PROPOSED BASEMENT AT NUMBER 24 GLADESMORE ROAD, TOTTENHAM, LONDON, N15 6TB

HYDROLOGICAL ASSESSMENT

APRIL 2016

REPORT REF: 1614/RE/04-16/01

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CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Mr Yakov Levy to carry out a hydrological assessment for the proposed single level basement at number 24 Gladesmore Road, Tottenham, London, N15 6TB. This assessment has been compiled specifically to address planning condition 6.

QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; hydrological and hydrogeological assessments; surface water drainage designs; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a “designers risk assessment”.

Report carried out by:



…….
Rupert Evans, BSc (Hons), MSc, CEnv, C.WEM, MCIWEM, AIEMA

DISCLAIMER

This report has been written and produced for Mr Yakov Levy. No responsibility is accepted to other parties for all or any part of this report. Any other parties relying upon this report without the written authorisation of Evans Rivers and Coastal Ltd do so at their own risk.

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CONTENTS

CONTRACT i
QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY i
DISCLAIMER i
COPYRIGHT i
CONTENTS iii

1. INTRODUCTION **1**
1.1 Project scope 1

2. DATA COLLECTION **2**

3. SITE CHARACTERISTICS **3**
3.1 Existing Site Characteristics and Location 3
3.2 Site Proposals 4

4. SOURCES OF FLOODING **5**
4.1 Fluvial/Tidal 5
4.2 Critical Drainage Areas (CDA) 5
4.3 Groundwater Flooding 5
4.4 Surface Water Flooding and Sewer Flooding 6
4.5 Reservoirs, Canals And Other Artificial Sources 7

5. SURFACE WATER DRAINAGE AND SUDS **8**

6. CONCLUSIONS **9**

7. BIBLIOGRAPHY **10**

DRAWINGS **GR/24/EX/101**
GR/24/EX/102/1
GR/24/PR/101

1. INTRODUCTION

1.1 Project Scope

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Mr Yakov Levy to carry out a hydrological assessment for the proposed single level basement at number 24 Gladesmore Road, Tottenham, London, N15 6TB.

1.1.2 This assessment has been compiled specifically to address planning condition 6 which reads:

Prior to the commencement of the development hereby permitted an assessment of the hydrological and hydro-geological impacts of the development and any necessary mitigation measures found to be necessary shall be submitted to and approved in writing by the Local Planning Authority. Thereafter the development shall be carried out in accordance with the details approved.

1.1.3 Specifically, this assessment intends to:

1) Carry out an appraisal of flood risk from all sources such as fluvial/tidal, groundwater, surface water/sewers, artificial sources in accordance with NPPF and other documents such as the SFRA and SWMP;

2) Recommend mitigation measures where appropriate;

3) Report findings and recommendations.

1.1.4 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated March 2012. Other documents which have been consulted include:

- DEFRA/Jacobs 2006. *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*.
- National Planning Practice Guidance – Flood Risk and Coastal Change.
- Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- Haringey Council Level 2 Strategic Flood Risk Assessment (SFRA) dated February 2015.
- Haringey Surface Water Management Plan (SWMP) dated 2011.
- Policy SP5 of Haringey's Spatial Strategy.
- Policy DM24 and DM25 of the emerging Development Management DPD dated January 2016.

2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map obtained via Promap (Evans Rivers and Coastal Ltd OS licence number 100049458).
- 1:250,000 *Soil Map of South East England* (Sheet 6) published by Cranfield University and Soil Survey of England and Wales 1983.
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
- Filtered LIDAR at 1m resolution.
- Information and data from:
    - Haringey Council Strategic Flood Risk Assessment (Level 2) dated February 2015.
    - Haringey Surface Water Management Plan (SWMP) dated 2011.

2.2 All third party data used in this study has been checked and verified prior to use in accordance with Evans Rivers and Coastal Ltd Quality Assurance procedures.

3. SITE CHARACTERISTICS

3.1 Existing Site Characteristics and Location

3.1.1 The site is located at number 24 Gladesmore Road, Tottenham, London, N15 6TB. The approximate Ordnance Survey (OS) grid reference for the site is 533709 188344 and the location of the site is shown on Figure 1.

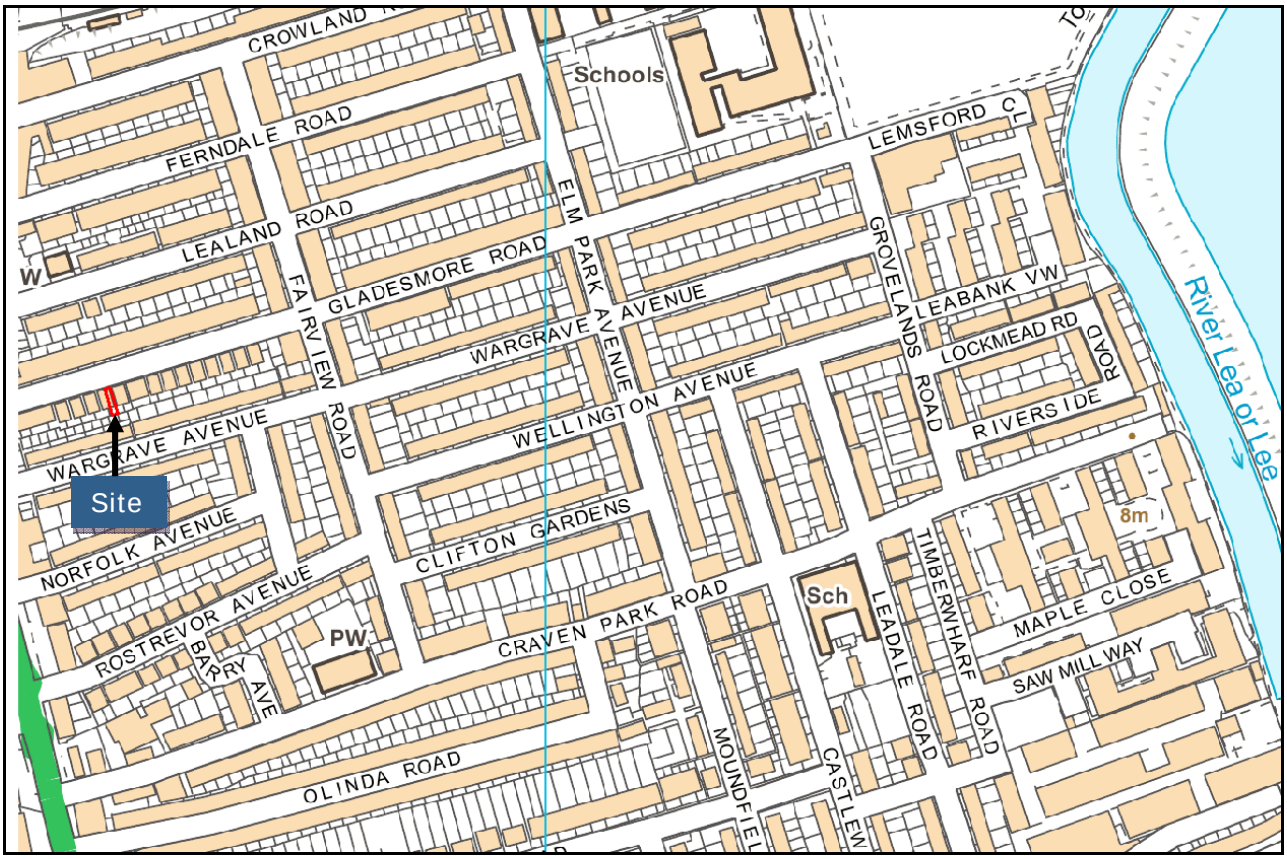


Figure 1: Site location plan (Source: Ordnance Survey, 2016)

3.1.2 The site is rectangular in shape and is located within a residential area. The site comprises a three-storey semi-detached house together with a paved front garden, paved side passage and largely paved rear garden.

3.1.3 The site is accessed from Gladesmore Road located adjacent to the northern frontage of the site. The existing site layout can be seen on Drawing Numbers GR/24/EX/101 and GR/24/EX/102/1.

3.1.4 Filtered LIDAR at 1m resolution has been obtained in order to determine the topography across the site and wider area (Figure 2). Inspection of the data indicates that ground levels across the site gently fall in a north westerly direction from 14.86m AOD to 13.66m AOD. Ground levels along Gladesmore Road adjacent to the site are set at 13.40m AOD.

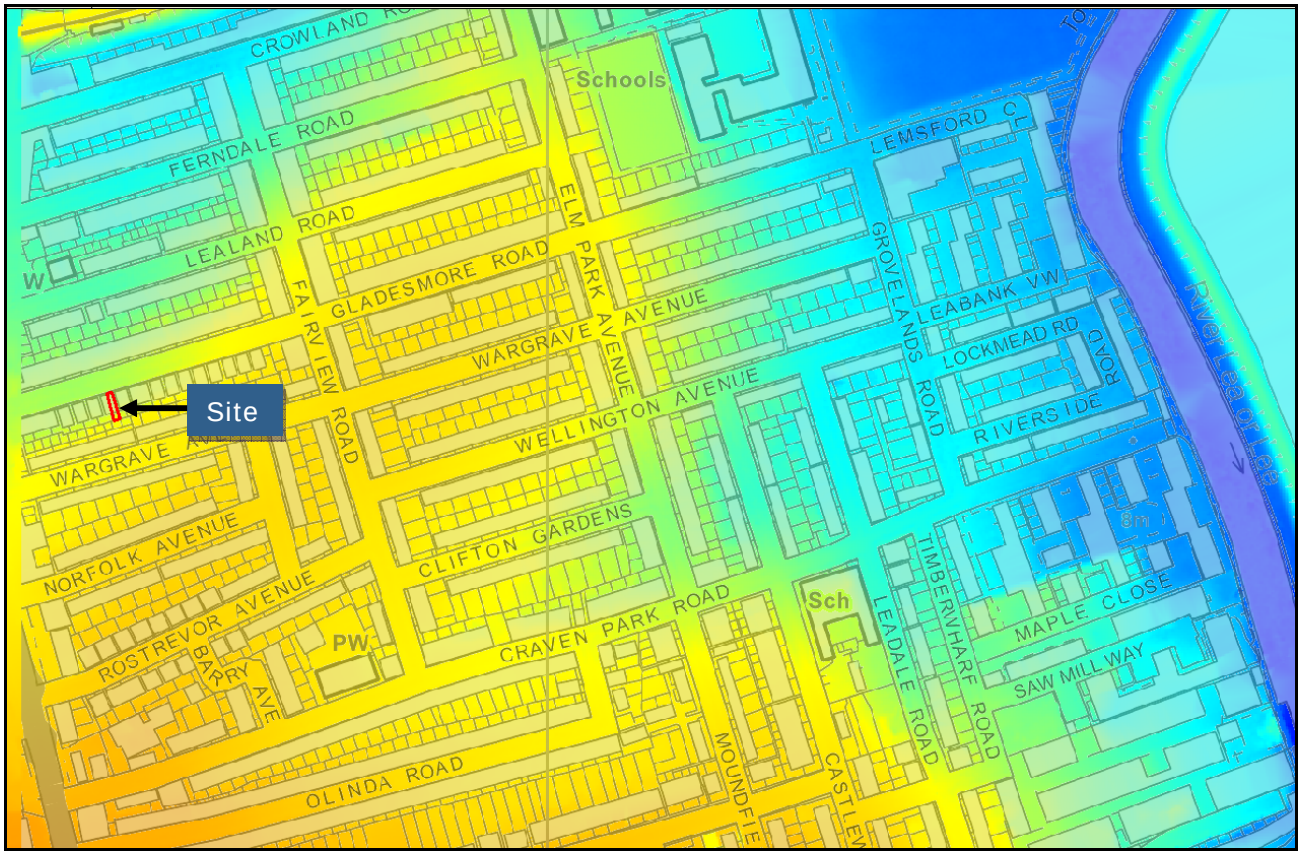


Figure 2: Filtered 1m LIDAR survey data where higher ground is denoted as orange and yellow colours and lower areas denoted by blue and green colours

3.2 Site Proposals

3.2.1 The proposals include a single level basement and will extend beneath the entire footprint of the existing dwelling and partially beneath the existing paved front and rear garden areas (i.e. to incorporate lightwells). The basement will extend approximately 2.3m below ground level.

3.2.2 The basement will be used as a play room and study and will have a bathroom and storage area across it. Access into the basement will be provided via an internal staircase leading up to the first floor.

3.2.3 The site proposals can be seen on Drawing Numbers GR/24/PR/101 and GR/24/EX/102/1.

4. SOURCES OF FLOODING

4.1 Fluvial/Tidal

4.1.1 The Environment Agency Flood Map and Figure 6-5 of the SFRA shows that the site is located within the NPPF Flood Zone 1, 'Low Probability' which comprises land as having less than a 1 in 1000 year annual probability of fluvial or tidal flooding (i.e. an event more severe than the extreme 1 in 1000 year event). NPPF states that all uses of land, including basements, are appropriate in this zone.

4.1.2 Figure 2-2 of the SFRA shows that the site is not located within the immediate vicinity of a culverted watercourse; however, the culverted Stonebridge Brook and the River Lea are located 300m north of the site and 650m east of the site respectively.

4.2 Critical Drainage Areas (CDA)

4.2.1 It is understood from Figure 2-6 of the SFRA that the site is located within Critical Drainage Area (CDA) Group4_057 known as Seven Sisters Road, South Tottenham.

4.2.2 The SWMP defines the CDA as:

"A discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding in one or more Local Flood Risk Zones during severe weather thereby affecting people, property or local infrastructure."

4.3 Groundwater Flooding

4.3.1 In addition to the information provided in the SFRA and SWMP, in order to assess the potential for groundwater flooding, the Jacobs/DEFRA report entitled *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study*, published in May 2004, was consulted, together with the guidance offered within the document entitled *Groundwater flooding records collation, monitoring and risk assessment (ref HA5)*, commissioned by DEFRA and carried out by Jacobs in 2006.

4.3.2 The British Geological Survey's *Online Geology of Britain Viewer* indicates that the soils beneath the site comprise London Clay. The local borehole data extracted from the *Online Geology of Britain Viewer,* together with ground investigation data for other planning applications in the general area, indicates that localised groundwater seepages are likely to be encountered within the London Clay at a depth of approximately 3.3m bgl. As the underlying soils have a low permeability, it is considered that the seepages are likely to be due to localised permeable soil layers rather than actual continuous groundwater.

4.3.3 There have been no recorded groundwater flood events across the area between 2000 and 2003, as indicated by the Jacobs study. Table 3-4 of the SWMP shows that the site and general area has not been affected in the past from groundwater flooding incidents.

4.3.4 Groundwater could be encountered below the site and within the basement excavation and at variable depths (but as pockets of water not continuous layers). The evidence suggests that it is unlikely that the water table has the potential to breach the ground surface and flow into the building and basement via the ground floor.

4.3.5 It is likely that the basement will be designed to achieve a Grade 3 level of waterproofing protection as outlined in BS8102:2009. A new reinforced concrete lining wall and

ground-bearing concrete slab will be constructed using water resistant concrete to form the primary barrier. Appropriate groundwater control such as sump pumping may be required especially during the construction phase.

4.3.6 The groundwater flooding risk to the property and basement is considered to be overall low and the risk reduced further by the appropriate mitigation measures stated within this section.

4.4 Surface Water Flooding and Sewer Flooding

4.4.1 Surface water and sewer flooding across urban areas is often a result of high intensity storm events which exceed the capacity of the sewer thus causing it to surcharge and flood. Poorly maintained sewer networks and blockages can also exacerbate the potential for sewer flooding.

Surface Water Flooding

4.4.2 It has been established that the site lies within the Group4-057 Critical Drainage Area. The SWMP notes that surface water follows the natural valley and there is no clear outfall due to the presence of railway embankments. The SWMP continues to state that surface water is observed to pond in low-lying areas such as those around Culvert Road and Seven Sisters Road.

4.4.3 The SFRA notes that due to the predominantly clay geology there is little opportunity for surface water to infiltrate into the ground resulting in increased volumes of surface water runoff. The SFRA also states that the extent of surface water flooding is controlled by the topography as well as the impermeability of the land surface.

4.4.4 It is difficult to identify the surface water flood risk to the site from Figure 6-7 of the SFRA and the SWMP, therefore, the updated Environment Agency's Surface Water Flooding Map has been consulted instead (Figure 3).

4.4.5 The Agency's Surface Water Flooding Map (Figure 3) indicates that across the site there is a very low surface water flooding risk (i.e. less than 1 in 1000 year chance).

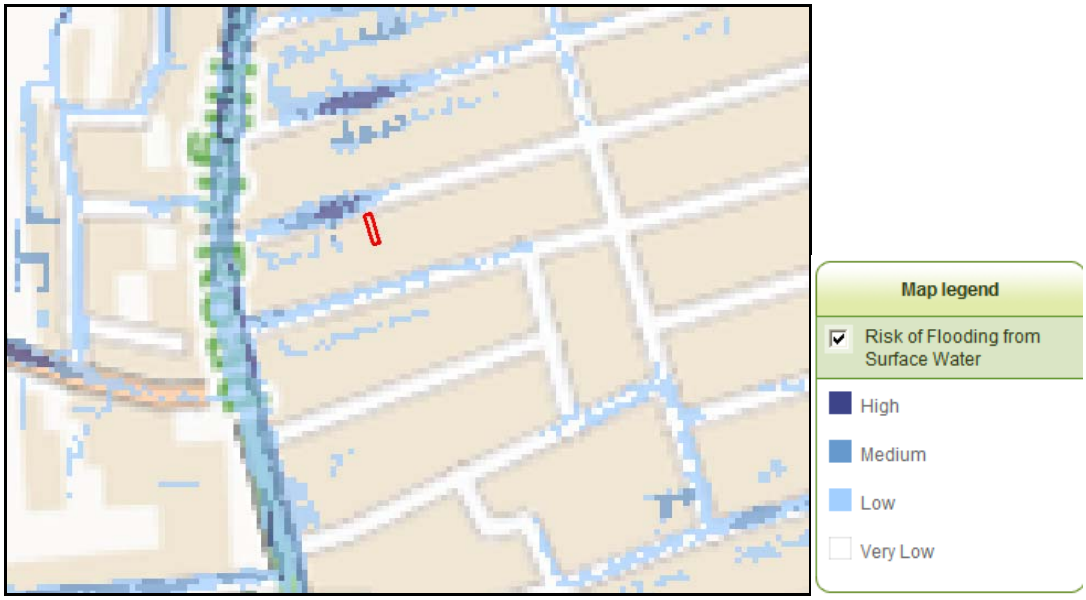


Figure 3: Environment Agency Surface Water Flooding Map, site extent and OS (Source: Environment Agency, 2016)

Sewer Flooding

4.4.6 The SFRA states that the impact of sewer flooding is generally localised to where a blockage or failure of a sewer network occurs. Table 3-5 of the SWMP indicates that there have been no recorded sewer flood records within this postcode area.

4.4.7 It is understood that foul water from the basement level will be pumped to ground floor level where it will flow into the surrounding sewer system via gravity. It is recommended that despite a low risk of sewer flooding, a non-return valve (e.g. http://www.forgevalves.co.uk/) should be installed so that the basement (and upper floors) will be protected further from sewer flooding.

4.4.8 Therefore, if the sewer in the road becomes completely full during a heavy storm, foul water does not backflow into the property.

4.5 Reservoirs, Canals And Other Artificial Sources

4.5.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can also occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.

4.5.2 The Environment Agency's "Risk of flooding from reservoirs" map and Map 10 of the SFRA suggests that the site is not at risk from reservoir flooding.

5. SURFACE WATER DRAINAGE AND SUDS

5.1 Policy 5.13 in Chapter 5 of the London Plan dated March 2015, requires sustainable drainage systems (SUDS) to be installed where appropriate and in line with the drainage hierarchy in order for runoff to be managed as close to its source as possible. This is also in line with the SUDS advice on the Haringey website and Policy DM25 of the emerging Development Management DPD dated January 2016.

5.2 There will not be an increase in impermeable area as a result of the development and the basement will mainly be beneath the existing dwelling footprint. Where the basement extends into the front and rear garden, these areas are currently paved. Overall, there will not be a net increase in impermeable area and there will not be an increase in runoff rate, runoff volume or flood risk to neighbouring areas as a result of the proposed development, thus complying with the aforementioned policies and Policy DM18 of the emerging Development Management DPD dated January 2016.

5.3 However, Policy DM25 of the emerging Development Management DPD dated January 2016 states that all minor development proposals should aim to achieve a Greenfield runoff rate and, at a minimum, achieve a 50% reduction on existing site run-off rates.

5.4 The London Plan states that SUDS should be utilised unless there are practical reasons for not doing so. Policy DM25 of the emerging Development Management DPD dated January 2016 states that where SUDS cannot be implemented due to site constraints (such as space limitations) robust justification must be provided along with the proposed alternative sustainable approaches to surface water management.

5.5 Due to the limited available space, and as there will not be an increase in impermeable area or flood risk as a result of the basement development, the use of SUDS are unlikely to be suitable at the site.

5.6 Despite this, SUDS measures such as rain gardens (i.e. vegetated depressions which hold back water) could be considered together with pervious surfaces. For example, impermeable surfaces comprising the side passage and front paved garden could be replaced/retrofitted with permeable block paving which would result in a net decrease in impermeable area across the site.

6. CONCLUSIONS

- A review of the relevant guidance documents and various types of data collected at the site has enabled a full assessment of the flood risks to be quantified.

- The site is located within the Flood Zone 1 therefore all uses of land are appropriate in this zone.

- This assessment has investigated the possibility of groundwater flooding and flooding from other sources at the site. It is considered that there will be low risk of groundwater flooding across the site.

- There is a low risk of flooding from other sources such as sewers and surface water, however, as a precaution; the risk from sewer flooding should be mitigated further by introducing a non-return valve to the pumped system.

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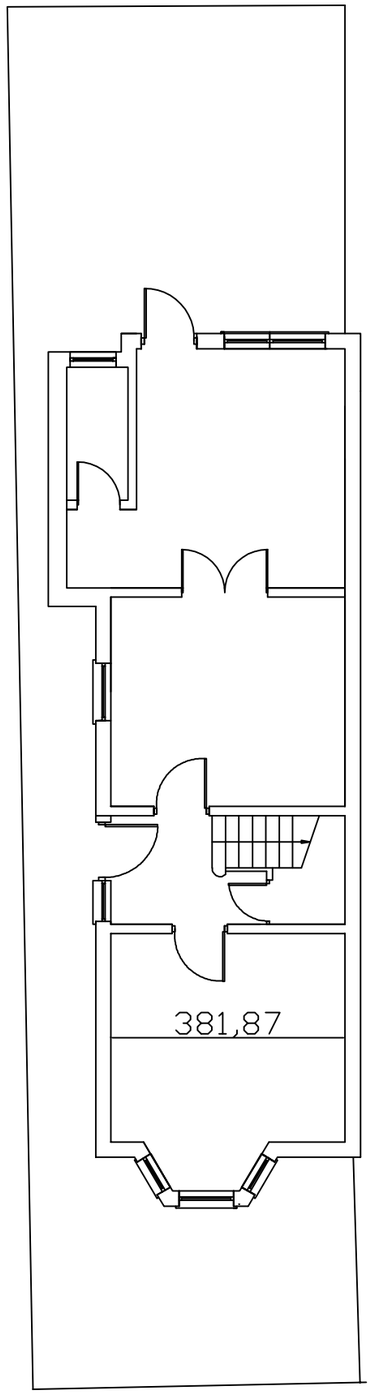
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DRAWINGS

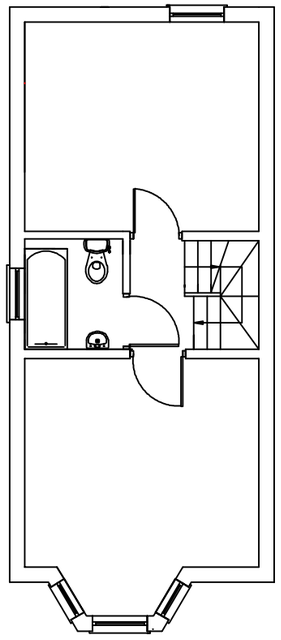
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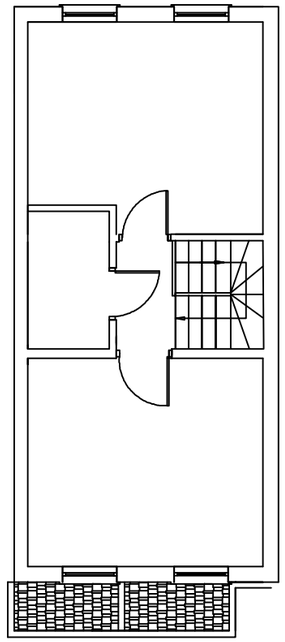
SCALE



Ground Floor



First Floor



Second Floor

YL & AJ

07749708930

NOTES

The contractors are to check all the dimensions, levels,drain runs and general condition of the site before works commence.

All works are to be carried out in accordance with current Building Regulations, British Standards, Code of Practice and Local Authority Requirements. Do not scale of from this drawing.

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24 Gladesmore Rd
London N15 6TB

Title:

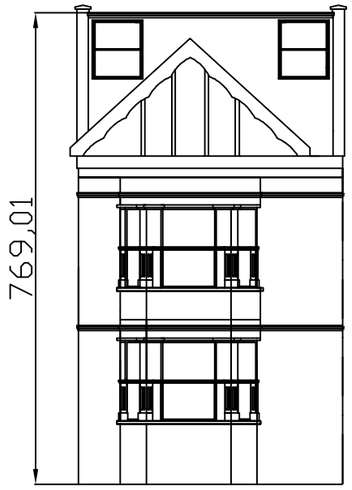
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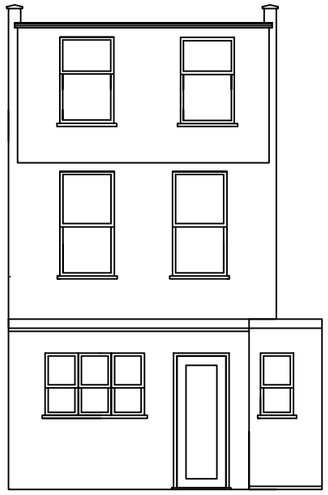
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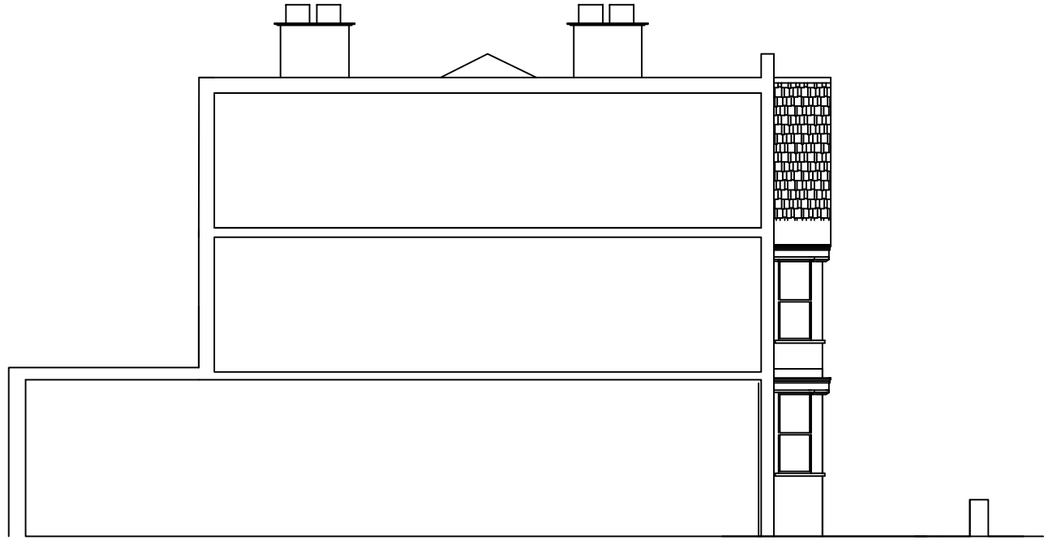
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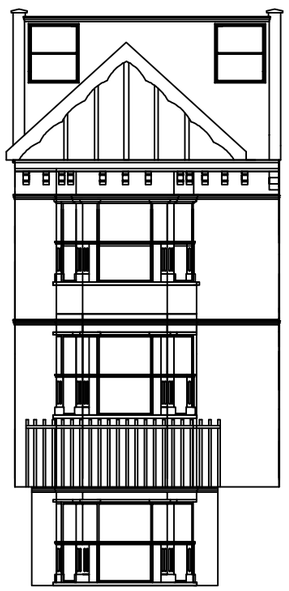


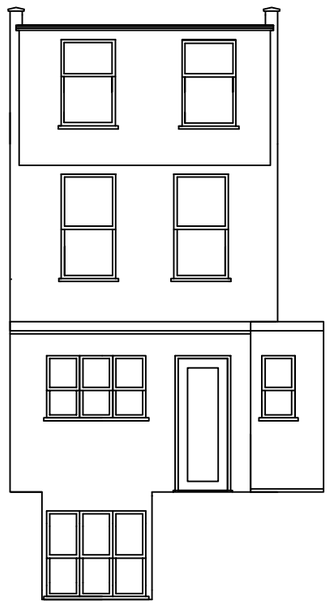


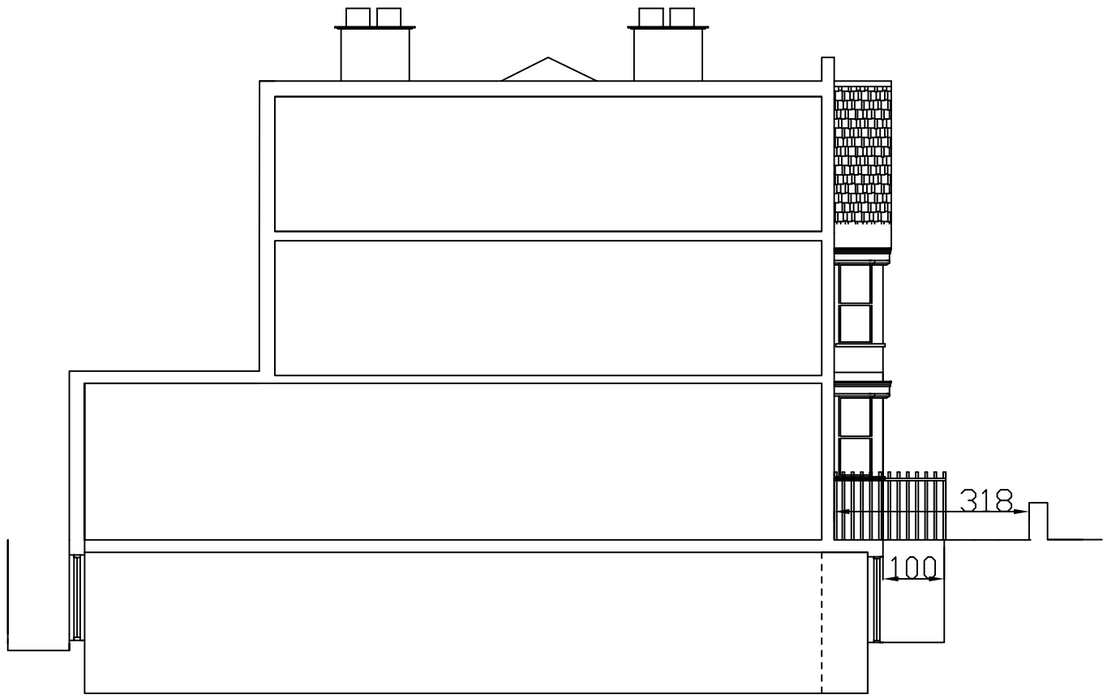


Front Elevations Rear Elevations Section

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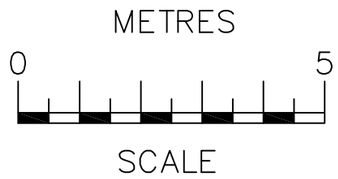






Front Elevations Rear Elevations Section

PROPOSED



YL & AJ
(07749708930)

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24 Gladesmore Rd
London N15 6TB

Title:
-EXISTING & PROPOSED-
Elevations & Section

Date: Apr '15

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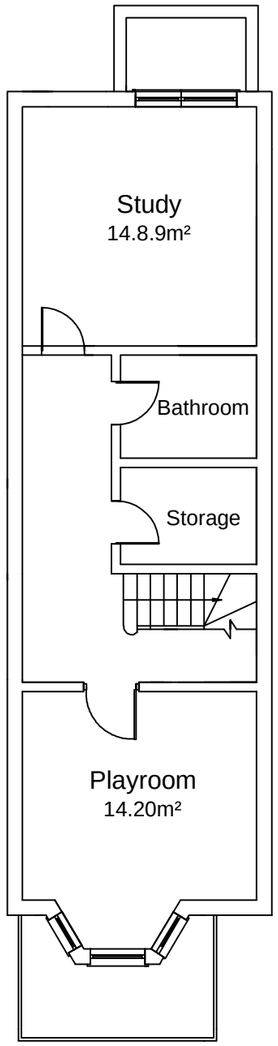
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Rev: 1

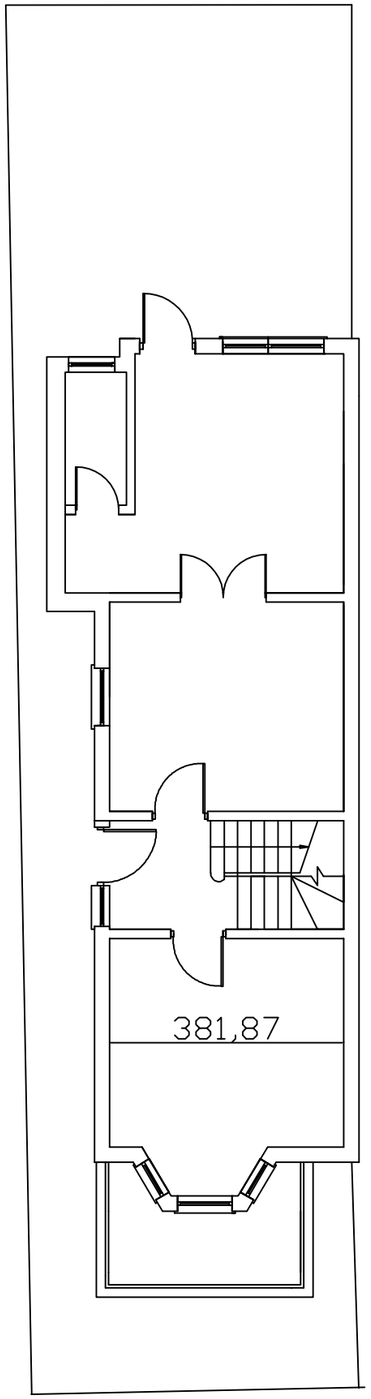
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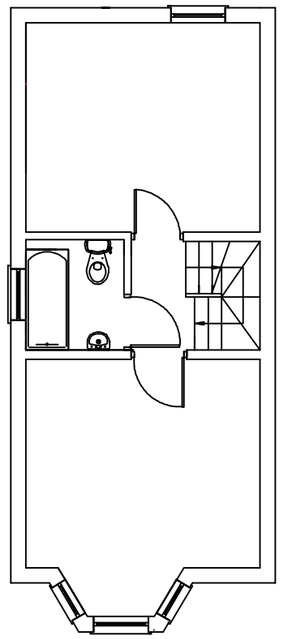
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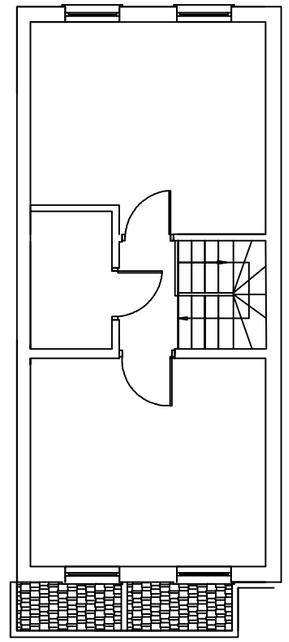
Basement



Ground Floor



First Floor



Second Floor

& AJ
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Project:
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London N15 6TB

Title:
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Floor Plans

Date: Apr' 15

Scale: 1;100 @ A3

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Rev:


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