engineersHRW

75 Lawn Road

Structural Survey

March 2019

Index

Revision	Status	Date	By	Checked
First	Draft	14/03/19	BS	
A	Final	22/03/19	BS	SH
B	Amended	25/03/19	BS	SH

Introduction

Appointment and brief

EngineersHRW have been appointed by Eamonn Hogan to carry out a non-intrusive survey of the existing building at 75 Lawn Road. The rear of the building is showing evidence of subsidence which was not evident at previous visits to the property.

The aims of the report

This report covers the work undertaken in the assessment which includes a review of previous report and investigations and a site walkaround.

The aims of the report are as follows:

- to confirm our understanding of the brief and scope.
- to assess the extent of damage to the existing building.
- to provide possible causes for the damage
- to provide recommendations for repair or reconstruction.

Existing Structure

Site

The site is located to the west side of Lawn Road, a residential road in the Belsize Park area of Camden. Access is gained from Lawn Road only. There is a garden to the rear of the property with a boundary to the garden of the rear neighbour's property. There are similar residential buildings to both the north and south side of the site. The house to the north, number 74 Lawn Road, shares a party wall with number 75 for the full length of the building and has a neighbouring garden wall at the back. Number 76, to the south side, shares a small section of party wall towards the rear and has a neighbouring garage wall and short external wall neighbouring the site. The site is approximately 400m^2. It is situated within the Parkhill conservation area and is cited as contributing to the character of the area. The building is not listed and there are no listed buildings neighbouring the site.

Existing Building

The existing house is a two-storey semi-detached loadbearing masonry structure with timber joist floors spanning side to side at first floor and a concrete ground floor slab. There is currently a loft space within the pitched roof which is accessed by ladder and used only for storage. The existing timber roof includes several beams which are structurally sound but have a noticeable bow along their length. A two-storey set-back portion of the property at the south west side houses the garage and a small first floor bedroom. This portion sits behind the paved driveway to the south side of the site which slopes down to the east end to meet road level. The small front garden is over 1m higher than pavement level with steps leading up to the front door. There is a larger garden at the rear which slopes by about 1.5m from the rear end at the west, where there are a number of trees, to the east end adjacent to the rear boundary.

Geology

A Geotechnical Site Investigation has been carried out by SAS. The exploratory borehole revealed that ground conditions are generally consistent with the geological records and known history of the area which is comprised of MADE GROUND up to 0.9m deep above a layer of Superficial Head Deposits which extend down to depths between 1.3 and 1.7m, these consist of slightly silty slightly clayey SAND/stiff silty sandy CLAY. The LONDON CLAY FORMATION then extends down to the full depth of the investigation of 15.0m. The clay here is stiff silty CLAY with occasional pockets and partings of silty fine sand and scattered gypsum crystals. this clay has occasional bands of brown fine sand from 8.5m depth. The LONDON CLAY FORMATION increases in stiffness and from 9.60m depth is described as stiff high strength dark grey silty clay, becoming stiff to very stiff from 10.40m depth extending to the full depth of the investigation of 15.0m.

Site Visit

EngineersHRW visited the site on the 8 March to review the condition of the existing building. This was a visual survey and did not include any intrusive works. The notes in Appendix II identify the structurally significant damage to the building and is shown in photographs in Appendix 3. It should be noted that there are minor hairline cracks that are not structurally significant throughout the house. A more extensive photographic record has been made to allow for future reference but is not included in this report.

The most significant damage to the building is at the junction of the rear two storey garage section of the house where it meets the main body of the house. At first floor the cracks in the masonry wall dividing these elements are up to 20mm wide. These can be seen in photographs 14, 19 and 23. Minor cracks extend into the adjacent rooms at ground and first floor. The front wall of the garage shows evidence of movement relative to the adjacent property. The pointing at the junction shows a widening separation with height.

The damage suggests the garage section of the building is rotating towards the rear garden. Possible causes could be the large trees in the rear gardens or damaged drainage. The guttering and down pipe in photograph 7 shows signs of overflowing. The garage floor has also dropped away from the manhole in the centre of the garage. There is a possibility the drainage run from the rear garden manhole has failed.

Movement of the adjacent house, No76, was also apparent on the side elevation. This is towards the front of the property over the side door within the carport. This building has been surveyed by Alan Baxter in relation to possible movement due the basement construction at No 77 Lawn Road.

Damage in Garage

Information Review

No 75 Lawn Road Report

A Building Survey was carried out by Malcolm Hollis LLP prior to the current owners purchasing the house. The report states “Based on our findings to date, from our perspective as building surveyors we see no reason to advise you against proceeding with the proposed purchase of this building.”

At the date of the Malcolm Hollis inspection, June 2017, the cracking throughout the rear of the building was not apparent. The only issue of a structural nature identified was the recommendation to replace the timber purlins within the roof structure.

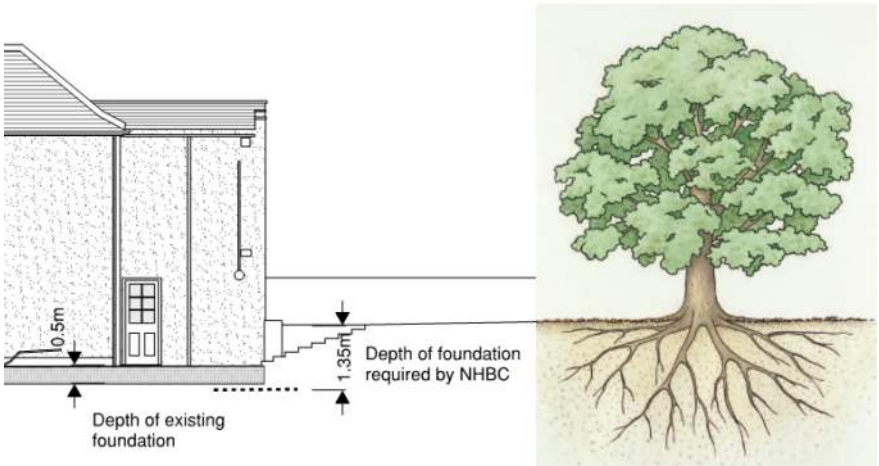
A CCTV survey of the existing drainage was also carried in conjunction with this survey. This identified minor damage requiring repair to the drainage in the rear garden plus some descaling elsewhere.

Existing Trees

An Arboricultural Impact Assessment has been carried out to support the planning application for a new basement at No75. The assessment considers root protection zones for the nearby trees that may be impacted by the development. Using this information, the site investigation by SAS and the design guidance given in Chapter 4.2 of the NHBC Standards it is possible to estimate if the trees may have an impact on the structure.

The SAS site investigation report defines the clay soils to be of high plasticity. This means the soil is sensitive to moisture changes and its volume will change with moisture content. The laboratory results indicate however that the clay is not desiccated at the depths tested. This infers the soil is not below its natural moisture level and hence would not have shrunk in response to the trees. The boreholes are however remote to the trees and the tests were at a depth of 2m, approximately 1.5m below the garage foundations.

Appendix IV indicates the influence zones of the trees based on the NHBC guidance. This shows that the Ash to the rear of No 75 may have an impact on the existing foundations. It is however not sufficiently definitive to confirm that this is the cause of the subsidence. The NHBC guidance would be for a depth of foundation of 1.35m from ground level, based on the ground level in the upper garden. Note that the existing foundation depth in the terrace area is approximately 0.5m below ground level and 1.1m below garden level. Typically, the foundations, based on the NHBC guidance, would be founded at a depth of 1m minimum below ground level.



No 76 Lawn Road Report

Alan Baxter were appointed by the owner of No 76 to review the causes of the cracking which may have occurred due to the construction of an adjacent basement at No 77. The report records the condition of the existing building, explores reasons for the cracking and also reviews the monitoring results associated with the basement works at No77.

We broadly agree with The Baxter Report which states the following: -

“The reason for the ground movements causing the main cracking to the building is not fully clear and we therefore recommend that additional monitoring and a number of trial pits are carried out to further investigate the cause of the movements. The trial pits should determine the depth of the footings, the nature of the clay and the presence of tree roots under the building. The condition of the underground drainage should also be checked by carrying out a CCTV survey.
Once the results of the investigations are obtained, it should be possible to confirm the cause of the cracking and movement to the property. Based on the information currently available, we consider that underpinning may be needed in order to stabilise the building.”

Conclusion

Based on our review of information available in reports, soil investigations, trial pits, and site visits, it is not possible to confirm the precise cause of the structural damage to No 75. It will undoubtably be due to settlement of the building resulting from moisture changes in the underlying soils beneath the foundations, which will have been exacerbated by unusually warm weather. The mature trees would be the most likely reason, however the information we have on the tree location and foundation geometry does not give a conclusive result. They are also covered by Tree Protection Orders, and are beneficial to the conservation area as a whole. It is therefore unlikely that their removal would be acceptable. We can also discount below ground drainage issues, as recent drainage CCTV evidence from No 75 suggests that whilst it has sustained some minor damage, this is not at a great enough extent to lead to the structural movement seen above ground.

In summary, the existing foundations of the house are not of a depth that would be acceptable based on current NHBC Standards, and as such, they have not been able to mitigate movement brought about by the recent moisture changes in the underlying soils.

This above ground damage cannot easily be reversed, and it may take a number of years for the underlying clay soils to be fully re-hydrated again. Further monitoring of the cracks could ascertain if the movement is seasonal or progressive, but in any instance the most likely and practical solution is to undertake underpinning. This would secure the property and ensure its long-term protection against any future ground movement. It should be noted that the same effect of shoring the property below ground could be achieved through the installation of a basement

Appendix I

Reference Information (Referenced but not included)

Nash Baker existing building drawings

Malcolm Hollis Building Survey Report dated 24 July 2017

Landmark Trees Report dated 26 January 2018

Alan Baxter 76 Lawn Road Report dated January 2019

SAS Report on a Phase 1 Risk Assessment dated March 2018

SAS Factual Report on a Ground Investigation dated March 2018

NHBC Standards Chapter 4.2

Appendix II

Site Visit Notes

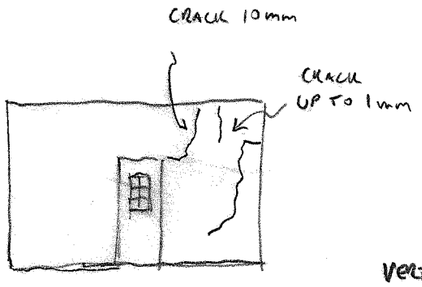
Workstage
4- TECHNICAL DESIGN

GENERAL NOTES

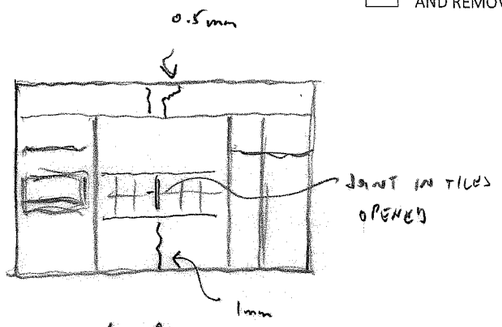
1. No dimensions to be scaled from this drawing for construction purposes.
2. This drawing is to be read in conjunction with all other consultants' drawings, specifications and schedules.
3. Any discrepancies found between this drawing and other documents should be referred immediately to the architect and consultants.
4. This drawing should be removed from currency immediately after a revised version is issued.
5. All dimensions are in millimetres.

0 1 2 3m

PROPOSED DEMOLITION AND REMOVAL



B - B
GARAGE



A - A
KITCHEN

Job No.	Dwg No.	Rev.
1722	101	A

SK/01
SITE VISIT
8/3/19

Rev	Date	Reason For Issue	Chk
A	12.10.2018	DEMOLITION, WINDOW/DOOR TAGS SHOWN SA	

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PROJECT	75 LAWN ROAD LONDON NW3 2XB
DRAWING TITLE	GROUND FLOOR PLAN AS EXISTING
JOB NUMBER	1722
DRAWING NUMBER	101
DRAWN	SA
CHECKED	-
SCALE	1:50/1:100
PAPER SIZE	A1/A3
DATE	20/07/2017
REVISION	A

Workstage
4- TECHNICAL DESIGN

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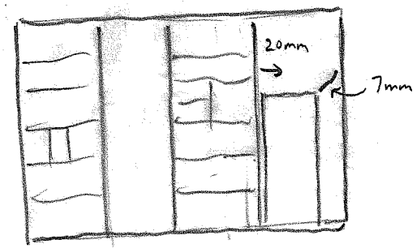
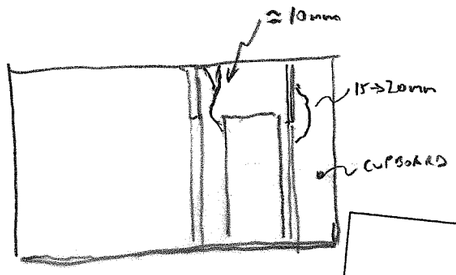
0 1 2 3m

PROPOSED DEMOLITION AND REMOVAL



A-A



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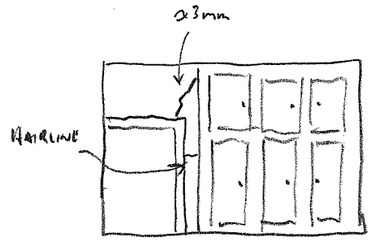
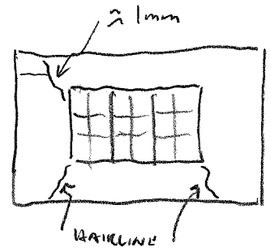


C-C



D-D

FIRST FLOOR PLAN

Job No.	Dwg No.	Rev.
1722	102	A

SK/02

SITE VISIT
05/3/19

Rev	Date	Reason For Issue	Chk
A	12.10.2018	DEMOLITION, WINDOW/DOOR TAGS SHOWN	SA

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PROJECT	75 LAWN ROAD LONDON NW3 2XB
DRAWING TITLE	FIRST FLOOR PLAN AS EXISTING
JOB NUMBER	1722
DRAWING NUMBER	102
DRAWN	SA
CHECKED	-
SCALE	1:50/1:100
PAPER SIZE	A1/A3
DATE	20/07/2017
REVISION	A

Appendix III

Site Photographs

For location of photographs see Appendix II

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

Photograph 10

Photograph 11

Photograph 12

Photograph 13

Photograph 14

Photograph 15

Photograph 16

Photograph 17

Photograph 18

Photograph 19

Photograph 20

Photograph 21

Photograph 22

Photograph 23

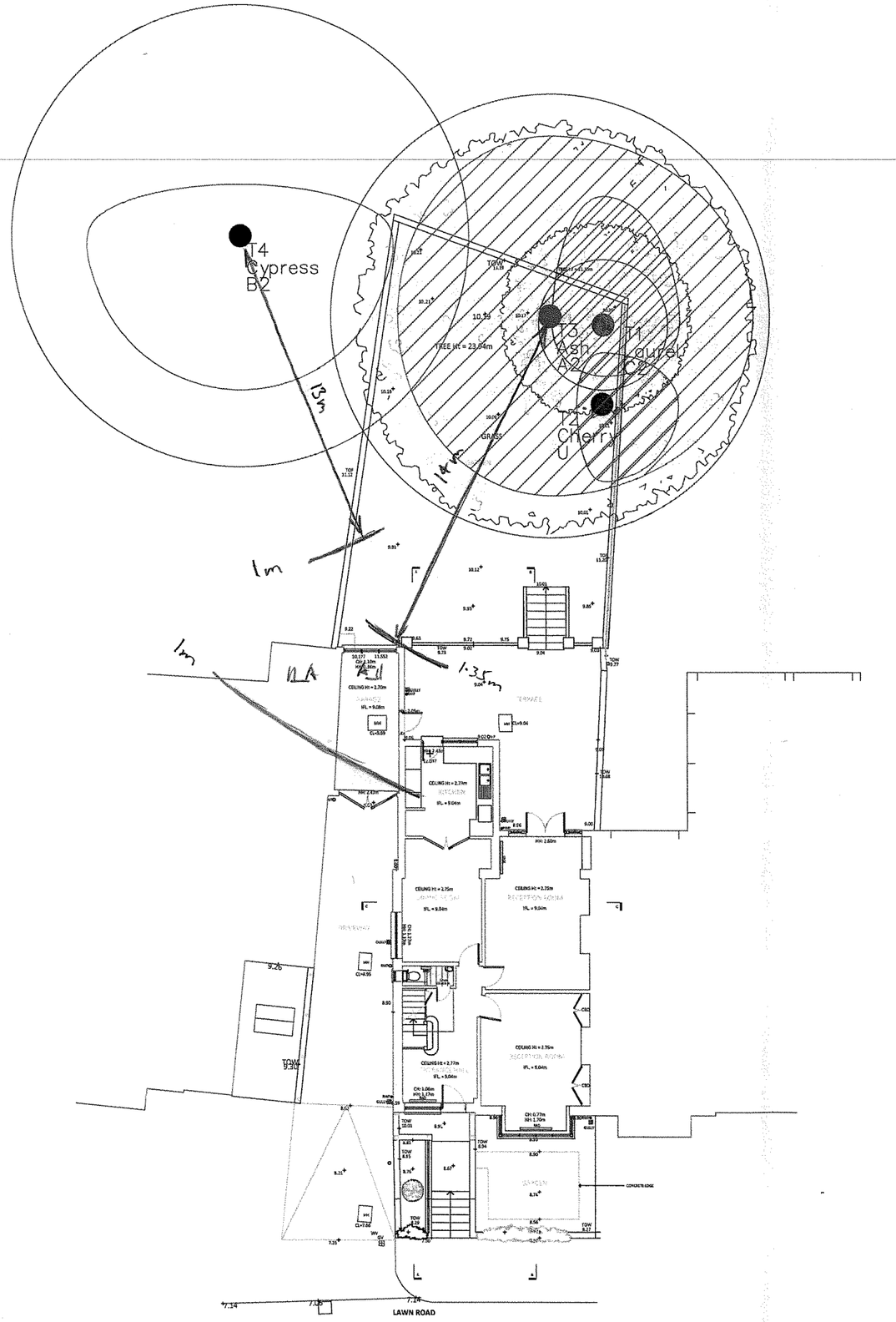
Photograph 24

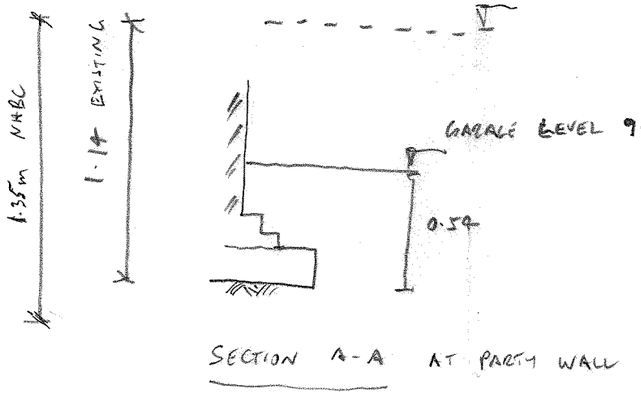
Photograph 25

Photograph 26

Appendix IV

Tree Review Notes





SECTION A-A AT PARTY WALL

NHBC

ASH	HEIGHT	23m	MODERATE WATER DEMAND
BROAD LEAFED		(35m)	@ 14m 1.35m DEEP
			19m 1m DEEP
SWAMP CYPRESS		20m	HIGH WATER DEMAND
CONIFEROUS		(30m)	@ 13m 1m DEEP

SK/03

EHRW

25/2/19

NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

Landmark Trees

20 Broadwick Street, London, W1F 8HT
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmerktrees.co.uk Web: www.landmarktrees.co.uk

Site: 75 Lawn Road	1:100@ A1
Drawing Title: Tree Constraints Plan	October 2017

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

Category — Crown Spread — Tree Number — Species — Category — Root Protection Area

Tree Position Approximate (not shown on original survey)

N

5m 10m