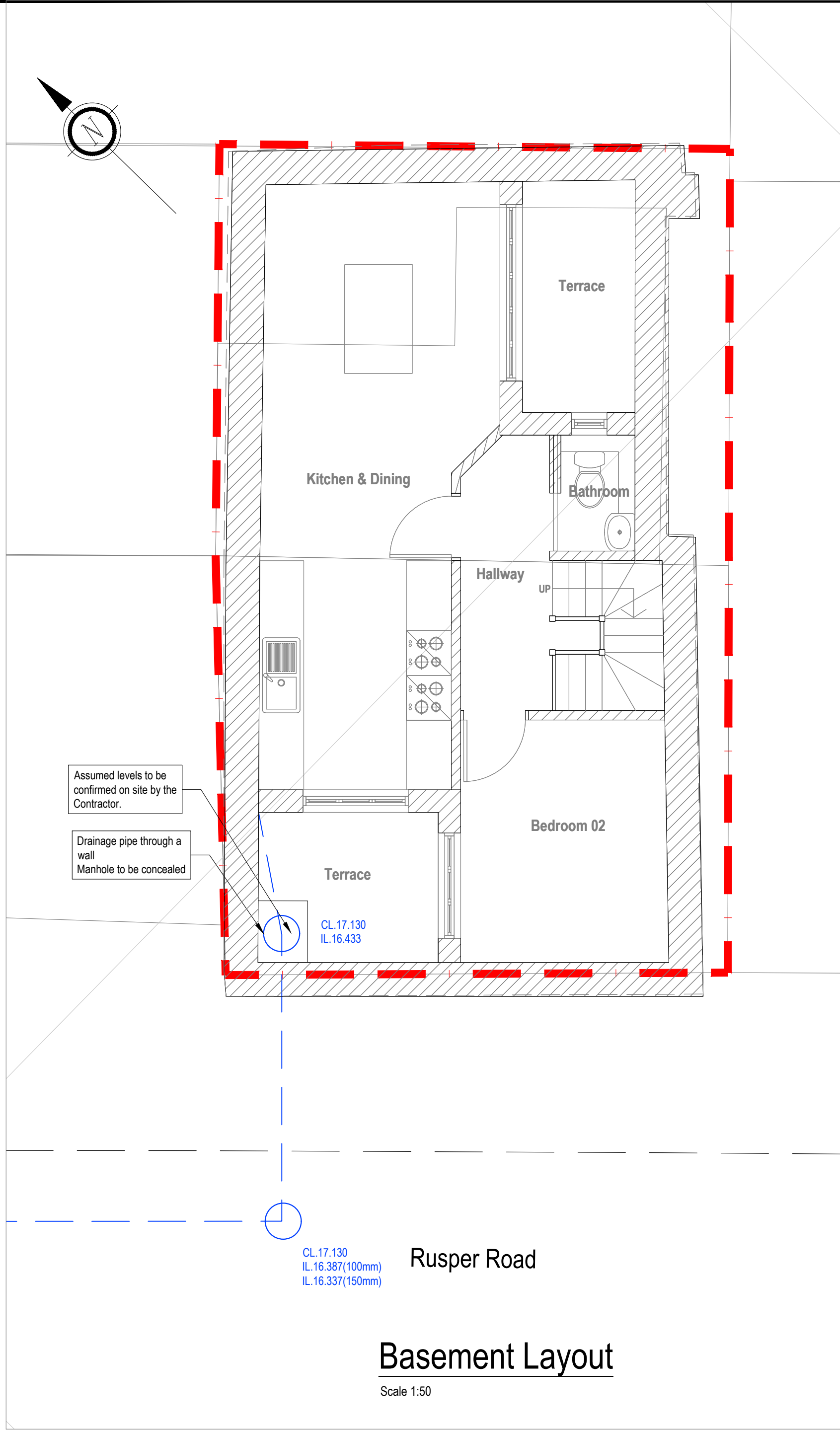
Time (mins)	Area
From: To: (ha)	

0	4	0.005
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JMS Chelmsford Ltd		Page 4																		
BIC110 - The MedBIC Alan Cherry Drive Chelmsford CM1 1SQ																				
Date 27/05/2026 17:39 File BLUE OR GREENROOF CALC ...	Designed by MathanKumarRenga... Checked by																			
XP Solutions		Source Control 2018.1																		
Model Details Storage is Online Cover Level (m) 10.000 Cellular Storage Structure Invert Level (m) 9.900 Safety Factor 3.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>50.0</td><td>50.0</td><td>0.101</td><td>0.0</td><td>56.0</td></tr><tr><td>0.100</td><td>50.0</td><td>56.0</td><td></td><td></td><td></td></tr></tbody></table> Orifice Outflow Control Diameter (m) 0.028 Discharge Coefficient 0.600 Invert Level (m) 9.850			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	50.0	50.0	0.101	0.0	56.0	0.100	50.0	56.0			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)															
0.000	50.0	50.0	0.101	0.0	56.0															
0.100	50.0	56.0																		
©1982-2018 Innovyze																				

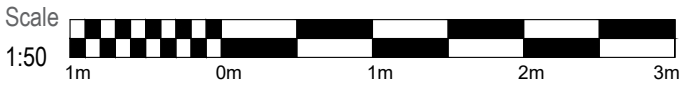
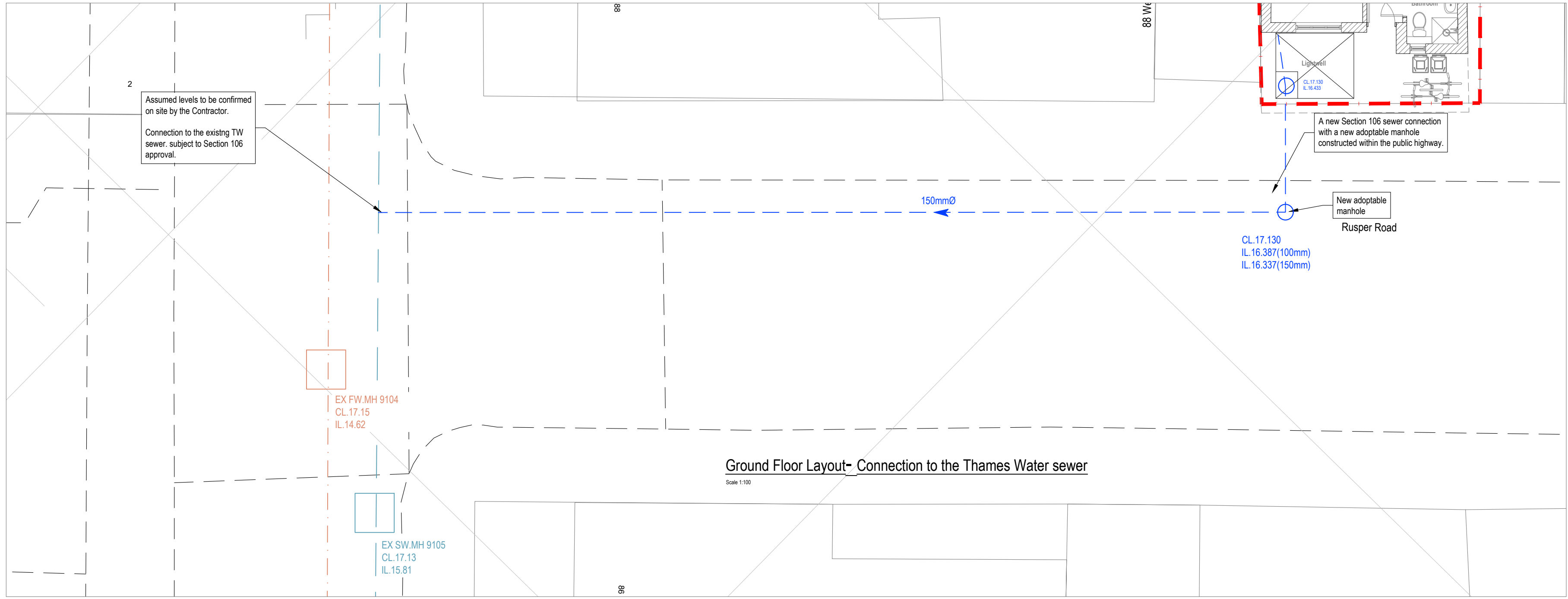
Appendix D – Proposed Drainage Layout and Details





- General Notes:
1. Do not scale this drawing. All dimensions are in metres unless otherwise noted. Any discrepancies are to be recorded and reported to the engineers immediately.
 2. This drawing is to be read in conjunction with all other engineers and architects drawings, and the specification.
 3. All work is to be to the satisfaction of the engineer and local authority building control.
 4. The contractor is responsible for and must take all necessary precautions to ensure the stability of the works at all times during construction.
 5. All workmanship and materials are to be to current British Standards.
 6. All services are to be located and protected as necessary by the contractor prior to the commencement of the works.
 7. Any existing details which are shown on this drawing are for guidance only and are to be checked on site by the contractor. Any variations are to be recorded and reported to the engineer immediately.
 8. All highway works are to be in accordance with the local authorities design guide and specification.
 9. Prior to the occupation of the first dwelling, street nameplates shall be erected in accordance with the highway authority and to the wording agreed with the planning authority.
 10. During construction works on site, all roads and footpaths are to be swept and kept clear of obstructions, this is to include existing highways as appropriate to ensure safe passage of all road users.
 11. Provision shall be made for the installation of all mains services including ducting prior to the laying of the road base-course.
 12. All road markings and signs are to be in accordance with 'The Traffic Signs Regulations and Directions' 2016.
 13. All sewer works are to be in accordance with the Sewerage Sector Guidance.
 14. All private connections to adoptable sewers should be a minimum of 100mm diameter (roul) and 150mm diameter (surface) made in vitrified clay connecting soffit to soffit.

Drainage Key		
Surface Water Manhole Text	CL.00.00 IL.00.00 BD.00.00	Existing Foul Water Sewer
Surface Water Pipe Diameter / Gradient	100/80	Existing Foul Water Manhole
Inspection chamber 480mm Ø >600mm Depth		Existing Surface Water Sewer
Rain Water Pipe	rwp	Existing Surface Water Manhole
Green/blue Roof		
Exceedance Route		



For Planning Only

P1 Preliminary Issue		MKR	BN	26.05.2026
Issue	Notes	Drawn	Approved	Date
 Engineering that brings design to life Award-winning Consulting Structural & Civil Engineers				
Issuing Office: JMS East Anglia (Ipswich): Unit 10, Brightwell Barns Brightwell, Suffolk, United Kingdom, IP10 0BJ, Tel: 01473 487047				
Project 88-90 Westbury Avenue London N22 6QT				
Drawing Title Proposed Drainage Floor Layout				
Project No. L26/123/03		Drawing No. 201		Issue P1
PRELIMINARY				

Private Drainage Notes:

1. Inspection chamber covers and frames as follows:-

Brickwork and pre-cast concrete:

- i) Private drives accepting vehicle traffic: BS EN124 class D400, 600mm clear opening, solid top cover and frame.
ii) Footpaths, verges and gardens: BS EN124 class B125, 600mm clear opening, solid top cover and frame.

Polypropylene:

- iii) Areas accepting vehicle traffic: Class B
iv) Soft landscaped areas: Class C

2. Mortar haunching to inspection chamber and frames.

3. i) For use with brick inspection chambers in non adopted roads, private drives, footways and verges; heavy duty (150mm nominal thickness) precast reinforced concrete cover slab to BS 5911, bedded on 10mm thick mortar bed; or 150mm grade C25P in-situ concrete (reinforced with A393 mesh to BS 4483) cover slab. Other locations inaccessible to vehicles; light duty (75mm nominal thickness) precast reinforced concrete cover slab to BS 5911, bedded on 10mm thick mortar bed; or 100mm grade C25P in-situ concrete (reinforced with A193 mesh to BS 4483) cover slab.
ii) For use with precast concrete inspection chambers in non adopted roads, private drives, footways and verges; heavy duty (150mm nominal thickness) precast reinforced concrete cover slab to BS 5911, of size and type to suit chamber sections.
Other locations inaccessible to vehicles; light duty (75mm nominal thickness) precast reinforced concrete cover slab to BS 5911, of size and type to suit chamber sections.

4. With precast or brick inspection chambers, cover slabs with a clear opening of 600x600mm are required. Offset to suit chosen face for step rungs.

5. 215mm thick walls in Class B engineering bricks to BS 3921 layered in English bond with frogs up. Inner faces to be plumb and in true alignment. Brick course to be level. Flush jointing to brickwork inner faces and precast concrete chamber sections to BS 5911.

6. All step rungs to BS 1247

i) General purpose pattern (with 230mm tail) to be built into chamber wall of brick inspection chambers.

ii) Precast concrete manhole pattern "let in" to chamber wall of precast inspection chambers. All step rungs to be horizontally and vertically staggered as shown on section x-x. Step rungs are not required to either type of inspection chamber where depth to soffit is less than 750mm.

7. Mass concrete infill.

8. Benching to rise vertically from edges of channel to a height not less than pipe (full section) soffit level. Steel float smooth hard surface with cement mortar 1:1 mix, 25mm thick.

9. 50mm min. thick mortar bed to half round channels.

10. 150mm min. thick mass concrete base slab (grade C20P) to precast, uPVC and brick types of inspection chamber.

11. 75mm thick lean mix concrete blinding.

12. Minimum of 2, and maximum of 4 courses of 215mm thick engineering bricks (Class B) to underside of cover & frame, built off cover slab, may be required to facilitate road or drive construction.

13. A brick relieving arch shall be turned over all pipes where they pass through the walls of a brick inspection chamber.

14. Pipes entering inspection chambers shall have a flexible joint within 150mm of the outer face of the brickwork or concrete surround.

15. Channel junctions within brick or precast concrete inspection chambers to be half round channel sections.

16. Backfill material to be as detailed above for normal pipe bedding.

17. Following the flexible joint from either a precast or brick inspection chamber (note 14 above) a 'rocker' pipe of 600mm length shall be installed.

18. Precast concrete inspection chambers may (if chosen for use) have a purpose made base units.

19. Where precast concrete inspection chambers are constructed wholly above the water table, joints are to be sealed with mortar. In waterlogged ground or where the water table is above the base slab, joints are to be water tight using a mastic sealant or rubber rings of a type suitable to the chamber units.

Pipe Bedding Notes:

Mortar

1. Mortar shall be mixed only as and when required, the relevant proportions indicated in the following table, until its colour and consistency are uniform. The constituent materials shall be accurately gauged, allowance being made for bulking of sand.

Alternative Nominal Mixes By Volume		
Cement:Lime:Sand	Cement:Sand	Cement:Sand with Plasticiser
1 : 1 1/2 : 3	1 : 3	1 : 2 1/2 to 3

2. Ready-mixed lime:sand for mortar and ready-to-use retarded mortar shall comply with the relevant provisions of BS 4721 and to be of category 1.12 and designation (i) respectively.

3. All mortar shall be conveyed fresh to the works as required for use. Mortar which has begun to set or which has been site-mixed for a period of more than one hour shall not be used. Plasticising and set retarding mortar admixtures shall comply with BS 4887: part 1 and 2, respectively and shall be supplied with instructions for use.

4. Fine aggregate for mortar shall be washed natural sand or crushed natural stone and shall comply in all respects with BS 1200.

5. 20mm thick Flexcell, or similar approved filler to be used to form a flexible joint to the concrete surround at the leading edge of a sleeved coupling. Dimensions shown are irrespective of type or diameter of pipe. The surrounds must terminate at a pipe joint.

6. If pipes are surrounded in concrete, the joints are to be protected from the ingress of concrete by wrapping them in polythene sheet or building paper.

General fill material
May be of selected locally excavated material or imported. It shall be uniform readily compacted material free from stones larger than 40mm dia. lumps of clay over 100mm, timber, frozen material, vegetable matter, tree roots and building rubbish. The material shall be placed and compacted in layers not exceeding 300mm loose depth. Mechanical compaction equipment shall not be used until there is a minimum of 450mm of compacted material above the crown of the pipe.

Selected fill material
To be free from stones larger than 40mm dia. lumps of clay over 100mm, timber, frozen material, vegetable matter, tree roots and building rubbish. The material shall be placed uniformly on each side of the pipe in layers not exceeding 100mm. Each layer being compacted by hand tamping. Care to be taken not to displace the pipe from its correct line and level.

Private Drainage Notes:

1. Formation of trench beds and inspection chambers

i) Excavate immediately before laying beds and pipes or base slabs for inspection chambers.

ii) Remove all mud, rock projections, boulders and hard spots and replace with well compacted selected fill. Localised soft spots are to be hardened by tamping in granular bedding material.

iii) If oil contamination is found adjacent to trench, the trench profile is to be cut back by 150mm from the face of bedding material and replaced with crushed concrete.

2. Concrete and mortar

i) The concrete used to surround pipes and in the construction of gullies and inspection chambers is to be grade C20P (unless noted otherwise) and mixed using SRPC unless directed otherwise by the engineer or local authority. Sulphate resisting cement is to be used for in-situ or precast concrete and mortars to foul drains.

3. Covers and frames

All inspection chamber cover and frames are to be laid to have the top surface in alignment with both the longitudinal and transverse gradients of adjacent roads, drives, footways and verges. They are otherwise to be laid level. All cover levels as shown on the drainage layout/longsection are approximate. Actual cover levels are to be determined on site from the position in the road, drive, footpath or otherwise.

4. Pipes to as follows:

Pipe dia. (mm)	Type	Remark
100 Internal (110 NOM. dia.)	uPVC	BS EN 1401
150 Internal (160 NOM. dia.)	uPVC	BS EN 1401

5. The contractor/developer is to ensure that all of the works comply with the following:

i) BS 8301: 1985 (code of practice for building drainage)

ii) The Building Regulations: Approved Document H 2002

iii) NHBC Technical requirements

iv) BRE Digest No. 363

6. The storage and installation of all proprietary drainage items used are to be strictly in accordance with the manufacturers instructions.

7. All uPVC items as specified on this drawing are to comply with BS EN 1401.

8. Mortar

Mortar shall be mixed only as and when required, the relevant proportions indicated in the following table, until its colour and consistency are uniform. The constituent materials shall be accurately gauged, allowance being made for bulking of sand.

Alternative Nominal Mixes by Volume		
Cement:Lime:Sand	Cement:Sand	Cement:Sand with plasticiser
1 : 1 1/2 : 3	1 : 3	1 : 2 1/2 to 3

9. Ready-mixed lime: Sand for mortar and ready-to-use retarded mortar shall comply with the relevant provisions of BS 4721 and to be of category 1.12 and designation (i) respectively.

10. All mortar shall be conveyed fresh to the works as required for use. Mortar which has begun to set or which has been site-mixed for a period of more than 1 hour shall not be used. Plasticising and set retarding mortar admixtures shall comply with BS 4887: part 1 and 2, respectively and shall be supplied with instructions for use.

11. Crushed natural stone and shall comply in all respects with BS 1200.

Materials for Access Points

Material	British Standard
1. Inspection chambers and manholes.	
Clay brick & blocks	BS 3921
Vitrified clay	BS EN 295, BS 65
Concrete-precast	BS 5911
Concrete-in situ	BS 8110
Plastics	BS 7158
2. Rodding eyes and access fittings (excludes covers and frames).	As pipes refer to materials for below ground drainage

Materials for Below Ground Drainage

Material	British Standard
1. Rigid pipes:	
Vitrified clay	BS 65, BS EN 295
Concrete	BS 5911
Grey iron	BS 437
Ductile iron	BS EN 598
2. Flexible pipes:	
UPVC	BS EN 1401*
PP	BS EN 1852*
Structure wallled	BS EN 13476
Plastic pipes	

*Application area code "UD" should normally be specified
Note
Some of these materials may not be suitable for conveying trade effluent.

Table of Protection Requirements Relative to Cover

Location	Gardens (no traffic loading)		Paved or hard surfaces (light traffic loading)		Roads (carriageways & footways)	
	Cover (mm) [from barrel of pipe]	Less than 600 More than 600	Less than 900 More than 900	Less than 900 More than 900	Less than 900 More than 900	Less than 900 More than 900
Type of protection required		Reinforced conc. or paving slab bridging None	Reinforced conc. or paving slab bridging None	Reinforced conc. or paving slab bridging None	Concrete surround	None

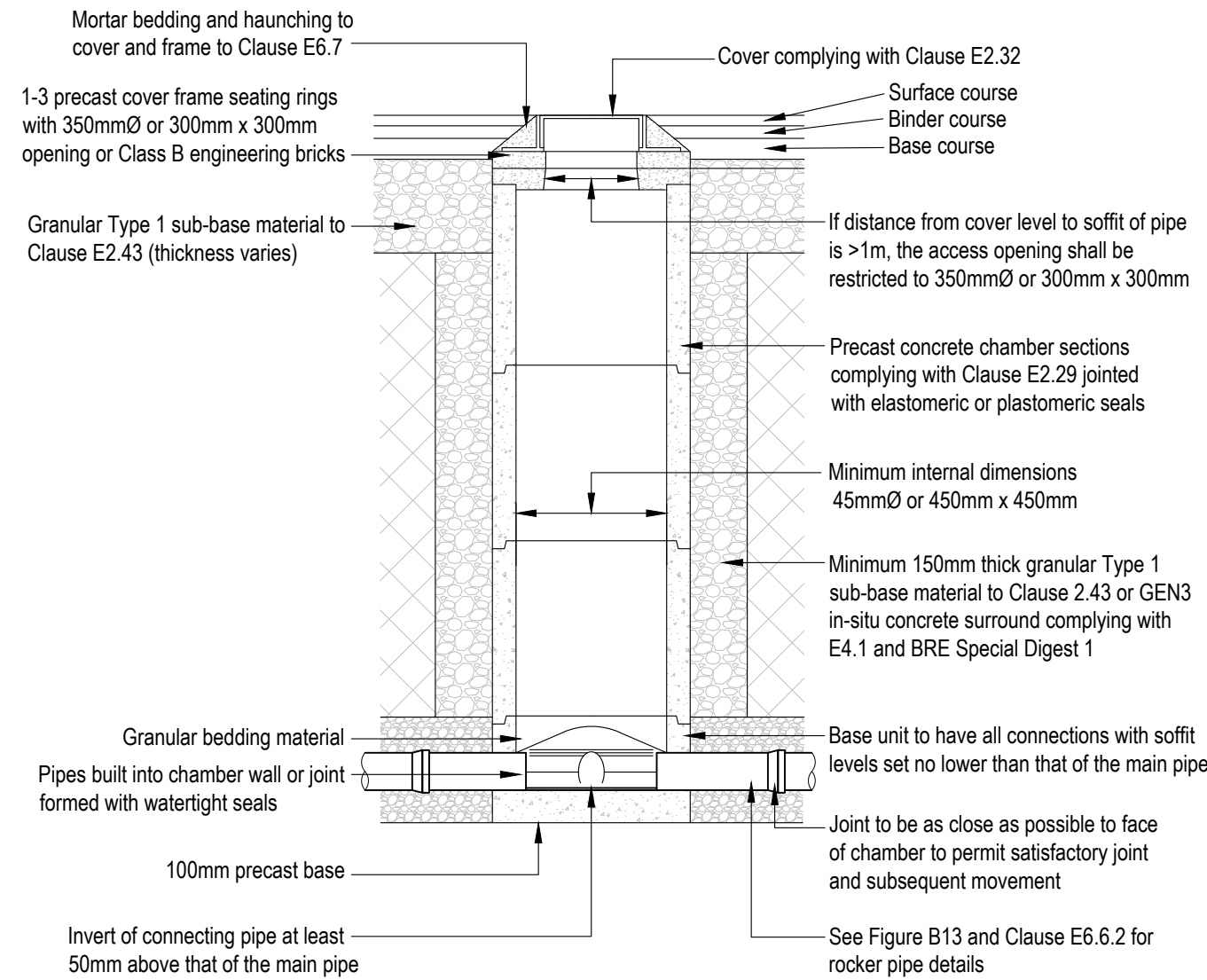
Notwithstanding these requirements the contractor is to give further consideration to the protection of drainage items from construction traffic and building works

Minimum Dimensions for Access Fittings and Inspection Chambers

Type	Depth to invert from cover level (m)	Internal dimensions		Cover dimensions	
		Length (mm) x width (mm)	Circular dia. (mm)	Length (mm) x width (mm)	Circular dia. (mm)
Rodding eye		As drain but 100 min.			Same size as pipework, 1
Access fitting					
Small	150 dia.	150x100	150	150x100.1	150.1
Large	150x100 225x100	225x100	225	225x100.1	225.1
Inspection chamber					
shallow	0.6 or less	225x100	190.2	-	190.1
Deep	1.2 or less >1.2	450x450	450	MIN. 430x430 MAX 300x300.3	430 access restricted to max 350.3

NOTES

- The clear opening may be reduced by 20mm in order to provide proper support for the cover and frame.
- Drains up to 150mm.
- A larger clear opening cover may be used in conjunction with a restricted access, the size is restricted for health and safety reasons to deter entry.



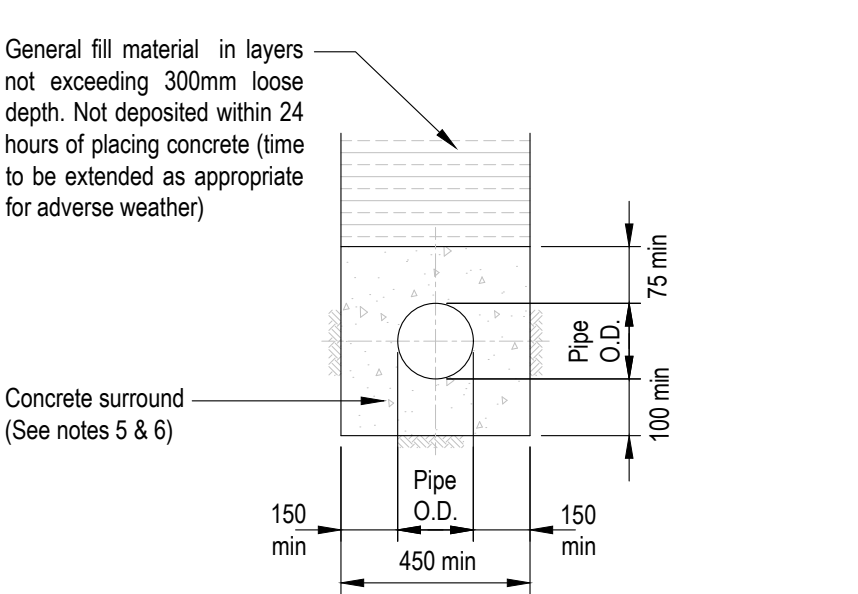
Note: Where the access chamber is in the highway (including any footway), the highway authority may have specific requirements

Figure B20 - Typical Inspection Chamber Detail - Type D

Scale 1:20

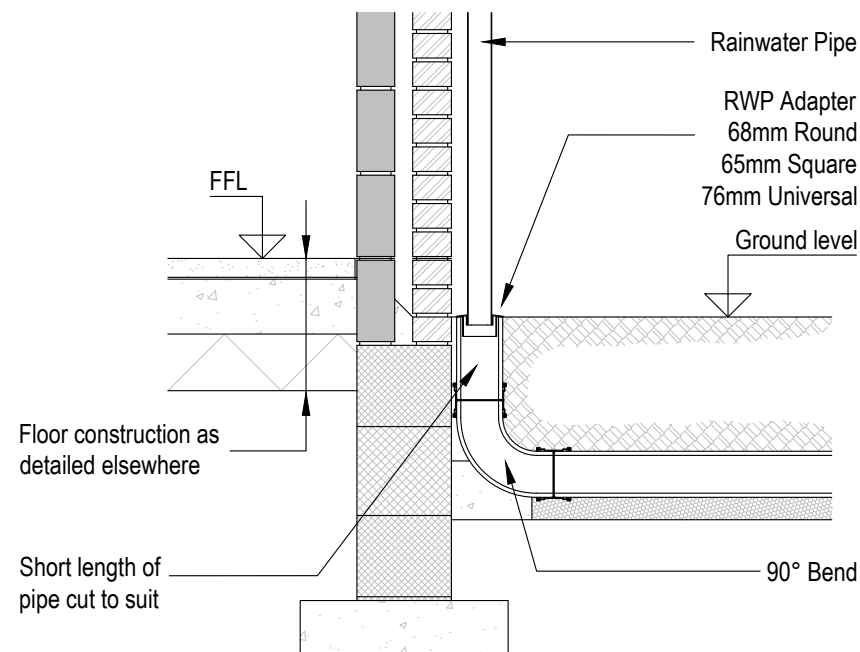
Depth from cover level to soffit of pipe up to 3m

Rigid material construction for use in areas subject to vehicle loading



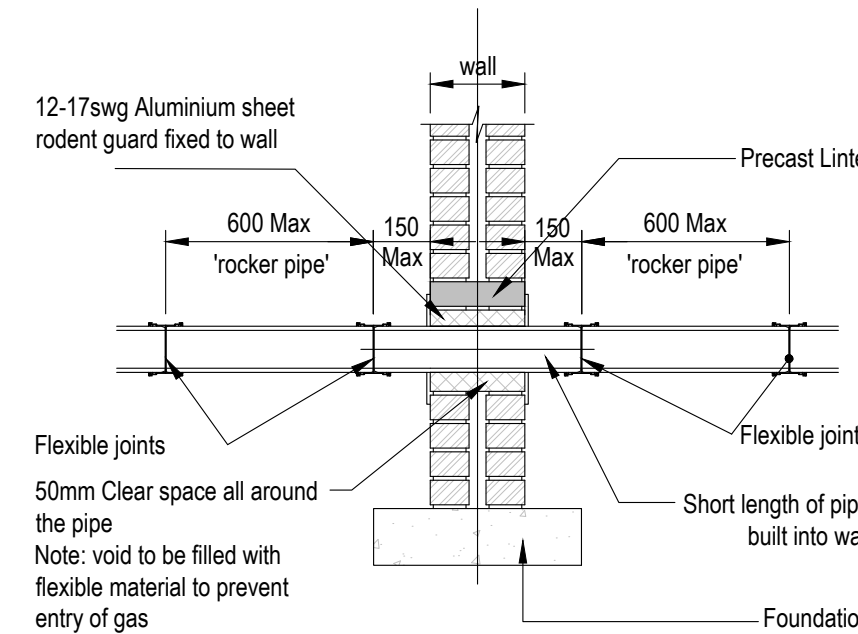
Concrete Surround Pipe Bedding

Scale 1:20



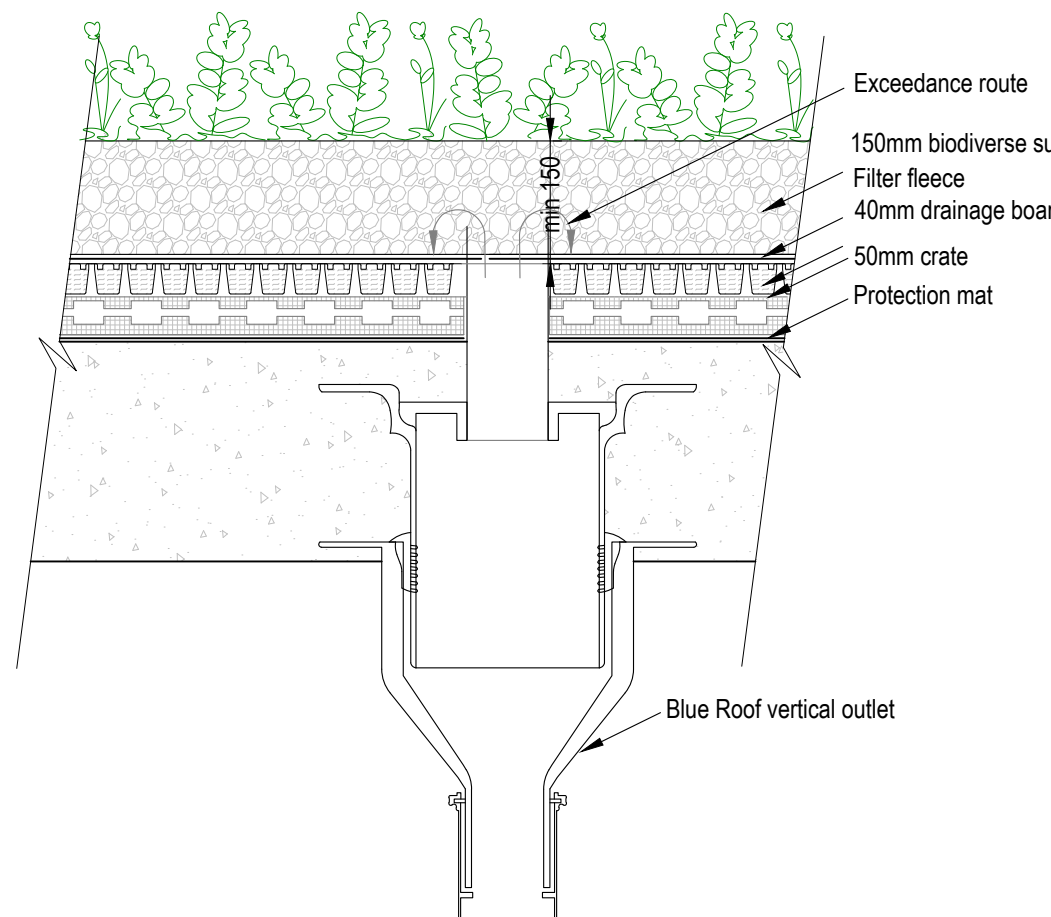
External RWP Connection

Scale 1:20



Drainage Through Walls

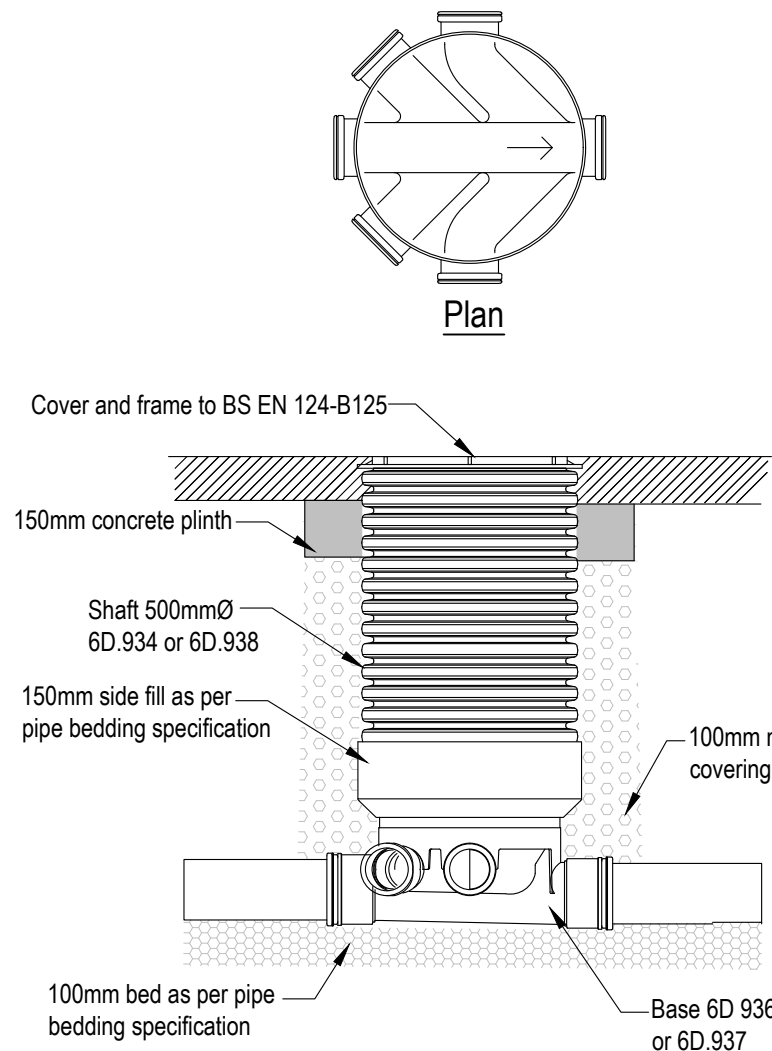
Scale 1:20



Typical Blue Roof System with Outlet Pipe

Crate Height 50mm

Scale 1:10



Polypropylene Shallow Inspection Chamber

Ø450mm (Light Loading B125)

Scale 1:20

Note:
3m maximum depth. Up to Ø150mm pipework for 450mm shaft, or up to 300mm pipework on 500mm shaft. B125 maximum Loading, suitable for car parks and private drives



P1	Preliminary Issue	MKR	BN	26.05.2026
Issue	Notes	Drawn	Approved	Date



Issuing Office:
JMS East Anglia (Ipswich): Unit 10, Brightwell Barns
Brightwell, Suffolk, United Kingdom, IP10 0BJ, Tel: 01473 487047

Project
88-90 Westbury Avenue
London N22 6QT

Drawing Title
Drainage Construction Details

Project No. L26/123/03	Drawing No. 202	Issue P1
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PRELIMINARY

