



CBC Structural Report

Project Name :-

Part-Demolition of Existing Building

Site Address :-

102 green lane Northwood Middlesex HA6 1AJ

Client : Mr Kais Issa

Written By		A. O. Oluwasere, BEng P.G. Dip CEng MICE	
Signed			
Checked By			
Rev	Date	Rev By	Comment



Contents

1.	Introduction	1
1.2.	Brief Description of Property	1
1.3.	Documents Provided	4
2.	Site	4
2.1.	Local Geology	4
3.	Main Property Observations	5
3.1.	External Observations	5
3.2.	Front Elevation	5
3.2.1.	Front Roof	5
3.2.2.	Chimneys and Parapets	5
3.3.	Rear Elevation	5
3.3.1.	Rear Roof	5
3.3.2.	Rear Elevation	5
3.4.	Flank Walls	5
3.4.1.1	Left Side Wall {Ground floor}	5
3.4.1.2	Right Side Wall {1 st floor}	5
3.5.	Internal Observations	6
4.	Conclusions and Recommendations	6
4.1.	Conclusion	6
4.2.	Recommendations	7
4.2.1	Further Investigation	8

1. Introduction

We have been requested by the client, Mr Kais Issa, to view of the structural condition of the building. I can confirm that this report, its contents and recommendations, can be used to demonstrate the picture of possible damage to the property.

- 1.1.1. This report is with regards to the structure, the engineer has considered the main load bearing walls to see if there are signs of cracking that may suggest defects and foundation movement to the building; no opening up works or intrusive investigations have been undertaken. From the defects seen our conclusion and recommendations have been provided. This report should not be considered an exhaustive catalogue of all defects.

1.2. Brief Description of Property

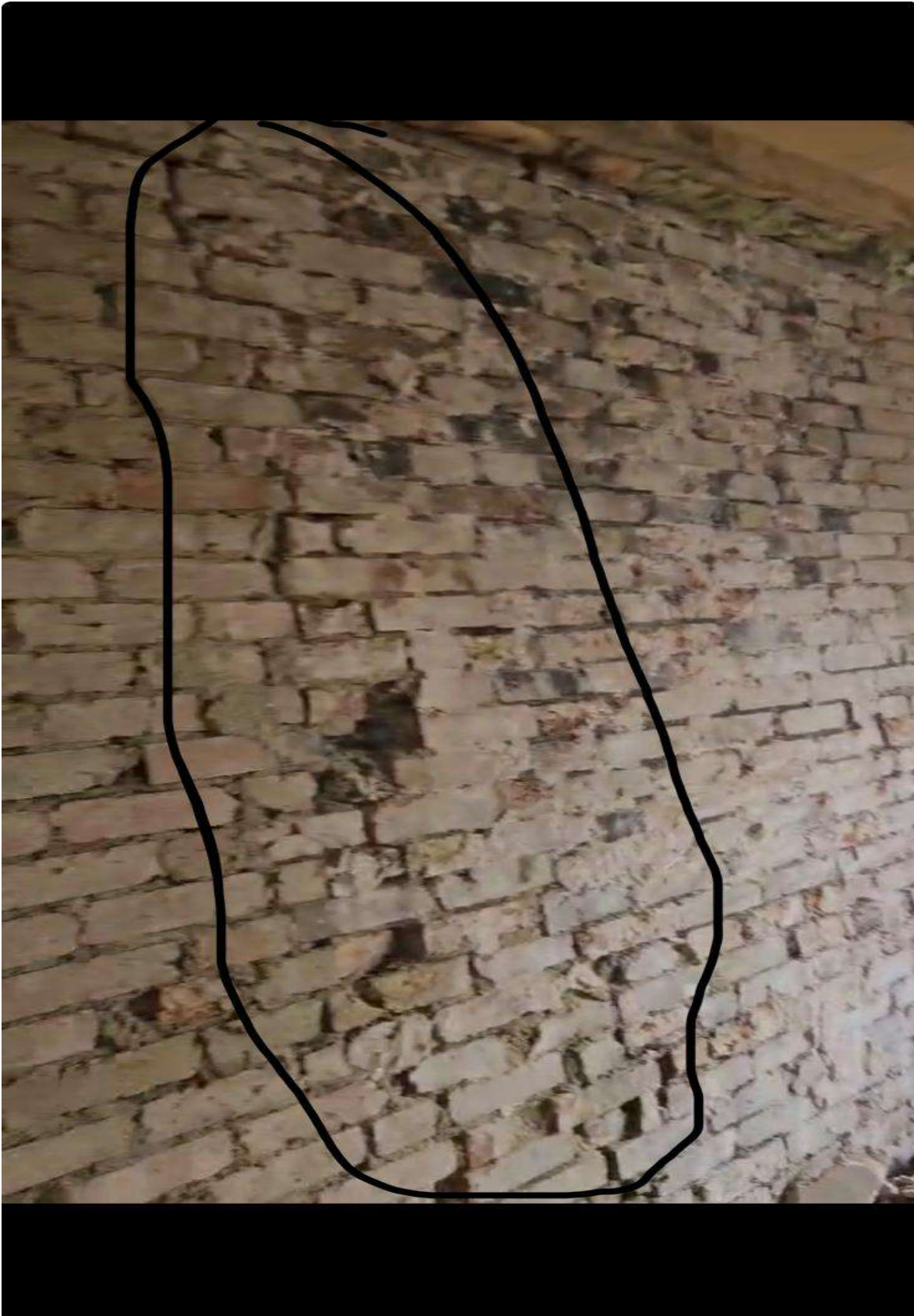
- 1.2.1. The property is a two-storey detached building, which was been built with traditional masonry walls plus its external walls part rendered as well as timber roof. The property has a two-storey bay window at the front elevation. The property could either be a Victorian or Edwardian building and assumed to be built in early 1900.
- 1.2.2. Pictures : - NB These pictures are not exhaustive in showing the full catalogue of damage defects to the property.
- (a) Badly damaged/dilapidated parts of internal wall



(b) Close-up of category 3 cracks of wall above mentioned in Pic (a)



- (c) A typical example of vertical cracks observed of the internal fabric of external/internal walls



1.3. Documents Provided

- 1.3.1. (a) Architectural building control plans prepared by De Architectural Consult Ltd {BC-102GL nos 01 to 06}
- 1.3.2. (b) A set of structural calculations

2. Site

2.1. Local Geology

- 2.1.1. We have examined the local geological drift sheets from the British Geographical Survey and an extract is noted below. It can be seen that the site is underlain by London Clay Formation -clay silt and sand bedrock, which originated from sedimentary marine rocks deposits.
- 2.1.2. Also, investigative records show that the property lies in a location of Southeast London underlain by heavily shrinkable clay soil. Moreso the geology of this area makes properties in this region highly susceptible to subsidence due to moisture changes.

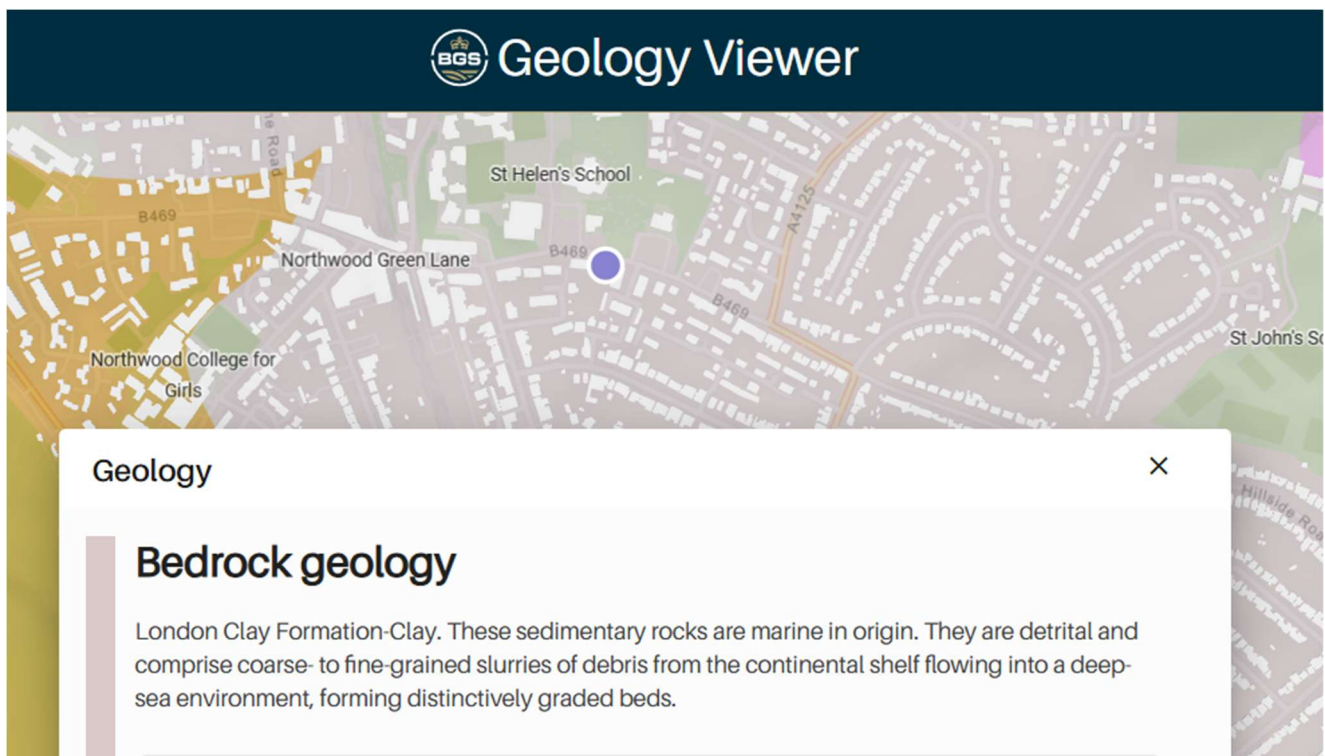


Figure 1 Extract From the British Geographical Survey



3. Main Property Observations

3.1. External Observations

3.2. Front Elevation

Traces of horizontal cracks below 1st floor windows – though these have been covered up with render.

3.2.1. Front Roof

3.2.1.1. No issues

3.2.2. Chimneys and Parapets

3.2.2.1. No issues

3.3. Rear Elevation

3.3.1. Rear Roof

3.3.1.1. No significant issues.

3.3.2. Rear Elevation

3.3.2.1. No significant issues.

3.4. Flank Walls

3.4.1.1 Left Side Wall {Ground floor}

This wall had been seriously dilapidated and damaged. The cracks on this wall were multiple and of category 3 "**SERIOUS**" according to BRE 251 (table shown below). The fact that these cracks were multiple and the seriousness of any such crack compromises the structural integrity of the building structure.

Moreover the damage was observed to be consistent with cracks generated by subsidence.

3.4.1.2 Right Side Wall {1st floor}

Equally, this wall had been seriously dilapidated and damaged. Moreover, cracks on this wall were considered to be similarly "**SERIOUS**".

3.5. Internal Observations

- 3.5.1.1. Internal Walls, especially close to the right frontal building area and right flank wall of the first floor were observed to have a general pattern of multiple cracking, broken down, and or partially damaged.
- 3.5.1.2. Multiple vertical cracks on the interior parts of the outside/external wall were observed. These cracks could potentially have resulted from one or more of a combination of the following problems:- (a) Structural movement and or subsidence, (b) Foundation settlement, or (c) Thermal expansion or contraction of the building materials.

4. Conclusions and Recommendations

4.1. Conclusion

- 4.1.1. The cracks in this building are multiple and grossly seen to lie across the building fibre of the areas mentioned above.
- 4.1.2. Though there was no records of a site-specific Soil Investigation S.I. available to us at the time of report, but from the investigation(s) mentioned above, the soil sub-structure underlying this building is considered to be London Clay of high shrinkability and prone to subsidence and ground movements.
- 4.1.3. Cracking is never wanted and perception of the scale of damage can be subjective. To provide a more subject view the Institute of Structural Engineers has provided guidance on the level of cracking and an objective approach.

Category	crack width	Definitions of cracks and repair types/considerations
0	<0.1mm	HAIRLINE – Generally considered to have negligible structural implications, and can be expected to occur in almost all buildings at any location. They are not generally related to subsidence/foundation movement
		Internally , cracks can be filled or covered by wall covering, and redecorated. Externally , cracks rarely visible and remedial works rarely justified.
1	0.1mm to 1mm	FINE – These cracks may occasionally have some structural significance, but are not usually deemed serious. Often these cracks are more visible inside buildings than in external brickwork . Would generally be located at points of structural weakness, e.g., window/door openings. Indicates slight foundation movement, particularly if isolated. An array/ series or large number of closely located fine cracks is unusual, but could signify more substantial foundation movement
		Internally , cracks can be filled or covered by wall covering, and redecorated. Externally , cracks may be visible, sometimes repairs required for weather tightness or aesthetics. Note: Plaster cracks may reappear if not covered by a wall covering.
2	1mm to 5mm	MODERATE – These cracks are likely to have some structural significance and will almost always occur at points of weakness or hinge points. Generally cracks will be visible internally and externally and will indicate foundation or other structural movement sufficient to distort door and window frames and make doors and windows stick. Weather tightness could be an issue that needs to be investigated as could the structural integrity of the building.

		Internal cracks are likely to need raking out and repairing to a recognised specification. May need to be chopped back, and repaired with expanded metal/ plaster, then redecorated. The crack will inevitably become visible again in time if these measures are not carried out. External cracks will require raking out and repointing. Cracked bricks may require replacement.
3	5mm to 15mm	SERIOUS – There will almost certainly be some compromise of the integrity of the structure and weather tightness may be impaired. Serious distortion to door and window frames may occur, and glass fracturing is possible, as are service fractures and strains.

Table 1 Extract from The Institution of Structural Engineers "Subsidence of Low-Rise Buildings"

4.1.4. The Table Above shows the Classification of visible damage to walls with particular reference to type of severity consideration. It is this table that insurers and other professionals should use to guide their opinion on mitigation, which include works to be carried out to address long term damage.

4.1.5. It can be seen from the whole building integrity, that the cracks in the areas recorded are structural.

4.1.6. From the pattern of cracking we believe that the building has major defects proportional to its age. **Therefore, we believe that ongoing movement nor subsidence is a concern.**

4.1.6.1. Our conclusion that the cracking is extensive and progressive is supported by the fact that:

- Cracks are multiple and numerous cracking is greater than level 2, therefore considered **SERIOUS**.
- Many internal walls in the area concerned are broken/damaged.
- Building has suffered damage due to subsidence e.g Large parts of the ground floor (left side wall).

4.2. Recommendations

CB Engineers recommendation the for property based on extracts from Institution of Structural Engineers "Subsidence of Low-Rise Buildings" Classification

Category of Damage	Approximate crack width (mm)	Description of typical damage Ease of repair in <i>italic type</i>
3	5mm to 15mm (or a number of cracks up to 3)	Breaking/down demolition of walls the mentioned -above badly affected walls, due to the afore-mentioned
	>10mm	Underpinning and foundation strengthening to be considered for other parts of the building not demolished to avoid further movements due to subsidence.



4.2.1 Further Investigation

Further investigations are recommended and required to establish full extent of underpinning, major and minor repair works to the remaining parts of the building. This is to ensure the adequacy of structural integrity of the building works as well as end use of the building to sustain its design life.