conisbee | Consulting Structural Engineers
Consulting Civil Engineers

5-13 Leeke Street, WC1X 9HY

Construction Method Statement

London
1–5 Offord Street
London N1 1DH
Telephone 020 7700 6666

Norwich
6 Upper King Street
Norwich NR3 1HA
Telephone 01603 628 074

Cambridge
16 Signet Court Swann Road
Cambridge CB5 8LA
Telephone 01223 656 058

design@conisbee.co.uk
www.conisbee.co.uk

Ref: 180832/J Little

Approved By: N Nicholls

Date: 27th Aug 2019

Status: For Information

Version: 2

0.0 INTRODUCTION AND BRIEF

This report has been prepared by Conisbee, consulting structural and civil engineers, to accompany the planning submission by Guy Stansfeld Architects for the Paul Hamlyn Foundation and it is intended to satisfy the requirements of the London Borough of Camden.

The following report outlines the construction methodology to add an additional storey to 5-11 Leeke Street and a new three storey building at 13 Leeke Street.

The report is based on the planning drawings and documents produced by Guy Stansfeld Architects, historical drawings and planning information and a non-intrusive visual survey of the existing buildings. The report should be read in conjunction with the structural sketches.

1.0 SITE INFORMATION

5-11 Leeke Street is a mid-to-late nineteenth century three-storey building originally used as a fire station. It has subsequently seen various uses and is currently the offices of the Paul Hamlyn Foundation. The building was refurbished in 2011 and a new lift was added, as well as a roof and ventilation system over the kitchen. In 2014 the roof terrace was refurbished. 13 Leeke Street was originally a single storey garage and in 2010 it was converted into a two storey house.

5-13 Leeke is bound by Leeke Street to the north; 3 Leeke Street to the east which is also a three-storey; and 4-26 Britannia Street which forms the southern boundary and wraps around the western boundary to front onto Leeke Street. 4-26 Britannia Street is a three storey building at the front and a single storey double height space with a flat roof at the rear which backs onto 5-13 Leeke Street.

The ground conditions for the area are typically London Clay as shown on the British Geological Survey website. A nearby borehole for the Channel Tunnel Rail Link found brick earth overlying London Clay at a depth of 2.3m which continued to the Woolwich and Reading beds at a depth of 17.6m. No ground water was encountered in the borehole. The historical maps show that there used to be an iron works on the site of 4-26 Britannia Street and the existing drawings for this building also show that there used to be a garage with fuel pumps, so there may be the potential for ground contamination.

There are no London Underground Limited (LUL) assets directly underneath the site and the majority of the site is outside of the LUL zone of influence, apart from a small part of the south west corner which borders with 4-26 Britannia Street, as shown on the Transport for London Property Asset Register Public Web Map. The Circle, Hammersmith and City and Metropolitan Lines run nearby from King's Cross Station.

There are no Thames Water assets directly underneath the site. The Thames Water Asset Location Map show that the foul and surface water sewers run along the middle of Leeke Street and do not pass underneath the site.

The London Bomb Damage Map for World War II indicates that there was damage beyond repair to the land to the west of the site, adjacent to the railway and 5-13 Leeke Street only suffered general blast damage which is likely to be because of this.

2.0 EXISTING BUILDING

5-11 Leeke Street is a steel framed building at ground floor with load bearing masonry walls and steel framing structures across the upper floors. The foundations are mass concrete pads supporting the steel columns and brick corbel foundations. The ground floor is a concrete ground bearing slab.

The entire first floor is assumed to be a concrete filler joist floor.

The second floor underneath the pitched roof side of the building is a timber floor that has been strengthened with underslung steel beams in the past (possibly when load bearing walls at first floor were removed). There have been remedial repair details to the timber floor including splices to join discontinuous joists together; splices to increase the bearing length of the joists; and remedial ties between the floors and walls. The vaulted pitched roof was added in the late 2000's. It is formed with a central cranked steel beam spanning front to back between the external walls which support steel beams spanning side to side acting as purlins. The pitched rafters span from the external masonry walls to a central ridge board. There were ceiling joists in between the steel purlins and timber rafters acting as collar ties to prevent the roof from spreading. The ceiling joists were removed as part of the refurbishment in 2011 to install rooflights and alternative tie details were installed.

The second floor below the flat roof side of the building is assumed to be a concrete filler joist floor as well as the roof itself.

At the rear of the property there is a pitched glazed roof light between the rear wall of the building and the southern boundary wall with 4-26 Britannia Street. This has metal purlins at regular intervals that span between the two walls with the glass spanning in-between them. This forms the covered courtyard area at the rear of the building.

Stability of 5-11 Leeke Street is provided by the masonry walls and by frame action at ground floor from the steelwork. The Party Wall with 3 Leeke Street is assumed to be stable in its own right as it should be retrained by the floors within this building.

13 Leeke Street is of traditional load bearing masonry and timber construction. There are timber joists at each level that span side to side between 5-11 Leeke Street and a 215mm brick wall built in front of the party wall on its own foundations. There are also steel beams that trim around the staircases which span side to side. Stability of the building is assumed to be provided by the masonry walls.

The Party Walls with 4-26 Britannia Street and 15 Leeke Street that form the southern and western boundary are assumed to be stable in their own right. Historic drawings for 4-26 Britannia Street show that that the southern boundary wall is a minimum 330mm thick brick wall supporting the pitched roof structure of 4-26 Britannia Street which is likely to be providing restraint to this wall. The glazed rooflight at the rear of 5-13 Leeke that spans onto this wall is likely to be a subsequent infill and is only providing partial restraint to the wall. Historic drawings for 15 Leeke Street show that the boundary wall is a minimum 215mm thick brick wall supporting the steel roof structure over which is providing restraint to this wall. 13 Leeke Street is independent of 15 Leeke Street and the boundary wall is a separate 215mm brick wall that has been built in front of the Party / Boundary Wall.

3.0 PROPOSED WORKS

The proposed structural work involves removing the existing timber pitched roof to 5-11 Leeke Street and constructing an additional single storey extension with a roof terrace. New mass concrete foundations and steel columns will be installed on the pitched roof side of the building to reduce the spans of the existing steel frame so that the loads on the existing walls and foundations are approximately halved. The columns will then continue up to support part of the new extension.

The existing concrete filler joist roof on the flat side of the building will also be removed and replaced with a new single storey extension without a roof terrace.

The additional storey will be constructed out of a lightweight braced steel frame that spans between the existing external load bearing masonry walls. The floors and roof will be timber joist or light gauge steel purlins (Metsec or similar) sheathed in plywood. The walls of the extension will also be timber or light gauge steel (Metsec or similar) studs. The building will be clad in a lightweight Corten. The floors will act as a rigid diaphragm and together with the steel frame will tie and laterally restrain the tops of the existing masonry walls. The roofs will also act as a rigid diagram and will transfer horizontal loads back to the bracing and supporting structure.

The horizontal and vertical loads will be transferred through the existing load bearing masonry structure and steelwork to the ground via the new and existing concrete pads and brick corbel foundations. The existing structure will be strengthened where necessary, although the overall net load increase will be kept within 5-10%.

The disproportionate collapse requirements for the building are unchanged by the additional storey. The building is categorised as Class 2b 'Offices not greater than 4 storeys' in accordance with part A3 of the Building Regulations and the new extension will be designed to provide the effective horizontal ties required.

The proposed structural works also involves the demolition of 13 Leeke Street to construct a new three storey building to the same height as 5-11 Leeke Street. There will also be a new two storey building at the rear in place of the existing kitchen which will require the removal of part of the existing pitched roof lights. It is proposed to construct both of these new buildings out of braced steel frames supported off reinforced concrete ground beams acting as spread foundations. The floors and roofs will be lightweight timber joist or light gauge steel purlins (Metsec or similar) sheathed in plywood. The walls will also be lightweight timber or light gauge steel (Metsec or similar) studs. The second floor of these buildings will be clad in brick slips fixed back to a light gauge steel frame. The third floor and roof will be clad in lightweight Corten as per the extension to 5-11 Leeke Street.

The vertical loads will be transferred via the floor slabs and beams to the columns and to the ground via the ground beams. The ground beams will be set out to avoid undermining any of the existing boundary walls so that underpinning is not required and they will also be outside of the LUL zone of influence. The horizontal loads will be transferred to the braced structure via the floors and roofs acting as rigid diaphragm and to the ground via the ground beams.

In order to meet the disproportionate collapse requirements, the new steel frame for 13 Leeke will be designed with effective horizontal ties as required for a Class 2b building 'Offices not greater than 4 storeys' in accordance with part A3 of the Building Regulations.

4.0 DESIGN AND OUTLINE CONSTRUCTION METHOD STATEMENT

All of the works are to be carried out in a manner which minimises noise and vibration that may affect the neighbouring properties. The Engineer will make regular site visits during the construction.

Outline construction sequence and temporary works assumed in the design as described below will be superseded by the Contractor's proposals. The Contractor will be required to submit full proposals, method statements and calculations to the Engineer for review prior to the start of works on site.

The Contractor will be responsible for the design, erection and maintenance of all temporary works in accordance with all relevant British Standards. The Contractor will be required to provide adequate temporary works and supervision to ensure that the stability of the existing structure, excavations and surrounding structures are maintained at all times.

The assumed sequence of construction is as follows and as shown on the sketches in Appendix B:

1) Install hoarding to the front of 5-13 Leeke Street including partial possession of the pavement with pedestrian and vehicle circulation maintained by temporary traffic control measures.
2) Install the necessary temporary works to maintain stability of the boundary walls before any demolition work takes places. The southern and western boundary walls with 4-26 Britannia Street and 15 Leeke Street are assumed to be stable in their own right. The eastern boundary wall with 3 Leeke Street is assumed to be stable in its own right up to roof level where the gable end will need temporary lateral restraint.
3) Phase 1 - Carefully demolish 13 Leeke Street and the kitchen behind and reduce site level as necessary.
4) Excavate and cast new reinforced concrete ground beams. Ground beams are to be installed sequentially so that they are excavated and cast within the same day to mitigate any ground movement.
5) Cast reinforced concrete ground floor slab to 13 Leeke Street and erect scaffolding off this as necessary to safely build the new steel frame.
6) Construct new steel frame up to the height of 5-11 Leeke Street. A mobile crane is likely to be required for the erection of the frame as practical constraints limit the erection of a tower crane and this will require occasional road closures.
7) Phase 2 – Install the necessary temporary works to maintain stability of 5-11 Leeke Street before any demolition works takes place. This includes vertical propping of floors and beams and temporary lateral restraint to the existing walls at second floor before the roofs are demolished which can be provided by temporary restraint from the scaffold and / or raking props off the internal floors.
8) Excavate and cast new concrete pad foundations. Pad foundations are to be installed sequentially so that they are excavated and cast within the same day to mitigate any ground movement.
9) Constructed the new steel columns off the concrete pad foundation, fixed between the existing steel beams up to second floor.
10) Carefully demolish the existing pitched roof and flat roof and level the existing masonry walls so that the new steel frame can be built off them.
11) Construct new steel frame extension off existing walls of 5-11 Leeke Street and continue up the frame of 13 Leeke Street to tie into this. A mobile crane will be required for the erection of this frame as practical constraints limit the erection of a tower crane and this will also require occasional road closures.
12) Temporary propping of existing walls and floors can be removed once floors, roofs and bracing are installed.
13) Temporary scaffolding can be removed once the cladding of the building is complete.

5.0 SUMMARY

The proposed development of 5-13 Leeke Street is to construct a single storey extension on top of 5-11 Leeke Street and a new three storey building in place of 13 Leeke Street. The permanent works should not affect the stability or structural integrity of the existing building and will have negligible or no impacts on the neighbouring properties.

The construction sequence indicated within this document allows for the development to be constructed in a manner that is safe and economic.

The work to 5-13 Leeke Street, although complicated, should not be unfamiliar to a competent and experienced contractor and are relatively modest.

APPENDIX A – OUTLINE STRUCTURAL DRAWINGS

APPENDIX B – CONSTRUCTION SEQUENCE DRAWINGS