

16 ETON VILLAS

LONDON, NW3

**Report on Structural Defects
and Repairs**

Consulting Engineers

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Introduction

The property is a Grade 2 Listed, mid-Victorian semi-detached house. It has previously been altered to create a separate apartment at Lower Ground Floor level with its own side entrance. The building has been poorly maintained for a long period (resulting in cracking and loss of adhesion of render, for example), and it is therefore intended to restore stability and structural integrity during the works proposed by the new owner.

Instructions

Trigram Partnership LLP were appointed by Mr & Mrs J Bekhor to investigate and report on cracks in the facades, and to define structural remedial works as necessary, both internal and external.

Surveyor's Report

A 'home-approved' report was prepared by a surveyor recording the general condition of the property and making recommendations for repairs. Areas of concern included the following:-

Pitched and Flat roofs: the slated slopes were considered to be at the end of their life, and the abutments with the Party Wall upstand and chimney stacks were considered to be poorly detailed. Localised timber repairs can be expected to be necessary.

Roof Dormers and Exterior Timbers: extensive rot and deterioration was noted, to all areas (frames, cills, fascias, etc). Replacement / re-construction of much was recommended. Hidden timbers (sub-structural members) are also likely to require replacement. Treatment of the reported insect damage was recommended.

Lower Ground Floor Walls: extensive damp was encountered throughout; some external walls retain soils to over a meter in height, with dampness penetrating laterally.

Facades: extensive cracking of the fully-rendered walls at all levels. Some areas of previous repair were noted to have been poorly executed. The cracking was considered to be historic with no signs of ongoing movement. Cracking of the masonry walls, and loss of bond of the render, was anticipated.

Internal Stud Walls and Joisted Floors: uneven floor (slopes) and cracks at the corners of rooms, between stud walls and external walls were noted.

Further investigation and / or repairs were recommended. Those associated with structural defects are noted below. The owner has also had a damp survey carried out, which confirmed the need of a new injected DPC and water-proof render internally. It was noted that the external render bridges the DPC and would need to be modified to create a 'break' at the level of the DPC.

Structural form of the house

The house is of traditional construction with solid masonry external walls on stepped footings. Some walls act as soil-retaining walls (e.g. flank wall, and front entrance walls). Upper floors are of timber joists but the Lower Ground floor is generally of solid construction.

Some internal wall are load-bearing. It is noted that both load-bearing cross-walls have hidden transfer structures – one at 1st Floor level and the other at Upper Ground. This latter appears to be poorly considered, leading to sagging and defects in the supported floors. Local additional supports which are proposed to be installed from below, (to properly support the wall), are shown in Appendix C.

Investigations of Structural Defects

A desk study shows the locality to be underlain by London Clay, which is known to readily soften if water is present.

A walk-over inspection shows that there are a number of cracks in the front façade, flank wall, and rear façade. The front entrance steps and porch are also cracked and steel beams have been recently installed below the entrance steps

The front light-well is of recent (re) construction, and its walls have a number of cracks. The left hand free-standing boundary wall is severely out of plumb, and attempts to arrest on-going movement have been carried out, with vertical steel posts installed at intervals.

Man-hole covers were noted in front of the entrance steps and also within the Basement apartment.

Site investigations

A CCTV survey of the below-ground drainage was carried out. The internal man-hole and clay-ware pipes are believed to have been constructed when the house was sub-divided. The CCTV inspection confirmed that many pipes are cracked and some joints are displaced. Therefore, water will have been leaking into the surrounding soils. A layout of the drains, and the locations for defects, is shown in Appendix B.

NHBC Guidelines

The NHBC 'Chapter 4.2' provides guidelines on foundation depths necessary to isolate foundations from seasonal soil movements due to particular tree species of a given size, at set distances from the foundations, on clays with different shrinkage potentials. These are for single tree; there is a group of trees to the front and a single tree to the rear. Therefore the effects at the front can be expected to be greater.

The recommendations are summarised at Appendix D. The single tree to the rear is too distant to have any affect, those at the front (if 'managed', see below) may not have any effect on the property.

Foundation Movement

Water leaking from the cracked pipes within the footprint of the house would tend to flow along the trench of the principle sewer passing parallel to the flank wall, and under the house entrance steps and front façade. Softening of the clay would reduce the clay's capacity and thus may be the cause of foundation settlement and thus cracking of the facades. Repair of all leaking drains would terminate this action.

The Purchaser's Surveyor reported that these façade cracks are historic.

Trees

The two mature Plane trees to the front have both previously been 'managed', with crown reduction being apparent (see photos in Appendix D). The single mature Chestnut to the rear has also been maintained, but to a lesser extent.

Ongoing tree management is recommended as good practice.

Proposed Works

It is proposed to carry out some alterations within the property, in both the main house and the separate apartment.

The existing arrangement of floor spans and supporting walls are proposed to be retained.

It is proposed to bring more of the existing top floor into use by creating headroom in the flank roof slope, over the stairwell, by enlarging an existing dormer. The main roof slopes, hips and ridge-line would be un-changed.

It is proposed to protect the foundations from further movement by adopting the following strategy:-

1. Repair the below-ground drains.
2. Ensure incoming water supply is intact.
3. Reduce size of the trees' canopies.
4. Resin-inject cracks; replace cracked bricks; install either stitch-lintels or Helibar reinforcement across cracks.

This strategy is intended to ensure that any cracking due to leaking pipes ceases, but ongoing management of the trees would be essential. Should further cracking occur then we would recommend that the possible effects of the trees is investigated.

This short report was prepared by:



B Huxtable CEng MIStruct E MICE MSt, BSc (Hons)
June 2015

Appendix A: Plans, etc, as Existing

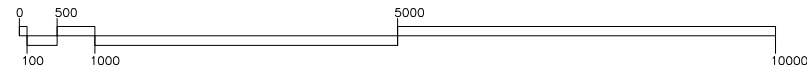
Blue Engineering Drawings:

100: Lower and Upper Ground Floors.

101: First and 2nd Floor plans.

102: Elevations to Front and Rear.

103: Side Elevation and Section A-A.

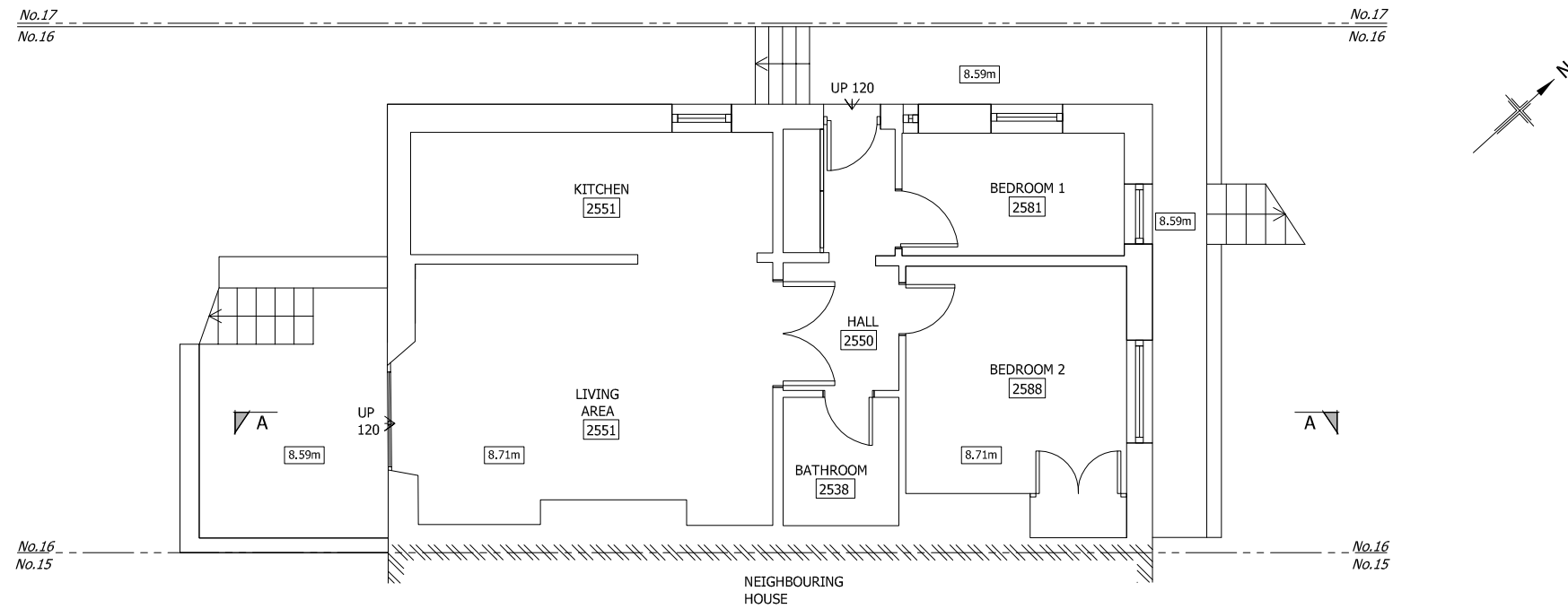


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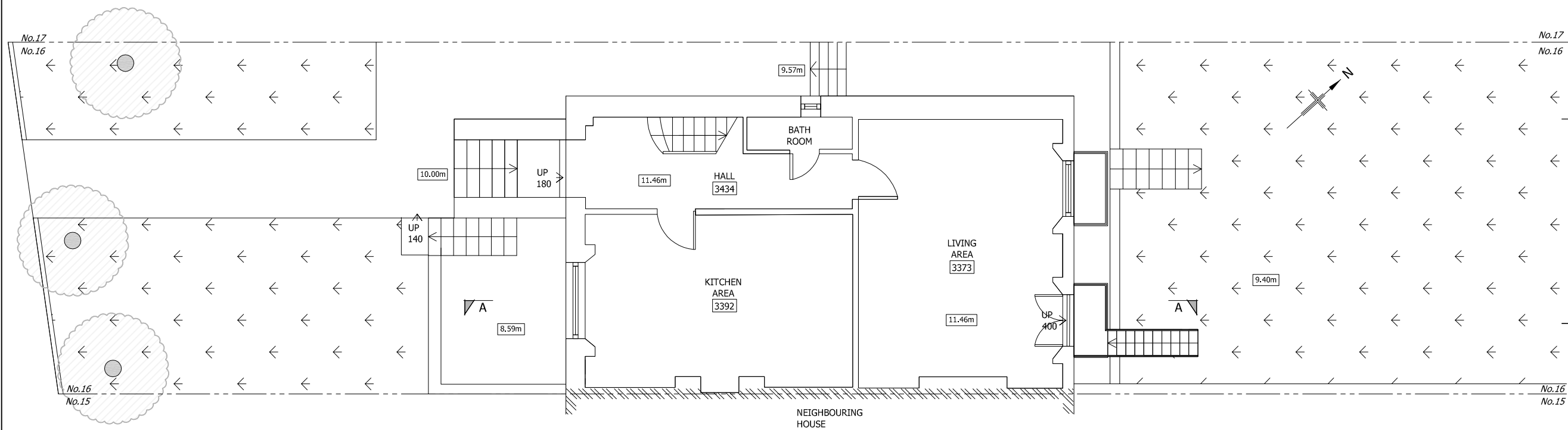
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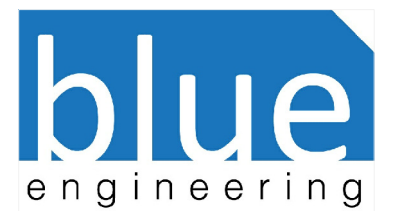
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P2	01.06.15	Revised levels	CM	JG
P3	02.06.15	Revised levels	CM	JG



Lower Ground Floor Plan
Scale 1:100 @ A3



Ground Floor Plan
Scale 1:100 @ A3



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Client
**Existing Lower Ground
and Ground Floor Plan**

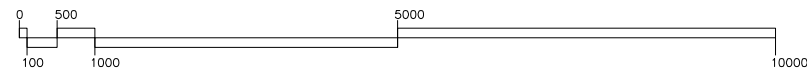
Project
16 Eton Villas, NW3 4SG

Client
Joesph Bekhor

Job No. Drawing No. Revision

2347-100 (P3)

ISSUED FOR COMMENT 1:100 @ A3

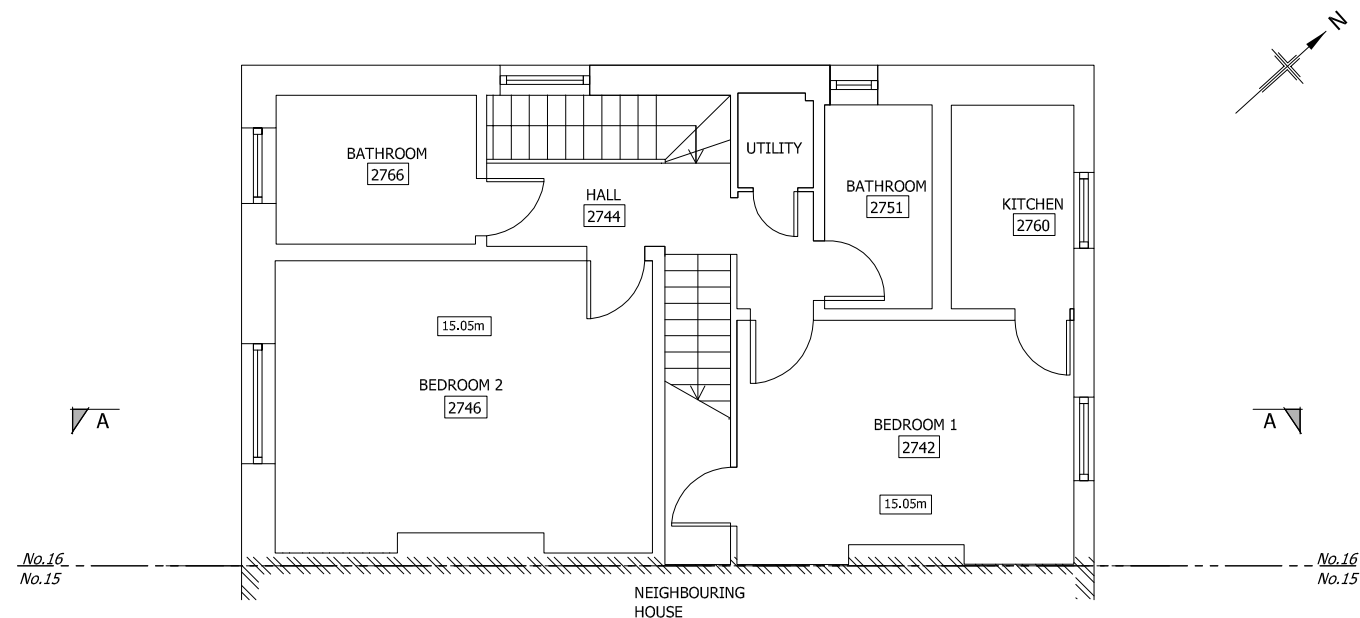


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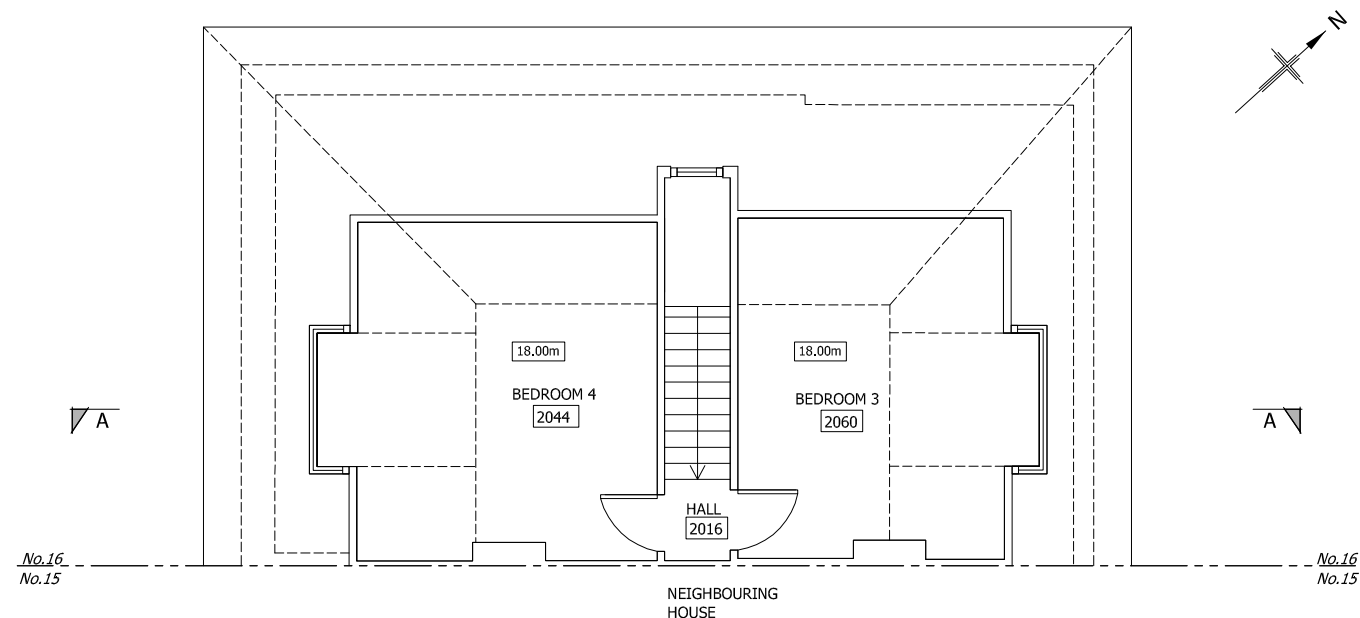
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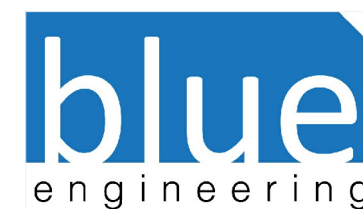
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First Floor Plan
Scale 1:100 @ A3



Loft Floor Plan
Scale 1:100 @ A3



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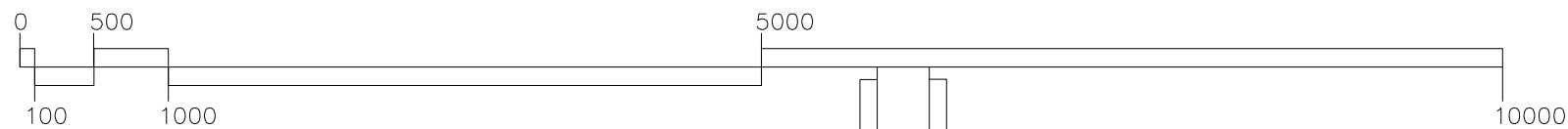
Existing First and
Loft Floor Plan

Project
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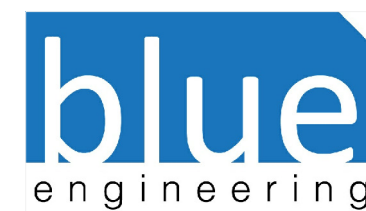
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P2	01.06.15	Revised levels	CM	JG
P3	02.06.15	Revised levels	CM	JG



Existing Front Elevation
Scale 1:50 @ A3

Existing Rear Elevation
Scale 1:50 @ A3



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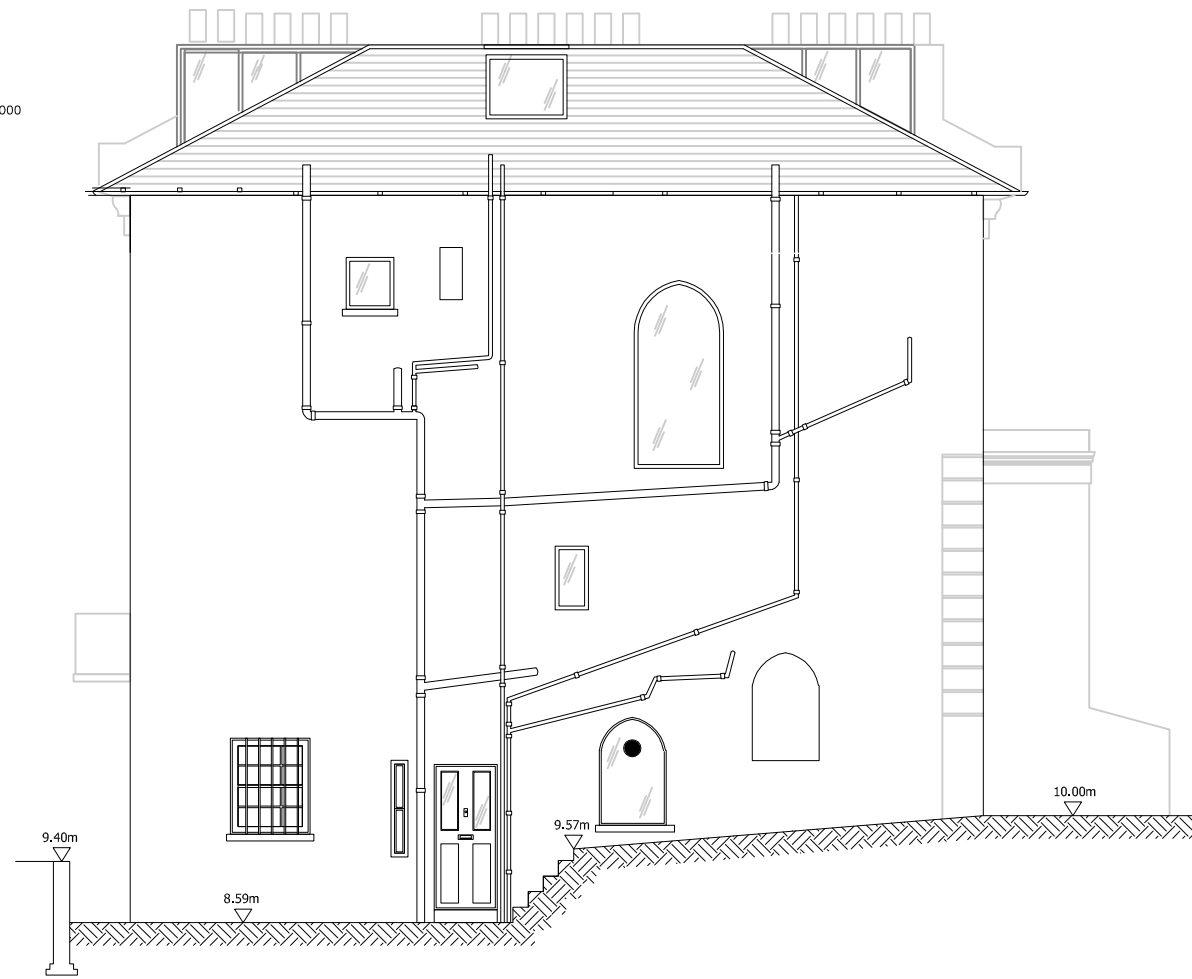
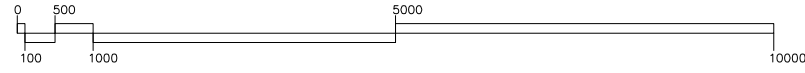
Existing Elevations

Project
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Client
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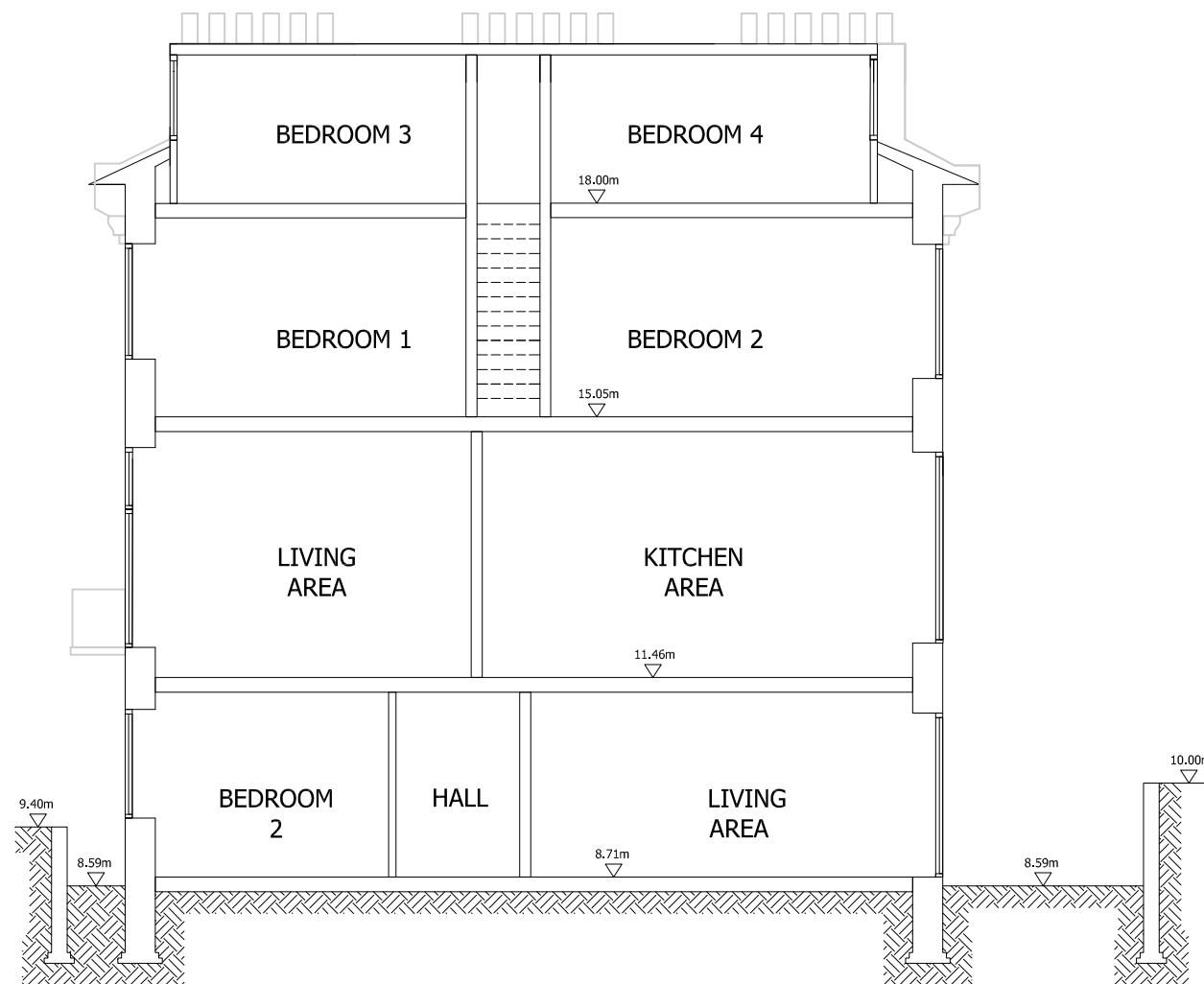
Job No. Drawing No. Revision

2347-102 (P3)

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Existing Side Elevation
Scale 1:100 @ A3



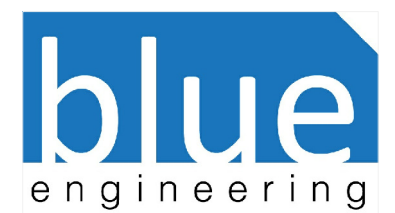
Existing Section A-A
Scale 1:100 @ A3

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Title
**Existing Side Elevation
and Section A-A**

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2347-103 (P3)

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Appendix B: Record of Defects: Plans and Elevations

Trigram Partnership LLP drawings:

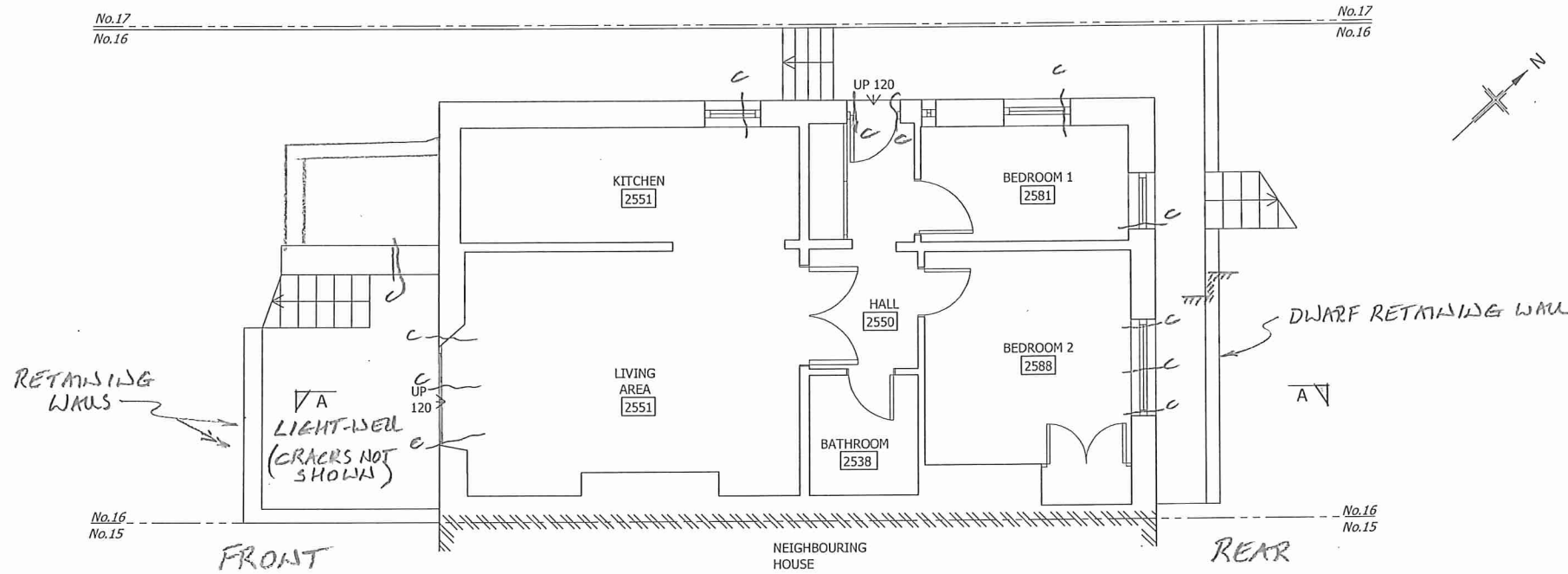
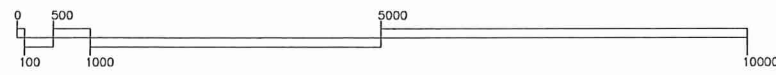
Record of Defects as at 12/3/2015

- SK/01: Lower and Upper Ground floor plans
- SK/02: First and Second floor plans
- SK/03: Front and Rear Facades
- SK/04: Side Elevation
- SK/05: Below-Ground Drainage

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Drawing History

REV	DATE	DESCRIPTION	DRAWN	CHKD
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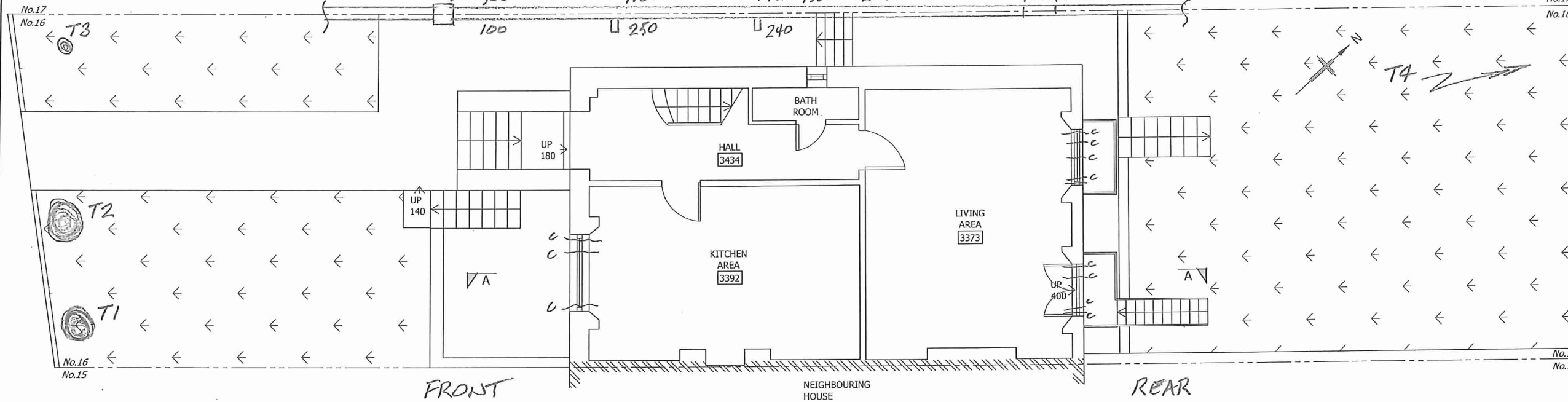
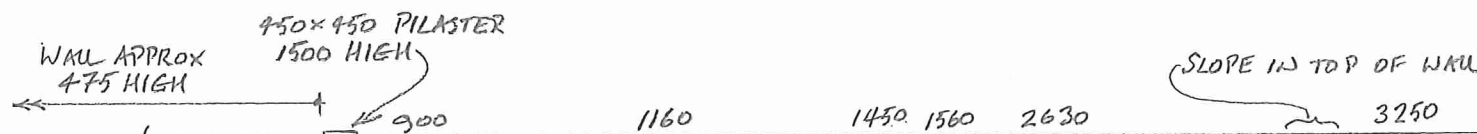


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RECORD OF FACADE CRACKS			
AS AT 12/3/2015			
4289/SK/01	03/15	BN	

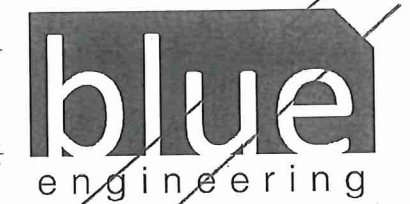
LEGEND:-

- CRACK OVER WINDOW/DOOR
- HEIGHT OF BOUNDARY WALL, mm
- OUT OF PLUMB (APPROX), mm
- T1-T4 DECIDUOUS TREE



TREES:-

T1	LONDON PLANE	T4	NYK
T2	LONDON PLANE		
T3	PLUM (?)		



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Title
Lower Ground and
Ground Floor Plan

Project
16 Eton Villas, NW3 4SG
Client
Joseph Bekhor

Job No. Drawing No. Revision

~~2347-100 (P1)~~

ISSUED FOR COMMENT 1:100 @ A3

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Drawing History

REV	DATE	DESCRIPTION	DRAWN	CHKD
P1	25.02.15	Issued for Comment	CM	JG



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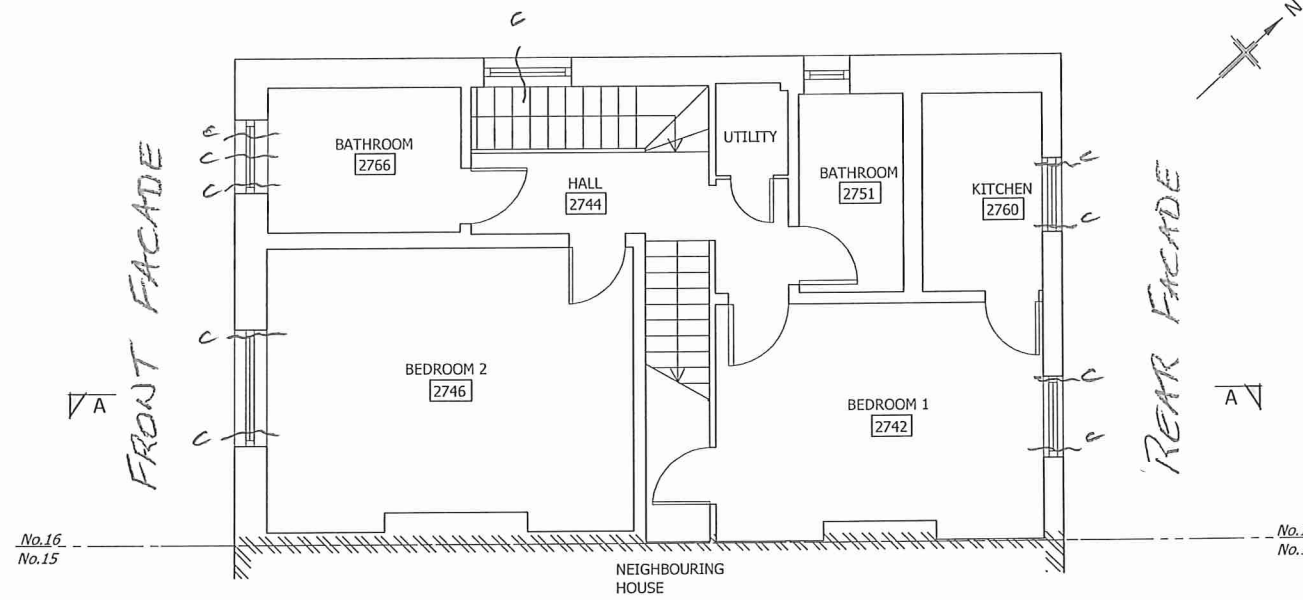
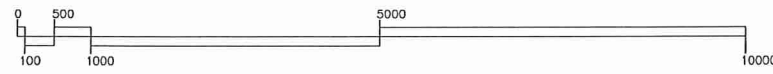
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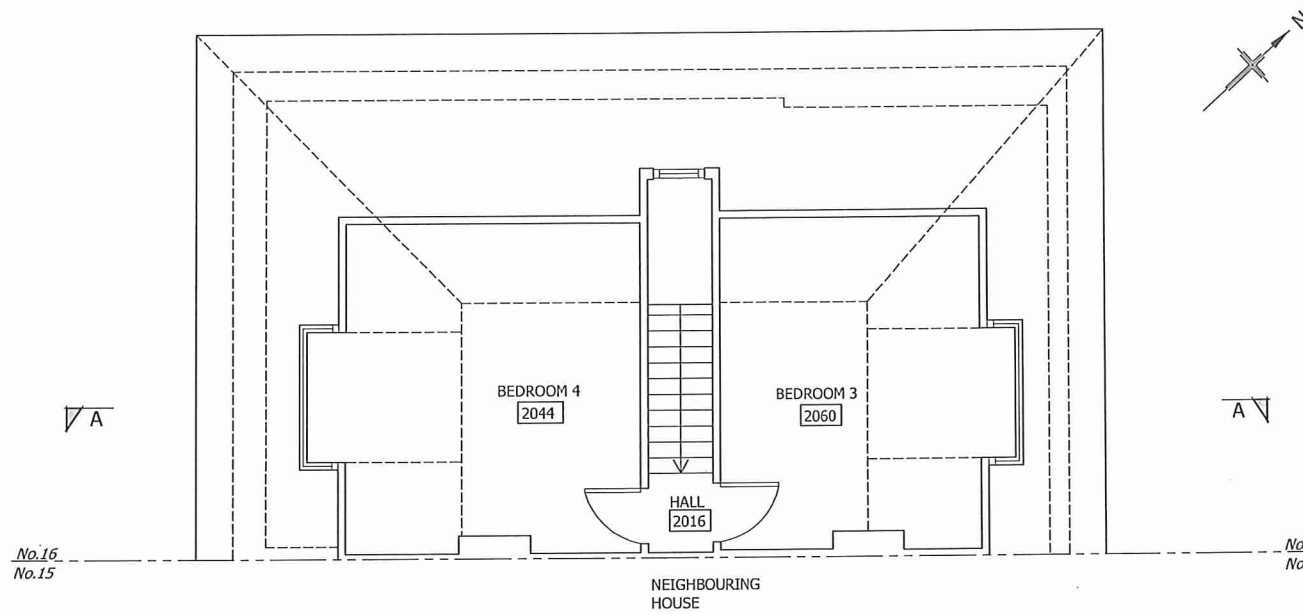
RECORD OF FACADE CRACKS			
AS AT 12/3/2015			
4289/SR/02	03/15	BJ	

LEGEND:-

CRACK, ABOVE WINDOW



First Floor Plan
Scale 1:100 @ A3



Loft Floor Plan
Scale 1:100 @ A3



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Title

First and
Loft Floor Plan

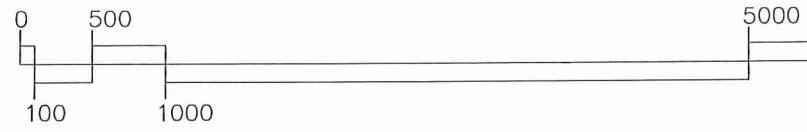
Project
16 Eton Villas, NW3 4SG

Client
Joesph Bekhor

Job No. Drawing No. Revision

~~2347-101~~ (P1)

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P1	25.02.15	Issued for Comment	CM	JG



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RECORD OF FACADE CRACKS			
AS AT 12/3/2015			
4289	/SK/03	03/15	TCH

LEGEND:-

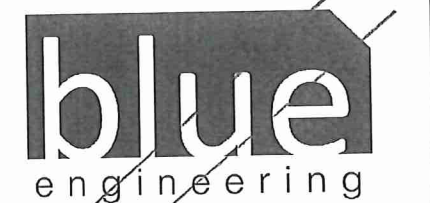
CRACK IN RENDER



Existing Front Elevation
 Scale 1:50 @ A3



Existing Rear Elevation
 Scale 1:50 @ A3

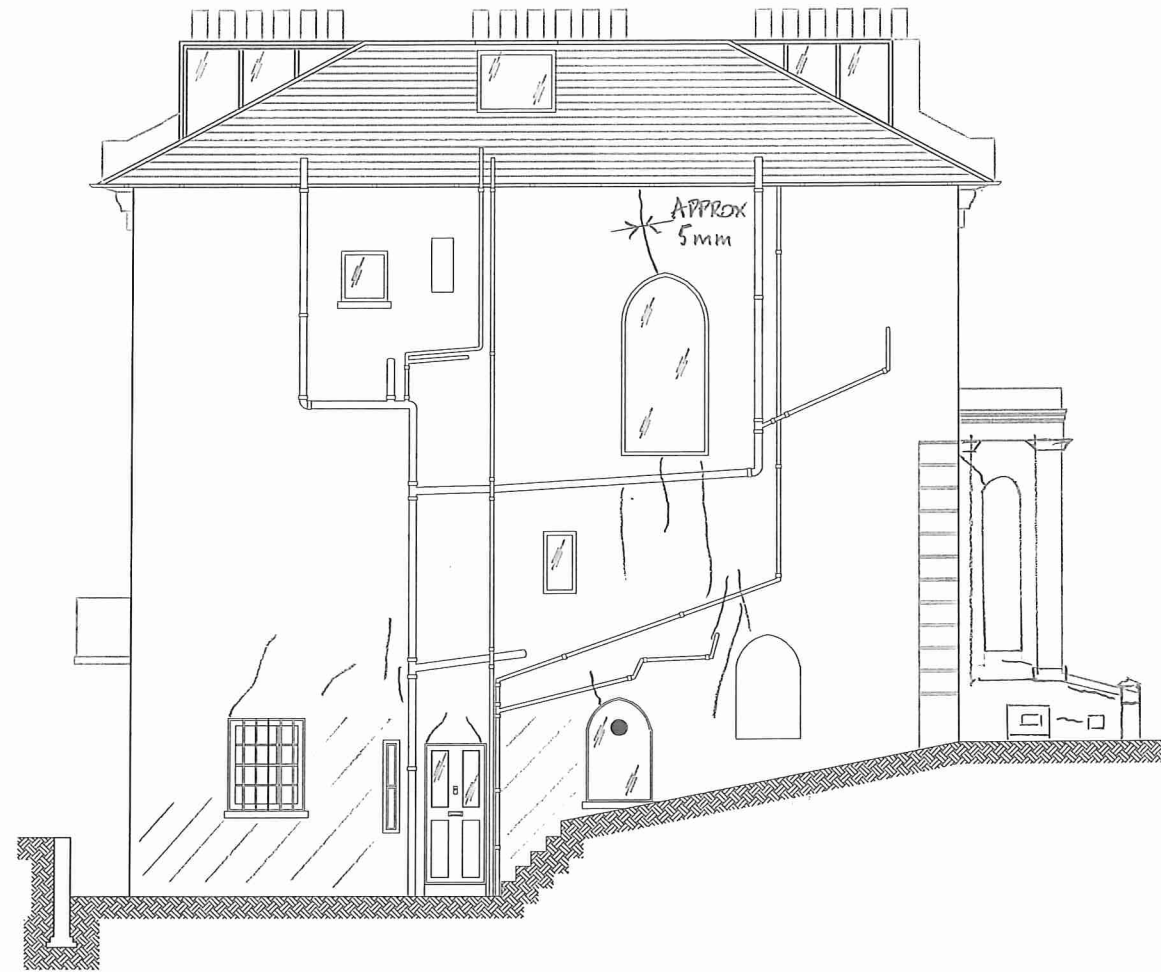
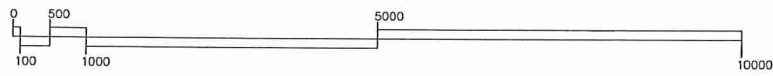


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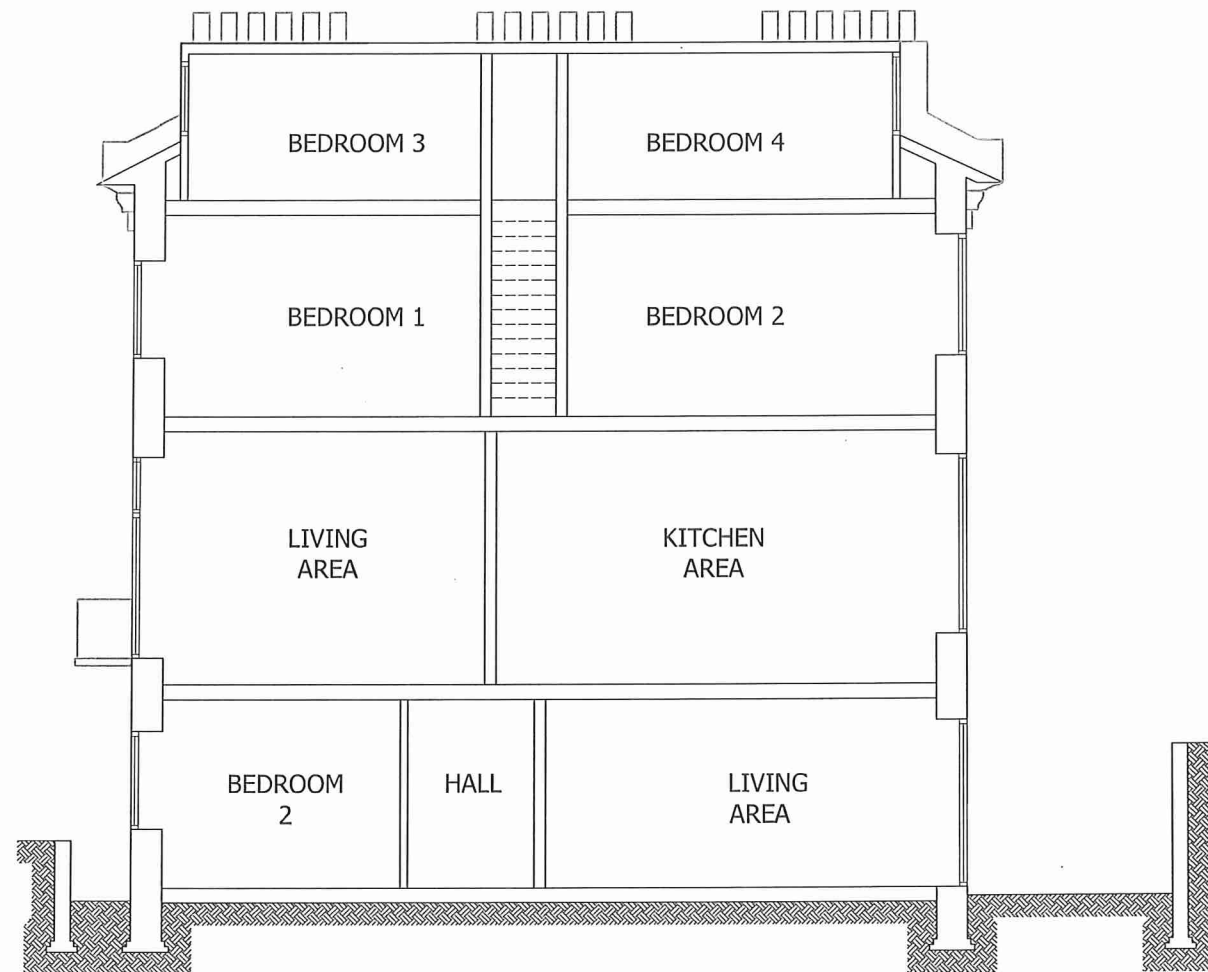
Title
 Elevations

Project
 16 Eton Villas, NW3 4SG
 Client
 Joesph Bekhor

Job No. Drawing No. Revision
~~2347-102~~ (P1)
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Existing Side Elevation
Scale 1:100 @ A3



Existing Section A-A
Scale 1:100 @ A3

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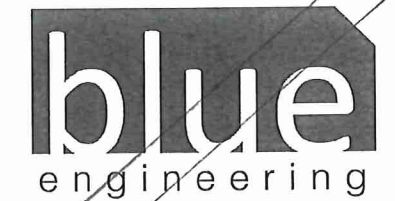
mail@trigrampartnership.com

Registered in England : 0C309613

RECORD OF FACADE CRACKS			
AS AT 12/3/2015			
4209/SK/04	03/15	DL	

LEGEND:-

- CRACK
- ZONE OF REPAIRED RENDER



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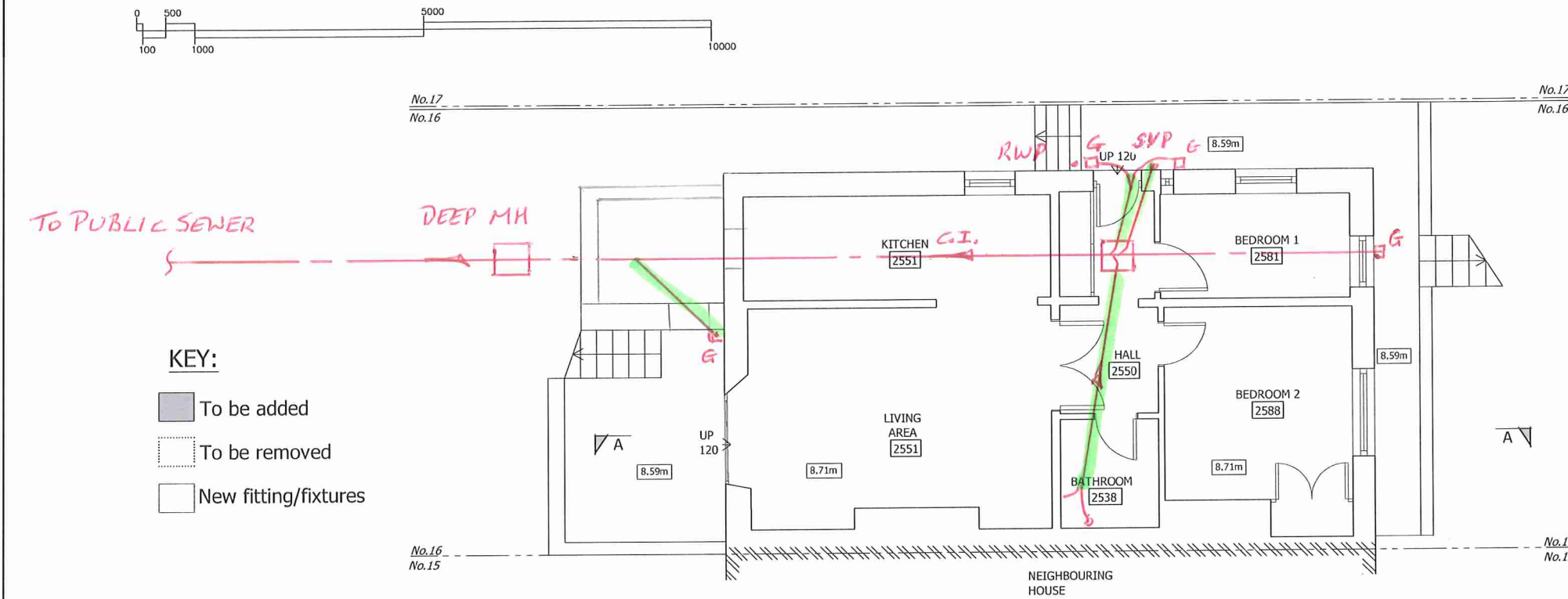
Title
Side Elevation and
Section A-A
Project
16 Eton Villas, NW3 4SG
Client
Joesph Bekhor

Job No. Drawing No. Revision
~~2347-103 (P1)~~
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P2	01.06.15	Revised levels	CM	JG
P3	02.06.15	Revised levels	CM	JG



BELOW-GROUND DRAINAGE :-

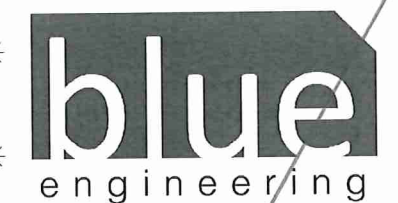
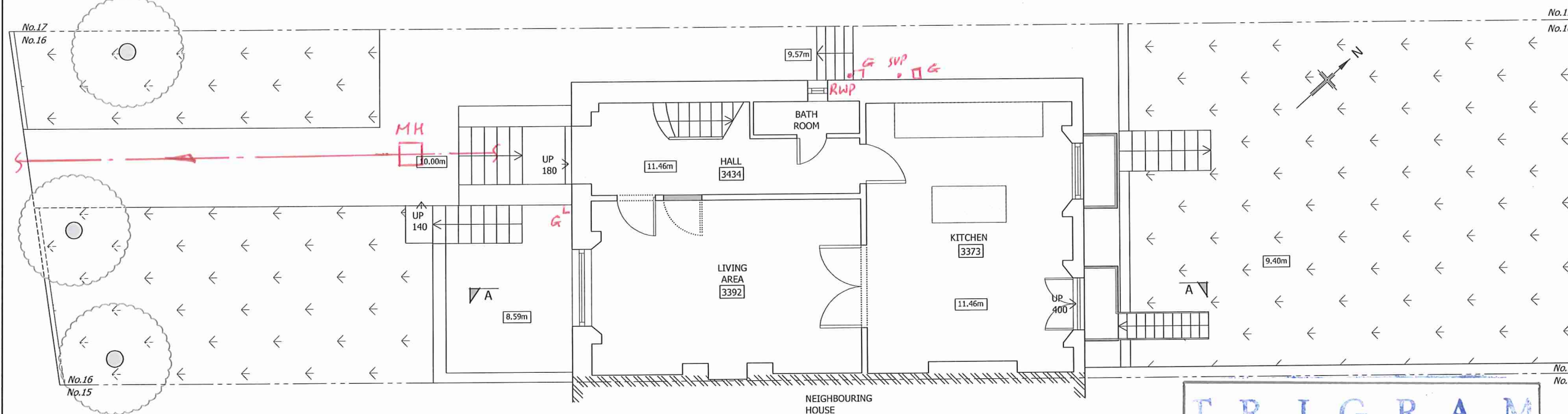
LEGEND :-

- MH MANHOLE
- C.I. CAST IRON PIPE
- CLAYWARE PIPE
- GULLY
- SOIL VENT PIPE
- RAIN WATER PIPE
- CRACKED PIPE

KEY:

- To be added
- To be removed
- New fitting/fixtures

Lower Ground Floor Plan
Scale 1:100 @ A3



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Title
Proposed Lower Ground and Ground Floor Plan

Project
16 Eton Villas, NW3 4SG

Client
Joesph Bekhor

Job No. Drawing No. Revision
2347-200 (P3)
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TRIGRAM PARTNERSHIP
16 ETON VILLAS, NW3
DRAINAGE DEFECTS
4209/SK/05 06/15 TSK

Ground Floor Plan
Scale 1:100 @ A3