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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
P2	05/10/2020	Mark Duncombe	Sven Griesemann	For information

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1 Introduction

1.1 Introduction

L+C Engineers were appointed by Pristine London Limited to carry out an initial structural survey of 31 Daleham 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 survey was carried out on 22nd September 2020 with an asbestos management contractor in attendance.

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

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 due to severe fire damage in the main stair area.

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.

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 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.

3 Recommendations

3.1 General Opinion

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. The possible exception to this would be the rear extension as this appears to have remained watertight. However, this is not considered to be worthy of retention as it is not part of the original construction of the building.

The external walls of the main building could 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 be an expensive option and the layout of the wall may not suit the proposed new building that will be constructed at a later date. We would therefore recommend the walls be taken down and the bricks could be retained for reuse if required.

3.2 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 and 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. The apartments at first floor should not be accessed at present.

We refer to section 2.3 of this report for precautions relating to asbestos and other hazardous materials.

3.3 Sequence of Work

In view of the above, our recommended sequence of work is described in more detail below.

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.

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.

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.

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*

An external access and protection scaffold should be erected to the remaining perimeter of the building prior to further demolition being carried out. 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.

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.

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.

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 internal 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.

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Checked by:



Sven Griesemann

MEng CEng MICE

Appendix A

Building Plans and Survey Findings

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

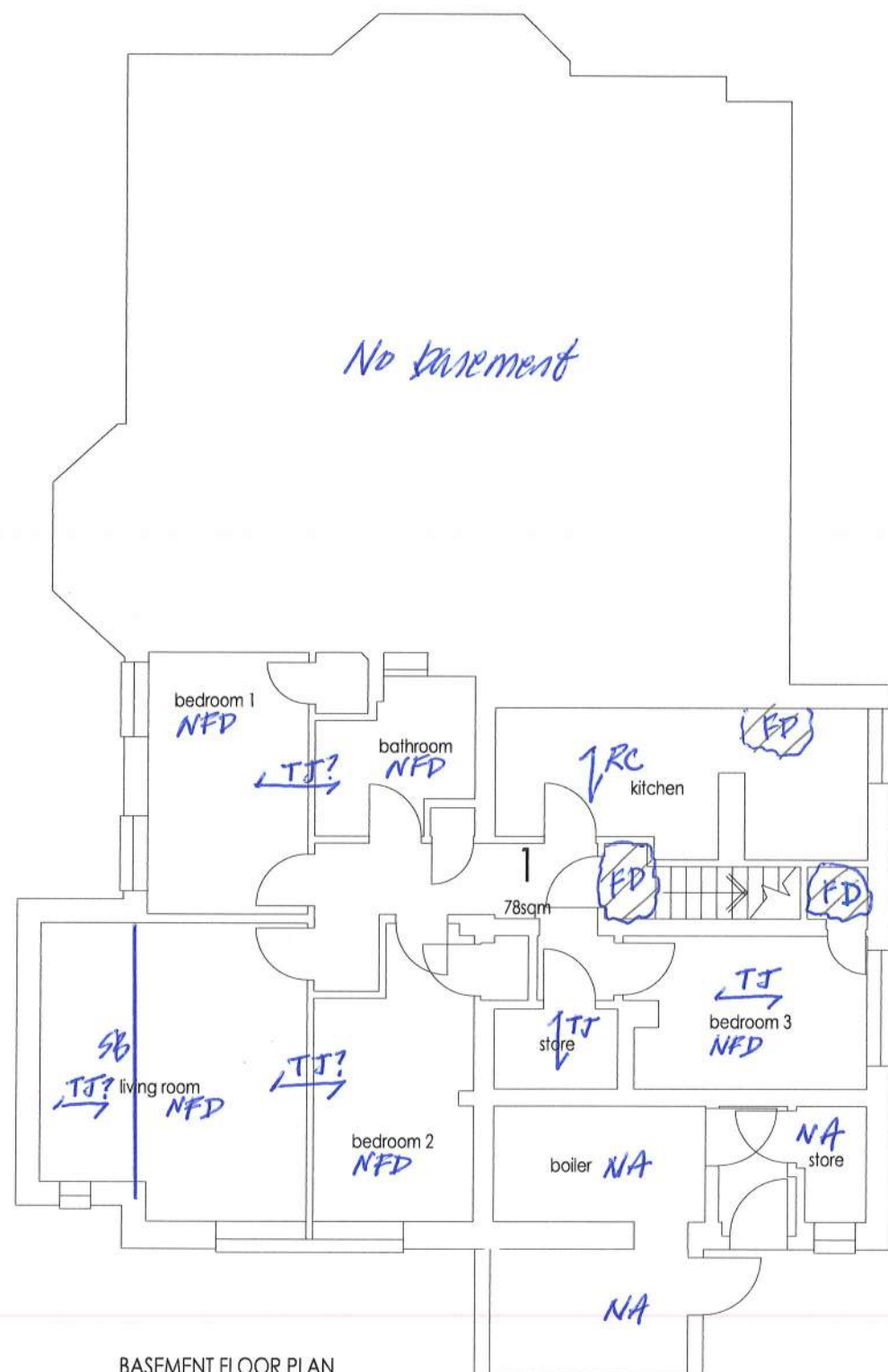
FM = Floor above missing due to fire damage (hatched area)

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

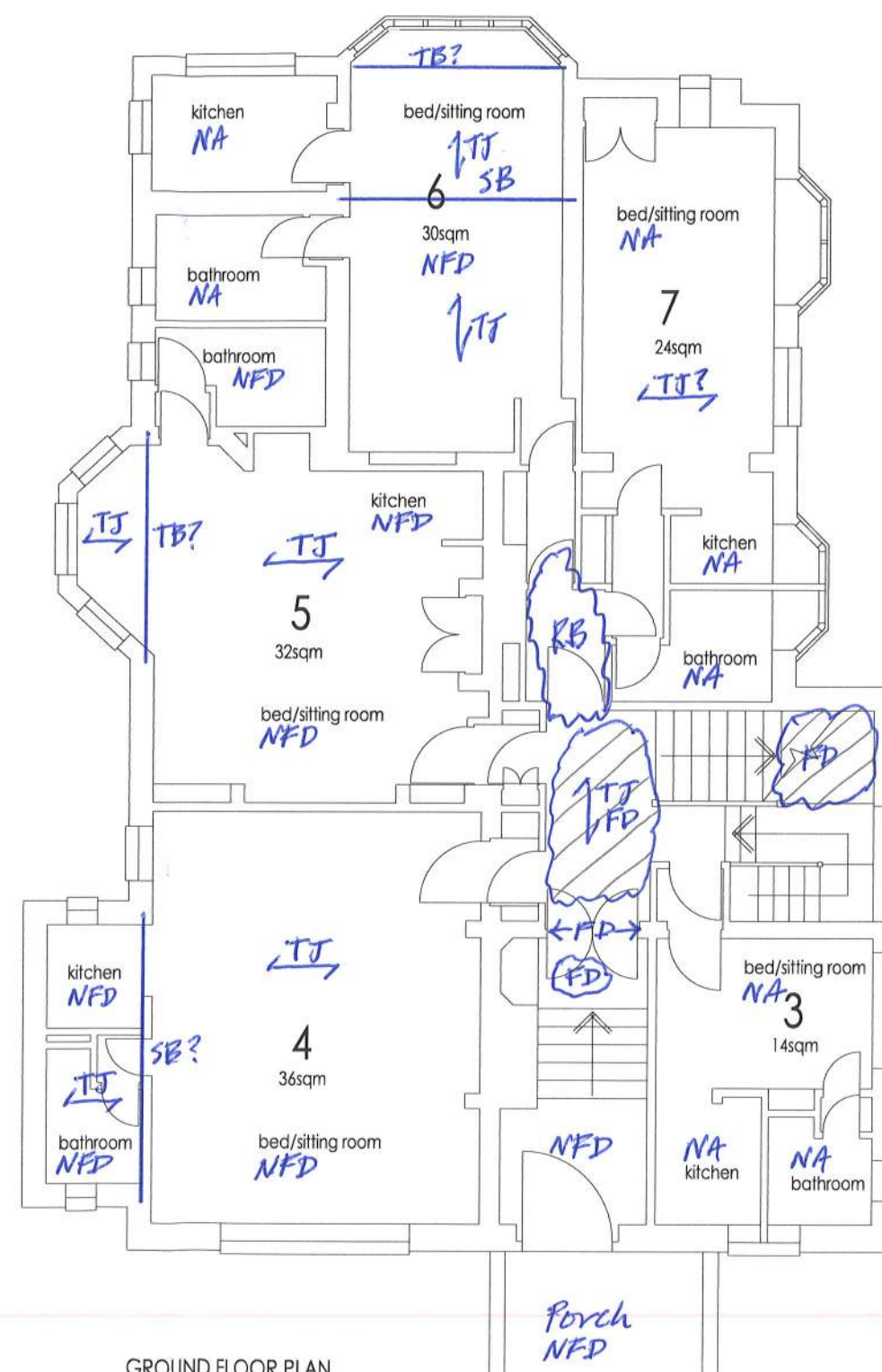
FD = Fire damage above (hatched area)



BASEMENT FLOOR PLAN

Showing Structure Over

Scale 1:50 (m)



GROUND FLOOR PLAN

Showing Structure Over

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

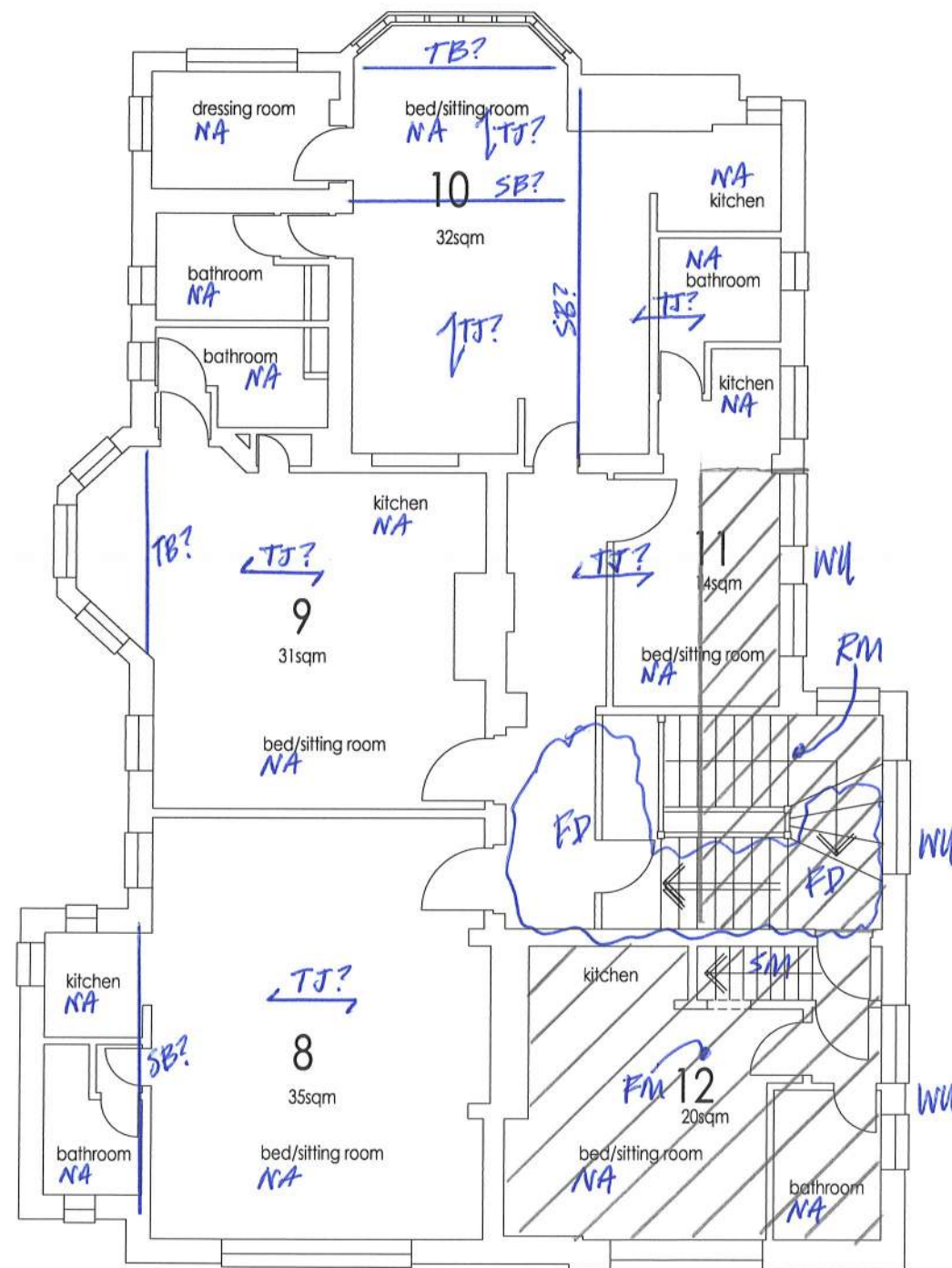


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Project 31 Daleham Gardens
London
NW3 5BU
Basement and Ground Floor Plans
AS EXISTING
Scale 1:50, @ A1 Date Dec 2017
Drawing No 17/253-01

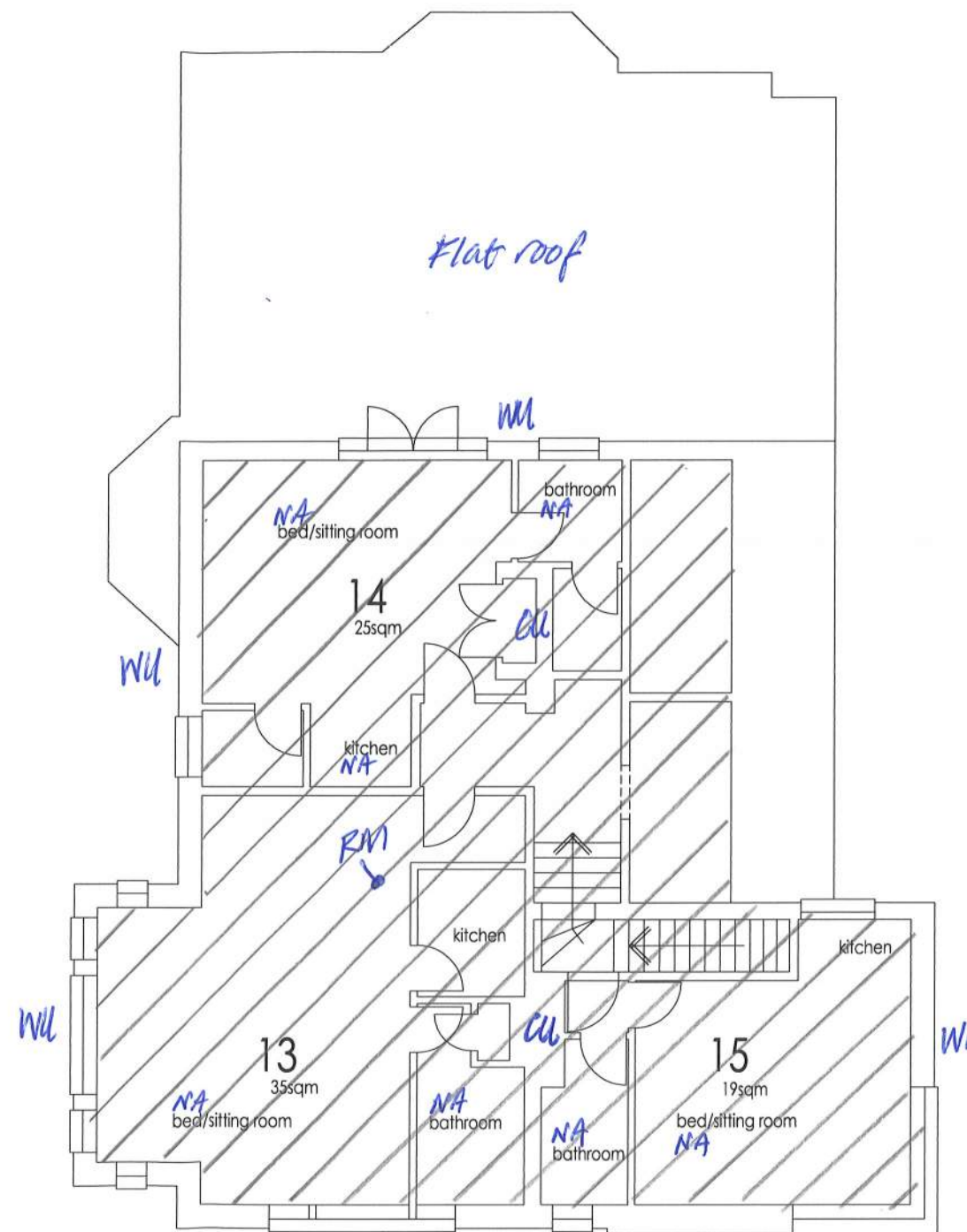
Amendments
L&C Engineers
Results of Initial Survey
40420/SK/01
MND 30/09/20



FIRST FLOOR PLAN

Showing Structure Over

Scale 1:50 (m)



SECOND FLOOR PLAN

Showing Structure Over

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

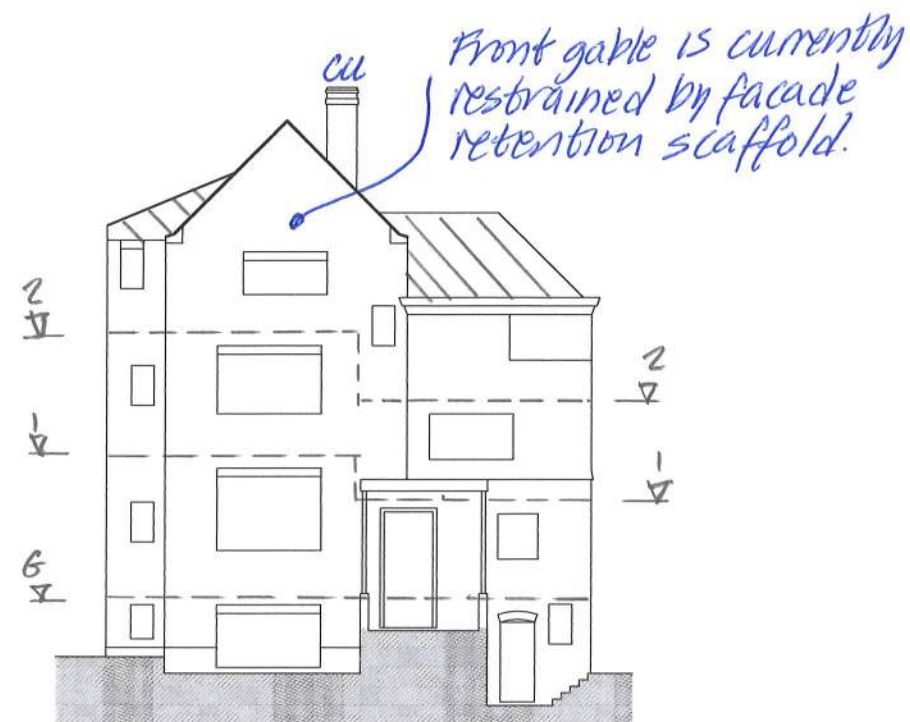


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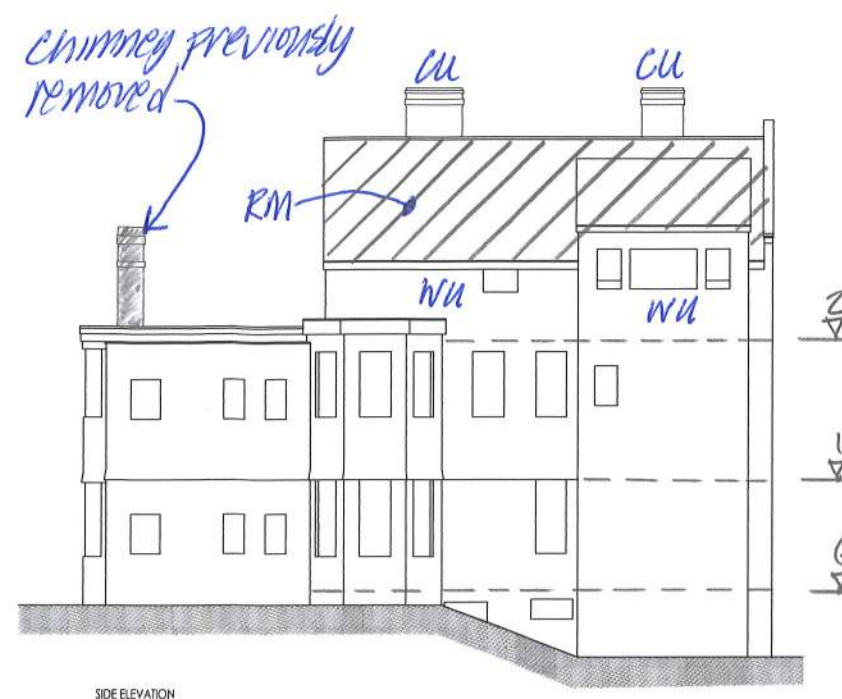


Project
31 Daleham Gardens
London
NW3 5BU
First and Second Floor Plans
AS EXISTING
Scale 1:50, @A1 Date Dec 2017
Drawing No 17/253-02

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



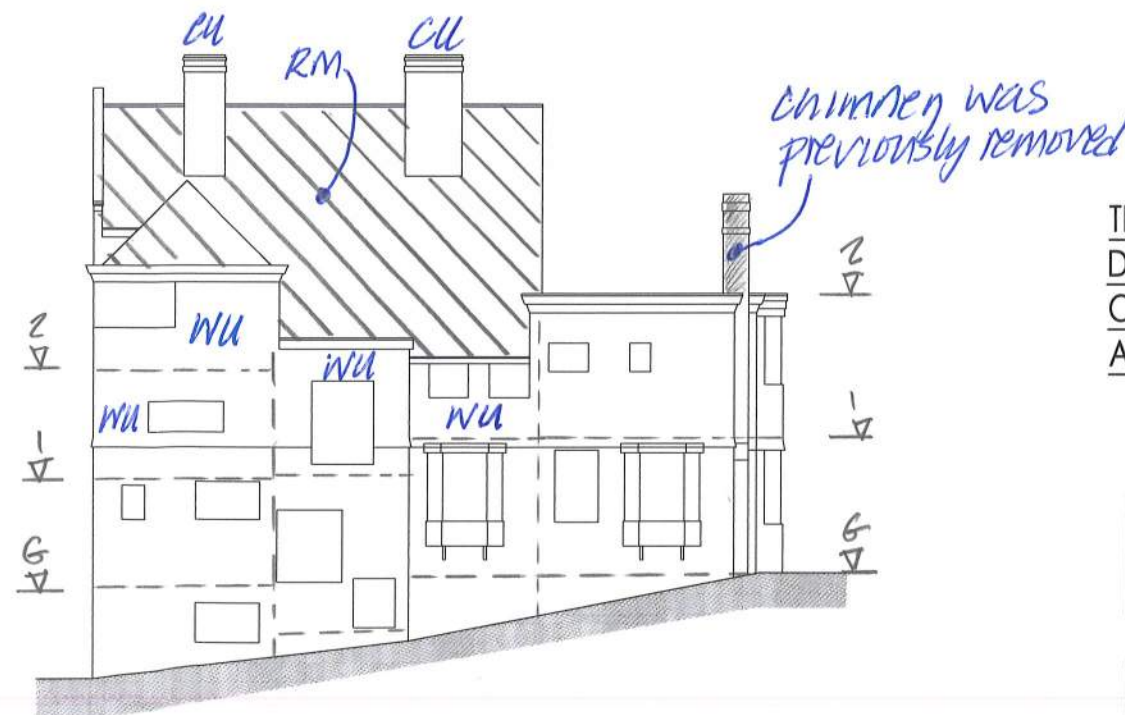
FRONT ELEVATION



SIDE ELEVATION



REAR ELEVATION



SIDE ELEVATION

THIS PLAN IS PRODUCED FROM
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Elevations - AS EXISTING

Scale 1:100, @A1 Date Dec 2017

Drawing No 17/253-03

Amendments
LTC Engineers
Results of Initial Survey
40420/SK/03
MNP 30/09/20

Appendix B

Photographs

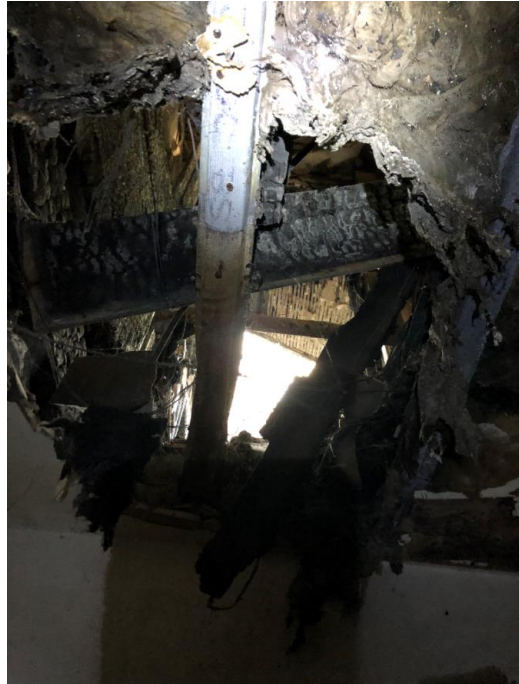


Photo 1 - Apartment 1 fire damage to stair above kitchen



Photo 2 - Apartment 1 bedroom 1

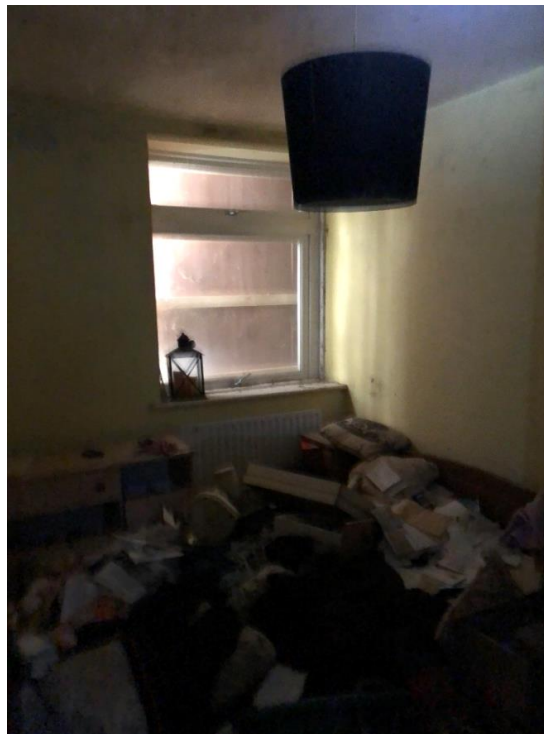


Photo 3 - Apartment 1 bedroom 2



Photo 4 - Apartment 1 living room

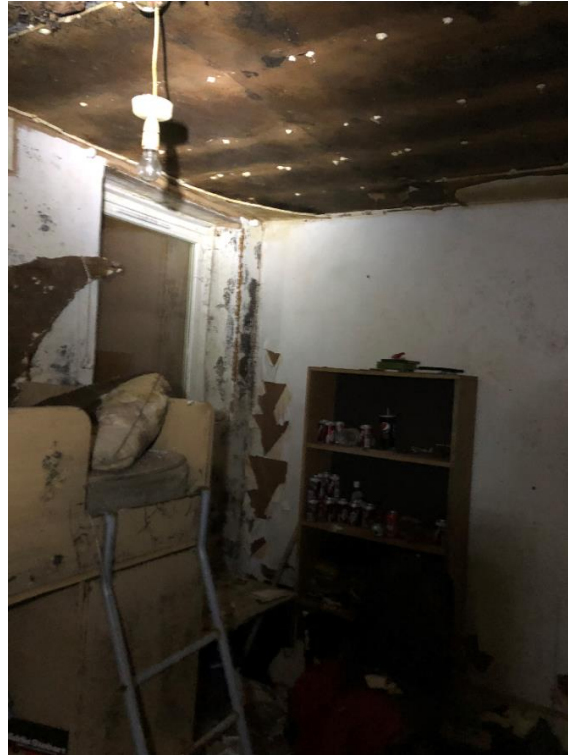


Photo 5 - Apartment 1 bedroom 3 & store



Photo 6 - Apartment 1 bedroom 3 cupboard
underside of stair



Photo 7 - Main entrance porch



Photo 8 - Main entrance hall

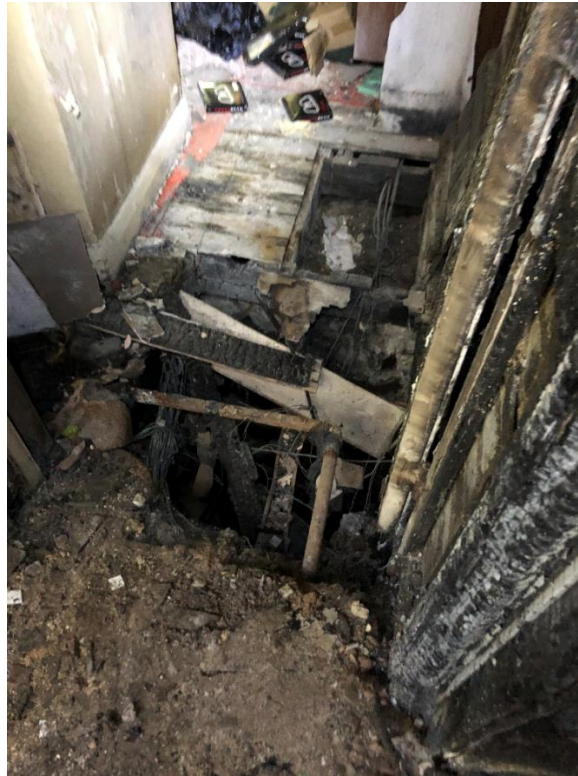


Photo 9 - Apartment 3 fire damaged in entrance



Photo 10 - Apartment 4 bed/sitting room



Photo 11 - Apartment 4 bathroom



Photo 12 - Apartment 5 bed/sitting room

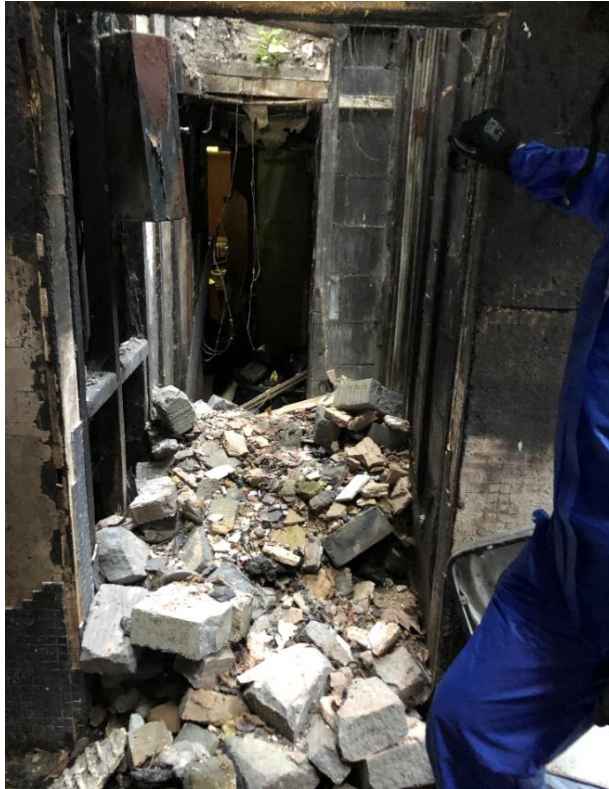


Photo 13 - Apartment 6 rubble build up in entrance



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

L + C



Photo 23 - Rear elevation



Photo 24 - South side elevation of rear extension

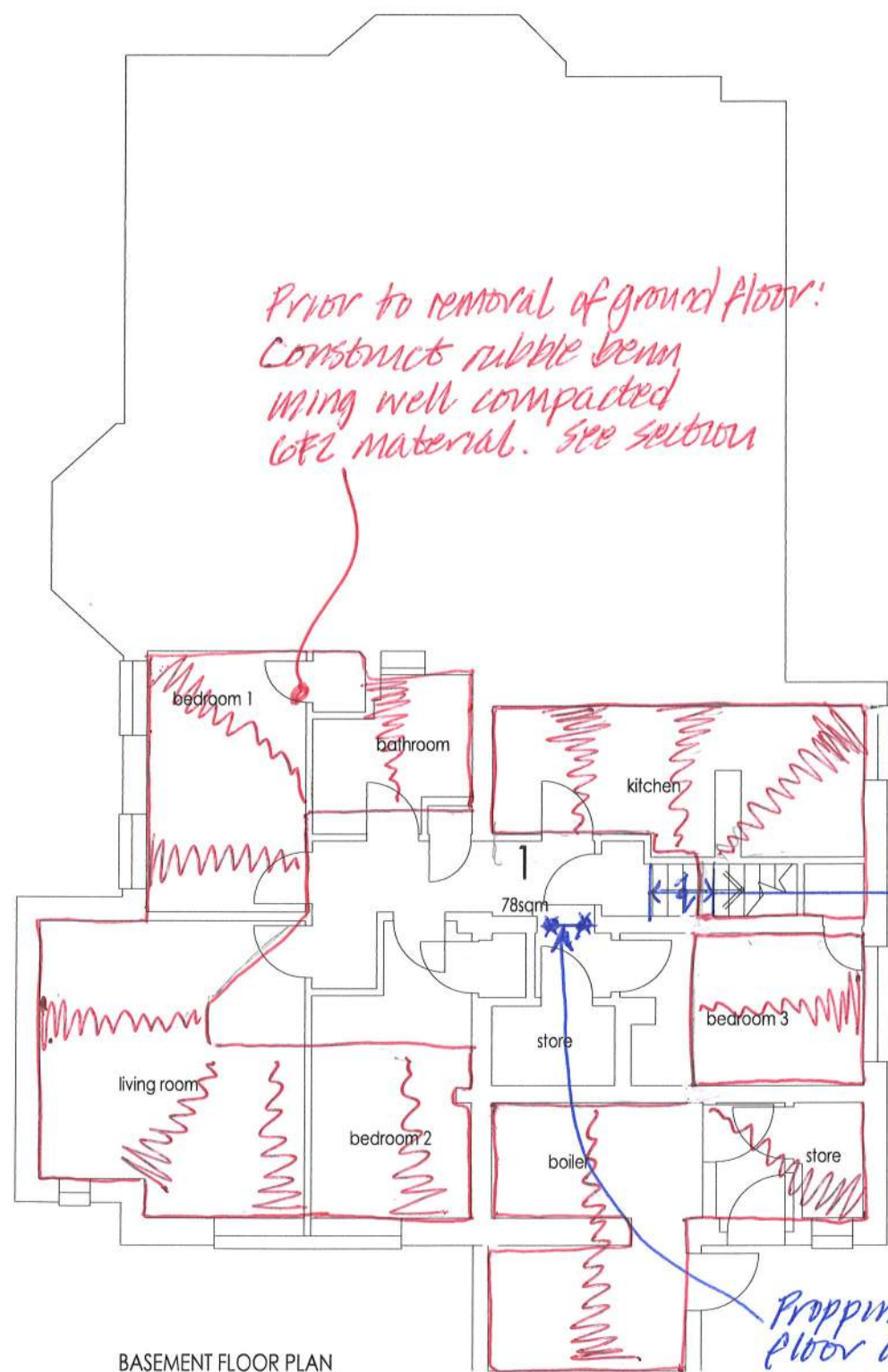
40420R01
31 Daleham Gardens, London



Photo 25 - South side elevation of main building

Appendix C

Preliminary Temporary Works Sketches

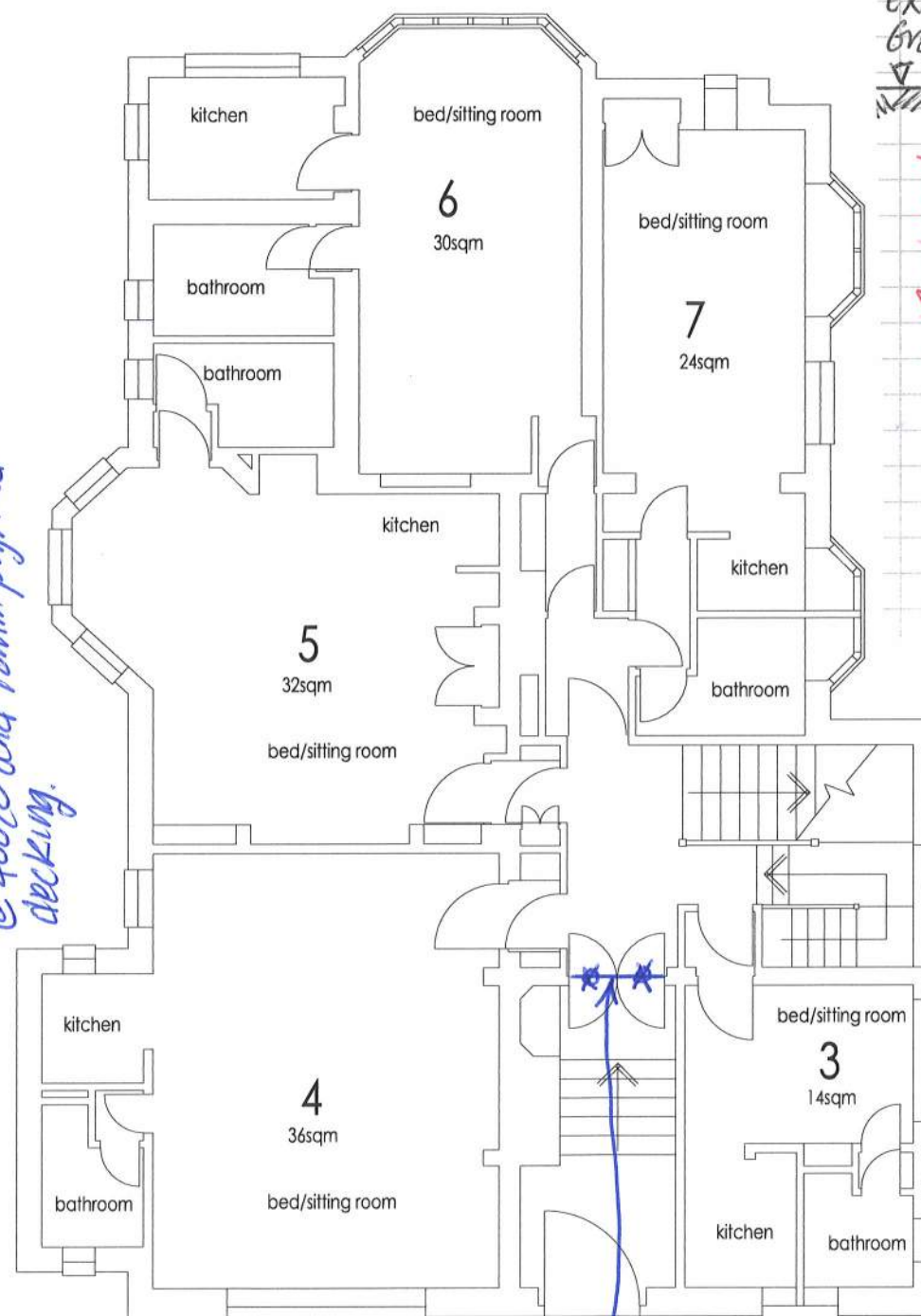


BASEMENT FLOOR PLAN

Scale 1:50 (m)



Replace ground floor
with 100x50 c16 joists
@ 400c and 180mm plywood
decking.



GROUND FLOOR PLAN

Prop door frame at
high level with 2NE
Acrow props 800c and
double scaffold board
head & sole plates.

External
Ground

1200 typical
1600 to rear
wall

Well compacted
GF2 material
to form berm

150:30°

2600

TYPICAL SECTION THROUGH BERM
(NTS)

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DRAWINGS AND DETAILS HELD ON
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Basement and Ground Floor Plans
AS EXISTING

Scale 1:50, @AI

Date Dec 2017

Drawing No 17/253-01

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L & C Engineers
Temporary Works at
Basement & Ground Floor
40420/5K/tw/01 MNP 05/10/20