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MULTIDISCIPLINARY ENGINEERING CONSULTANTS

| Report No | Date |
|---|---|
| **XL03964** | **July 2015** |

Project

# Antwerp House, 26 Kirby Street, London EC1
# Structural Overview Statement

Client

**PETER TUSON**

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**SE1 3ER**

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| Issue Date | Status | Description of Amendments |
|---|---|---|
| 14 July 2015 | FINAL | |
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| Report prepared by: |
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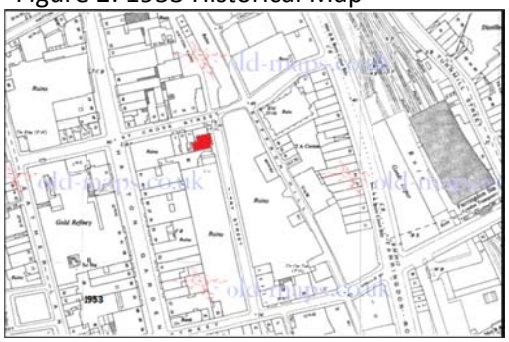
| **Approved for issue by:** |
| |

Antwerp House was constructed circa the early 1950' and its structural form and layout remains broadly unchanged. Prior to then it was two sites and the redevelopment amalgamated both sites, refer to Figures 1 & 2.

Figure 1:1916 Historical Map


Figure 2: 1953 Historical Map




During WWII the area was extensively bomb with adjacent buildings suffering total destruction and Antwerp House sustained only general non-structural blast damage, refer to Figure 3 which is an extract from the WWII London Bomb Damage Maps.

Figure 3: WWII Bomb Damage Maps

It fronts Kirby Street and is the penultimate property on the West side of the street adjacent to Saint Cross Street. The adjacent building immediately to the North probably dates back to the mid 1800' and the building immediately to the South is of more contemporary framed construction.

It has a basement and extends two floors over the ground floor. To the rear of the site there is a lightwell extending above the 1st floor roof, along with two other higher level flat roofs, refer to Figures 4 and 5.

Figure 4


Figure 5


Access to the upper floor and basement is vis a concrete stairs situated adjacent to the North gable wall.

Currently the access to the flat roof over is via a ladder.

From a review of some archive drawings issued to us by the client it would appear the structural form appears to be reinforced concrete floor slabs spanning back to front with an intermediate internal support from a down stand beam (possibly steel) spanning North South between the flank walls. It is assumed that the beam is supported off steel / concrete columns buried in either flank wall. We would suspect that the elevations are also framed rather than loadbearing masonry.

The front elevation brick spandrel panels on 1st, 2nd and roof are constructed in stretcher bond suggesting cavity construction, refer to Figure 5.

Figure 5


Lateral stability is achieved by the diaphragm action of the floor plates transferring lateral wind loads into the perimeter loadbearing masonry walls. The stair core will also enhance the buildings stability / robustness.

The archive information provided contained correspondence from David A Berle, Consulting Engineers, dated 23rd April 2008 relating to proposed reconfiguration of the structure which included the addition of a floor above 2nd and the instillation of a number of 2 tonne safes. The letter states the following "*The property appears to consists of sold concrete floors with either a steel or concrete frame. It was originally used as a small factory which would account for the London County Council loading notices at first and second floors. These stated that the loads were not to exceed a statuary limit of 100lb/sq.ft or 4.8kN/m$^2$. …… The maximum load at ground floor level was 75lb/sq.ft or 3.6kN/m$^2$.*"

From a review of the British Geological Maps the underlying ground conditions at the site are as follows:

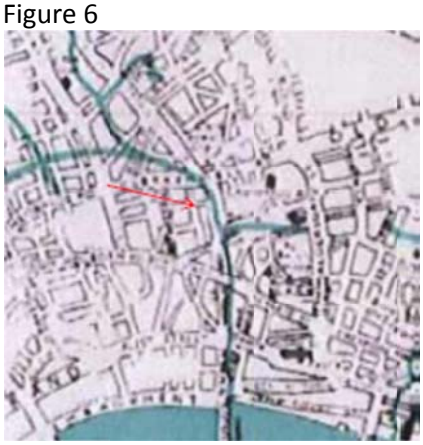
Geology:

- Drift:
    - Hackney Gravel – Sand and Gravel. Local borehole 100m east indicates gravel to 4.25mBGL (13mOD)
- Solid:
    - London Clay – to depth

Geomorphology:

- The site lies about 30m west of the bank of the infilled channel of the River Fleet (the River is now in culvert). Geological maps indicate the channel to extend to potentially 10mBGL and filled with clay/silt Alluvium. There is apparently no groundwater within the channel. Also no groundwater is recorded within the Hackney Gravel.

Figure 6



- The site elevation is c.17mOD. Farringdon Road level (within the Fleet channel) is 12mOD. The 5m level difference is about the thickness of the Hackney Gravel, which was apparently completely eroded away along the course of the River Fleet.

Basement Construction:

- It is likely that the existing basement (assumed single story, seated at about 4mBGL) will be constructed entirely in the Hackney Gravel, and that this is dry.
- Vertical extension will pass into the London Clay, and in the absence of water in the overlying Hackney Gravel, will be dry.
- The London Clay may be susceptible to heave on unloading as the basement is deepened. The magnitude of heave will depend on the net future unloading, assuming all heave from the existing basement development ceased long ago. Whilst likely to be a small value, allowance will be required in the basement construction.

- Conventional underpinning techniques are likely to be suitable.

Underground Infrastructure:

- The site is not underlain of within the zone of influence of existing tube tunnels.
- Cross Rail will pass from Farringdon LUL station to Holborn LUL station on the South end of Kirby Street therefore consultation with Cross Rail is unlikely to be required.
- Post Office tunnels run south from Mount Pleasant apparently to west of Farringdon Road, therefore should not be affected by the development.

The building would originally have been used for light industrial / commercial activity and as such the design live load is stated to be 100lbs/sq.ft or 4.8kN/$m^2$ on the 1$^{st}$ and 2$^{nd}$ floors and Ground floor 3.6Kn/$m^2$. The flat roof would have been designed for a live load of 30lb/sq.ft or 1.5kN/$m^2$.

The proposed scheme is to convert the upper floors into residential accommodation and extend the building upwards at roof level to match approximately the existing gable wall heights. The current Building Regulation requirement for residential live loading is 1.5kN/$m^2$ and 3.0kN/$m^2$ for the stair core.

Downgrading the live load to 1.5kN/$m^2$ provided a spare capacity of 3.3kN/$m^2$ per floor for 1$^{st}$ and 2$^{nd}$ floors or 6.6kN/$m^2$ this loading can be offset against the proposed roof extension which will be in lightweight construction. Furthermore the roof live load will be as required for residential loading.

As the number of floors is increasing progressive collapse / robustness will need to be discussed with building control to agree on the most appropriate method of addressing it. However as we believe the building to be a framed construction this should simplify matters.

There will be an increase in wind loading, East / West, but this should be accommodated by the gable and stair core walls.

Access to the upper floors will be by the existing stair core extended to roof level and a lift situated between the stair core and front elevation. As the lift will not serve the basement the lift pit will be contained within the basement thus avoiding the need to form a lift pit below the existing basement structure.

It is also proposed to lower the existing basement floor to create an improved floor to ceiling height. This may involve underpinning of the perimeter walls. It may also result in exposing the tops of any foundations to internal columns.

As part of ongoing design development it will be necessary to undertake appropriate site exploratory works to finalise matters. Party wall notices may also need to be served on the adjoining owners.

For construction site access we would imagine a scaffold with a gantry over the pavement for material storage. A temporary roof may also be required to keep the building water tight. More detailed method statements can be provided at the appropriate time in the procurement of the works from specialist contractors.