



STRUCTURAL REPORT ON
EXISTING FLOOR CONSTRUCTION

FOR

HEATH HOUSE
NORTH END WAY
LONDON NW3 7ET

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INTRODUCTION

Following our structural report on the existing building at Heath House dated February 2013 further ceilings were stripped and a digital survey of the floor and ceiling joists was carried out by On Centre Surveys Ltd.

This report covers the visual inspection of the individual joists and beams and their condition.

THE BUILDING

The property is a detached house originally constructed in the 1700's. The west side of the building is four storeys including the lower ground floor and the rooms within the roof space. The east side is three storeys including the lower ground floor. The external walls are facing brick with masonry walls internally and generally timber floors. The roof over the west side is pitched with plain tiles and a flat top. There is a flat roof terrace over the east side of the building.

Alterations have been made to the building over the years with the construction of an additional storey in the late 1800's, and reconstruction of the building in the 1950's following bomb damage during the Second World War.

A full history of the building is covered in the report by the Architectural History Practice dated March 2007.

INVESTIGATION

An inspection of the timber joists to the ground, first and second floors was carried out by ladder between 29th May and 1st June 2013. The pitched roof construction over part of the building is to be reconstructed as part of the improvement works and this area was not therefore inspected.

OBSERVATIONS

The extent of unsupported joists and rot to individual beams and joists is shown on drawing numbers 12221/TF01 to 03 appended to this report.

Ground Floor

All the floor joists were spanning from front to back (south to north).

Area G1

The floor in this area was predominantly timber joists supported off the brick walls and steel beams. There was no visible evidence of defects to the timber in this area.

Area G2

This area comprised of timber joists spanning between brick walls and bulk timber beams with timber lintels over openings in the brickwork.

Most of the timber in the area including the bulk timber beams and the timber lintels was rotten with the structural failure of some members.

Area G3

This area comprised of timber joists spanning between the brickwork walls.

The joists were rotting at their support on the north wall.

Area G4

The floor in this area comprised of joists spanning between the brickwork walls with a bulk timber beam across the middle of the room. The joists were supported off trimmers along the south wall.

Part of the joists towards the south west corner were rotten and the joist along the west wall that was supporting the trimming beam had failed at its support.

Area G5

The joists in this area were supported off the brickwork walls and bulk timber beams with a steel beam supporting one of the timber beams.

There was no visible evidence of rotting to the timber in this area.

Area G6

This was a large area of flooring with separate layers of ceiling and floor joists supported off timber beams with bulk timbers primary beams supporting the secondary beams.

The ends of the joists in the north east corner were rotten. Rot was also noted to the ceiling joists towards the south west corner. In the central bay towards the south of the room some rotting was evident to the secondary beams.

Area G7

The joists in this area were spanning between the brickwork walls with a trimmer supporting the joists in the south east corner.

The timber trimmer was not adequately supported by the brickwork on the south and east walls.

Area G8

The joists in this area span between the brickwork walls, steel beams and bulk timber beams.

There were rotten joists in the north bay of flooring, and along the south wall the ends of the joists and the timber wall plate was rotten and had failed.

Area G9

In this area the joists were supported off the brickwork walls and steel beams.

In the southern bay the ends of the joists were rotten along their full length. The timber lintel in the south east corner was rotten. There was originally a stairwell in the central bay and the removal of the stairs has left this area of flooring generally unsupported.

First Floor

Area F1

The joists in this area were spanning from front to back supported off the brickwork walls, steel beams and bulk timber beams.

The southern timber beam had been cut back and the end was supported off trimming joists the other end of this beam was rotten. The end of the joist in the north west corner was rotten. The joists supported by the southern beam adjacent to the west wall were also rotten. Along the east end of the south wall the wall plate and timber lintel were rotten.

Area F2

The joists were spanning from front to back between the brickwork walls.

The joist adjacent to the east wall was rotten and the south end of one of the joists was rotten.

Area F3

The joists were spanning from side to side between the brickwork walls.

The ends of the joists towards the north end of the west wall were rotten and the end of the joist in the south east corner was rotten.

Area F4

This area of flooring comprised of separate levels of ceiling and floor joists supported off secondary bulk timbers with primary bulk timbers spanning from east to west on each side of the bay.

There was rotting to the end of a beam in the south east corner and along the north wall the end of the joists and beams were rotten.

Area F5

The joists were spanning from front to back, to the rear of the main stair they were supported off the brickwork wall and timber studding forming the rear wall of the stairwell. In the remaining area of flooring the joists were spanning in both directions with a combination of timber trimmers, bulk timber beams and steel beams supporting the joists.

At the rear of the stairwell the ends of the joists were rotten with rot along the full length of some of the joists. The timber stud supporting the joists was also rotten.

Area F6

The joists in this area were spanning from front to back supported off a series of bulk timber beams spanning in both directions.

To the west end of the south wall the ends of the joists and the end of one of the timber beams was rotten.

Area F7

This area comprised of separate levels of floor and ceiling joists supported off bulk timber secondary beams with bulk timber primary beams spanning from front to back.

The end of the joists were rotten in the north east corner and the wall plate was rotten in the west corner of the south wall. A large notch had been cut out of the bottom of one of the secondary beams towards the south east corner.

Second Floor

The joists were generally spanning from front to back.

Area S1 (Flat Roof)

This level of this area is to be raised with the removal of the existing construction and the existing structure was not therefore inspected.

Area S2 (Flat Roof)

This area comprised of separate levels of roof and ceiling joists supported off secondary bulk timbers and primary bulk timber beams to the front and rear of the bay. The primary beams comprised of three bulk timber two at high level and the central one at a lower level.

The ends of the primary beams were rotten and had failed with a visible drop to the construction. Along the north wall the ends of the joists were rotten and several joists were rotten adjacent to the south wall. Joists were rotten adjacent to the west wall and around the perimeter of the bay the joists and wall plate were rotten along the south and east walls.

Area S3

These joists were spanning between the brickwork walls with a central bulk timber beam.

The bulk timber beam was rotten and had dropped adjacent to the west wall. The joist adjacent to the east wall was rotten and along the south wall the end of most of the joists was rotten

Area S4

These joists were spanning between the brickwork walls with trimming around the fire place. There was no visible rotting to the joists in this area.

Area S5

The joists in this area were supported off brickwork walls, steel beams and bulk timber beams.

The central bulk timber beam had been cut back and was supported off two steel channels. The end of some of the joists along the north wall were rotten.

Area S6

The floor and ceiling joists in this area were supported off the brickwork walls and steel beams.

The end of the joist in the north west corner were rotten and the joists were rotten towards the centre of this area. Several of the joists towards the front of this area were unsupported.

Area S7

This area comprised of timber joists supported off bulk timber beam spanning in both directions.

The timber beam adjacent to the west wall and the stair to the second floor had been cut back to accommodate the stair. One of the timber beams (SB5) was splitting at the joists with a secondary beam (SB4).

CONCLUSION AND RECOMMENDATIONS

In addition to the visual inspection relating to the condition of the timber an analysis of the members was carried out to assess their structural adequacy.

In appraising the timbers consideration has been given to the historic nature of the area of flooring under consideration.

Area G1

The timbers in this area were generally in good condition.

As part of the proposed works with the removal of some of the walls on the lower ground it will be necessary to introduce additional steel beams to support the existing timbers.

Area G2

The timbers in this area generally appear to be part of the original construction, however there was a significant degree of rot to both the joists and the timber beams. The ends of the timber beams had failed and the whole floor had dropped. One of the timber beams is providing support to the main stairway and the floors to the rear of the stair.

In our opinion whilst it may be possible to repair and strengthen some of the timbers, the condition of the timbers to the north end of this area is beyond repair and should be replaced with new timbers.

Area G3

This is a small area of flooring. The floor joists were rotting at the support along the north wall. In view of the extent of the rot and the span of the joists it would be feasible to cut back the ends and splice on the new timbers.

Area G4

The timbers in this area generally appeared to be part of the original construction with a bulk timber beam supporting the joists across the centre of the room. Whilst the majority of the timbers in this area were in reasonable condition, the timbers in the south west corner were rotten.

In view of the limit of work required to remedy the problems in this area we recommend that the defective timbers are renewed retaining the majority of the original construction.

Area G5

This area comprised of sections of what appeared to be the original construction together with a steel beam to provide additional support to the original timbers.

At the time of the inspection there was no evidence of defective timber in this area.

Area G6

The timbers in the area generally appeared to be part of the original construction.

Whilst the majority of the timbers appeared to be in reasonable condition there were isolated areas of rotten timbers, the most significant being the secondary beams in the central bay towards the front of the room. The rotting was along the length of the beams and whilst it was not severe at the time of the inspection it will have reduced their strength.

We recommend that these rotten joists are replaced with new timbers. In the north east corner the joists were rotten and had failed at their support. These joists should either be replaced or cut back and spliced. We recommend that the rotten ceiling joists towards the south west corner are renewed.

Area G7

Whilst the joist in this area were generally acceptable, in the south east corner they were supported off a timber trimmer that was not adequately built in to the supporting walls.

We recommend that the brickwork supporting the trimmer is reconstructed to provide adequate support.

Area G8

This area comprises of a combination of what appeared to be the original construction and new timbers some spliced to the original, and steel beams. The timber joists were rotten along the south wall and we recommend that the rotten timber is cut out and replaced with either new joists or joists spliced to the existing.

Area G9

The floor in this area has been generally reconstructed over the years with the introduction of steel beams. With the removal of a stairway a large area of the floor is currently unsupported.

In view of the fact that most of the construction in this area is not original we recommend that the existing joists are replaced with a new steel beam to provide support in the unsupported area.

FIRST FLOOR

Area F1

This area comprises of a combination of timber joists and a timber beam that appear to be original, towards the south end of the room, together with replacement joists, some spliced and steel beams. The original timber beam is rotting where it was built into the west wall and the other end has been cut back and was supported off replacement timber joists.

In addition to the rotting to the timber beam the wall plate supporting the joist along the south wall was rotten together with the joists adjacent to the timber beam and the west wall.

In view of the extent of the alterations to the floor in this area we recommend that the defective beam and joists are removed and new joists provided.

Area F2

The joists in this area were in a reasonable condition with the exception of one joist adjacent to the east wall and we recommend that this joist is replaced.

Area F3

The joist to the north end of this room were rotten at their support on the west wall and some had failed. We recommend these joists together with the joist adjacent to the south wall are replaced.

Area F4

The floor to this area appeared to be part of the original construction, generally with the exception of the timbers adjacent to the north wall and a beam in the south east corner the timber was in reasonable condition. We recommend that the defective joists and beams are cut back and that new joists are spliced onto them.

Area F5

All the joists in this area were rotten to a certain degree, some along their full length. In view of this we recommend that all the joists were renewed.

To the west side of the main stairway the joists were supported off a series of trimming joists. An analysis of these joists (FB1 and FB2) indicates that they are not adequate to support the proposed floor loading and in view of this we recommend that this area of floor is also renewed.

Area F6

The timber beams and joists in this area appeared to be part of the original construction,

The joist and beams were rotten at their support along the south wall and we recommend that the joists are cut back and spliced. Support should be provided at the end of the timber beam with steel plates spliced on to the beam.

Area F7

The floor and ceiling in this area appear to be part of the original construction. There was rotting to the end of the joists on the north east corner and along the wall plate supporting the joist towards the west end of the south wall. We recommend that the joists in the north east corner are cut back and spliced and the rotten wall plate is renewed along the south wall. In addition a large notch has been cut out of the underside of beam FB8 reducing the strength of the beam. We recommend that steel plates are fixed across the notch to strengthen the existing timber.

SECOND FLOOR

Area S1

This area is to be reconstructed at a higher level and the existing construction was therefore not inspected.

Area S2

This area appears to be part of the original construction. It comprises of separate layers of roof and ceiling joists supported off timber beams with two lines of main support off two primary beams consisting of three sections of bulk timber.

These bulk timbers are rotten and have failed at three of the four supports. The whole of the roof construction has dropped at the failed supports.

In addition the ends of the joists were rotten along the north wall, the timbers were rotten around the perimeter of the bay on the east wall, joists were missing and rotten along the south wall and there were rotten joists along the west wall.

In view of the complexity of trying to jack up and repair the bulk timbers together with the repair and replacement of all the rotten joists around the perimeter of the construction we would recommend that the existing construction is taken down and replaced with new timber joists and steel beams. In view of the fact that the first floor construction in this area is similar to the roof it may be considered acceptable to reconstruct the roof as recommended.

Area S3

This area appears to be the original floor construction with the joists spanning onto a central bulk timber beam. The ends of the joists are rotten along the south wall and the bulk timber beam is rotten and has failed at its support in the west wall. We recommend that the floor is removed and replaced with new joists spanning from east to west.

Area S4

There were no notable defects to the timbers in this area and they would therefore be retained.

Area S5

This area comprised of what appeared to be some of the original joists with bulk timber beam and new joists and steel beams. The bulk timber beam had previously been cut back and steel channels had been spliced on to support it. The ends of the joists along the north wall were rotten. We recommend that the rotten joists are cut back and new joists are spliced on to the original.

Area S6

This area comprises of steel beams and joists some of which may be original, at high and low level to support the roof and ceiling. The joists towards the centre of the area were unsupported and several joists were rotten. We recommend that all the rotten and unsupported joists are removed and replaced with new joists spanning between the existing walls and steel beams.

Area S7

The construction in this area appeared to be original joists and bulk timber seams. Beam SB5 was splitting at the junction of beam SB4 and an analysis of the beam in this area indicates that beams SB5 and SB6 are not adequate to support the floor design loading. However with the proposed modifications to the second floor levels a new floor would be provided over the existing construction such that the existing construction would be retained and would only be supporting its self weight and ceiling loads and it could therefore be retained without having to provide additional strengthening.

SUMMARY

It can be seen from the survey results that specific areas, in particular the central stair area and the structure to the flat roof terrace have been subject to water penetration with rotting to the timbers. Generally the defects in most areas can be resolved by treating and cutting back the rotten timber and splicing on new timber. The extent of the damage in the stair area and to the roof terrace, is in our opinion, such that these specific areas should be stripped out and reconstructed.

On the basis of this we recommend that these proposals are considered with English Heritage in order to achieve the most satisfactory solution to refurbishing the building as a whole.

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