consulting
structural engineers

Lucking & Clark LLP
31 Cowcross Street
London, EC1M 6DQ

Tel. 020 7336 8986

info@LCengineers.co.uk
www.LCengineers.co.uk

31 Daleham Gardens, London, NW3 5BU

Initial Structural Survey of

Fire Damaged Building

for Pristine London Limited

40420–R01

Revision	Date	Prepared by	Checked by	Reason for issue
P4	09/11/2020	Mark Duncombe	Sven Griesemann	For information

Contents

1 Introduction

1.1 Introduction

L+C Engineers were appointed by Pristine London Limited to carry out an initial structural survey of 31Daleham Gardens, London, NW3 5BU. The purpose of our survey was to assess the condition of the existing structure, make recommendations for demolition sequencing and provide preliminary design of temporary works required to stabilise the structure, facade and external walls during demolition. Our initial survey was carried out on 22nd September 2020 with an asbestos management contractor in attendance.

A second site visit was carried out on 22nd October 2020 after scaffold towers had been installed to provide access to first floor apartment numbers 8, 9 and 10.

We understand that a fire occurred in November 2017 and the building has been empty since. A façade retention scaffold was erected by Mattison Scaffolding to the front of the building shortly after the fire. Other scaffolds were erected to the side and rear of the property but these have since been removed. The rear gable wall and chimney have been taken down to second floor level, presumably whilst the scaffold was erected. Debris from the fire and the possessions of previous occupiers have generally not been cleared.

2 Survey Findings

2.1 Existing Structure

The building was used as a residential block of fourteen apartments. The original part of the building consists of basement, ground, first and second floors and contains eleven of the apartments. The rear extension consists of a ground and first floor only and contains three of the apartments.

The building structure is constructed of load bearing masonry with timber floors and some localised steel beams, a timber flat roof is present to the extension at second floor and a timber pitched roof to the original building. Part of the ground floor of the original building appears to be a reinforced concrete slab located above the kitchen of apartment 1.

Lateral stability is provided by the timber floors and roofs transferring wind loads to the loadbearing masonry walls which act as strongpoints and transfer wind loads to the foundations.

It is anticipated that the foundations consist of mass concrete strip footings. The basement retaining walls are expected to be of masonry construction

Plans and elevations of the building showing the layout of the structure and the findings of our inspection are included at Appendix A.

2.2 Fire Damage Observed During First Site Visit

We understand the fire started near the half landing of the basement to ground floor stair and spread up the main stair to the upper levels and roof. Many of the rooms at basement and ground floor were accessible during our site visit. None of the rooms at first or second floor were accessible during our first site visit due to severe fire damage in the main stair area. A second site visit was carried out after scaffold towers had been installed to provide access to first floor apartment numbers 8, 9 and 10.

At basement level there is smoke damage but little evidence of structural fire damage. The basement boiler room and store area were not accessible due to the access door being locked. However, it is assumed there will not be much damage in these rooms as they were protected from the fire. Our findings at basement level are summarised in the table below and photographs are included at Appendix B.

Basement Level Apartment	Room	Accessible	Structural Fire Damage Observed	Location of Damage	Photograph Number
1	Kitchen	Yes	Yes	Stair flight above ceiling	1
1	Bedroom 1	Yes	No		2
1	Bathroom	Yes	No		
1	Bedroom 2	Yes	No		3
1	Living Room	Yes	No		4
1	Bedroom 3 and store	Yes	No		5
1	Cupboard below stair	Yes	Yes	Stair flight above ceiling	6
	Boiler room and store	No	Unknown		

At ground floor there is smoke damage but little evidence of structural fire damage in most areas. However, there is significant charring of a load bearing door frame around the main entrance door that supports the first floor joists above. It was not possible to access apartment 3 due to fire damage of the ground floor in the entrance to the apartment. Apartments 4 and 5 were accessible and had no evidence of structural fire damage. There is rubble present on in the entrance hall to apartments 6 and 7 that has fallen from above. There was no access to apartment 7 due to the entrance door being blocked by the belonging of the previous occupier. Our findings at ground floor level are summarised in the table below and photographs are included at Appendix B.

Ground Floor Apartment	Room	Accessible	Structural Fire Damage Observed	Location of Damage	Photograph Number
	Entrance porch	Yes	No		7
	Entrance hall	Yes	Yes	Load bearing door frame	8

3	All	No	Yes	Entrance to apartment	9
4	Bed/sitting room	Yes	No		10
4	Bathroom	Yes	No		11
4	Kitchen	Yes	No		
5	Bed/sitting room	Yes	No		12
5	Bathroom	Yes	No		
6	Entrance hall	Yes	Yes	Rubble on floor fallen from above	13
6	Bed/sitting room	Yes	No		14
6	Bathroom and Kitchen	No	Unknown		
7	All rooms	No	Unknown		
	Stair to first floor	No	Yes	Extensive	15 to 18

The stair from ground to first floor has severe fire damage and is supporting fallen debris most of the way up. We would not recommend using this stair as it is likely to collapse if it subject to additional loads. The first floor landing is also severely fire damaged and has very little remaining integrity, as shown in photograph 18.

During our first site visit it was not possible to access any of the rooms at first or second floor due to the condition of the stair and landing area. From part way up the stair we could see that the second floor and roof above apartment 12 have collapsed as shown in photograph 19. We could also see that the floor above apartments 8 and 9 appeared to be present. It can be seen from Google maps that the second floor roof to the rear extension is present and may be relatively undamaged by the fire. However, it would be necessary to access apartment 10 through the rear elevation window in order to confirm its condition.

The main roof above apartments 13, 14 and 15 has been largely destroyed by the fire. Due to the loss of the main roof and part of the second floor, the external walls and two remaining chimneys are considered to be unstable above first/second floor as they have lost the lateral restraint afforded by the roof and second floor. The rear gable wall and chimney have been previously removed as described earlier. The front façade gable wall is restrained by a scaffold as described earlier. Photographs 20 to 25 show views of the external walls and chimneys.

2.3 Fire Damage Observed at First Floor Level During Second Site Visit

During our second site visit we were able to access first floor level apartments 8, 9 and 10 using external scaffold access towers and entering through the windows. Our findings are summarised below and photographs are included at Appendix B.

Apartment 10 is considered safe to access via the scaffolding and through the window. There is fire damage to the first floor near the entrance door from the main stair landing. A 1.5m x 1.5m exclusion zone should be provided here and the joists should be propped down to ground

floor level. The timber stud wall between apartment 10 and 11 has fire damage as shown in photograph 26. Any person entering this apartment should avoid leaning against this wall.

The roof above apartment 10 is of filler joist concrete slab construction. This has not been structurally damaged by the fire but is suffering from water penetration as shown in photograph 26. There is a steel beam located above the stud wall between apartment 10 and 11 that supports the filler joist roof slab. Photograph 27 shows the roof slab, steel beam and stud wall.

Apartment 9 is considered safe to access via the scaffolding and through the window. There is fire damage just outside the entrance door from the main stair landing. This door should not be used to access the landing.

The second floor above apartment 9 is of timber joist construction. The second floor is sagging due to a trimmer joist around the chimney breast becoming disconnected at one end as shown in photographs 28 and 29. This trimmer joist should be propped down to the top of the basement retaining wall using a single Acrow prop at each level with double scaffold board spreader plates above and below the first floor joists.

Apartment 8 is considered safe to access via the scaffolding and through the window. There is fire damage just outside the entrance door from the main stair landing. This door should not be used to access the landing.

The second floor above apartment 8 is of timber joist construction. Refer to photographs 30 and 31 for general views of this apartment.

2.4 Asbestos and Other Hazardous Materials

We refer to the report by Gerald Brown and Sons dated 5th September 2020 which describes the hazardous materials that should be expected at the property. All contractors carrying out future work at the property should read this report and take appropriate precautions.

The fire has resulted in the high likelihood that asbestos containing materials remain within and on the premises, including in the ash, debris and standing parts of the structure. For this reason an asbestos management contractor was in attendance during our survey. Appropriate PPE was used and air monitoring was carried out to check for airborne fibres. No airborne fibres were recorded during our site visit.

2.5 Proposed Future Works

We consider that the building should be soft stripped and demolished as soon as possible due to its current unsafe condition, continuing deterioration and risk of asbestos contamination to surrounding areas.

We recommended that all unrestrained chimneys, walls and severely fire damaged areas be demolished as a matter of urgency as they are considered to be unstable and at risk of collapse in high winds or if subject to additional imposed loads. The remaining parts of the building should be soft stripped and have any ACM's removed prior to demolition. All of the timber floors of the building should be demolished as these are likely to be suffering from wet rot due being exposed to the elements for three years. After our first site visit, we thought

the possible exception to this would be the rear extension as this appeared to have remained watertight. However, following our second site visit it became apparent that this is also suffering from water penetration through the filler joist roof slab and timber first floor. These will therefore also require demolition.

The external walls of the building could possibly be retained but this would require the construction of an external facade retention system all-round the property. This could be constructed either using scaffolding, similar to the one that is erected at the front, steel towers and waling beams or a shoring system such as Mabey system 160. This would have the following disadvantages:

1. High cost of façade retention system
2. Health and safety concerns of working within a retained façade
3. Retention system would surcharge the existing basement retaining walls.
4. Restricted site access during reconstruction.
5. Existing wall layout may not suit proposed new building.
6. Loss of space in new building due to columns being inside walls and walls requiring additional insulation on the inside face.

In view of the above, we would recommend the walls be taken down and the bricks could be retained for reuse if required.

3 Recommendations

3.1 Current Access Restrictions

In view of the condition of the existing building we consider that access to the basement and most of the ground floor can be permitted. Care should be taken when using the stair from ground floor to basement level and we recommend only one person at a time on the stair. Access should not be permitted to apartment 3 due to fire damaged floor in the entrance or apartment 7 due to the entrance door being blocked.

The stair from ground to first floor and the first floor landing are not suitable for use and barriers should be installed to prevent people from accessing these areas. First floor apartments 8, 9 and 10 should only be accessed via the external scaffold and through the windows Access to first floor apartments 11 and 12 should not permitted due to fire damage.

Access to the second floor should not be permitted due to fire damage.

We refer to section 2.4 of this report for precautions relating to asbestos and other hazardous materials.

3.2 Sequence of Work

In view of the finding of our survey, our recommended sequence of demolition work is described below. This should be developed into a full method statement by a suitably experience contractor prior to commencing work on site.

1. *Demolish Unrestrained Walls and Chimneys*
   The unrestrained areas requiring demolition are shown on our sketches contained at Appendix A. These should be demolished by hand using a cherry picker located outside the building for access. Bricks should be removed by hand, loaded into the cherry picker and removed from site. Rubble should not be allowed to fall into the building. The walls should be removed first followed by the two chimneys.

2. *Provide Access to Ground and First Floor Apartments*
   We need to access apartments 7,8, 9 and 10 to allow a structural survey to be carried out and for later soft strip and ACM removal to be undertaken. Access should be achieved by providing local scaffold towers to the external windows of the apartments at first floor and by removing the entrance door to apartment 7. A structural survey can then be carried out to check that the areas are safe for soft strip, ACM removal and demolition to be carried out by others.

   This has now been completed except for apartment 7 as the door could not be removed due to the presence of asbestos.

3. *Inspection of Ground and First Floor Apartments*
   L+C should undertake an inspection of apartments 7, 8, 9 and 10 to assess their structural condition and report on our findings.

   This has now been completed except for apartment 7 as the door could not be removed due to the presence of asbestos.

4. *Local Temporary Propping and Floor Replacement*
   The load bearing door frame that supports the first floor joists should be propped using Acrow props with double scaffold head and sole boards at basement and ground floor levels. Refer to sketch number 40420/SK/TW/01 for details of propping required.

   The fire damaged area of the ground floor in the entrance to apartment 3 should be locally removed and replaced to enable access to the apartment. Refer to sketch number 40420/SK/TW/01 for details.

   An exclusion zone should be provided near the entrance door or apartment 10 and the first floor joists should be propped down to ground floor level. Refer to sketch number 40420/SK/TW/02 for details.

   The second floor trimmer joist in apartment 9 should be propped down to the top of the basement retaining wall using a single Acrow prop at each level with double scaffold board spreader plates above and below the first floor joists. Refer to sketch numbers 40420/SK/TW/01 & 02 for details.

5. *Soft Strip and ACM Removal at Basement, Ground and First Floors*
   An asbestos management contractor should carry out soft strip and ACM removal to apartments 1 to 10. It will also be necessary to remove the rubble build up in the entrance to apartment 6 in order to gain access. Access will not be possible to apartment 11 and 12 due to the dangerous condition of the roof and second floor structure above.

6. *Access/Protection Scaffold to Perimeter & Birdcage Scaffolds Below Floors*
   An external access and protection scaffold should be erected to the remaining perimeter of the building prior to further demolition being carried out. A birdcage scaffold will also be constructed to act as a protection deck below the ground, first and second floors. The standards will need to be designed to pass through the existing floors. L+C should then be asked to attend site to review the condition of the remaining parts of the roof and second floor.

7. *Demolish Main Stair Area at First Floor*
   The existing first floor landing and stair from first to ground floor should be demolished as they are unsafe for use. Edge protection should be provided at first floor and ground floor prior to demolition. A temporary Haki access stair may be installed if required by the contractor.

8. *Remove Remaining Fire Damage Roof and Debris Second Floor*
   The remaining areas of fire damaged roof and debris at second floor level should be removed. The method of access and removal will need to be assessed at stage 6.

9. *Take Down Front Gable Wall to Second Floor Level*
   The front gable wall should be taken down by hand to second floor level. Bricks can be retained for reuse if required. The method of access for this should also be assessed at stage 6. The façade retention scaffold should then be struck to the same level.

10. *Remove Floors at Second Floor*
    The remaining second floor boards and joists should be removed using traditional hand demolition methods. An enhanced crash deck will be required for demolition of the filler joist roof slab above apartment 10. The birdcage scaffold can then be struck down to first floor level.

11. *Take Down Walls to First Floor Level*
    All walls including the front gable wall should be taken down to first floor level using traditional hand demolition methods. Bricks can be retained for reuse if required. The façade retention and perimeter scaffolds should then be struck to the same level.

12. *Remove Floors at First Floor*
    The first floor boards and joists should be removed using traditional hand demolition methods. The birdcage scaffold can then be struck down to first floor level.

13. *Take Down Walls to Ground Floor Level*
    All walls including the front gable wall should be taken down to ground floor level using traditional hand demolition methods. Bricks can be retained for reuse if required. The façade retention and perimeter scaffolds should then be struck to the same level.

14. *Berm Against Basement Retaining Walls*
    All non-loadbearing walls should be removed at basement level. A rubble berm should then be installed against the inside face of all basement retaining walls. Refer to sketch number 40420/SK/TW/01 for details of the berm required.

15. *Remove Floors at Ground Floor*
    The ground floor boards and joists should be removed using traditional hand demolition methods. The area of ground floor concrete slab should be demolished using a hydraulic muncher or similar.

16. *Demolish Internal Basement Walls*
    All internals walls should be demolished down to basement level.

17. *Demolish Basement Slab and Internal Wall Foundations*
    Demolish the existing basement slab and grub up existing internal wall foundations. Backfill to basement level.

18. *Demolish Retaining Walls and Foundations*
    The existing retaining wall should be removed in 2m strips by locally excavating the berm, demolishing the wall, grubbing up the footing and then reinstating the berm. This process can be completed in a 1 in 5 sequence similar to underpinning.

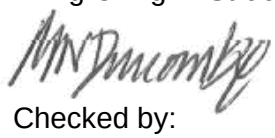
4 Report Limitations

This report is based on information obtained during a limited access site inspection of visible parts of the existing structure. We were unable to access parts of basement and ground floor, most of the first floor and all of the second floor due to fire damage. It is expected that during the works unforeseen factors will come to light and our recommendations will require reconsidering.

Author:

Mark Duncombe

BEng CEng MIStructE



Checked by:

Sven Griesemann

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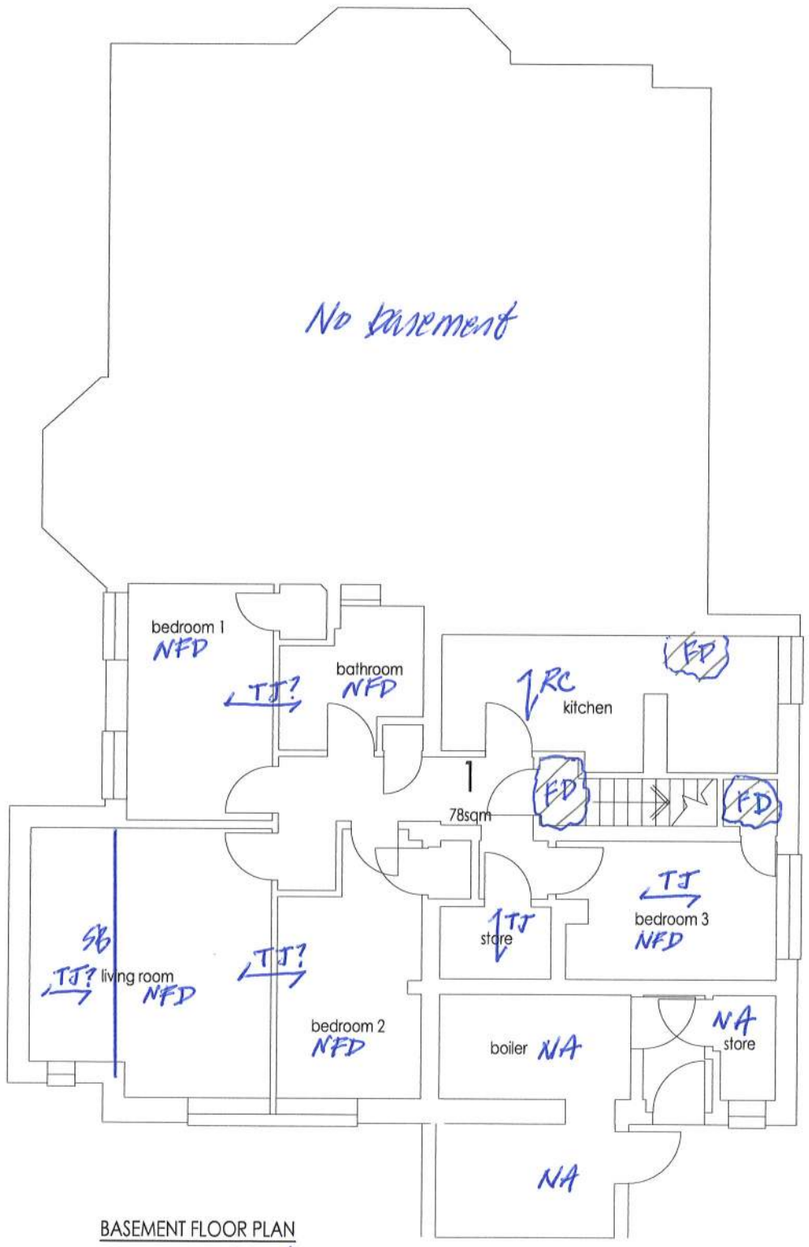
Appendix A

Building Plans and Survey Findings

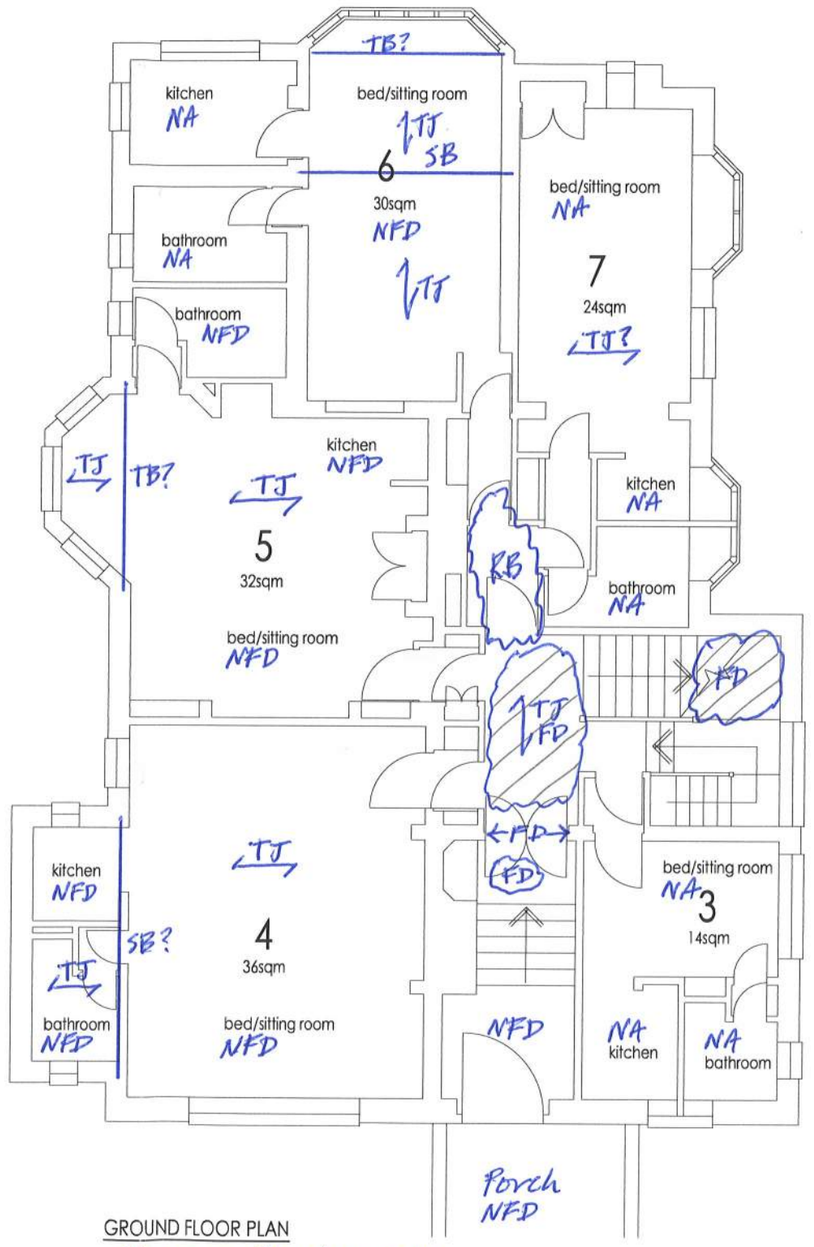


BASEMENT FLOOR PLAN

Showing Structure Over

Scale 1:50 (m)

0 1 2 3 4 5



GROUND FLOOR PLAN

Showing Structure Over

KEY

TJ = Timber joists over
RC = RC slab over
SB = Steel beam over
TB= Timber beam over
? = Assumed structure or span direction
NFD = No visible structural fire damage above
RB = Rubble build up fallen from above
NA = No access to room
SM = Stair missing due to fire damage
FM = Floor above missing due to fire damage (hatched area)
RM = Roof above missing due to fire damage (hatched area)
WU = Wall unstable due to loss of floor or roof
CU = Chimney unstable due to loss of floor or roof
FD = Fire damage above (hatched area)

THIS PLAN IS PRODUCED FROM DRAWINGS AND DETAILS HELD ON COUNCIL RECORDS AND NOT A SITE MEASURED SURVEY.

Whymark & Moulton
Chartered Surveyors &
Building Engineers
14 Cornard Road, Sudbury,
Suffolk. CO10 2XA
Tele: 01787 371371

Project
31 Daleham Gardens
London
NW3 5BU

Basement and Ground Floor Plans
AS EXISTING

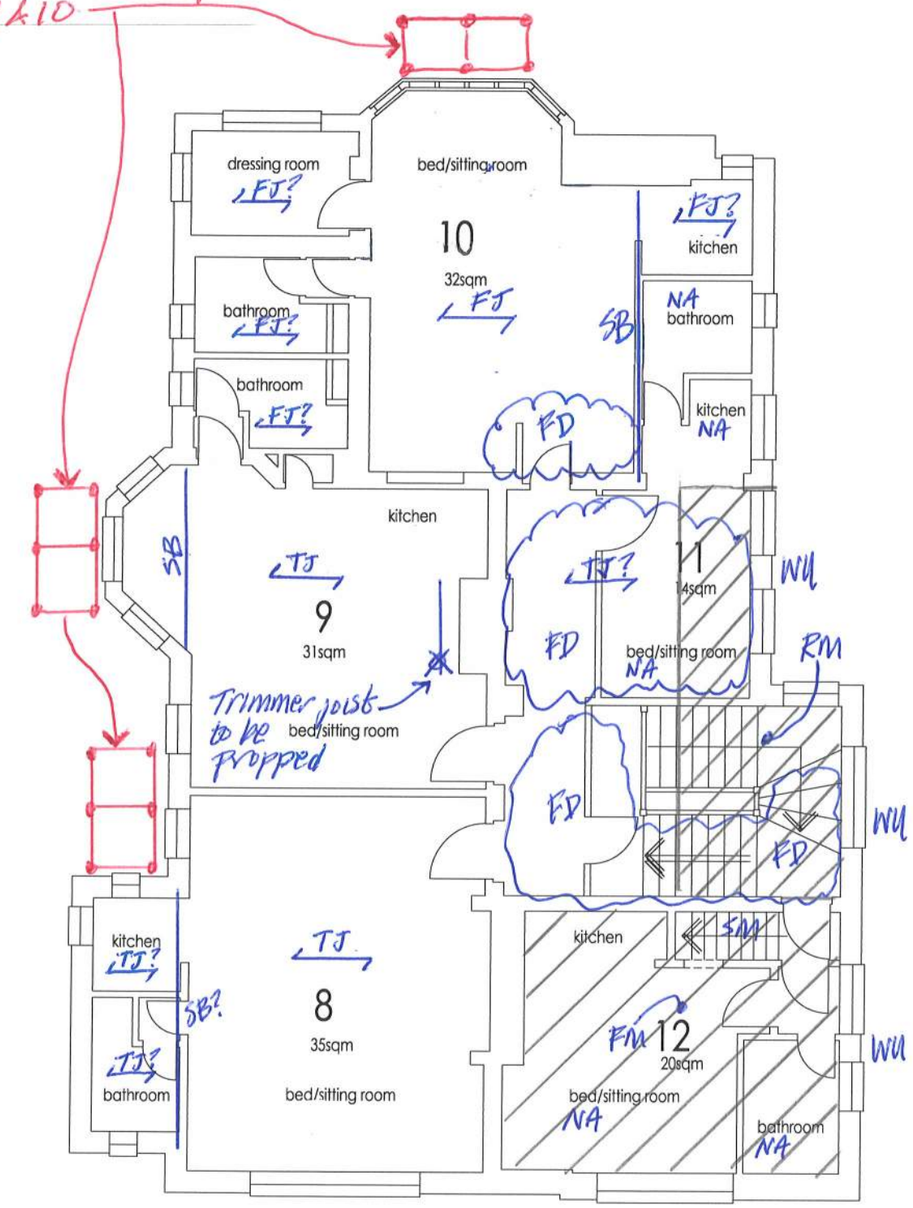
Scale 1:50, @ A1 Date Dec 2017

Drawing No ~~17/253-01~~

Amendments
L+C Engineers
Results of Initial Survey
40420/SK/01
MND 30/09/20

Refer to 40420/SK/01 for Key
FJ = Filler joist slab

scaffold access towers for access to apartments 8, 9 & 10



FIRST FLOOR PLAN
Showing structure over

Scale 1:50 (m)
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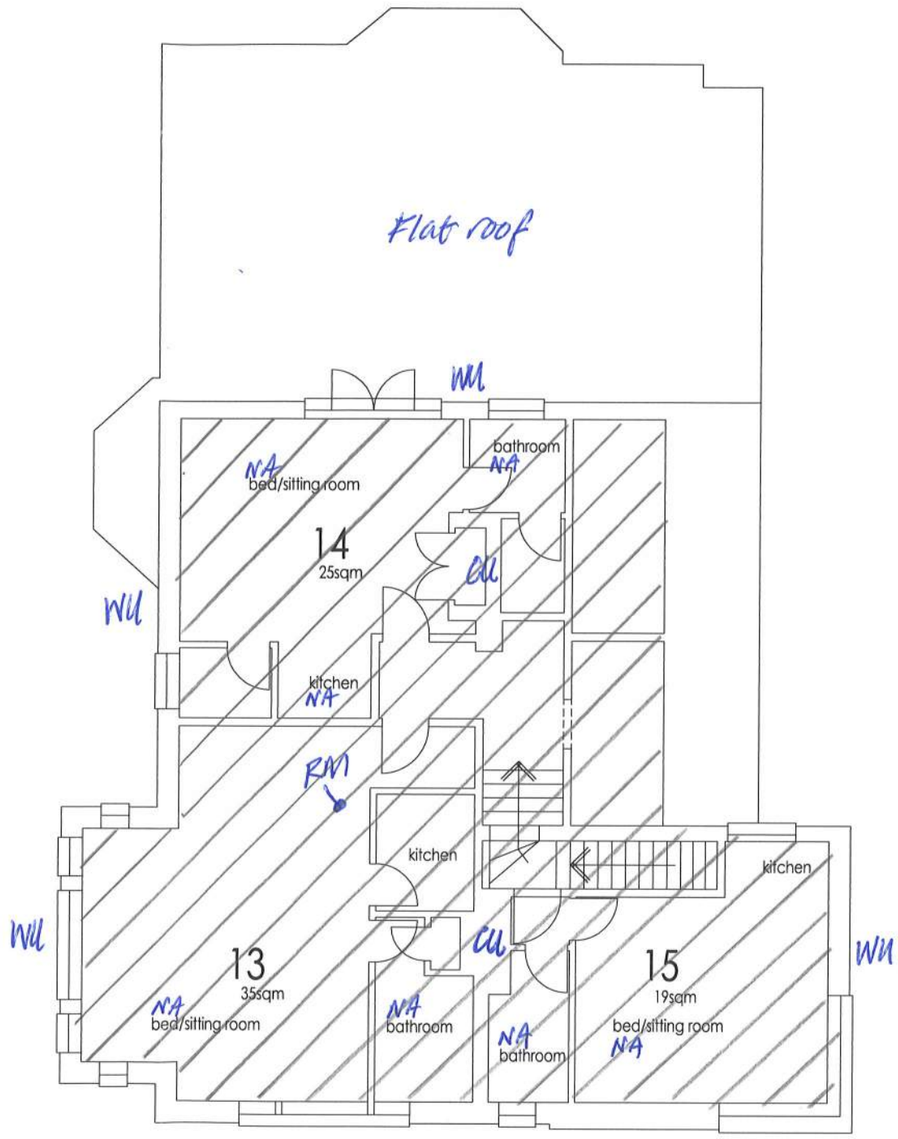


SECOND FLOOR PLAN
Showing structure over

THIS PLAN IS PRODUCED FROM DRAWINGS AND DETAILS HELD ON COUNCIL RECORDS AND NOT A SITE MEASURED SURVEY.

Whymark & Moulton
Chartered Surveyors & Building Engineers
14 Cornard Road, Sudbury, Suffolk. CO10 2XA
Tele: 01787 371371

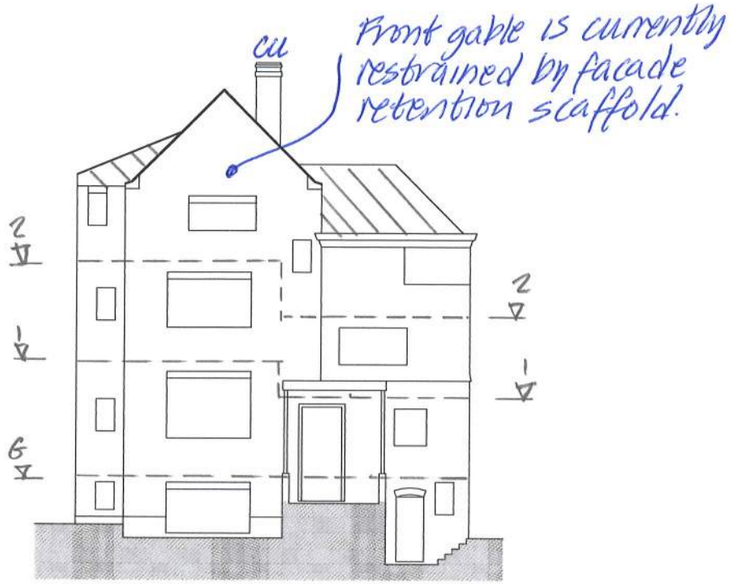
Project
31 Daleham Gardens
London
NW3 5BU

First and Second Floor Plans
AS EXISTING

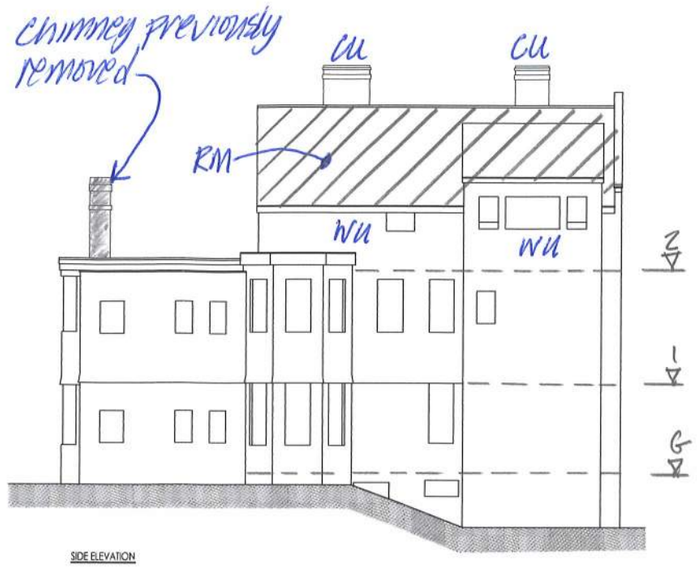
Scale 1:50, @A1
Date Dec 2017
Drawing No 17/253-02

Amendments
L+C Engineers
Results of Initial Survey
40420/SK/02
MND 30/09/20 REVB-23/10/20

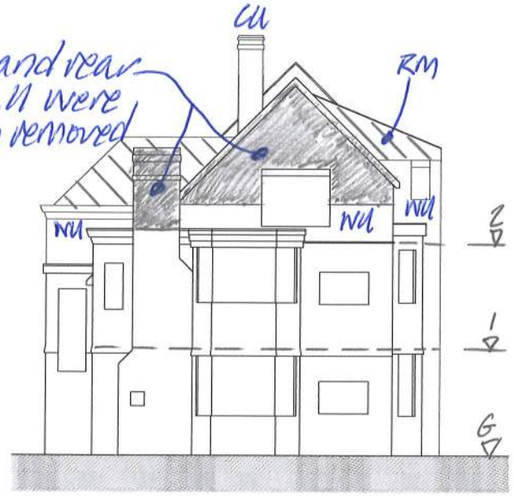
Refer to 4042O/SK/01 for key



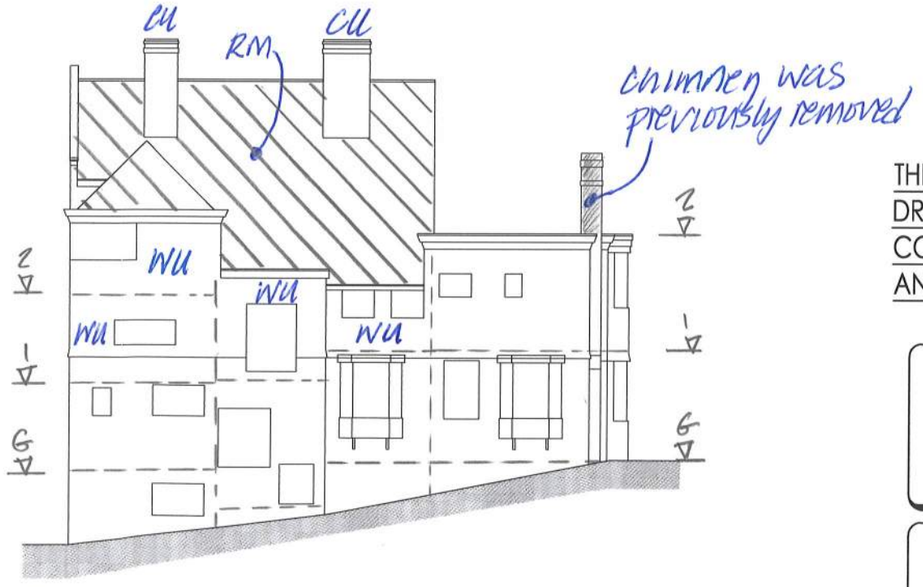
FRONT ELEVATION



SIDE ELEVATION



REAR ELEVATION



SIDE ELEVATION

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Whymark & Moulton
Chartered Surveyors &
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14 Cornard Road, Sudbury,
Suffolk. CO10 2XA

Tele: 01787 371371

Project
31 Daleham Gardens
London
NW3 5BU

Elevations – AS EXISTING

Scale 1:100, @A1 Date Dec 2017

Drawing No 17/253–03

Amendments
L+C Engineers
Results of Initial Survey
4042O/SK/03
MMR 30/09/20

Appendix B

Photographs

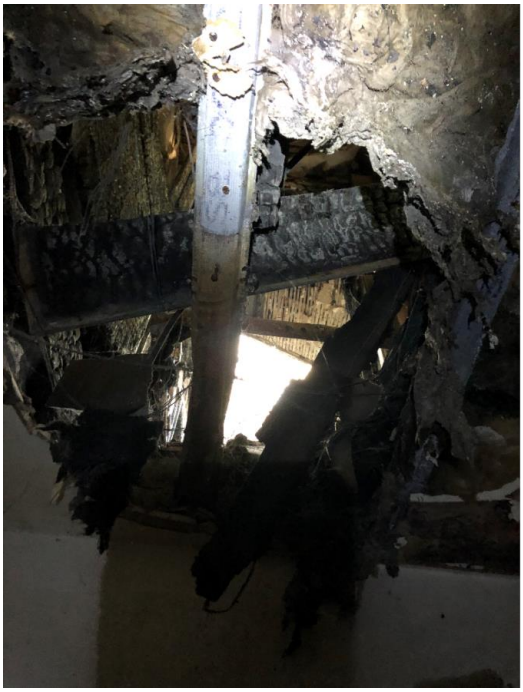


Photo 1 - Apartment 1 fire damage to stair above kitchen

Photo 2 - Apartment 1 bedroom 1

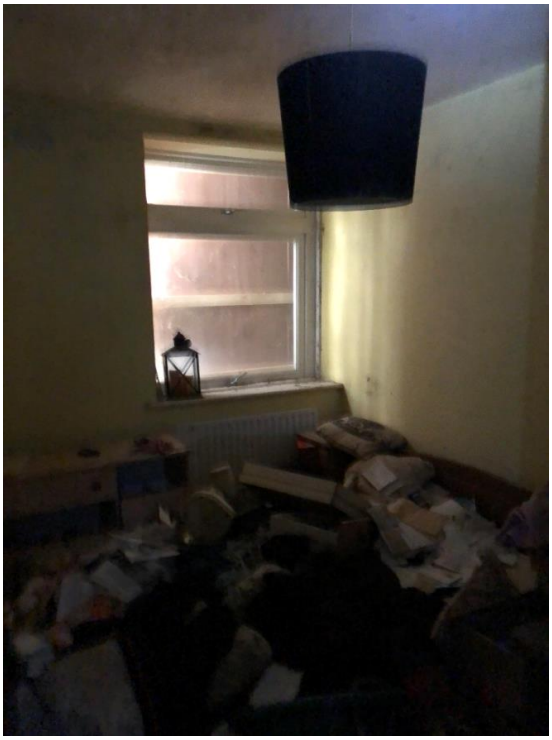


Photo 3 - Apartment 1 bedroom 2

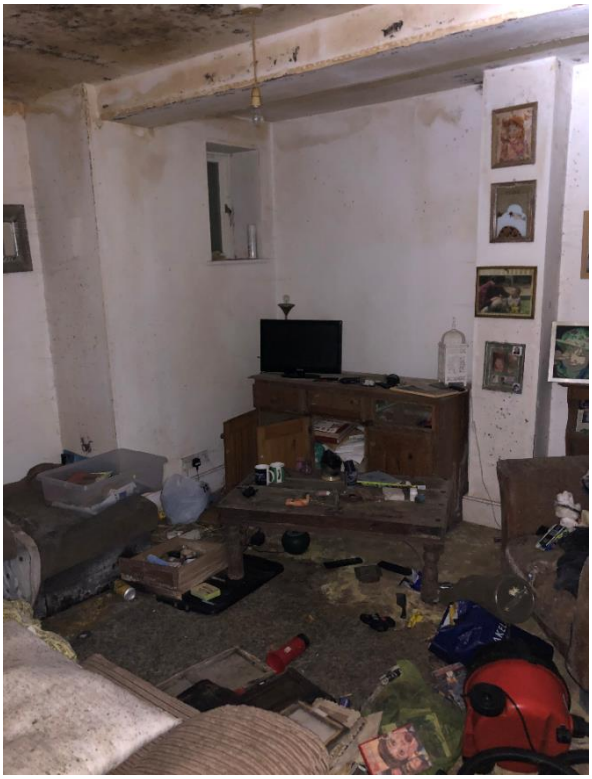


Photo 4 - Apartment 1 living room

Photo 5 - Apartment 1 bedroom 3 & store

Photo 6 - Apartment 1 bedroom 3 cupboard underside of stair

Photo 7 - Main entrance porch

Photo 8 - Main entrance hall

Photo 9 - Apartment 3 fire damaged in entrance

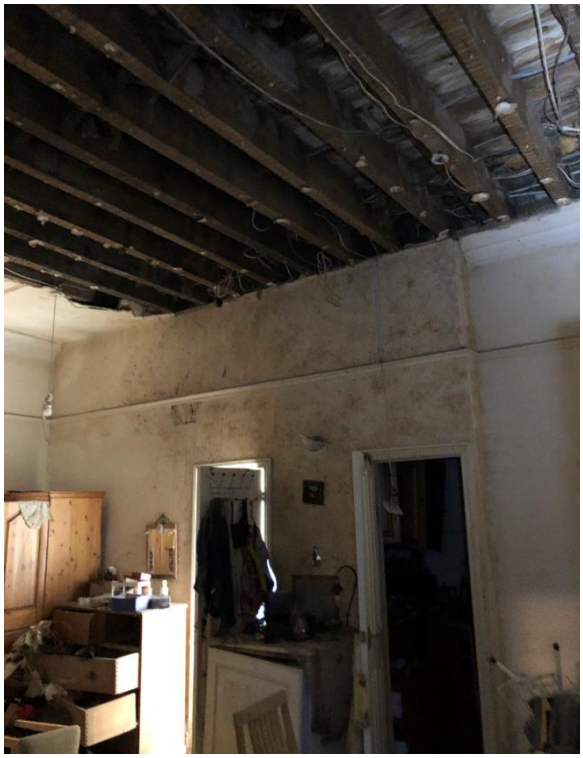


Photo 10 - Apartment 4 bed/sitting room

Photo 11 - Apartment 4 bathroom

Photo 12 - Apartment 5 bed/sitting room

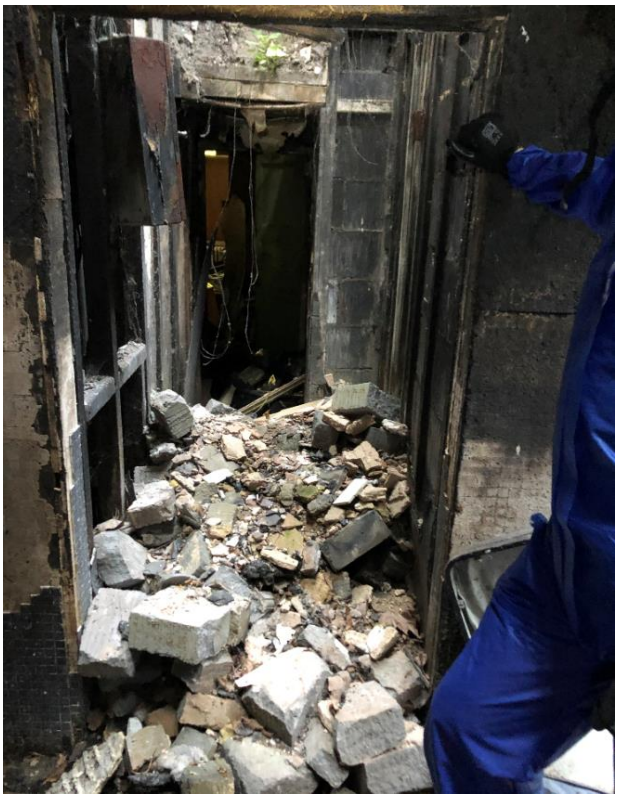


Photo 13 - Apartment 6 rubble build up in entrance

Photo 14 - Apartment 6 bed/sitting room

Photo 15 - Stair from ground to first floor underside of half landing

Photo 16 - Stair from ground floor to first floor

Photo 17 - Stair from ground to first floor

Photo 18 - First floor landing

Photo 19 - Apartment 12 view of second floor and roof

Photo 20 - Front façade gable and scaffold

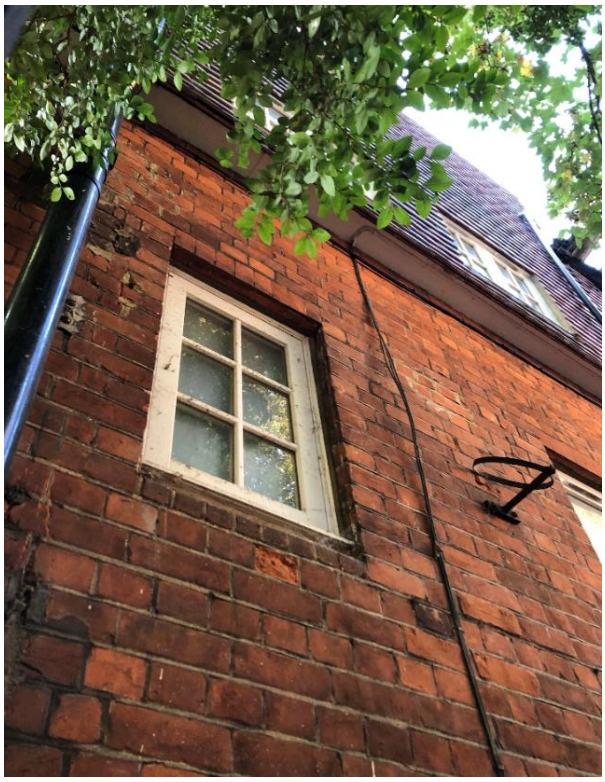


Photo 21 - North side elevation of Main Building

Photo 22 - North side elevation of rear extension

Photo 23 - Rear elevation

Photo 24 - South side elevation of rear extension

Photo 25 - South side elevation of main building

Photo 26 - Fire damage wall and water penetration through roof of Apartment 10

Photo 27 - Steel beam above fire damaged wall of Apartment 10

Photo 28 - sagging trimmer joist at second floor level above Apartment 9

Photo 29 - sagging trimmer joist at second floor level above Apartment 9

Photo 30 - Timber joists at second floor above apartment 8

Photo 31 - Timber joists at second floor above Apartment 8

Appendix C

Preliminary Temporary Works Sketches

Prior to removal of ground floor:
Construct rubble berm
using well compacted
GF2 material. See section

Across prop to
S u/s first floor

bedroom 1
bathroom
kitchen
1
78sqm
living room
bedroom 2
store
bedroom 3
boiler
store

Replace ground floor joists with 100x50 C16 joists @ 400c/c and 18mm plywood decking.

Propping as floor above

BASEMENT FLOOR PLAN

Scale 1:50 (m)

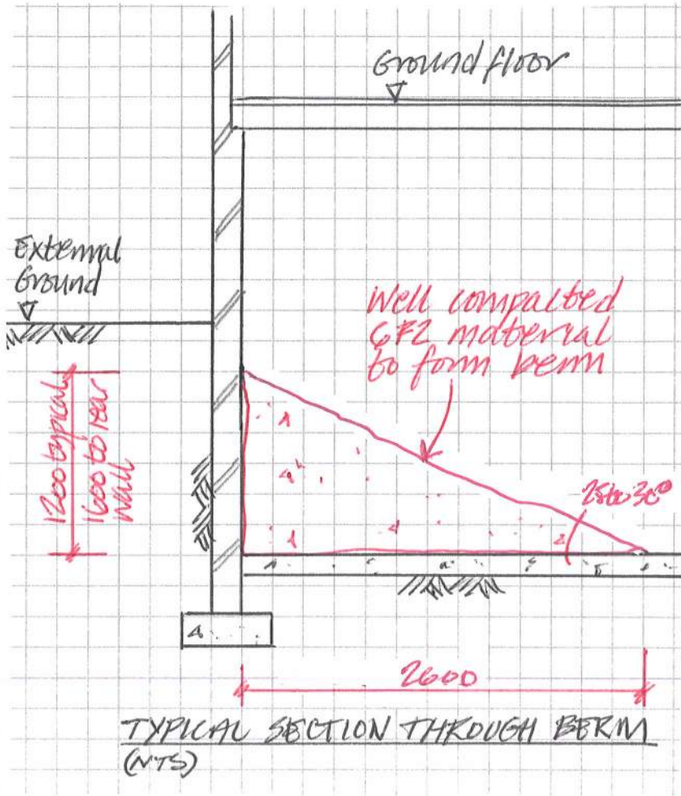
0 1 2 3 4 5

Across props to u/s first floor joists

kitchen
bed/sitting room
6
30sqm
bathroom
bathroom
bed/sitting room
7
24sqm
kitchen
kitchen
Across prop with double scaffold boards above & below first floor
5
32sqm
bed/sitting room
bathroom
kitchen
4
36sqm
bed/sitting room
bathroom
bed/sitting room
3
14sqm
kitchen
bathroom

Prop door frame at high level with 2No Across props 600c/c and double scaffold board head & sole plates.

GROUND FLOOR PLAN



TYPICAL SECTION THROUGH BERM (NTS)

THIS PLAN IS PRODUCED FROM DRAWINGS AND DETAILS HELD ON COUNCIL RECORDS AND NOT A SITE MEASURED SURVEY.

Whymark & Moulton
Chartered Surveyors &
Building Engineers
14 Cornard Road, Sudbury,
Suffolk. CO10 2XA
Tele: 01787 371371

Project
31 Daleham Gardens
London
NW3 5BU

Basement and Ground Floor Plans
AS EXISTING

Scale 1:50, @A1 Date Dec 2017

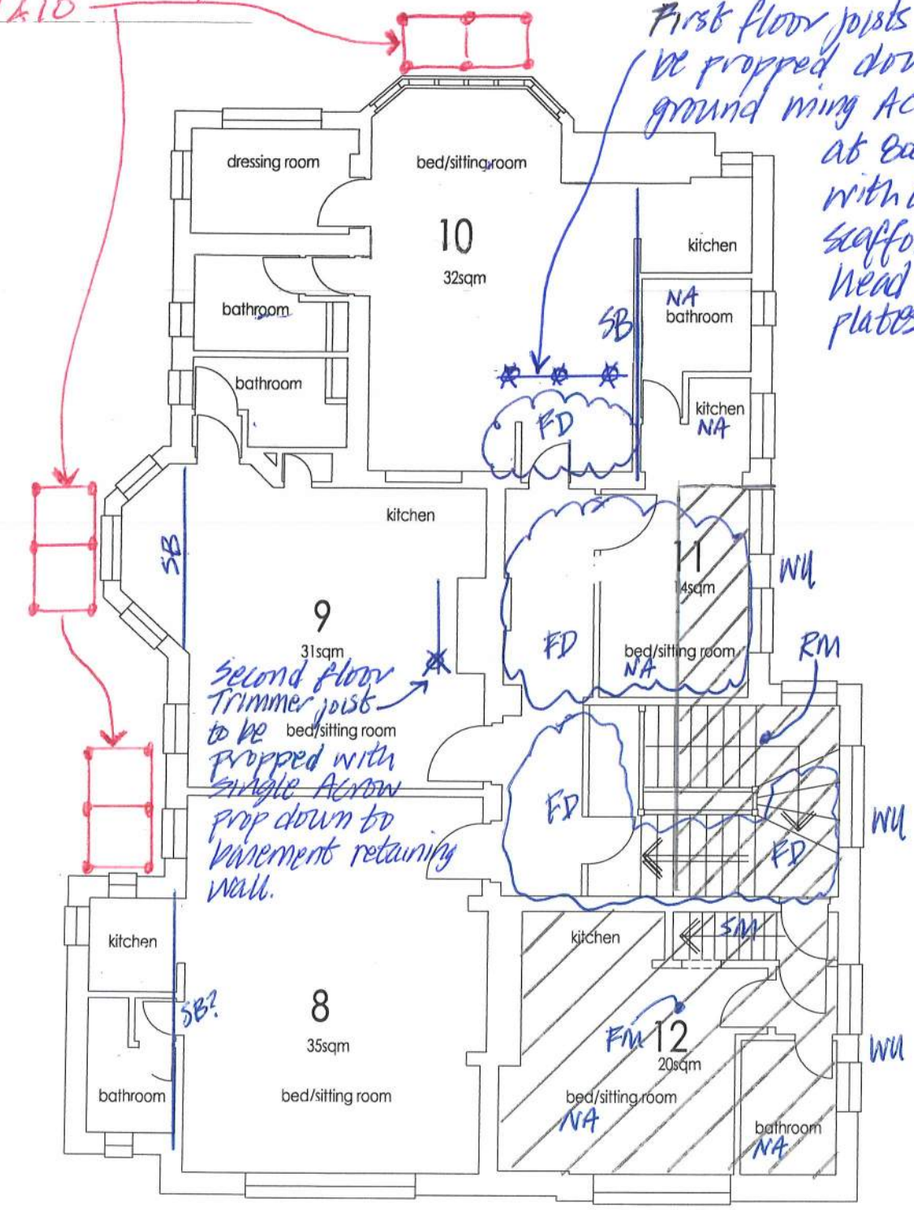
Drawing No ~~17/253-01~~

Amendments
L+C Engineers
Temporary Works at Basement & Ground Floor

Revision A-28/10/20 40420/SK/TW/01 MNP 05/10/20

scaffold access towers for access to apartments 8, 9 & 10

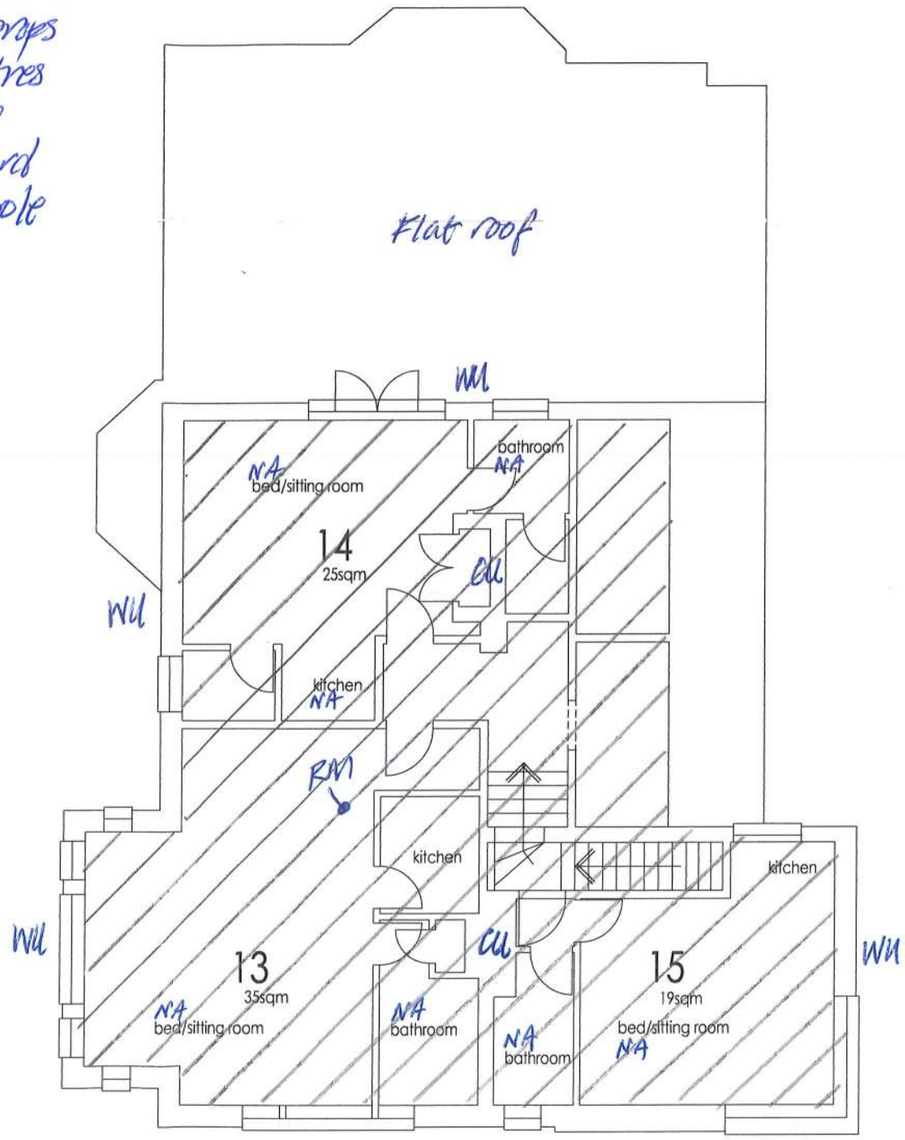
First floor joists to be propped down to ground using Acrow props at 800 centres with double scaffold board head and sole plates.



FIRST FLOOR PLAN

Scale 1:50 (m)

0 1 2 3 4 5



SECOND FLOOR PLAN

THIS PLAN IS PRODUCED FROM DRAWINGS AND DETAILS HELD ON COUNCIL RECORDS AND NOT A SITE MEASURED SURVEY.

Whymark & Moulton
Chartered Surveyors & Building Engineers
14 Cornard Road, Sudbury, Suffolk. CO10 2XA
Tele: 01787 371371

Project
31 Daleham Gardens
London
NW3 5BU

First and Second Floor Plans
AS EXISTING

Scale 1:50, @A1 Date Dec 2017

Drawing No 17/253-02

Amendments
L+C Engineers
Temporary Works c/o
First & Second Floor
4042C/SK/TW/02 MND 28/10/20